

An Investigation of the Asymmetrical Relationship between Population Growth and Food Importation in Nigeria

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ABSTRACT

The paper studied the impact of population growth on importation of consumables (food) in Nigeria using time series data for the period of 1982 to 2022. Vector error correction model (VECM), the Granger causality test and the impulse response functions (IRFs) analytical techniques was employed. Malthusian population theory and the dependency theory were adopted as the theoretical framework. The unit root test revealed that the variables are integrated of order one which shows that the variables of interest are stationary at first difference. Johansen co-integration reveals existence of long run relationship among the variable of interest. The results revealed that population growth has a negative but significant effect on consumable importation in Nigeria. A unidirectional relationship between population growth and food importation. Short run and long run negative effect of population shock on food importation over the period studied. From the results, Government is advised to increase budget allocation on Agriculture to boost food output through mechanization of farming process. Establishment of agricultural institute to help educate and equip the population with modern knowledge on food and livestock production. Stabilization of the exchange rate level by the government, to control import and export levels, as well as prices of imported foods. Government intensified efforts to reduce insurgency especially in the North and resolving of herders and farmers conflicts to help encourage people involved and interested in undertaking farming and livestock production in Nigeria.

Keywords: Population, Consumable Importation, Malthus theory, Dependency theory.

INTRODUCTION

Macroeconomic activity like international trade through the medium of import and export of goods and services has become an increasingly important and prominent economic activity amongst countries particularly in this volatile economy. The exchange of goods and services across borders is an avenue through which countries are able to achieve and promote economic self-sustainability as well as a platform for transforming a country's natural resources such as crude oil, gold, diamond, etcetera into economic wealth (Owolabi, Inuk, & Odediran, 2015). International trade affects the economy of developing countries especially in Africa as it presents opportunities for local industries to internationally broaden their market reach. This results to potential increase of market size and increased profit turnover which in turn leads to the encouragement and growth of the local industries and creation of employment opportunities for the teaming populace.

International trade to some extent creates competition in the world market thereby providing consumers with a variety of products and an avenue for the importing and exporting countries to discriminate in terms of prices and choices. Imports being a component of international trade transactions can boost economic progress when it is carried out on productive commodities (Nteegah & Mansi 2016). It follows that excessive importation of non-productive commodities can generate an undesired effect on the domestic economy as long as such commodities can be locally produced. But it has been noted that excessive importation is likely to exert pressure on the external reserves of the country, thereby creating a negative impact on the economy. However, the positive impact of imports has been that it "increases the varieties of goods available to domestic consumers, generate positive competitive pressures on the domestic economy, promote standardization, and could be used to bridge the gap in domestic supplies of essential commodities to poor households" (Alex & Ebipumere 2020).

In Nigeria population is growing at a historical unprecedented rate. The possible differences between number of people and world food production brings to resurrect the Malthusian hypothesis that long-run equilibrium consumption lies on higher than at the subsistence level. For individual countries or regions, the arithmetic observation that greater number of mouths to feed means lower consumption for each has won some supporters. More advanced views of the impacts of population growth on the age structures, labour force, investment levels and social needs have also been formulated. Numbers of people and their rates of growth are said also to affect the military strength, world influence, territorial security, and mostly on the importation of consumable goods. Conversely, a large population supports greater specialization and a large increase in market return to human capital and knowledge.

The link between population and economic growth depends on whether the incentives to human capital and expansion of knowledge are stronger than diminishing return to natural resources. The large population implies a large market for imported consumable goods and services as well as large pool of human resources for development. Although, the impact of population on development depends on the absolute size but also on its quality. However, from the stand point of international trade, it is said that exports enriches a nation, while imports impoverish a nation and that for any nation to improve its wellbeing, it has to specialize in and export the relatively less expensive domestic goods. This inter-dependency of nations in the international trade is a vital factor for economic progress of nations.

