Nigeria's Bilateral Trade in Goods and Services with Selected International Trading Partners

Chuks K. Okogor[1] Christopher O. Orubu[2] Chigoziem T. Ezi[3]

1 Department of Economics, Faculty of Social Sciences, Delta State University, Abraka, Nigeria
2 Department of Economics, Faculty of Social Sciences, Delta State University, Abraka, Nigeria
3 Department of Economics, Faculty of Social Sciences, Delta State University, Abraka, Nigeria

DOI: https://doi.org/10.56293/IJMSSSR.2022.4711

IJMSSSR 2023
VOLUME 5
ISSUE 5 SEPTEMBER – OCTOBER **ISSN: 2582 - 0265**

Abstract: Over the period, Nigeria's major export commodities are agricultural goods, solid minerals, energy goods manufactured goods, crude oil and other oil products of which petroleum crude accounted for about 79% of total export while imports consisted of refined petroleum, raw materials, cars, agricultural goods, energy goods and other manufacture products. Using the augmented gravity model approach, this study analysed Nigeria's bilateral trade in goods and services with selected international partners namely Belgium, China, France, India, Italy, Netherlands, South Africa, Spain, United Kingdom, and United States for the period 1995–2020. This study estimated the pooled ordinary least square and the fixed effect estimation in a balanced panel model. It was found that trade flow in Nigeria is positively and significantly determined by gross domestic product, population, and common colony in both models. The result further showed that distance negatively and significantly affects trade flow in Nigeria while relative price was positive and significant in the pooled effect model and negatively significant in the fixed effect model. Common language was positively significant in the pooled effect model but was statistically insignificant in the fixed effect model. Lastly, real effective exchange rate was not statistically significant in explaining bilateral trade flow in Nigeria within the study period in both models. Based on the results and the implications it holds, the study recommends amongst others, that policies aimed at diversifying the economy away from oil towards a technological, service and export driven economy should be earnestly pursued. This study further concludes that policy actions and human capital development programmes are therefore required to convert the teeming population into active and effective labour force which will in turn improve the gross domestic product and consequently improve trade flow.

Keywords: Trade Flow, Bilateral Trade, Exchange Rate Volatility, Gravity Model and Economic Size

JEL Classification: F10, F13, F14

1. Introduction

International trade is the exchange of capital, goods, services, and investment across territories and international borders, which can be in the form of imports or exports. Given the diversities in a country's resource endowment, international trade ensures specialization in the production of goods in cheap and efficient ways so that a country can export goods in which it has a comparative advantage and otherwise import them. Trade flows on the international frontier have tremendously increased in the past decades. Most economies with longer periods of trade are usually tied to trade agreements in order to achieve significant economic growth. According to Feenstra (1998), the causes driving the large expansion in trade flow include lower transportation costs, trade liberalization, economic convergence across nations, and an increase in the trading of intermediary goods. Adekunle and Gitau (2013) observed that the increase in local manufacturing, management of the exchange rate, and well-defined economic programmess improve trade flows. Sidamor (2013) opined that exchange rates and foreign investments are responsible for the growth of trade flows. Eisenman (2012) held that a country's natural resources and the rapid growth of its economy determine trade flows and subsequent growth. Kuncic (2012) argued that countries with similar economic conditions tend to have more trade flows.

It is pertinent to note that trade between two or more countries can only be conducted if the factors that necessitate trade flows across national frontiers are reconciled within, between, or the among countries. According to the classical gravity model by Tinbergen (1962) and Poyhonen (1963), international trade flow is necessitated by economic size and distance. Other factors are population, performance of stock markets, inflation, exchange rate, international involvement in international trade relations such as the Economic Community of West African States (ECOWAS), World Trade Organisation (WTO), the African Union (AU), political stability, product category, cultural similarity, colonial past, FDI, R&D, and other similar factors. Consequently, the importance of international trade flow stems from the continual globalization of the world market, the inability of nations to rely completely on the goods produced locally, the need for business firms to widen their market share across national frontiers, the consumption of high-quality standard goods, and the exposure to new and better technology and innovation. In as much as international trade flow is pertinent for any nation to achieve development, this does not mean that there are no barriers that militate against the free flow and functioning of such flows. Mostly, language, political instability, different currencies, time factors, etc. are responsible for such impediments in the international trade flow business. For instance, a volatile exchange rate or interest rate, rising inflation, and government restrictions may affect the stability of international transactions. Hence, the Nigerian economy has to pay attention to these factors that affect the free flow of trade across her national boundary.

Trade is a crucial instrument for industrialization and sustainable economic development, and despite Nigeria's long history of international trade, it is important to emphasize that its participation and contribution to world trade are still very low. Osuegbu (2013) noted that Nigeria, as a country, has not been able to fully utilize the potentials of global trade for high productivity and rapid economic transformation. While neglecting trade volumes, traditional trade theories focus primarily on defining the items that a country trades. There have been significant efforts made to comprehend the nature and scope of countries' exports and imports (see, for example, Warner and Kreinin 1983). But why does one country trade with another country more than with other countries? What variables impact the volume of international trade? Are the same forces that account for bilateral trade in raw materials also responsible for trade in manufactured goods? In studies on international trade, these issues have received less consideration.

Understanding the factors determining the bilateral trade volumes of a country or a region widens the horizons of a country or region's trade policies. The gravity flow model helps to understand the factors that determine a country's bilateral trade volumes from an empirical point of view (Alleyne and Lorde 2014; Akpoilih and Farayibi 2015; Oladipupo & Adedoyin 2019). Various gravity analyses are performed to evaluate different trade policy issues, such as the effects of the openness of an economy or protectionist policies and the merits of proposed regional trade arrangements. Although substantial empirical work on bilateral trade flows has been done in developed countries (Sokchea, 2006; Chen et al., 2007; Bonuedi, 2013; Garcia et al., 2013), there is very little work in this area in Africa and Nigeria specifically. Thus, it is against this background that this study employs the augmented gravity model to analyse factors affecting Nigeria's total bilateral trade flows with key international trading partners. In this study, we will attempt to establish if a significant relationship exists between exchange rate volatility, economic size, geographical distance, population, relative price, common language, colonial affiliation, and Nigeria's trade flows with her major trading partner.

2. Review of Related Literature

2.1 The Goal of International Trade

According to Gonnelli (1993), the goal of international trade is to acquire goods and services that are either superior in quality, more affordable, or just different from those produced domestically. Foreign trade and trade policies have historically attracted the attention of decision-makers, policymakers, and analysts due to their economic, social, and political significance. Throughout much of history, it has also been the center of attention for relevant international issues. It appears that a number of developing nations, most notably the newly industrializing East Asian (Tiger) nations, have been able to strategically harness trade's fundamental drivers to accelerate growth and development over very short periods of time. As noted by Frankel and Romer (1999), foreign trade has been regarded as a tool and a driver of economic growth. The reason for this is that trade encourages the efficient development of goods and services by distributing resources to nations with a comparative advantage in production.

Additionally, its effects on an economy go beyond just quantitative growth; they also influence the economy's structure and make it easier for money to move internationally. Foreign trade is based on the idea that different countries have different resource endowments, tastes, technological capabilities, levels of production, and capacities for growth and development. A further benefit of such trade may be the promotion of greater information diffusion, which will improve the productivity of inputs and the quality of produced goods, both of which will contribute to economic growth. Any of these scenarios allows us to refer to international trade as a growth engine (Hogendorn, 1996; Cypher and Dietz, 1997). Trade must result in a continual improvement in people's conditions by broadening people's options in order to serve as a growth-promoting tool, a concept that the idea of human development aims to express (Oviemuno, 2007).

2.2 Nigeria in World Trade

The volume of international trade between countries has expanded dramatically over the past few decades. Specifically, Nigeria has seen a substantial increase in the amount and value of trade with other nations. According to the Economic Complexity Index (ECI, 2021) foreign trade statistics, Nigeria's economy is the 30th largest in the world in terms of GDP ($440.83 billion in current US dollars), the 52nd economy in terms of total exports ($57.7 billion), the 50th in terms of total imports ($61.6 billion), and the 126th most complex economy. An enlarged study of the trade's constituent parts from figure 2.1, reveals that Nigeria shipped the majority of its goods to India ($9.07 billion), Spain ($6.78 billion), the United States ($3.69 billion), France ($3.32 billion), and China ($3.05 billion). Nigeria's biggest exports include crude petroleum ($41.8 billion), petroleum gas ($8.52 billion), special-purpose ships ($1.25 billion), cocoa beans ($779 million), and refined petroleum ($667 million); see figure 2.2

