
Investigating the Impact of Diversification on Economic Growth in Nigeria: Evidence From Structural Vector Autoregression Analysis

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ABSTRACT

Fluctuations in oil prices have caused economic contractions and challenges to oil-exporting economies. In particular, Nigeria suffers both the previous and current global oil price shocks and this has raised concerns among policymakers, governments, and economic analysts because of the impact of oil and oil prices in Nigeria's macroeconomic development. However, this paper investigates the role of diversification on economic growth in Nigeria using annual data from 1986 to 2018. The techniques applied showed that only remittances and official development assistance have affected economic growth in the short run. However, the coefficients of one period lagged indicated that the system is capable of adjusting to its long-run equilibrium condition after some shocks in the system. The findings from variance decomposition indicated that diversification plays a positive role on economic growth in both the short and long-run horizons. By overall implication, the study concludes that diversification has a positive role on Nigeria's economic growth. Therefore, the study recommends the need for the government to provide active and inclusive policies such as soft loans and commercial agricultural programs to improve its export of agricultural output competitiveness, improve supervisory and regulatory frameworks in the financial sector to

ease remittances inflow. For these reasons, diversifying the economy from oil revenue is the ultimate goal for achieving sustainable economic growth and development goals or targets by the year 2030.

Keywords: *Nigeria, Diversification, economic growth, cointegration, agriculture*

JEL Classification: *C01;C10; L80;O29;O40;Q01;Z32*

1. INTRODUCTION

Globally, oil and fuel-related commodities have become sources of significant revenue to oil-producing economies over the last five decades. For example, World Bank ranked Kuwait, Oman, Saudi Arabia, Bahrain, Iraq, Qatar, Libya, Venezuela, and Nigeria as the top countries that largely depend on oil exports and revenues over 80 percent. However, (Bowler, 2016) argues that fluctuations in oil prices have been causing serious economic contractions and challenges to these economies. For example, from 1985 to 1986 a supply shock posed pressure on oil prices to decline while from 2008 to 2009, the decline in oil prices resulted from a collapse in demand. Yet, there was a stunning decline from \$108 per barrel in January 2014 to a less than \$38 per barrel in June 2016 (i.e 65 percent decline in the price of Brent oil). Recently, in March 2020, there was a historical sharp decline in the oil prices to below \$20 due to global lockdown, fall in oil demand, slow or closure of business activities caused by the outbreak of coronavirus the world over. The price drop was last seen in 18 years when the international benchmark of Brent oil dropped by 8,7 percent to \$22.76 per barrel in 2002.

The recent drop in the oil prices had raised concerns among policymakers, governments, and economic analysts because of the impact of oil and oil prices on the global macroeconomic development. For example, Saudi Arabia has since started far-reaching economic reforms that would diversify its economy over the next decades from its so much dependence on oil revenue and falling oil prices under the vision 2030 program. Therefore, it becomes imperative for Nigeria as a nation to adopt economic alternative reforms that will enhance economic growth and which are independent of oil revenue. (Federal Ministry of Budget and National Planning, 2013) maintained that the Nigerian economy generates its incomes largely from oil and gas up to about 35 percent of Gross Domestic Products, 95 percent export incomes as well as 70 percent of government revenue. The fact is that a rise in oil price inevitably influences net export as well as the budget incomes of oil-exporting economies and in turn, will strengthen financial development, primarily through expansionary monetary policy (Alekhina and Yoshino, 2018; Nasir et al., 2019; Galadima and Aminu, 2019). However, a decline in the oil price contracts the growth of these economies particularly when they do not have oil price benchmark in their budgetary plans (see; Osalor, 2016). For example, Nigeria's oil income

fell to \$41.33 billion (organization for petroleum exporting countries (OPEC) Yearly Measurable Bulletin, 2016). This means that the drop in oil prices in the global market induces a weak budget implementation in the Nigerian economy and this may pose difficulties in accomplishing a feasible level of development.

In the 1960s, before the 1970 discovered oil, agriculture, and the non-oil sectors contributed as much as 65% to the export Item (GDP) (Yesufu, 1996). However, the oil boom of 1973 to 1974 brought about a significant impact on the Nigerian economy indeed till the early 1980s. Agriculture and other non-oil sectors' contributions dropped drastically to 30% (see; National Bureau of Statistics (NBS), 2010). Chigbu (2005) argues that farming gave more than 80% of Nigerian trade profit within the 1960s, 65% of the whole yield of the GDP created by business, and around 50% of government income.