Importation is likely to be influenced by various factors, such as the availability of the required external reserves, exchange rate, relative price level, terms of trade, trade openness, real income, level of output, market size etc. Different countries of the world today engage in importation and exportation of goods and services on various scales depending on their comparative advantage. This has led to most countries to produce and export goods and services which they enjoy comparative advantage over and import other consumable goods. This is not the case for sub-Saharan African economies, especially for Nigeria where excessive importation without corresponding increase in export as evident has precipitated balance of payments problems (Nwogwugwu, Madichie, & Maduka, 2015) and shallow domestic production, exporting jobs in the process. However, instead of Nigeria to import those goods that it cannot produce, it opts for what it has a comparative advantage such as food and other agricultural commodities. Across many regions of the world, local food production and supply are limited compared to the quantity and compositions demanded. Estimate shows that 72-78 percent of the world populations could not meet their food demand for basic grains locally (Kinnunen, Guillaume, Taka, D'Odorico, Siebert, Puma & Kummu, 2020). It is also argued that by 2050 the number of people to rely on food import globally will be between 1.5 and 1.6 billion (Prajal, Matthias, Dominik & Juergen, 2014). In fact, the World food demand is expected to grow by 60 percent towards 2050 (FAO, 2015). There is the tendency for the earth's population to outgrow the capacity to feed it.

Food and Agricultural consumable commodities constitutes a chunk of Nigeria's import volume, due to the fact that Nigeria's domestic food production cannot meet the demand of her growing teeming population. The problem of population and population growth has worried economists and other social scientists for a very long time. The question has always been what the population of a country is likely to be in the future and the economic and social consequence of a change in population, whether upwards or downwards. A rapid growth in population can lower per capita incomes through three key channels. Firstly, increased pressure by population on natural resources; especially land. Secondly, it can lead to a scarcity of goods and services which often leads to an increase in price (consumption cost). Finally, it leads to a decline in capital accumulation and savings because the larger a family, the higher their expenses, and the lower their propensity to save (World Population Review, 2019). A steady growing population as Nigeria implies that there's an increasing need for expansion of shelter, clothing, education, health facilities and food production; in a case where such are not adequately provided the growing population puts a strain on the already existing facilities and resources. As we are witnessing today, a wild growth in real estate in the country as lands formally used for agricultural purposes are used for housing purposes, the implication is that there is a decline of available lands for agricultural purposes, hence a drop in our domestic food production.

Although as predicted by the Malthusian theory, the population of Nigeria has not grown geometrically over time, the growth has been however remarkable, while the envisaged "misery" or "vice" by the theory have continued to manifest in Nigerian economy (Ewugi and Yakubu, 2012). Due to the decline in the agricultural

sector which was previously the leading sector in the 1960s, as a result of fall in investment and low technology in the industry, domestic food production has continued to fall behind the consumption requirement of the growing population which thus necessitate importation of food. The importation of food to complement local food production shows the inability of Nigeria to feed their growing population.

In Nigeria, the 1952/1953 census puts its total population at 30.4 million with a growth rate of 2.1%, while the 1963 and 1991 census put Nigeria's population at 55.6 million and 88.5 million with growth rates of 5.6% and 2.6% respectively (Nyangito, 2017). Although the 2006 census put the total population at 140 million, Nigeria's population is estimated to be over 200 million people as at 2021 with a growth rate of 2.56% and is the largest in Africa and seventh largest in the world. It is observed from the foregoing analysis that consumable imports has been rising along with the country's population, which makes it unclear whether population influences importation of consumables in Nigeria.

Surprisingly, only a limited number of studies have looked into the effect of population growth on importation of goods specifically on consumable goods in Nigeria. Most of the studies focused more on the population growth and economic growth or importation generally. The impact of population growth on imported consumable goods is still fluid, Hence the need to investigate the effect of population growth on importation of consumable goods in Nigeria.

LITERATURE REVIEW

Malthusian Population Theory

Malthusian Population Theory as it relates to the world's hunger problem and the challenge to feed the world sustainably. Maslow (1954) noted that the need to relieve hunger and thirst is among the fundamental needs and is necessary for human survival in his 'classification of needs by urgency and intensity'. Malthus argued in "An Essay on the Principle of Population, as It Affects the Future Improvement of Society", that population growth increases geometrically, beyond measure, although food production increases only in arithmetic terms (Malthus, 1798). According to Malthus, if the population increases while the availability of natural resources (particularly land) remains constant, agricultural productivity tends to fall. As a result, food productivity is unable to keep up with the increasing population, and starvation ensues as a result of the supply shortage (Pawlak & Kołodziejczak, 2020).