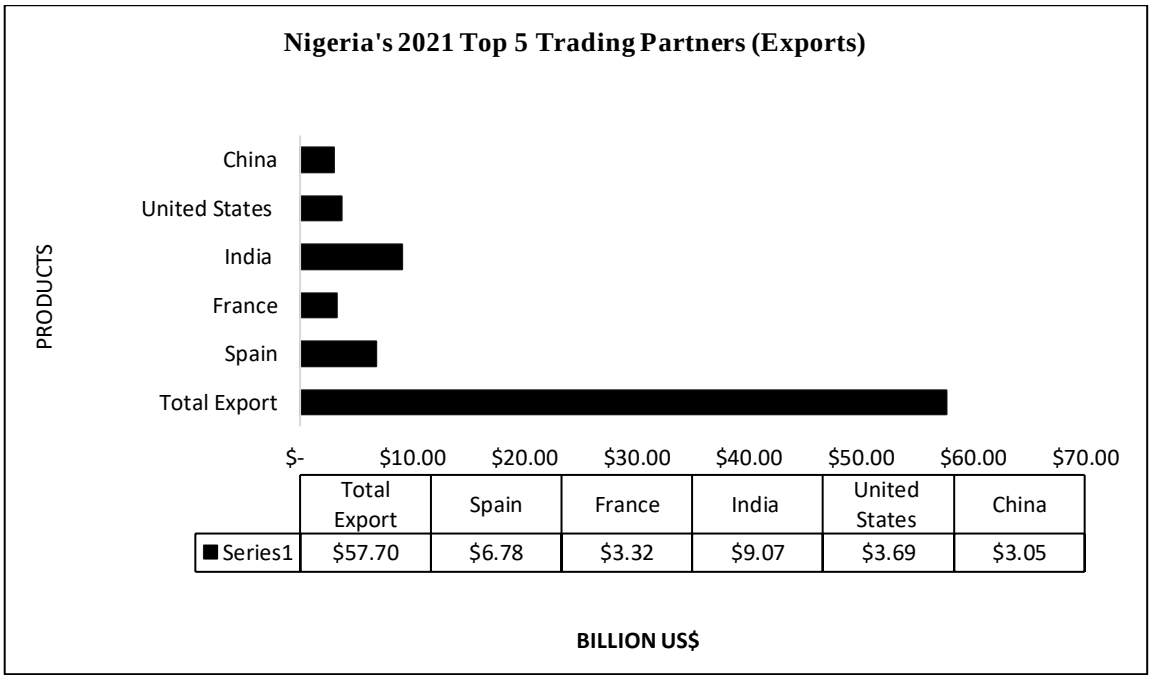


Figure 2.1: Nigeria's 2021 Top 5 Trade Partners (Export)
Source: Economic Complexity Index (ECI) Data

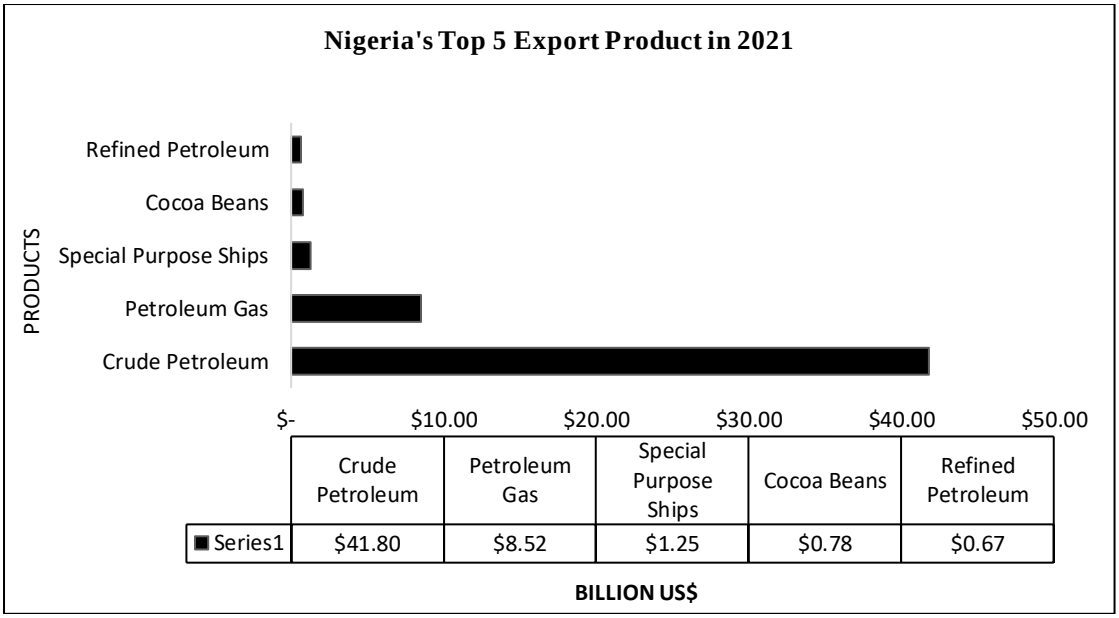


Figure 2.2: Nigeria's 2021 Top 5 Export Product
Source: Economic Complexity Index (ECI)

According to the Economic Complexity Index, Nigeria's total import value was $61.6 billion, ranking it as the world's 50th-largest trading destination on the other hand. Figure 2.3 shows that Nigeria imported the most goods during the reported year from China ($21.9 billion), India ($4.75 billion), the Netherlands ($4.58 billion), the United States ($4.42 billion), and Belgium ($2.34 billion). The top five import products into Nigeria are refined petroleum ($11.3 billion), wheat ($3.32 billion), cars ($2.42 billion), packaged drugs ($972 million), and broadcasting equipment ($734 million); see figure 2.4. In 2021, Nigeria was the world's biggest importer of synthetic filament tow ($110 million) and equine and bovine hides ($56.8 million).

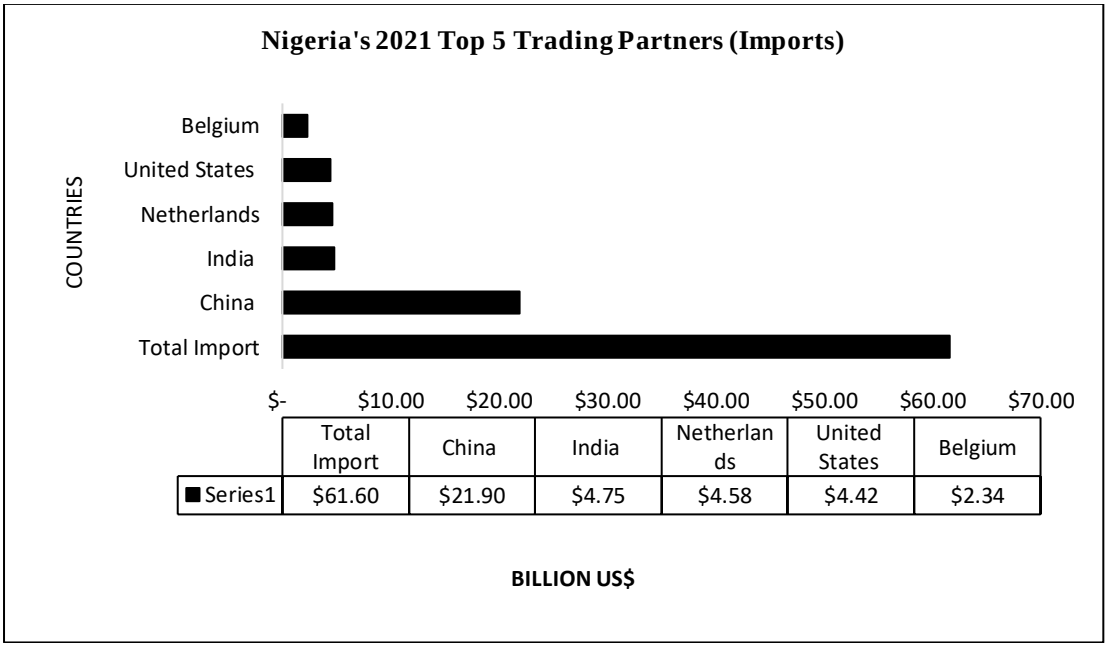


Figure 2.3: Nigeria's 2021 Top 5 Trade Partners (Import)
Source: Economic Complexity Index (ECI) Data