(Ekechukwu, 2010) also maintain that tourism another non-oil sector that is known to form employments at different levels that are fundamental to the development of the Nigerian economy. (Creace and Querini, 2011) observed that tourism is currently one of the world's biggest businesses. It is a known fact that the world economy depends largely on three major industries and these are media transmission, tourism, and innovation (Adeleke, 2006). The government in this manner ought to get the relative significance of tourism to their locale, counting tourism's commitment to financial activities within the zone (Daniel, 2013).

With the recent advancement in information and communication technology, the service sector is coming of age to enhance the socio-economic development and advancement of any country. (Latha, 2016) argues that the development rate of the service sector is contributing much more as well as creating employments that expand incomes more than any other sector.

Remittances are being seen as a moderately appealing source of foreign aid for nations that can be utilized to advance financial advancement and resolve any emergency circumstance.

Accordingly, Cape Verde and Senegal like Nigeria, in turn, rank among the strike beneficiary of remittance in West Africa. As a little Island country, Cape Verde's economy like intensely subordinate on settlement and this may be seen in their commitment to the nation. GDP (Pop, 2011). Concurring to official gauges, almost one-third of the populace of Cape Verde live overseas, even though few researchers put the figure well over that, contending indeed that the number of displaced people surpasses the entire inhabitant populace of Cape Verde (Cohen, 2005 and Pop, 2011).

Diversification is a technique that reduces the risk of dependence on one line of production to a new field(s) which stimulates and expands the existing or traditional products or revenue. (Ayeni, 1987; Iniodu, 1995) believed that diversification does not hinder specialization but ensures that

national resources are channeled into the best alternative uses or line of investment and production. Economic diversification could be a pillar of sustainable economic growth development.

Therefore, this study seeks to fill this gap because the need for diversification has been acknowledged as well as put forward in key internationally agreed development goals such as the Decade 2011-2020 (Istanbul Programme of Action) for developing nations and the Sustainable Development Agenda for 2030 among other programs.

Our key contribution to the literature is to investigate the role of diversification on growth in Nigeria and to answer how does the level of agriculture production, service sector output, official development assistance, remittance inflow, and tourism affect growth in Nigeria because the need for diversification has been acknowledged as well as put forward in major globally established development goals such as the Sustainable Development Agenda for 2030 among other programs which are seldom considered. Our contribution to the study is in this direction and to the best of researchers' knowledge will help in creating jobs, fostering structural transformation, and achieving sustainable economic growth in Nigeria.

The objective of this study is to empirically investigate the role of economic diversification on economic growth in Nigeria using annual data from 1986 to 2018. The paper is organized as follows; section one deals with introduction, section two reviews the related literature, the methodology is discussed in section three, section four presents the analysis and discussion. Finally, section five discusses the research conclusion and implications.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Several research findings have been related to economic complexity and these findings have uncovered some stylized facts concerning the pattern of diversification of economies. These patterns are mostly associated and limited to theories of economic growth, technological change, structural transformation, and trade (Freire, 2017).

This study will connect these findings to enrich our understanding of the role of diversification on economic growth. The knowledge of the relationship could be of economic benefit to policymakers in Nigeria to design and implement policies as well as strategies that will enhance economic growth. For example, (ESCAP, 2011, 2014, 2015; Lei and Zhang, 2014) empirically find that economies that diversified their production and export base tend to have higher levels of GDP. Similarly, (Hausmann & Hidalgo 2011; ESCAP, 2011 and 2015) argue that economies that diversify tend to export products that are highly needed in terms of demand than

their existing exports. (Hendrix, 2019) argues that nations with higher levels of oil and gas reliance and having a larger population have been found to witness effective diversification particularly in the course of the commodities boom.

(Udanwa and Esu 2015) finds that diversifying the Nigerian economy can induce large scale industrialization of the real non-oil sector, technological spillovers that can benefit both trade and investment, and help in improving the agricultural sub-sector, to mention but just a few. Equally, (Mukail and Mulkat, 2015) findings reveal that a unilateral causality and positive long-run association between tourism development and economic growth in Nigeria. Using input and output techniques, (Lin, & Sung, 1984) found that the labor productivity and the content of valued added of tourism particularly when compared to domestic manufacturing is comparatively high because involves the use of a small number of laborers, little energy, fair amounts of capital as well as appreciable amounts of skills in tourism development. They argued that due to minimal import protectionism in Hong Kong, tourism growth is more stable than many major commodity exports.