The fundamental assumption underlying Malthus population theory, is that the desire for sex is strong in man and hence his ability to procreate without control because of the instinct and urge. Hence, unless man is checked, the population will grow at a faster rate than can better be imagined within a few years (Weeks, 2002).

This theory is relevant to this work despite its criticisms because Ahlburg (1998) argued that an increase in population growth leads to an increase the need for goods and services through the "technology-pushed" and the "demand-pulled" channels. Becker et al (1999) argued that high population growth rate induces high labour force which is the source of real wealth.

The Heckscher-Ohlin theory

The Heckscher-Ohlin theory, also known as the Heckscher-Ohlin-Samuelson model (HOS model), is a fundamental theory in international trade developed by Swedish economist Eli Heckscher and his student, Bertil Ohlin, in the 20th century. This theory builds upon the principles of comparative advantage, but it differs by emphasizing the role of factor endowments in shaping a country's trade patterns.

Heckscher was a Swedish economist and economic historian, while Ohlin was his student and later a renowned economist himself. The theory is based on several key assumptions: The theory typically considers trade between two countries. It simplifies the analysis by focusing on the production and exchange of two goods. The theory mainly deals with labor and capital as the factors of production. Factors of production are assumed to be immobile between countries but can move freely within a country. The production functions for each good exhibit constant returns to scale. The markets for goods and factors are perfectly competitive.

The Heckscher-Ohlin theory posits that countries will specialize in and export goods that utilize their abundant factor of production and import goods that use their scarce factor of production. This specialization arises due to differences in factor endowments, particularly differences in labor and capital across countries. The theory identifies differences in factor endowments (e.g., abundant labor or capital) as the primary driver of trade patterns. A country with abundant capital relative to labor will tend to specialize in and export capital-intensive goods, while a country with abundant labor relative to capital will specialize in and export labor-intensive goods. However, it's essential to consider other factors such as technological advancements, infrastructure development, and government policies in analyzing the impact of population growth on trade patterns in Nigeria

Review of Empirical Literature

A number of empirical studies have been done on the relationship between population growth and importable consumable goods and some of them are reviewed.

On the determinants of food import demand, Mwangi (2021) analysed a panel data set of 37 sub-Saharan African countries on agricultural import, using augmented gravity model. The study found that, GDP, membership to regional trade agreement, inflation and quality of governance encourage agricultural imports in these countries. On the other hand, population growth and transport cost affect imports negatively. Hyuha, Williams and Grace (2017) examined the determinants of import demand in Uganda using multiple regression models. Their findings indicate that domestic production of rice; population growth and price are significant factors that influence rice import in the country. The study also recommends that policy action should be geared towards supporting rice farmers in order to increase its supply and stabilize prices.

Abdullahi (2021) examined the determinants of food import demand in Africa using Nigeria as a case study. The study employed ARDL bound testing approach to cointegration. Results from the study showed that population growth and domestic food production influence food import demand in both short run and long run, while exchange rate appeared to be insignificant factor. Vaughan, Afolami, Oyekale and Ayegbokiki (2014) examined the structure and trends of Nigeria's food import bills, secondary data was analysed using descriptive statistics and time series regression. Evidence shows that based on current price an average of ₦1.923 trillion worth food is imported per annum, which translate in to about ₦1.0 billion worth of food per day for the period 1990-2011. Further results reveals that the country had overall positive trade balance within the period, but annual food import bill was in multiples of five times of the export.

Abdulmalik and Njiforti (2018) investigated the determinants of demand for agricultural import in Nigeria 1981-2015. An ARDL model was developed and estimated. Results show that both in the long run and short-run, growth in real gross domestic products and external reserves accretion increased demand for agricultural import. Conversely, depreciation of exchange rates and improved capacity of agricultural products processing decreased demand for agricultural import. Metu, Okeyika, and Maduka (2016) evaluated food security situation in Nigeria from 1991 to 2015 using descriptive statistics. Findings show that Nigerian population growth at the rate of 3.2% while the growth in food production has been less than one. Thus, domestically produced food in Nigeria fall short the growth in the population, this shows that demand for food (population) is greater than the domestic production and supply and Nigeria has to depends on food importation to augment domestic food production.