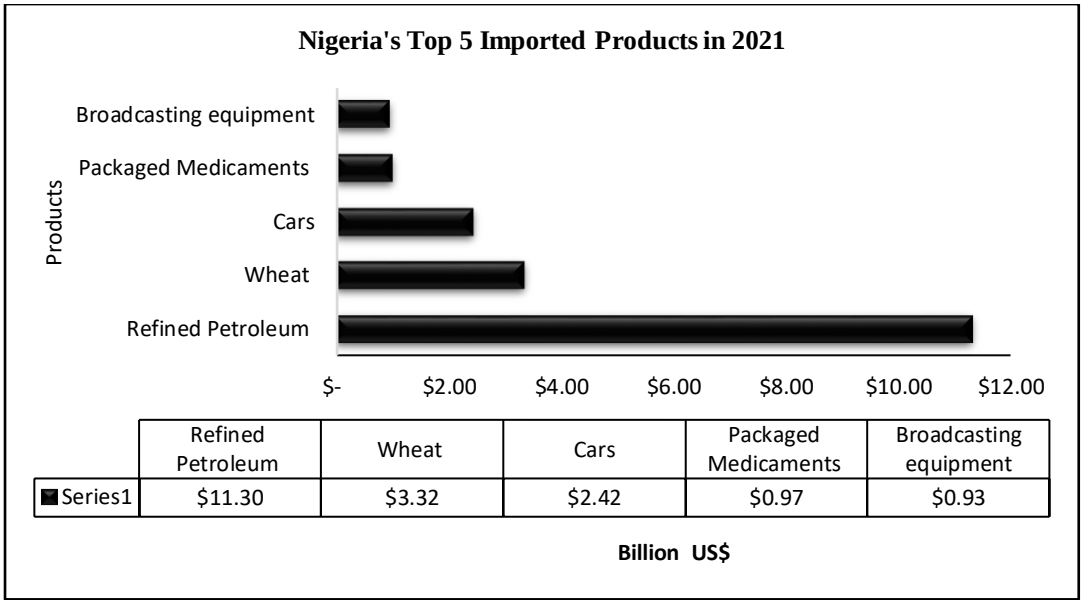


Figure 2.4: Nigeria's 2021 Top 5 Import Product
Source: Economic Complexity Index (ECI) Data

2.3 Nigeria's key Trading Partners

A further analysis of Nigeria's trade data from the Economic Complexity Index (ECI) as shown in Table 2.1 for the years 2017 to 2021 shows that India was the country that imported the most goods from Nigeria during that time. Nigeria's total exports to India were 15.50% in 2017 and 15.70% in 2021. This shows a 0.02% increase in Nigeria's exports to India for the five-year period and a 1.1% increase from the preceding year. The second-ranked export market for Nigeria during the period was Spain; exports to Spain rose from 10.30% in 2017 to 11.6% in 2021, improving Nigeria's exports to Spain by 1.30% within the period. However, exports to the United States of America fell from 15.5% in 2017 to 6.4% in 2021, indicating a fall in exports of 9.1% within the period under review. Nigeria's exports to France improved marginally by 0.5%, while exports to China increased by 2.07% within the same period.

Table 2.1: Nigeria's 2021 Top-5 Export Destination as Percentage of Total Export

	% Share of Total Export				
Partner Name	**2017**	**2018**	**2019**	**2020**	**2021**
India	15.50	15.90	16.30	14.60	15.70
Spain	10.30	9.64	9.87	11.10	11.60
United States	15.50	9.08	7.30	3.92	6.40
France	5.25	6.36	6.83	4.58	5.75
China	3.21	2.92	4.02	5.94	5.28

Source: Economic Complexity Index (ECI) Data

From Table 2.2, Nigeria's imports in 2021 were made up primarily of goods from China (25.50%), India (7.70%), the United States (7.44%), the Netherlands (7.17%), and Belgium (3.79%). However, Nigeria's imports from China declined by 5.60% between 2017 and 21, going from 31.10% in 2017 to 34.10% in 2020 and 25.5% in 2021. Nigeria's import from India increased by 2.23% while imports from the United States, the Netherlands and Belgium increase by 0.07%, 0.67% and 0.87% respectively.

Table 2.2: Nigeria's 2021 Top 5 Import Destination as Percentage of Total Import

	% Share of Total Import				
Partner Name	**2017**	**2018**	**2019**	**2020**	**2021**
China	31.10	28.80	30.90	34.10	25.50
India	5.47	5.91	7.34	6.58	7.70
United States	7.37	10.40	11.40	8.74	7.44
Netherlands	6.50	5.52	6.19	8.54	7.17
Belgium	2.92	2.56	2.09	3.78	3.79

Source: World Integrated Trade Solution (WITS) Data

Trade has remained a vital component of Nigeria's gross domestic product (GDP), as the contribution of external trade to Nigeria's gross domestic product (GDP) for the period 2017–2019 averaged 26.48%. A careful examination of the data for the period as shown in figure 2.5 indicates, that the yearly contribution of trade to GDP for the five-year period (2017–2021) has shown significant improvement, rising from 26.35% in 2017 to 34.02% in 2019. However, its contribution to GDP declined by 16.40% in 2020, most probably as a result of the COVID-19 pandemic that brought about a global lockdown of all economies with a consequential effect on trade as a result of trade restrictions. In 2021, the contribution of trade to Nigeria's GDP improved by 6.2%, indicating that Nigeria's economy was on the path to recovery.

According to the World Integrated Trade Solution (WITS, 2021), the components of Nigeria's imports and exports by product category show that the country's imports are heavily dominated by consumer goods, which accounted for 36.0% in 2015, a slight increase to 42.10% in 2016, and a further decline to 41.37% in 2018. The second-largest category of imports into Nigeria during that time was capital goods, which increased from 28.73% in 2015 to 32.81% in 2018 before taking the top spot in 2019 and accounting for 39.59% of all imports. Machines and electrical equipment accounted for an average of 22.6% of the third-most imported product category over the time frame. Similarly, the least exported product category was hides and skins, which contributed an average of 0.11% to overall exports. The largest export from Nigeria continues to be fuel, which contributed 87.87% in 2015, 93.03% in 2017, and then 87.04% in 2019.

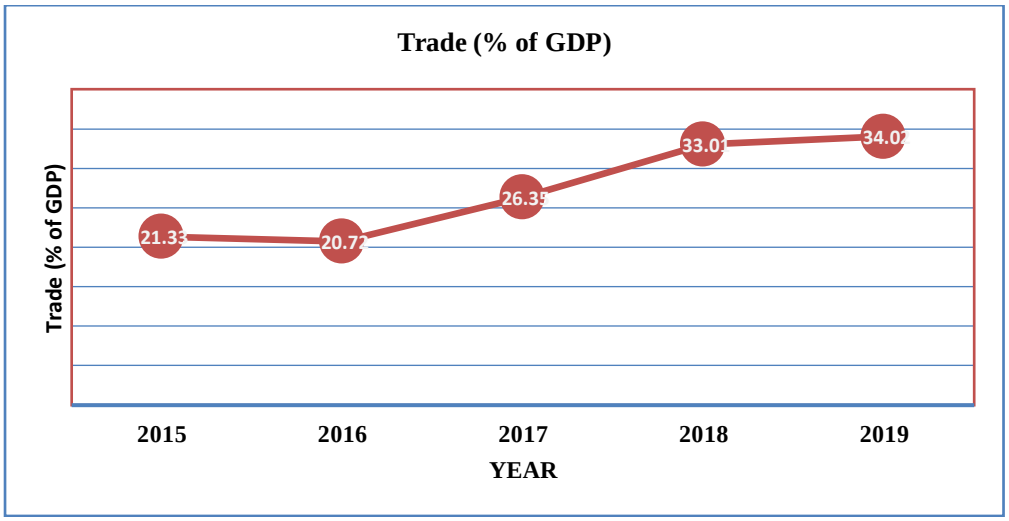
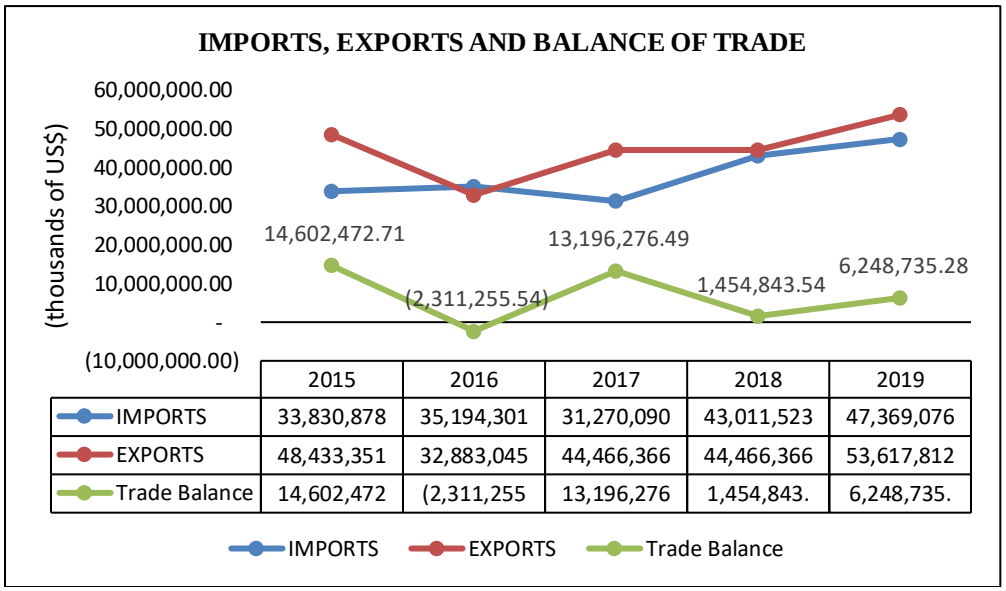


Figure 2.5: Nigeria's External Trade as Percentage of GDP
Source: World Integrated Trade Solution (WITS) Data

An advantageous trade balance has recently existed in Nigeria. However, from 2015 to 2019, this trade balance has fluctuated significantly (see figure 2.6). The trade balance was $14,602,472 (in US dollars) in 2015, for example. A trade balance that was in the red for $2,311,255 in 2016 closely followed this. A $13,196,276 increase in the trade

balance was seen in 2017. Due to the persistent requests for increased trade liberalization to promote economic growth around the world, these up and down swings in the trade balance will likely continue in the long run.