Oji-Okoro (2011) found a positive association connecting economic growth, FDI, domestic saving, and government expenditure on agriculture. However, Lawal (2011) found that government expenditure has not pursued the usual pattern but the contribution of the agric sector to the GDP indicates a clear connection in the sector with government expenditure.

In a study in Turkey by (Zortuk, 2009) who investigated the connection between the development of tourism and economic growth, the study finds a unidirectional causality running from tourism development to economic development.

Similarly, (Kreisan, 2010) finds a positive association linking economic development and tourism development. Another finding from the study shows a unidirectional impact running from tourism earnings to economic performance.

The foregoing mixed and inconclusive empirical findings related to economic diversification have become a subject of concern among researchers to formulate further hypotheses to explain if diversification plays any role on growth and to ask how does the level of agriculture production, service sector output, official development assistance, remittance inflow, and tourism affect growth with particular interest to developing nations such as Nigeria because it can be understood that the literature is related to economic complexity in developed economies. Therefore, this study seeks to fill this gap.

2.1 THEORETICAL FRAMEWORK

It is known that; most economic theories are related to the optimum allocation of scarce resources. However, these theories have not been accepted within the realm of economic diversification because they failed

to specifically deal with economic diversification. For example (Krugman, 1979) believes in the varieties of products with imperfect substitutes failed to specify which nations should specialize in a specific product because of the continuum assumption of symmetric goods and services. Also, economic theories that concentrate on technological progress have a chance to be related to diversification. For instance, studies on growth hypothesis have emphasized that technological change has a role to play in achieving growth (Freire 2017). However, none of these models or theories examined above give details about economic magnitudes of output growth but the employment effect is reasonable to investigate this approach related question that connects diversification with the basic economic dynamics of affected countries.

This study is within the framework of structural economic dynamics (SED) along with endogenous technological changes. (see Pasinetti 1993, Anderson 2001, Duchin 2005). This can be beneficial particularly in the agricultural sector output global competitiveness as well as development in production and consumption pattern in line with a generalized form of Engel's law. Gaulerzi (2012) argues that SED recognizes the effect of potential goods and services within the demand for old products mix. Similarly, (Clower 1965) maintained that the model utilizes the Keynes-kulecki rule of effective demand. However, the model does not incorporate full employment, instead, it uses the adjacent possible concept to formalize path dependence in line with the diversification process (Kauffman 2008). Accordingly, the model formalizes economic diversification endogenously determined in the model which can be applied to a multi-sector economy pursuing economic diversification.

3. METHODOLOGY

3.1 Data sources and description

The study employs data from world development indicators (WDI) database for the periods of 1986 to 2018 to reflect the turning point of structural adjustment policies and changes in Nigeria after 1986 to study the role of diversification on economic growth in Nigeria using Vector Error Correction Model (VECM) and Structural Var (SVAR) approach. We included an annual percentage of Gross Domestic Product Per Capita (GDPC) as the dependent variable to capture the per-capita welfare effects in terms of growth dynamics. We also employed Agricultural production output (AGO) measured as a % of GDP, Service sector output (SSO) as % of GDP. Official development assistance (ODA) was measured as % of gross capital formation. Remittances receipt (RMTU) measured in current U.S. dollars, and the receipts on tourism (TRS) measured as a% of GDP

3.2 Model Specification

Various functional forms describe the model's relationship (i.e. role of diversification on the economic growth of an economy). Therefore, the study varies with the related models reviewed in the study as it takes into account the agriculture, service sector output, and tourism receipt variables described above. The model is specified as below:

$$GDPC = f(AGO, SSO, ODA, RMT, TRS) \quad \text{eqn (1)}$$

Linear Relationship is as follows:

$$GDPC = \beta_0 + \beta_1 AGO + \beta_2 SSO + \beta_3 ODA + \beta_4 RMTU + \beta_5 TRS \quad \text{eqn (2)}$$

Econometric Relationship is as follows:

$$GDPC = \beta_0 + \beta_1 AGO_t + \beta_2 SSO_t + \beta_3 ODA_t + \beta_4 RMT_t + \beta_5 TRS + \mu_t \quad \text{eqn (3)}$$

Where:

$GDPC_t$ = gross domestic product per capita (annual% in current US dollars)

AGO_t = agricultural production given by index of agricultural production (% of GDP)

SSO_t = Service sector output (% of GDP)

ODA_t = Official development assistance received (% of gross capital formation)

RMT_t = Remittances inflow received (at current US dollars)

TRS_t = Tourism (international receipts measured as a % of GDP).