Pawlak & Kołodziejczak (2020) examined the role of agriculture in ensuring food security. The study was conducted to cover one-hundred developing countries using data that covers 2016 – 2018. The method of comparative analysis was utilized in the course of executing the study. The paper pointed out that increased investments in agricultural infrastructure and extension services coupled with employing measures geared towards increasing the purchasing power of households, those in rural areas principally, seems to be the major stimulants for improvement in the quantity of food available and the access to food.

Furthermore, Adeniyi and Adeyemo (2014) conducted a quantitative analysis of some selected food imports to Nigeria: rice, wheat and sugar; using descriptive statistics, regression and correlation analysis. Evidence indicates that variation in the quantity of the selected food items are explained by exchange rate, population, domestic food production index, national income and external reserves. Peters (2015) examines the relationship among population dynamics, savings and agricultural output in Nigeria from 1980 to 2014. The study adopted

ordinary least square technique. He found that population dynamics affects savings negatively, and this affects investment in the agricultural sector, leading to low agricultural output. It is this poor yield in agricultural produced, emanating from the dynamic nature of the population that resulted into food insecurity that characterized the Nigerian economy. This partly explained the rise in food import bill in the country.

Okwori, Ajegi, Ochinabo, and Abu (2015) examine the validation of the theory of Malthus within the period between 1982 and 2012. The study found out that population growth had no significant impact on economic development in Nigeria within the study period. Limiting the structure of the model to the tendencies of the Malthusian theory by using only agricultural production and population growth. Okoh, Ojiya, & Chukwu (2017), researched on the impact of a growing population on agricultural output in Nigeria using annual time series data from 1986 to 2016. Employing the Johansen co-integration test, the study discovered a long-run relationship between agricultural production and population growth in Nigeria. The study also discovered an indirect relationship between agricultural output which was used as the dependent variable, and population growth rate.

To validate the Malthusian postulation in Nigeria; Sakanko & David (2018) used time series data covering the period from 1960 to 2016. The study used food production, agricultural land, population growth rate and growth in the agricultural sector of the economy as its variables. Employing the Bounds test for the long-run relationship among the variables, and ARDL to estimate the long and short run dynamics of the variables, it was discovered that in the long-run, population growth and food production move proportionately while population growth poses a depleting effect on food production in the short-run, thus validating the incidence of Malthusian impact in Nigerian economy in the short-run. The Granger causality test further indicates the unidirectional relationship of causality moving from population growth rate to agricultural land.

METHODOLOGY

Theoretical Framework

The combined effect of Malthusian population growth and dependency on imports exacerbates Nigeria's reliance on imported consumable goods as the population expands. Rapid population growth increases demand for consumable goods, straining domestic production capacity and necessitating higher levels of imports. Nigeria's structural dependency on imported goods perpetuates reliance on foreign markets to meet the consumption needs of its growing population.

The theoretical underpinnings of the population growth and imports as the core issue in this section is to develop a model involving some sets of equations that connect the relevant variables identified as key factors within the context of importation and population growth sector performance. Empirically, the Nigerian population is not only the epicenter of the model but also the epicenter of production of goods and services in larger quantities in the country using the necessary inputs that include imported intermediate and imported capital goods. Thus, our model explained the relationship between imported input factors and population growth.