	2015	2016	2017	2018	2019
IMPORTS	33,830,878	35,194,301	31,270,090	43,011,523	47,369,076
EXPORTS	48,433,351	32,883,045	44,466,366	44,466,366	53,617,812
Trade Balance	14,602,472	(2,311,255	13,196,276	1,454,843.	6,248,735.

Figure 2.6: Imports, Exports and Balance of Trade (2015 – 2019)
Source: World Integrated Trade Solution (WITS) Data

2.4 Theoretical Framework

In order to analyse the determinants of bilateral trade flows between Nigeria and key international trading partners, this study adopted the gravity model of international trade. The gravity model of international trade states that the volume of trade between two countries is proportional to their respective GNPs and inversely related to distance between them

$$T_{AB} = \delta \frac{Y_A^{\beta 1} Y_B^{\beta 2}}{D_{AB}^{\theta}} \qquad (2.1)$$

where T_{AB} is the volume of international trade between the two nations, δ is a constant, D denotes their distance from one another, and $Y_{A(B)}$ is the economic stature of the nation being evaluated. In studies like Anderson (1979), Deardorff (1995), Anderson and Van Wincoop (2003), and Krugman, Obstfeld, and Melitz (2012), the theoretical underpinnings of the gravity model have been examined. These studies demonstrated how the gravity model might be derived from several theories of global trade. The gravity model's theoretical underpinnings were further established by Helpman (1985) and Bergstrad (1989) in their research by demonstrating how its equation may be derived from various international trade models.

The gravity model is notable for taking into account factors that affect supply and demand, such as GDP and population, as well as trade resistance factors, such as geographic distance and trade policies, and trade preference factors, such as preferential trade agreements, common borders, political blocs, and common languages, to explain bilateral trade flows between nations (Luca and Vicarelli, 2004; Bacchetta et al., 2012). This model continues to be useful in research on global trade.

In terms of its ability to adequately account for most differences in the observed trade patterns, the gravity model has likewise proven empirically successful. It also benefits from being based on theories of global trade, such as those based on variations in technological or factor endowments between countries, as well as models of increasing returns to scale and monopolistic competition. In fact, the gravity model approach offers a clear framework for analyzing international trade trends, including trade within developing economies. This model is generally accepted in applied research on international trade since it considers both trade and non-trade policy

issues, as well as trade preference considerations (Luca and Vicarelli, 2004). Given the preceding, it is reasonable to draw the conclusion that, in addition to its success in empirical studies on bilateral trade flows, the gravity model has found a theoretical foundation in theories of international trade, which serves as the basis for its application in this study.

3.1 Model Specification and Estimation

We used the methodologies proposed by Batra (2006), Sharma (2000), Panda and Sethi (2015), and Bonuedi (2013) in the estimation of the augmented gravity model. GDP, population, and distance have been utilized as independent variables since the gravity model's dependent variable is bilateral trade (the total of exports and imports) between countries. Additional independent variables were also included in our model in order to account for additional control and dummy variables that could have an impact on trading. Hence, the augmented gravity model:

$$lnTrade_{ij} = \alpha_0 + \alpha_1 lnGDP_{it} + \alpha_2 lnGDP_{jt} + \alpha_3 lnX_{ij} + d_{ij} - \alpha_4 lnD_{ij} + \varepsilon_{ij} \quad (3.1)$$

Since our focus in this study is on exchange rate volatility and bilateral trade performance of Nigeria, equation 3.3 above will be augmented further:

$$lnTrade_{ij} = \alpha_0 + \alpha_1 lnGDP_{ijt} + \alpha_2 lnPOP_{ijt} + \alpha_3 lnEXVOL + \alpha_4 lnREEXR + \alpha_5 COMLANGij + \alpha_6 COMCOLij - \alpha_7 lnDIST_{ij} - \beta_8 lnREL\_PRICE + \varepsilon_{ij} \quad (3.4)$$

where,

α_0	=	the general intercept
$\alpha_1 - \alpha_8$ =	all coefficients,	
i and j	=	Nigeria and its trading partner respectively
t	=	time or the year,
ln	=	Natural log
$Trade_{ij}$	=	Bilateral total trade between Nigeria and the trading partner at time t
GDP_{ijt}	=	The product of Nigeria's GDP and trading partner at time t,
$Dist_{ij}$	=	Distance between country i and j,
POP_{ijt}	=	Population of country i at time t,
Reexr	=	Real effective exchange rate of country i at time t,
$Comlan_{ij}$	=	Common official language (dummy variable) and
$Comcol_{ij}$	=	Common colony (dummy variable),
Rel_price	=	Relative Price

It is well known that a variety of theoretical models can be used to support the gravity equations. Various researchers have used this attribute to do a gravity analysis in order to conduct empirical studies on correlations between global trade and the relevant variables. According to recent exchange volatility research, the gravity equation in this study was estimated using panel data analysis, pooled ordinary least squares (OLS), as well as a fixed/random effects estimator or random effects estimator depending on the Hausman specification tests to obtain a robust result and overcome obvious statistical challenges. Fixed effects models are utilized if the P-value (Prob > chi2) is significant and less than 0.05. The random effects model will be the most effective model if the P-value is higher than 0.05. The dummy and distance variables must be eliminated since the fixed effects model has trouble estimating variables that do not change over time because intrinsic transformation combs out such variables. As a result, this study used a second-stage regression and followed earlier studies like Martinez-Zarzoso (2003), Eita (2008), and Elshehawy, Shen and Ahmed (2014). Individual effects or fixed effects were utilized as the dependent variables in this regression, and dropped dummy variables were used as the independent variables. The following will be the estimated equation for the second-stage regression:

$$IE = \alpha + \beta_1 lnDist_{ij} + \beta_2 COMLANGij + \beta_3 COMCOLij + \uparrow \varepsilon_4 \quad (3.2)$$

Different studies have used different types of variables to predict exchange rate volatility. Following Havi's (2019) research, this study uses a commonly used indicator, real exchange rate volatility, which will be obtained by using

returns on the real monthly exchange rate to estimate the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model that Bollerslev (1986) originally proposed. Peride (2003) came to the conclusion that using GARCH modeling to estimate the proxy for exchange rate volatility produced a more statistically significant result in his study that examined the analysis of panel data for international trade. In order to estimate the volatility of the exchange rate, this study used the GARCH (1,1) model, which is denoted by:

$$\sigma_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2 + \alpha_2 \sigma_{t-1}^2 \quad (3.3)$$

Equation 3.3 says that the conditional variance of u at time t depends not only on the squared error term but also on its conditional variance in the previous period [as in ARCH (1)]. This model can be generalised to a GARCH (p, q) in which there are p lagged terms of squared error terms and q terms of the lagged conditional variance.

3.2 Nature, Description and Sources of Data

This study used a secondary panel dataset of annual observations on a sample of 10 trading partners of Nigeria for a period of 26 years in order to accomplish its research goals (1995–2020). Secondary data on Nigeria's trading partners was collected annually, and the countries included were: Belgium, China, France, India, Italy, the Netherlands, South Africa, Spain, the United Kingdom, and the United States.

Table 3.1: Description of variables and Expected Sign

S/N	Variables	Source	Measurement	
1	Trade Flow	IMF, Directory of Trade Statistics	The total of bilateral exports and imports is known as the trade flow.	
2	Gross Domestic Product	World Bank, World Development Indicators (WDI) online database.	This is the market value, expressed in real 2010 U.S. dollars, of all goods and services produced in a nation.	Positive Sign
3	Population	The UN Population Division, World Population Prospects, 2017 via the World Bank, World Development Indicators online database.	The de facto definition of total population given by the United Nations Population Division is the sum of all people residing in a nation, regardless of citizenship or legal status. This does not apply to refugees who have not established themselves permanently in the nation offering them refuge; as a result, they are regarded as belonging to their country of origin.	Positive Sign
4	Real Effective Exchange Rate	Data on real effective exchange rates were obtained from the Bruegel online database.	The real effective exchange rate (REEXR), which measures a country's currency to a basket of its trading partners, measures how the real value of that country's currency is changing. This variable is frequently used in theoretical and applied economic research as well as policy analysis to evaluate the equilibrium value of a currency, changes in price or cost competitiveness, the factors that influence trade flows, or the incentives for reallocating production between tradable and non-tradable sectors.	Positive or Negative