μ_t = Stochastic Error Term

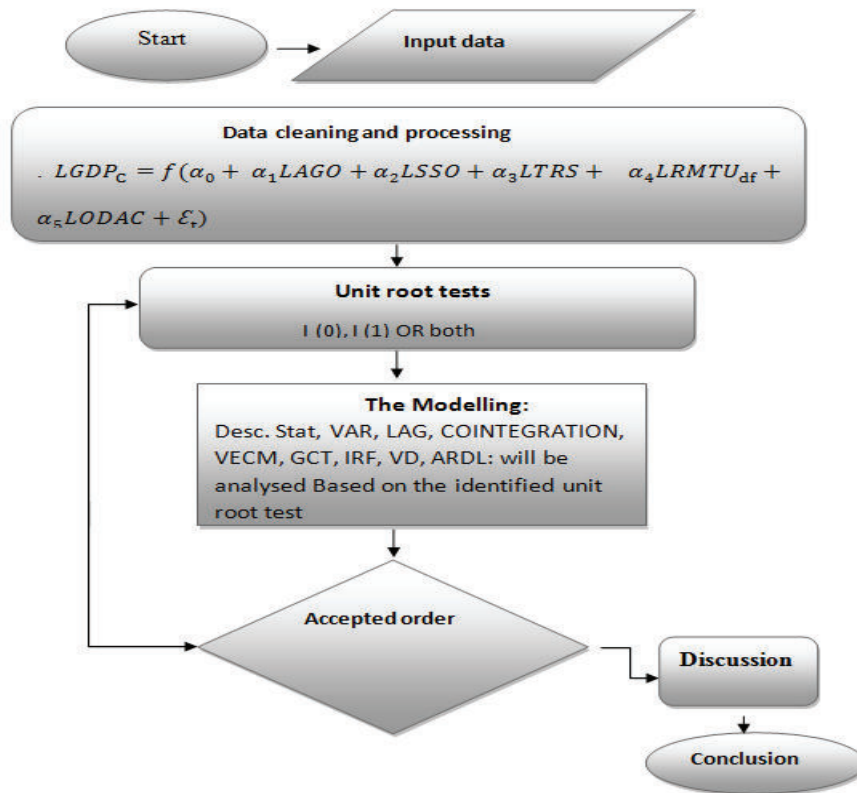
t = Time period

β_0 = the intercept of the model

β_1, β_2 and β_3 = Regression Coefficients of the independent variables.

Schematic of the Estimation Technique

Figure 1



It is known that various economic data exhibit a nonstationary process. However, determining their appropriate order of integration is highly recommended to apply the best technique of analysis (Nelson and Plosser, 1982). The study applied Augmented Dickey-Fuller (ADF), Philip Perron as well as Kwiatkowski, Phillips, Schmidt-Shin (KPSS) stationarity tests and the variable has been found to exhibit the same differenced order (i.e I(1)) after which we applied cointegration to check the long-run association among our considered variables in the study. As required by (Engle & Granger, 1987), the VECM which integrates both the short run and the long-run equilibrium conditions is analyzed as specified below:

$$\Delta X_t = \alpha \beta' X_{t-1} + \sum_{i=1}^m \phi_i \Delta X_{t-i} + \alpha x_t - 1 + \alpha t - \sum_{i=1}^m \theta_j \alpha t - j \beta + U_t \text{ --- eqn(4)}$$

Where: α and β are both $k \times m$ matrices, ΔX_t indicates first difference as $\Delta X_t = X_t - X_{t-1}$, ϕ_i represent the AR coefficients. Finally, θ_j represents MA coefficients. The cointegrating equation is defined by $\beta' X_{(t-1)}$. β is composed of the coefficients for the m cointegrating vectors. Accordingly, we carried diagnostic and robustness checks, Granger causality test, Impulse Response and Variance Decomposition to validate the findings with a certain degree of confidence.

3.3 RESULTS

Unit Root Results

Table I

Variables (1986-2018)	ADF(1) (P-Value)	PP(2) (P-Value)	KPSS(3) (5% Value)
LGDPC	-7.612066 (0.0000)	-19.76202 (0.0000)	0.396591 (0.146000)
LAGO	-7.680534 (0.0000)	-12.98879 (0.0000)	0.252004 (0.146000)
LSSO	-4.541109 (0.0000)	-10.52807 (0.0000)	0.614480 (0.146000)
LTRS	-9.522515 (0.0000)	-8.746294 (0.0000)	0.17468 (0.146000)
LRMTU	-7.690478 (0.0000)	-7.886943 (0.0000)	0.57770 (0.146000)
LODAC	-7.572997 (0.0000)	-6.471924 (0.0000)	0.506204 (0.463000)

Unit root Result

From table I which shows unit root test using augmented dickey fuller (ADF), Philip Peron (PP), and Kwiatkowski-Phillips-Schmidt-Shin (KPSS). The results show that all the variables are stationary taking into consideration their ADF and PP statistics as well as their probability values. The KPSS result also shows that the variables are also stationary because the t-statistics values are greater than the critical values at all levels of significance.