This theoretical framework provides a basis for empirical research to investigate the relationship between population growth and importation of consumable goods in Nigeria within the contexts of Malthusian theory and dependency theory. Thus Malthusian theory was specified as

$$P_t = P_0 * e^{rt} \quad (3.1)$$

Where P_t is the population at time t , P_0 is the initial population, r is the population growth rate, and e is the base of the natural logarithm. This exponential growth model illustrates how population increases over time.

$$I_t = \alpha * P_t + \beta \quad (3.2)$$

Where I_t is the level of importation of consumable goods at time t , P_t is the population at time t , and α and β are parameters representing the elasticity of imports with respect to population growth and a constant term, respectively. This equation suggests that importation of consumable goods increases with population growth, assuming a positive relationship

Incorporating dependency theory to have equations two as Import Dependency:

$$D_t = y * X_t * \delta \quad (3.3)$$

Where D_t is the import dependency index at time t , X_t is the level of exports (e.g., oil exports) at time t , and y and δ are parameters representing the elasticity of import dependency with respect to exports and a constant term, respectively.

This equation indicates that import dependency increases with exports, reflecting the structural dependence of Nigeria's economy on external markets.

Thus Combining the Malthusian and dependency theories, we propose the following hypothesis:

$$I_t = P_t + y * X_t + \delta \quad (3.4)$$

Where ϵ represents the error term capturing unexplained factors affecting importation of consumable goods.

Empirical Model Specification

Equation (3.4) is augmented to accommodate population growth and some other control variables so as to capture its effect on import demand.

The functional form of the model is given below as:

$$FIMP = f(PG, GEXPA, RGDP, EXCH, INFL) \quad (3.3)$$

Equation (7) implies that import demand is a function of population growth, government expenditure on agriculture, real GDP as well as exchange rate. By building an econometric model of the functional model above, the model is specified thus:

$$FIMP = \beta_0 + \beta_1 PG + \beta_2 GEXPA + \beta_3 RGDP + \beta_4 EXCH + \beta_5 INFL + \mu_1$$

Where;

FIMP = Food Importation

PG = Population growth

GEXPA = Government expenditure on agriculture (Proxy for Nigerian domestic food importation)

RGDP = Real gross domestic product

EXCH = Exchange rate

INFL = Inflation rate

μ = Disturbance term/error term

β_0 = Constant term

$\beta_1 \beta_2 \beta_3 \beta_4 \beta_5$ are parameters to be estimate

Apriori Expectation

FIMP/PG > 0, FIMP/GFCF > 0, FIMP/RGDP > 0, FIMP/EXCH < 0, FIMP/INFL < 0.

The above signifies a positive and negative relationship and movement of exogenous variables on importation of consumable goods

Estimation Technique and Procedures

A vector error correction model (VECM) model is designed for use with non-stationary series that are known to be cointegrated. Given the nature of the relationship of the variables, vector error correction model autoregressive and impulse response functions were adopted to explain the reaction of an endogenous variable to one of the innovations. Also, it describes the evolution of the variable of interest along a specific time horizon aftershocks in a given moment the cointegration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments.

RESULT PRESENTATION AND ANALYSIS

The data used in the study are attached in the appendix section, for better understanding of the nature of the series, we presented the descriptive statistics for the variables used for the analysis. This section includes unit root test, co-integration test and error correction test.

Stationarity Test

The ADF results comprising of the t- statistics and 5% critical value as originally generated are represented below in the table below

Table 4.1.3 Unit root (ADF test)

Variables	Adf test at level	Adf test at 1 st Difference	5% critical values	Order of integration	Remarks
FIMP	-2.849099	-4.410522	-3.552973	1(1)	Stationary
PG	-1.215939	-11.04759	-3.529758	1(1)	Stationary
GEXPA	-1.440683	-5.735623	-3.526609	1(1)	Stationary
RGDP	-3.197465	-9.879882	-3.526609	1(1)	Stationary
EXCH	0.985092	-4.438754	-3.526609	1(1)	Stationary
INFL	-3.130094	-6.537386	-3.529758	1(1)	Stationary

Source: Authors' Computation Using Eviews 12

Decision Rule: Reject H_0 if ADF test value is greater than 5% critical value, otherwise accept. From the above result, at first difference, the ADF test value of food importation (FIMP); population growth (PG), government expenditure on agriculture (GEXPA), real GDP, exchange rate (EXCH) and inflation (INFL) are greater than their critical values at 5% respectively. Therefore, we reject H_0 of food importation, population growth, and government expenditure on agriculture, real GDP, exchange rate and inflation and then conclude that they are stationary at first difference. This implies that the variables of the model are integrated of order one.