5	Exchange Rate Volatility	We obtained the exchange rate volatility using the GARCH (1,1)	A measure of exchange rate volatility is the amount or frequency of variations in the price of foreign exchange over time.	Positive or Negative
6	Common Language	Thierry Mayer and Zignago CEPII's GeoDist database	Common Language (COL) measures the cost of information, which is anticipated to support an increase in trade volume. It takes the value 1 if a common language is spoken by at least 9% of the population in both nations I and j. Otherwise, the indicator variable has a value of zero.	Positive Sign
7	Bilateral Distance	Thierry Mayer and Zignago CEPII's GeoDist database	This is the geographical distance between the economic centre (capital city) of Nigeria and its trading partners, measured in Kilometres. This variable serves as a stand-in for the transportation, time, and cultural expenses of bilateral trade. Transaction costs are expected to be higher the further apart two nations are in terms of trade.	Negative Sign
8	Relative Price	World Bank, World Development Indicators (WDI) online database	The consumer price index (CPI) was used as a proxy for the relative price. This is derived by dividing the CPI of Nigeria by the CPI of the partner country. The Consumer price index reflects changes in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly.	Negative Sign

Source: *Author's Compilation*

4.0 Presentation of Result

4.1.1: Descriptive Statistics

The result of the descriptive statistics is presented in Table 4.1. These statistics will help us determine if the sample is normally distributed or if there are outliers in the data. It will also aid us in describing the essential characteristics of the study data. Some of the characteristics we shall consider from this result include the mean, median, standard deviation, minimum, and maximum values of our variables. The kurtosis and skewness will also be considered in order to ascertain the variability or normality of our variables.

Table 4.1: Descriptive Statistics

	LNTRADEIJ	LNGDPIJT	LNPOPIJT	LNDISTIJ	LNREEXR	LNEXVOL	LNREL_PRICE
Mean	7.831812	742.549	338.1435	8.593674	5.215878	-4.674464	0.944667
Median	7.902927	739.0475	336.7361	8.455336	4.611737	-4.646292	0.952125
Maximum	10.5731	825.0987	403.1978	9.302051	18.89099	-4.644529	1.214421
Minimum	2.685176	669.2004	-5.274024	8.199613	4.236637	-5.253287	0.645163
Std. Dev.	1.251186	35.22453	56.19463	0.35876	2.761192	0.11702	0.145271
Skewness	-0.57159	0.358318	-4.171611	0.819629	2834.685	-4.67348	-0.132814
Kurtosis	4.371086	2.73028	26.7715	2.256781	23.32317	23.20533	2.054798
Jarque-Bera	34.52298	6.351764	6875.848	35.09504	5425.753	5369.228	10.44295
Probability	0.000000	0.041757	0.000000	0.000000	0.000000	0.000000	0.005399
Sum	2036.271	193062.8	87917.31	2234.355	1356.128	-1215.361	245.6134
Sum Sq. Dev	405.4559	321358.7	817879.7	33.54329	1974.663	3.546680	5.465869

Observations	260	260	260	260	260	260	260

Source: Author's computation (using Eviews)

The descriptive statistics show that the mean value for trade flows in Nigeria during the study period was 7.83, while the mean value for gross domestic product (GDP) was 742.549, or about 94.8 times the mean value of trade flows. Considering the standard deviation (SD), which measures the level of variation or degree of dispersion of the variables from their mean, the actual deviation of the data from their means is relatively small as all the standard deviations are visibly low. The standard deviations further indicate that among the variables, lnGDPijt and lnPOPijt, with values of 35.22 and 56.19, deviated more from their true mean when compared to other variables, while the variable with the least variability is the exchange rate volatility (0.11). In consideration of the skewness and kurtosis, the variables for Nigeria's GDP (GDPit) and partner country's populations (POPjt) mirror a normal skewness and were found to be platykurtic (flattened curve), indicating that there are more lower values below the sample mean. All other variables were leptokurtic, which suggests that they have a positive kurtosis (peaked curve), indicating that there are more high values than the sample mean. From the Jarque-Bera statistics with the corresponding probabilities, all the variables are not normally distributed. However, from the unit root test which showed that the variables were either stationary at level or first difference, the multivariate time series technique was used.

4.1.2 Scatter Plot

To understand and give a clue to the link between bilateral trade flows and its critical variables derived from the gravity model (i.e., GDP and distance), this study utilised scatter plot pre-estimation diagnostics, which is a non-parametric approach to understanding and identifying correlational relationships between variables. Figure 4.1 shows the relationship between trade flow and the GDP of trading partners, while Figure 4.2 is a plot showing the relationship between total trade flow and distance between Nigeria's capital city and the capital city of Nigeria's trading partner.

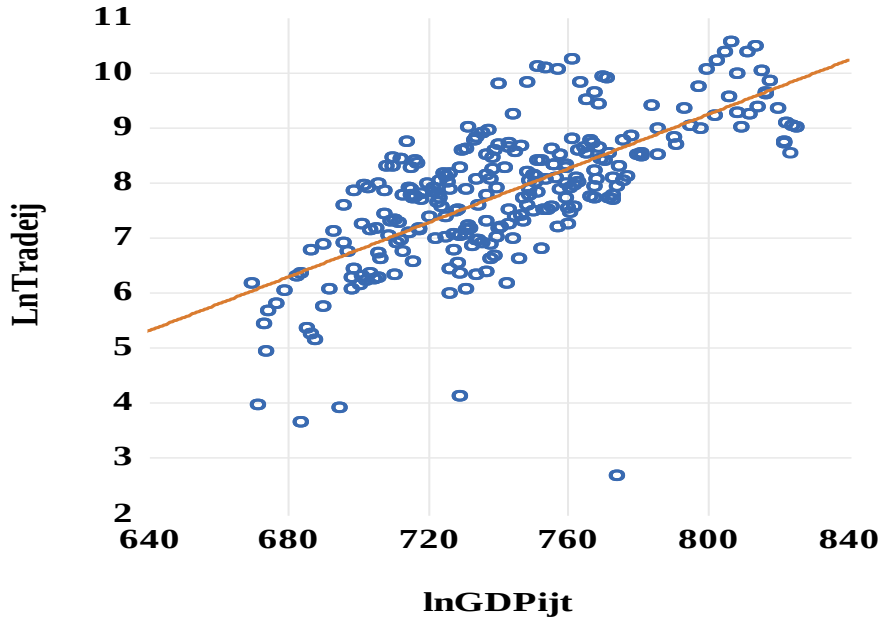


Figure 4.1: Graph of Trade flows and GDP of trading partners
Source: Author's computation (using Eviews)

The result of the scatter plot presented in Figure 4.1 predicts that a positive relationship exists between trade flows and the gross domestic product of Nigeria's trading partner. This is in conformity with the prediction of the gravity model that trade flows are directly related to the economic size of trading countries.

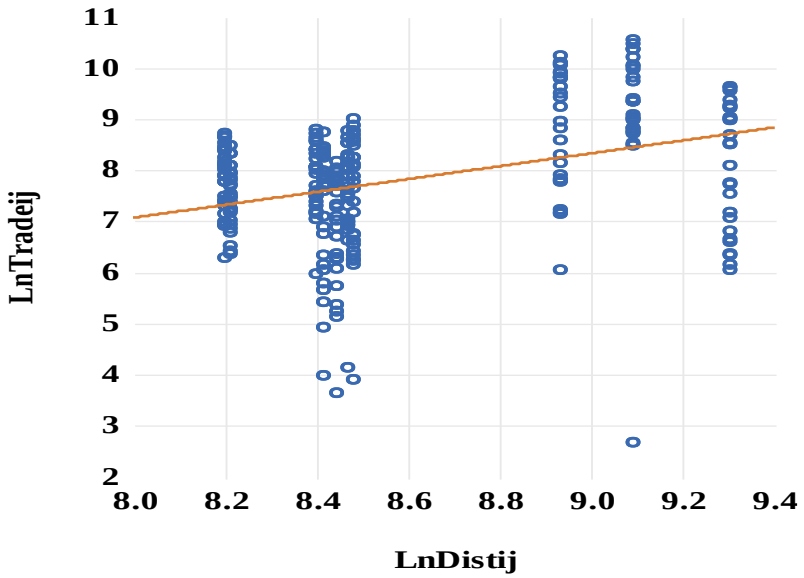


Figure 4.2: Graph of Trade flows and Bilateral Distance
Source: Author's computation (using Eviews)

Figure 4.2 plots a graph of total trade against distance. At first glance, one might conclude that a positive relationship exists between trade flow and bilateral distance. However, a closer examination indicates that Nigeria's trade is clustered more around developed and probably major developing partners like Belgium, France, Italy, the Netherlands, South Africa, Spain, and the United Kingdom. The plot further shows that beyond this clustering, trade flows begin to decrease, which is indicative that trade flows in Nigeria decrease with distance, which is in line with the gravity equation. An obvious point to note here is that the strength and direction of the relationship between total trade and distance are affected when other covariates are included.