Test for Co-integration

Given that the series are integrated of order one that is 1(1), Johansen co-integration approach is found worthy in ascertaining if there is a long run relationship exist between the variables of the model.

Johansen Co-integration Test

According to the Johansen test of co-integration, the residuals of the supposed co-integrating regression is expected to be stationary at levels,

Table 4.1.4 Co-integration results

Variables	Level of significance	Trace stat	Critical value	Prob
ECM	5%	151.8931	95.75366	0.0000

Source: Authors' Computation Using Eviews 12

From the result above, the evidence that residuals are not stationary since the trace statistics (151.8931) is greater than the critical value at 5% (95.75366) or probability values less than 0.05, thus, our variables are co-integrated indicating long run relationship. We proceed to estimate the vector error correction model to ascertain the long run dynamics of the variables of the model. Thus result can be seen in appendix index

Lag selection Criteria

Akaike information criterion and Schwarz criterion was used to ascertain the optimal autoregressive lag length that is suitable for the best model to adopt. It was stipulated that the best model to choose is the one with lowest Akaike information criterion and Schwarz criterion. The result shows model with auto redistributive lag length of one was selected; hence the variables are taken to their fourth lag in ascertaining if they have long run relationships. The result is shown on the appendix index.

Evaluation of Estimates

The satisfactory results obtained from the unit root and co integration tests motivated the estimation. The vector error correction model result of this study is presented below

Table 4.1.5 VECM Long Run Result

Dependent Variable: D(FIMP)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINTI-EQU(ECT)	-0.215339	0.070117	-2.351261	0.0034
D (PG (-1))	-5.020394	1.555881	-3.064617	0.0005
D (GEXPA (-2))	3.185902	5.226085	2.328234	0.0037
D (RGDP (-2))	8.741072	3.205509	2.737327	0.0078
D (EXCH (-1))	-2.536825	0.552266	-2.759367	0.0407
D (INF (-2))	-6.176323	2.683228	-2.368493	0.0033
C	87.33164	52.99854	1.751531	0.0821
R-squared	0.892833	Mean dependent var		76.85923
Adjusted R-squared	0.729106	S.D. dependent var		258.6875
S.E. of regression	227.1292	Akaike info criterion		13.96218
Sum squared resid	1289692.	Schwarz criterion		14.55935
Durbin-Watson stat	2.088564			

Source: Authors' Computation Using E views 12

The coefficient of the constant implies that if population growth, government expenditure on agriculture, real GDP, exchange rate and inflation are set equals to zero, food importation will increase by about 87.33 percent point. The coefficient of population growth (PG) is -5.02, which implies that with the influence of all other variables held constant, an increase in the population growth rate by one percent on the average, will lead to a decrease in food importation by about 5.02 Percent point. The coefficient government expenditure on agriculture (GEXPA) is 3.185, this suggest that all things being equal, as government expenditure on agriculture increases by one percent on the average, food importation will increase by about 3.18 percent point.

The coefficient of real GDP (RGDP) is 8.74, which implies that with the influence of all other variables held constant, an increase in the RGDP change by one percent on the average leads to an increase in food importation by about 8.74 Percent point. The coefficient of exchange rate (EXCH) is -2.53, this suggest that all things being equal, as exchange rate increases by one percent on the average, food importation will decrease by about 2.53 percent point. More so, the coefficient of inflation rate (INFL) is -6.17, which implies that with the influence of all other variables held constant, an increase in inflation rate by one percent on the average, will lead to a decrease in food importation by about 6.17

Summary of Statistics

R² and Adjusted R² From the regression table, it can be observed that multiple coefficient of determination (R²) is given as 0.892 or 89.2%. This means that about 89.2% of the variation in food importation is explained by changes in population growth, government expenditure on agriculture, real GDP, exchange rate and inflation. The remaining 10.8% is explained by other variables not included in the model. The adjusted R² is reported as the multiple coefficient of determination adjusted to take into account the degrees of freedom associated with the sum of squares. The Adjusted R² is given as 0.729 or 72.9%. This implies that about 72.9% of the fluctuations in the dependent variable food importation are jointly explained by the fluctuations in the explanatory variables.