4.1.3: Correlation Matrix

The result of the correlation matrix is presented in Table 4.2. The correlation was carried out to assess the relationship between the variables at a 5% level of significance. The matrix depicts the correlation between all the possible pairs of values in a table. It is a powerful tool to summarize a large dataset and to identify and visualize patterns in the given data.

Table 4.2: Correlation Matrix for selected variables

	$lnTrade_{ij}$	$lnGDP_{ijt}$	$lnPOP_{ijt}$	$lnDis_{tij}$	lnReexr	lnExvol	lnRel_Price
$lnTrade_{ij}$	1.000000						
$lnGDP_{ijt}$	0.691712	1.000000					
$lnPOP_{ijt}$	0.574490	0.405427	1.000000				
$lnDis_{tij}$	0.361721	0.531247	0.428884	1.000000			
lnReexr	-0.371450	-0.173399	-0.634095	5.18E-18	1.000000		
lnExvol	0.197290	0.146273	0.004281	1.53E-17	0.063449	1.000000	
lnRel_Price	0.612060	0.460187	0.306769	-0.001032	-0.375371	0.269086	1.000000

Source: Author's computation (using Eviews)

It indicates that the variables are not just relevant in theory but also significant according to the data. From the table, trade flows (lnTradeij) have a strong positive and significant relationship with population (lnPOPijt), level of

income (lnGDPijt), and relative price (lnRel_Price), which is an indication that the flow of trade in Nigeria can be influenced by Nigeria and the partner country's population, the level of their income, and the relative price. Also, lnGDPjt has a strong positive significant relationship with bilateral distance (lnDistij), and a strong positive significant relationship also exists between lnDistij and lnReexr. A weak positive relationship was found between lnGDPjt and lnPOPijt, lnGDPjt and lnRel_Price, lnPOPijt and lnDistij, and between lnPOPijt and lnRel_Price. A negative, strong relationship was found to exist between lnPOPijt and lnReexr, while a weak negative relationship exists between lnTradeij and lnReexr.

4.1.4: Panel Unit Root Test

In analysing the univariate characteristics of the data, the Fisher Augmented Dickey-Fuller (Fisher-ADF) and Fisher Phillips Perron (Fisher-PP) statistics were employed to test the unit root properties of the series, and the results are presented in Table 4.3.

The result clearly indicates that the variables $lnGDP_{ijt}$ lnReexr and lnExvol were stationary at level for the Fisher-ADF while the variables $lnTrade_{ij}$, $lnPOP_{ijt}$, and lnRel_Price became stationary at first difference. For the Phillips-PP statistics, $lnGDP_{ijt}$ $lnPOP_{ijt}$ lnReexr and lnExvol were stationary at level while $lnTrade_{ij}$, and lnRel_Price became stationary at first difference.

Table 4.3: Panel Unit Root Test Results

	Fisher - ADF				Fisher - Phillips Perron			
Variables	**Level**	**Prob-Value**	**First Difference**	**Prob-Value**	**Level**	**Prob-Value**	**First Difference**	**Prob-Value**
$LNTRADE_{ij}$			221.638	0.0000			225.335	0.0000
$LNGDP_{ijt}$	39.1867	0.0063			28.449	0.0992		
$LNPOP_{ijt}$	9.97233	0.9232	65.0435	0.0000	175.388	0.0000		
LNREEXR	184.207	0.0000			184.207	0.0000		
LNEXVOL	124.666	0.0000			124.702	0.0000		
LNREL_PRICE	8.47017	0.9883	154.595	0.0000	9.7194	0.973	188.219	0.0000

Source: Author's Computation (Using Eviews). The optimal lag length was based on SIC:0 to 5

4.1.5 Cointegration Result

This study further investigated the presence of a long-run equilibrium relationship (cointegration) among the series using the Pedroni residual cointegration (Pedroni, 1999). The Pedroni statistics (six of them) were used to investigate whether the error process of the estimated equation is stationary and to test the null hypothesis of no cointegration against the alternative. The first four statistics tested the null hypothesis of no cointegration within dimensions, while the other two tested the null hypothesis of no cointegration based on pooling within dimensions. The result indicates the existence of cointegration, which suggests that the estimated relationship is not spurious.

Table 4.4: Results of the Pedroni Residual Cointegration Test

Alternative hypothesis: common AR coefs. (Within dimension)		
	Statistics	**Prob-Value**
Panel v-Statistic	-0.366212	0.6429
Panel rho-Statistic	1.849914	0.9678
Panel PP-Statistic	-0.552057	0.2905
Panel ADF-Statistic	-2.003637***	0.0226
Alternative hypothesis: individual AR coefs. (Within dimension)		

Group PP-Statistic	-1.920485***	0.0274
Group ADF-Statistic	-2.814304***	0.0024

*Source: Author's Computation (Using Eviews); Note: ***denotes rejection of the null hypothesis of no cointegration at 1% significant level.*

4.1.6 Regression Results

In order to overcome some statistical issues associated with repeating a set of data for various countries in panel data estimation, we generated the GDP_{ijt} and POP_{ijt}, which are derived by multiplying Nigeria's GDP and POP by the partner country's GDP and POP, respectively. Thus, our model is a product model, and the result of the pooled effect model is presented in Table 4.6.

Table 4.5: Result of the pooled OLS estimates

Variable	Coefficient	Standard. Error	t-Statistic	Prob.*
lnGDPijt	0.018532	0.001838	10.07996	0.0000
lnPOPijt	0.004852	0.001255	3.865355	0.0001
lnDistij	-0.351418	0.173401	-2.026616	0.0044
lnRel_Price	2.268918	0.387361	5.857377	0.0000
lnReexr	-0.021403	0.022896	-0.934785	0.3508
lnExvol	0.557612	0.380678	1.464789	0.1442
Comcol	0.911765	0.179248	5.086618	0.0000
Comlangij	0.19677	0.096815	2.032437	0.0432
C	-4.144691	2.232724	-1.85634	0.0646
R-squared	0.7155	Adjusted R-squared		0.706
F-statistics	78.922	Durbin-Watson Stat		0.7241
Prob(F-statistic)	0.000000			

Source: Author's Computation (Using Eviews)

From the result, the variables, gross domestic product, population, distance, and common colony dummy were correctly signed according to theoretical expectation and statistically significant at the 1% level of significance. The variable relative price was not correctly signed but was highly significant at 1%. The dummy variable for common language was also correctly signed and statistically significant at the 5% level of significance. Real effective exchange rate and exchange rate volatility were expected to be either positive or negative, and from the result, real effective exchange rate had a negative sign while exchange rate volatility was positively signed, and both were not statistically significant.

The coefficient of determination (R2) was found to be high, with a value of 0.7155, which indicates that only 71.55% of the systematic variation in the model is explained by the included regressors. The F-statistic with a value of 71.922 was significant at the 1% level of significance, indicating that the explanatory variables are jointly significant in explaining trade flow in Nigeria and that our model provides goodness of fit.

However, a significant limitation of the pooled OLS model is that it treats all observations for the entire period as a single sample (i.e., homogeneity) and disregards individual or country-specific effects. Gujarati (2009) pointed out that the pooled OLS ignores the "individuality" of each country and distorts the real picture of the relationship between the dependent and independent variables. To address this concern of homogeneity and biased estimates of the pooled OLS, we went further and estimated the fixed effects (or within the group) and random effects (generalised least squares) of the model analysis. In estimating the fixed effects and the random effects models, we treated the country-specific effects as fixed and random, respectively.

Therefore, to ascertain which of the two models would best fit the data of this study, we performed the Hausman specification test as mentioned in the estimation technique section of this study. The fixed effects will be more efficient than the random effects, but only if the null hypothesis has been rejected. The result of the Hausman test indicates that the p-value of the Hausman test is less than 0.05 (see Appendix); therefore, we reject the null hypothesis. Thus, the Hausman specification indicated that country-specific effects are correlated with regressors, and as such, our interpretative work and discussions will be based on the common constant model and the fixed effects model.

Table 4.6: Result of the Fixed Effect (FE) estimates

Variable	Coefficient	Standard. Error	t-Statistic	Prob.*
lnGDPijt	0.048157	0.004817	9.996488	0.0000
lnPOPijt	0.007107	0.001158	6.139878	0.0000
lnRel_Price	-1.196375	0.616959	-1.939147	0.0536
lnReexr	0.005316	0.020240	0.262652	0.7930
lnExvol	0.366146	0.324142	1.129587	0.2598
C	-27.51652	3.614870	-7.612036	0.0000
R-squared	0.800	Adjusted R-squared		0.788
F-statistics	70.096	Durbin-Watson Stat		0.9456
Prob(F-statistic)	0.000000			

Source: Author's Computation (Using Eviews)

From the result of the fixed effect model reported in Table 4.8, the coefficients of gross domestic product ($lnGDP_{ijt}$) and population ($lnPOP_{ijt}$) have positive signs in accordance with theoretical expectation and were statistically significant at the 1% level, while that of relative price (lnRel_Price) variable was negative and statistically significant at 5%. The coefficients real effective exchange rate and exchange rate volatility were not statistically significant in explaining trade flow in Nigeria within the study period.