Test for Autocorrelation: Empirical result from Durbin-Watson (D-W) test shows that computed D-W for the model is 2.08. While the result from Durbin-Watson (D-W) tabulated lower case (d_L) is equals to 1.160 and 1.222, Durbin-Watson (D-W) tabulated upper case (d_U) is equals to 1.803 and 1.726 respectively. Given the Durbin-Watson value shows that there is no evidence of autocorrelation or no autocorrelation with a first order scheme in the specified models.

DISCUSSION OF FINDINGS

The negative impact of population growth on food importation is a suggestive of food insecurity in Nigeria as earlier envisaged by Peters (2015), Oguntegbe et al. (2018), and Owoo (2021). As a population grows, there is often an increase in the capacity for domestic production of goods and services. This can lead to a reduced reliance on imports for certain products, as the country becomes more self-sufficient in meeting its own demands. However, these findings are essential because they stress the need to have population growth that will keep pace with food productivity. For instance, in the last few years in Nigeria, the level of hunger has increased as many families cannot feed themselves as a result of the hike in food prices. Several factors were responsible for the increase in prices, but two of these were notably more pronounced. This included scarcity of food occasioned by rising insecurity that scared away farmers, as well as the fact that most of the foods consumed in Nigeria were imported at exorbitant prices, thereby making them above the reach of the common person. The result is hunger and malnutrition. For example, the fear of Boko Haram Terrorists and banditry is increasing in the northeast and northwest of Nigeria. High levels of violence have been reported throughout the areas, resulting in reduced agricultural activity, displacement, and reduced humanitarian access, with many people being relocated many times. This, along with much higher-than-average basic food costs, limits family buying power and access to food. As a consequence, most of the northwest and northeast experienced crises and emergencies.

Furthermore, since humanitarian access has deteriorated in recent years due to increasing violence and displacement, many families in hard-to-reach locations face huge food consumption gaps, indicating excess mortality and acute malnutrition. The danger of famine will continue to exist as these people struggle to satisfy their food demands. According to current data, about 690,000 individuals have been relocated in the Nigeria's North-central and Northwest regions, interrupting family participation in traditional subsistence activities (FAO,

2021). The increase in the level of insecurity has been responsible for disruption in agricultural farming seasons in Nigeria as most farmers are prevented from being engaged in land preparation, planting, weeding, and harvesting. High input prices for products like better seeds, herbicides, and fertilizers have added to the insecurity issue, limiting agricultural development to a level that is now below average. Similarly, most families displaced in the northeast relied on host communities that are vulnerable to their basic needs as a result of insurgency. Thus, host communities became even more impoverished, exposing them to food insecurity and malnutrition. In addition, many farmers have been unable to carry out their farming activities due to incessant attacks and constant looting, resulting in the loss of farm products, low harvests, productive assets, and low purchasing power. Statistics from FAO revealed that between March and May 2020, at least 9.2 million people in the country have been confronted by various crises or worsened levels of food insecurity due to armed conflicts, Covid-19's effects, and climate change (FAO, 2021). Approximately 3.2 million people live in Yobe, Borno, and Adamawa states out of these totals. Except for the adoption and implementation of strict humanitarian actions, the figure is expected to rise to over 12.8 million between June and August 2021, with 4.4 million living in the three northeastern states.

The relationship between government expenditure on agriculture and food importation was characterized as a complex interplay with both positive effects as demonstrated by the estimated results point an increased government expenditure on agriculture often leads to economic growth. When businesses invest in new capital, infrastructure, or technology, it can enhance productivity, create jobs, and stimulate overall economic activity. As the economy grows, there is typically an increased demand for goods and services, including imported ones. A thriving economy with increased investment tends to result in higher levels of consumer spending. This can lead to increased demand for both domestically-produced and imported goods. Consumers with higher incomes are more likely to have the means to purchase imported products. In many cases, domestic investment and import demand are complementary. For example, if a company invests in advanced manufacturing technology, it may need to import certain components or raw materials that are not readily available domestically. This relationship supports a globalized supply chain and allows for specialization and efficiency gains.