The value of the R-square was also quite high, as it indicates that 80% of the systematic variation in the model is explained by the explanatory variables. The value of the F-statistic was 70.096 and statistically significant at the 1% level of significance. Thus, we conclude that the explanatory variables are jointly significant in explaining trade flow in Nigeria and that our model provides goodness of fit.

From the fixed effect result presented in Table 4.8, it is observed that the fixed effect estimator omitted the distance and dummy variables included in the model. Thus, this study followed previous studies such as Martinez-zarzoso (2003), Eita (2008), Elshehawy et al. (2014), and Oladipupo and Adedoyin (2019) and performed a second-stage regression. In this regression, the individual effects or fixed effects were used as the dependent variables, while the dummy variables that were dropped were used as the independent variables. The result of the second-stage regression is presented in Table 4.9.

Table 4.7: Second stage regression: Dependent variable is the Individual Effects.

Variable	Coefficient	Standard. Error	t-Statistic	Prob.*
lnDistij	-2.244673	0.149530	-15.01149	0.0000
Comcol	1.789862	0.186989	9.572033	0.0000
Comlangij	0.120616	0.113951	1.058497	0.2908
C	19.06276	1.273425	14.96968	0.0000
R-squared	0.5104	Adjusted R-squared		0.5046
F-statistics	88.965	Durbin-Watson Stat		0.00000
Prob(F-statistic)	0.000000			

Source: Author's Computation (Using Eviews)

The result of the second-stage regression reported in Table 4.9 indicates that the natural log of the distance variable was negatively signed in accordance with theoretical expectation and statistically significant at 1%. The dummy for common colony (comcol) was positively signed as theoretically expected and significant at the 1% level, while the dummy for common language (comlangij) was positively signed in accordance with theoretical expectation but was not statistically significant.

4.2 Discussions of Estimation Results

4.2.1 Discussion of the pooled OLS model

The pooled OLS result reported in Table 4.7 indicates that the estimated coefficients of GDP and population were correctly signed and statistically significant at the 1% level of significance. As a result, a 1% increase in domestic income (GDP) and population (POP) will increase trade flows in Nigeria by 0.02% and 0.004%, respectively. The result therefore shows that Nigerian trade flows are positively and significantly determined by GDP and POP, which is in agreement with the gravity model postulation. The geographic distance variable (lndistij) had its expected negative sign and was statistically significant at 5%. It shows that a 1% increase in geographical distance will decrease trade flow by 0.35%. This further indicates that Nigeria's trade flow is negatively determined by geography and distance.

The variable for the real effective exchange rate (lnreexr) was negative and statistically insignificant. The dummy for common language (comlangij) and the dummy for common colony (comcol) were correctly signed and statistically significant at 5% and 1% levels, respectively, in explaining trade flows in Nigeria within the study period. However, the variable for exchange rate volatility (lnexvol) was correctly signed but statistically insignificant in explaining trade flows. A 1% increase in trade with countries with a common language and a 1% increase in trade with countries that have colonial affiliations with Nigeria will increase trade flow by 0.2% and 0.9%, respectively.

The relative price variable was highly significant in determining trade flow in Nigeria within the study period. A 1% increase in relative price would increase trade flow by 2.3%. The performance of relative price in this model is surprising; ordinarily, as the naira appreciates, it is expected that Nigeria's export becomes cheaper and consequently increase trade flow. It is also expected on the other hand that as Nigeria's currency depreciates, imports become more expensive in relation to other country's currency and as a result imports will fall. But because Nigeria does not have good substitute for most of the imported products, we continue to import and import even more.

4.2.2 Discussion of findings of the fixed effects model

The results of the fixed effects estimates reported in Table 4.8 follow a similar path as observed in our pool model estimates. The result indicates that Nigeria's trade flow increases significantly with the economic mass (as measured by GDP) and is statistically significant at the 1% level of significance. Citeris paribus, a 1% increase in the gross domestic product (GDP) increases Nigeria's total trade flow by 0.04%. Thus, we reject the null hypothesis and conclude that a significant relationship exists between economic size measured by GDP and trade flows in Nigeria. This finding is also in line with the works of Eita (2008), Akpoilih and Farayibi (2015), and Oladipupo and Adedoyin (2019), who found a significant relationship between economic mass and trade flows.

The coefficient of population was found to be positive, as was expected, and statistically significant at the 1% level of significance. All things being equal, a 1% increase in population will increase trade flows by 0.007%. This finding is also in line with the work of Oladipupo and Adedoyin (2019), who found a significant relationship between population and trade flows. The coefficient of relative price was negative, as expected, and statistically significant at 5%. All things being equal, a 1% increase in relative price will decrease trade flow in Nigeria by 1.19%. The real effective exchange rate and exchange rate volatility (Exvol) variables were statistically insignificant in explaining trade flow in Nigeria within the sample period. The real effective exchange rate was found to be insignificant in explaining trade flows within the study period. The finding of this result is in line with the works of Eita (2007), Oladipupo (2018), and Adedoyin (2019).

Discussion of findings of the Second stage regression:

The result of the second-stage regression reported in Table 4.9 shows that the log of the distance variable was correctly signed and statistically significant at the 1% level. It shows that trade flow in Nigeria is negatively associated with distance and suggests that the longer the distance, the less trade there is with partners. Citeris paribus, a 1% increase in geographical distance will decrease trade flow by 2.24%. This finding suggests that the trade elasticity of distance is highly elastic. Thus, we reject the null hypothesis and conclude that a significant relationship exists between geographical distance and trade flow in Nigeria. This finding is also in line with the works of Dilanchieve (2012), Gracier et al. (2013), Akpoilih (2015), and Farayibi (2015), who found a significant relationship between geographical distance and trade flows.

The dummy variable for common language was positively signed in accordance with theoretical expectation and was expected to have a significant effect on trade as a common official language can help lower transaction costs and aid in effective communication between trading partners. However, this result was not statistically significant. The dummy for common colony (comcol) was positively signed in line with theoretical expectation and statistically significant. This indicates that all things being equal, a 1% increase in trade with countries that have colonial affiliations with Nigeria will increase trade flow by 1.78%. The result of this finding is in line with the work of Batra (2004) and Gracier (2013), who found a positive and significant relationship between colonial ties and trade flows.

5.1 Policy Implications and Suggestions

The findings of this study bear several policy implications for Nigeria, which are:

1. The results of our empirical analysis suggest that the gross domestic product (GDP) of Nigeria and that of Nigeria's key trading partners are strong determinants of trade flows in Nigeria. Ordinarily, this would imply that Nigeria could rely on just economic growth to facilitate an increase in trade flow. However, one fact that should readily come to mind is that, as the economy grows, both taste and preference also change, and as such, most of these countries, in pursuit of cleaner energy, may move away from buying Nigeria's crude oil, which makes up a higher percentage of Nigeria's external trade, and opt for renewable energy, which will consequently cause trade flow to be hampered.

   In light of the foregoing, there is therefore a need to look carefully into our production structure and the composition of our export trade, which is characterized by oil exports and the export of primary commodities with exogenously determined prices, which also accounts for an important source of macroeconomic instability, thereby resulting in highly unstable terms of trade at various times over the past decades with large asymmetric effects. Policies to diversify the Nigerian economy away from oil towards a technological service and export-driven economy should be earnestly pursued. Moreso, stabilization policies and the establishment of a conducive and attractive business environment for private development, which will ensure high growth rates, should be high on the policy agenda.

2. The result of our empirical analysis has also shown that an increase in population significantly contributes to increased trade flow in Nigeria. Population has a tendency to increase trade with more products for export, increase the amount of labor force, and increase the level of specialization by producing gains from specialization. In the long run, however, a higher population has a tendency to decrease income per capita, making every individual poorer, and therefore it may cause production and exports to decrease. In addition to that, lower income per capita tends to decrease the demand for imports, and a higher population may increase the need for imported goods as well. Given this, this study recommends that, with regard to the increase in labor force being one of the outcomes of population growth, policy actions and human capital development programmes are therefore required to convert the teeming population into an active and effective labor force. Additionally, actions and plans should be put in place to address the population growth rate. Family planning initiatives and enlightenment are two of the ways to address this.

3. Geographical distance was found to have a significant negative effect on Nigeria's trade flow. This implies that Nigeria would do better if the country traded more with its neighbors, as trade with farther-flung countries would increase transport costs and other transaction costs. This will have a significant effect on trade flows, especially imports. This provides some justification for the need to expand trade with the ECOWAS sub region.

4. The coefficient of our variable for colonial affiliation was highly significant in explaining trade flows in Nigeria. The statistical significance of this variable both in the pooled effect and fixed effect models suggests that an increase in trade with countries that have colonial ties with Nigeria, like India, will increase trade flow in Nigeria. Therefore, there is a need for Nigeria to increase her trade with countries like Ghana, as the result indicates that there are untapped trade potentials with countries that are closer and share colonial ancestry. Additionally, it will help reduce transactional costs.

5.2 Conclusion

The research objective of this study was to examine Nigeria's bilateral trade in goods and services with selected international trading partners. Using panel data covering a cross-section of 16 trading partners of Nigeria for the period 1996–2020, the study estimated an augmented version of the gravity model with the aid of the pool and fixed effects estimation techniques.

The results showed that the gravity model explains what determines Nigeria's bilateral trade flows. The coefficients of the key gravity variables and other control and preference variables (GDP, population, distance, relative price, and comcol) were statistically significant in explaining trade flows in Nigeria within the study period. Specifically, Nigeria's total trade flow was found to increase with economic size as measured by GDP and POP. The study also corroborates the proposition of the gravity model that distance is an important factor in trade between Nigeria and other countries. Specifically, the more distant the country is from Nigeria, the less trade takes place between Nigeria and that country, implying that Nigeria can exploit the beneficial trade potential between it and other ECOWAS countries, as it has been shown that international economies and political ties remain an important factor in trade between countries. Other than China, Nigeria has continued to trade more with member countries of the Common Wealth, which were former colonies of Britain.

The study recommends amongst others, that policies to diversify the Nigerian economy away from oil towards a technological, service and export driven economy should be earnestly pursued. More so, policy actions and human capital development programmes are therefore required to convert the teeming population into active and effective labour force. It also recommends the need for Nigeria to increase her trade with countries like Ghana as the result indicates that they are untapped trade potentials with countries that are closer and share colonial ancestry.

REFERENCES

1. Adekunle, B., & Gitau, C. M. (2013). Illusion or reality: understanding the trade flow between China and Sub-Saharan Africa. *Journal of African Business*, *14*(2), 117-126.
2. Akpoilih, R. and Farayibi, A. (2015). Determinants of Nigeria-China bilateral trade in manufacturing products. *Munich Personal RePEc Archive*, Paper No. 74183. Retrieved Monday, May 16, 2022 from: https://mpra.ub.uni-muenchen.de/74183
3. Anderson J.E., (1979). A theoretical Foundation for the Gravity Equation. *American Economic Review*, 69 (1), pp. 106-116.
4. Anderson, J. E. and van Wincoop, E. (2003). Gravity with gravitas: a solution to the border puzzle, *American Economic Review* 93: 170–92.
5. Bacchetta, M., Beverelll, C., Cadot, O., Fugazza, M., Grether, J. M., Helble, M., Nicita, A., and Plemartini, R. (2012). *A Practical Guide to Trade Policy Analysis*. United Nations Publications: New York.
6. Batra, A., (2006). India's Global Trade Potential: The Gravity Model Approach. *Global Economic Review*, Vol. 35, 327-361. Available from: http://dx.doi.org/10.1080/12265080600888090. [Accessed 15 March 2018].

7. Bollerslev, T. (1986). Generalized Autoregressive Conditional Heteroskedasticity. Journal of Econometrics, 307-327
8. Bonuedi, I., (2013). Determinants of Ghana's bilateral trade flows: a gravity model approach [online]. Master's Thesis. Kwame Nkrumah University of science and technology, Kumasi. Retrieved April 2, 2021 from: http://www.ir.knust.edu.gh/bitstream/123456789/5718/1/BONUEDI%20ISAAC.pdf.
9. CEPII Database. Retrieved Monday October 18, 2021 from http://www.cepii.fr/cepii/en/bdd_modele/bdd.asp
10. Chaney, T. (2008). Distorted gravity: the intensive and extensive margins of international trade", *American Economic Review* 98: 1707–21.
11. Chen, X., Yang, Z. and Lui, X. (2007). Empirical Analysis of Xinjiang's Bilateral Trade: Gravity Model Approach. *Chinese Geographical Science,* 18(1): 9 -16. Available at www.springer/link.com
12. Chou, W. L. (2000.) Exchange Rate Variability and China's Exports. *Journal of Comparative*
13. Cypher, J. M and Dietz, J. L (1997). The process of economic development. Routledge, London.
14. Deardorff, A. V. (1998). *Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?* Chicago: University of Chicago Press.
15. Dilanchiev, A., 2012. Empirical Analysis of Georgian Trade Pattern: Gravity Model. *Journal of Social Sciences,* Vol. 1(1): 75-78. ISSN: 2233-3878.
16. Economic Complexity Index (2021). Retrieved May 9, 2023 from www.oec.world/en/profile/country/nga
17. Eita, J. H., (2008). Determinants of Namibian Exports: A Gravity Model Approach, *University of Namibia, Namibia.* Retrieved February 9, 2022 from http://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=8F2E97E212BB7D22193B70B80327125B?doi=10.1.1.593.9145&rep=rep1&type=pdf.
18. Elshehawy, M., Shen, H. and Ahmed, R. (2014) The Factors Affecting Egypt's Exports: Evidence from the Gravity Model Analysis. *Open Journal of Social Sciences*, **2**, 138-148. http://dx.doi.org/10.4236/jss.2014.211020
19. Esezobor, E.A. (2009). International Finance, The CIBN press limited, Lagos Nigeria.
20. Feenstra, R. C. (1998). Integration of trade and disintegration of production in the global economy. *Journal of Economic Perspectives*, *12*(4), 31-50.
21. Frankel, J. A. and D. Romer (1999). Does trade cause growth. *American Economic Review*, vol 89, pp. 379-399.
22. Gärtner, M. (1993). *Macroeconomics under flexible exchange rates*. United Kingdom:
23. Gonnelli, Adam (1993). "The basics of foreign trade and exchange, Federal Reserve Bank of New York. Public Information Department, New York, pg. 7.
24. Gonzaga, M.G. & Terra, M.C.T. (1997). Equilibrium real exchange rate, volatility, and stabilization. *Journal of Development Economics*, 54 (1). 77 - 100.
25. Gujarati, D. N. and Porter, D. C. (2009). Basic Econometrics. 5th ed., international ed. London: McGraw-Hill.
26. Havi, D.K. (2019). The effects of exchange rate volatility on foreign trade in Ghana. *Journal of Economics Library* Volume 6, December 2019 Issue 4. Retrieved August 6, 2021 from www.kspjournals.org
27. Helpman, E. (1985). Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition and the International Economy. Cambridge: MIT Press. ISBN: 9780262081504283
28. Hogendorn, J. S. (1996). Economic Development. 3rd edition, Arper Collins, C.
29. https://ideas.repec.org/a/fip/fedkpr/y1991p7-58.html
30. Krugman, P. R., Obstfeld, M., and Melitz, J. M., (2012). International Economics: Theory and Policy, 9th Edition. Addison-Wesley: Boston.
31. Kuncic, A. (2012). Institutional determinants of bilateral trade: Taking another look (No. 462). *Kiel Advanced Studies Working Papers.*
32. Martinez-Zarzoso, I. (2003). Gravity model: An application to trade between regional blocs *Atlantic Economic Journal* Vol 31: 174. Retrieved August12, 2022 from https://doi.org/10.1007/BF02319869
33. Oladipupo, Olushola and Adedoyin, Festus (20219). Determinants of bilateral trade flows of Nigeria: An application of the Augmented Gravity Model. Retrieved Tuesday, April 19, 2022 from http://dx.doi.org/10.2139/ssrn.3439986
34. Oviemuno, A. O. (2007). International trade as an engine of growth on developing countries, a case study of Nigeria (1980-2003). *Journal of Economics Perspective* 12(4) 45-62.

35. Oyovwi O. D. (2012). Exchange rates volatility and economic growth in Nigeria.
36. Panda, R. and Sethi, M. (2015). India and bilateral trade: A Gravity Model Approach. *International Journal of Business Insights and Transformation*, Vol. 8 (2), pp. 30-36. Business Source Complete, EBSCOhost.
37. Poyhonen, P. (1963). A tentative model for volume in trade between countries. *Weltwirshaftschaftliches Archiv*, 90, 91-113.
38. Sharma, S.C. and Chua, S.Y., 2000. ASEAN: Economic Integration and Intra-Regional Trade. *Applied Economics Letters*, Vol. **7**, 165-169. Available from: http://dx.doi.org/10.1080/135048500351726. [Accessed 8 August 2018]
39. Sidamor, Z. (2013). Sino-African bilateral trade flows: A reality to qualify. *International Journal of Economics, Commerce and Research, 3*(2), 117-124.
40. Sokchea K., (2006). An analysis of Cambodia's Trade Flows: A Gravity Model. Working Paper Series, pp. 1 – 24. Available at www.papers.ssrn.com
41. Tinbergen, J. (1962). Shaping the World Economy. Twentieth Century Fund, New York.
42. Warner, D., and Kreinin, M. E. (1983). Determinants of international trade flow. *Review of Economics and Statistics* 65 (February): 96-104.
43. World Bank (2020). World Integrated Trade Solution Retrieved Saturday 12 February from https://wits.worldbank.org/CountryProfile/en/Country/NGA/Year/2019/Summary