The negative and significant relation between exchange rate and food importation reflect on a country's currency depreciates (i.e., its value falls relative to other currencies), it makes imported goods more expensive for domestic consumers. This is because, with a weaker currency, it takes more of the domestic currency to buy the same amount of foreign currency needed to purchase imported goods. As a result, the prices of imported goods rise. Higher prices for imported goods tend to reduce the quantity demanded by domestic consumers. This is because consumers either switch to domestically produced alternatives (if available) or reduce their overall consumption of the imported goods. A weaker currency can lead to an increase in demand for domestically produced goods and services, as they become relatively cheaper compared to imports. This is known as the substitution effect. If the demand for imported goods is inelastic (meaning that changes in price have a relatively small impact on quantity demanded), a depreciation of the currency may lead to a decrease in the value of imports but not a proportionate decrease in the quantity imported. This is because consumers may continue to buy some quantity of the imported goods despite the higher prices. A negative relationship between exchange rates and food importation can influence a country's trade balance. A depreciation of the currency, by reducing food importation and potentially increasing export demand (since domestic goods become cheaper for foreign buyers), can improve a country's trade balance. This is because exports may increase while imports decrease, leading to a reduction in the trade deficit. This finding is in line with the findings of Oluyemi and Isaac (2017) who found the magnitude of the impact of exchange rate changes on food importation depends on the price elasticity of demand for imported goods. If demand is very elastic (sensitive to price changes), a change in exchange rates will have a relatively large impact on the quantity demanded. Conversely, if demand is inelastic, the impact will be smaller.

The negative relationship between the inflation rate and food importation implies that as inflation rises, import demand tends to decrease. When inflation is high, the purchasing power of a country's currency decreases. This means that people can buy fewer goods and services with the same amount of money. As a result, consumers may reduce their spending on imported goods, which are likely to become more expensive due to the weaker currency. High inflation can erode the competitiveness of domestic products in the global market. A country's inflation rate is significantly higher than that of its trading partners; its goods become relatively more expensive

compared to similar products produced in countries with lower inflation rates. This can lead to a decrease in demand for imports as consumers and businesses opt for cheaper domestic alternatives.

CONCLUSION AND RECOMMENDATIONS

This study concludes that population growth has a negative significant relationship with the food importation in Nigeria. Also government expenditure on agriculture has a positive impact on food importation. Real GDP has a positive impact on food importation. Exchange as well as inflation impacted negatively to food importation in Nigeria. Results also posit that changes in population growth, real GDP, domestic investment causes change in food importation in Nigeria for the period under review. More so, the impulse response functions of population growth rate shows that one standard deviation shock given to population growth will result to a decrease in food importation. Given the stated objective, the study then concludes that there is a negative and significant relationship between population growth and food importation. However, these findings are essential because they stress the need to have population growth that will keep pace with food productivity. Sequel to the findings of the study, the study recommends the following:

- i. Since increase in population could lead to decrease in importation of consumable goods Government should put policy that will encourage productivity to enable the population to produce more to substitute imported goods it is also recommended that the government consider an increase in budget allocation in the agriculture sector to boost food output. In addition, rewarding incentives should be given to all those willing to take up a career in agriculture, particularly the youth, thereby fast-tracking the current diversification drive of the government.
- ii. Based on the positive relationship between government expenditure on agriculture and food importation, government should encourage policies and initiatives that support the increment of expenditure on agriculture which will have the capacity to reduce importation but increase exportation on goods and service, this could enhance economic growth.
- iii. The positive relationship between real GDP and food importation, suggests that government should implement policies that foster capacity building to discourage importation and encourage local production as this could lead to economic growth and advancement.
- iv. Policy measures towards the stabilization of the exchange rates are highly recommended so that level of imports can be controlled and exports encouraged. Exports capacity should be enhanced through acquisition of improved technology and means of production; this will in turn further reduce the demand for imports. Deliberate policies targeted at diversifying foreign earnings should be introduced. Going by the results of this study, the Central Bank of Nigeria is advised not to devalue the naira due to its insignificant effect/impact on export in Nigeria.

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