Descriptive Statistics

Table II

	LGDPCC	LAGO	LSSO	LTRS	LRMTU	LODAC
Mean	43.41153	0.099348	0.120129	-85093.75	7.60E+08	0.125068
Median	53.48863	0.104126	0.192775	169500.0	51040252	0.079289
Maximum	401.1098	12.48973	6.046954	3240000.	1.24E+10	12.31320
Minimum	-554.4307	-6.596607	-7.252547	-8040000.	-9.28E+08	-14.03112
Std. Dev.	226.6949	3.101164	2.828366	1993151.	2.28E+09	3.476139
Skewness	-0.835416	1.649696	-0.484584	-2.068390	4.328579	-0.774341
Kurtosis	3.691561	9.581848	3.445835	9.396341	22.60215	14.22632
Sum	1389.169	3.179125	3.844142	-2723000.	2.43E+10	4.002167

The descriptive result indicated that LGDPC has a mean value of 43, while LAGO, LSSO, LTRS, LRMTU, and LODAC have 0.099, 0.120, -8509, 7.60 and 0.125 respectively. LGDPC has a median value of 53.4, LAGO with 0.10, LSSO 0.192, LTRS 1695, LRMTU 51040, and LODAC with 0.079 respectively. The standard deviation from the table shows that LSSO, LAGO, and LODAC have approximately a standard deviation of 3, which shows that, they are thrice far from the sample mean. While LGDPC, LTRS, and LRMTU have 226, 199, 2.28, respectively.

In terms of skewness, LGDPC, LSSO, and LODAC are normally distributed with asymmetric around its mean. LAGO and RMTU have positive skewness which implies long right tail with higher values than the sample mean, while LTRS is negatively skewed.

LGDPC and LSSO are mesokurtic with a normal distribution, while LAGO, LTRS, LRMTU, and LODADC are leptokurtic with a peak curve with higher values than the sample mean.

Lag selection criteria

Table III

LAG	LOGL	LR	FPE	AIC	SC	HQ
0	-1585.026	NA	4.68e+38	106.0684	106.3486*	106.1580
1	-1568.980	24.60332	1.86e+39	107.3987	109.3603	108.0262
2	-1495.700	83.05128*	2.13e+38*	104.9133*	108.5564	106.0788*

(*) indicates the recommended lag by the criterion.

Knowing the specified lags in the analysis is significant in time series analysis because it helps in obtaining the required outcome. From the VAR order selection criteria in table III both AIC, LR, FPE, HQ specify 2 lags, except Schwarz criteria which specify 0 lag. Therefore, 2 lags will be used throughout the analysis.

Cointegration Test

Table IV

Hypothesis		Eigen-value	Trace		Maximum Eigen-value	
H ₀	H ₁		Statistics	Probability**	Statistics	Probability**
r= 0	r>1	0.926998	197.2288	0.0000*	75.90085	0.0000*
r≤1	r≥2	0.765059	121.3279	0.0000*	42.00426	0.0043*
r≤2	r≥3	0.739619	79.32365	0.0000*	39.02263	0.0011*
r≤3	r≥4	0.549638	40.30102	0.0022*	23.13338	0.0258*
r≤4	r≥5	0.389926	17.16764	0.0277*	14.33108	0.0488*
r≤5	r≥6	0.093181	2.836556	0.9021	2.836556	0.9021

The (*) indicates rejection of the null hypothesis of no cointegration at the five percent significance. The (**) denotes the Mackinnon, Haug, and Michelis (1999) probability values.

The trace test and maximum Eigen-value show 5 cointegrating equations at 5% (0.05) significance level. This shows a long-run association among the considered variables and the null hypothesis of no cointegration is rejected as both trace and max Eigenvalue indicated five cointegrating equations and also the probability values are less than 5% level of significance. Therefore, we conclude that LGDPC, LAGO, LSSO, LTRS, LRMTU, ODAC are cointegrated or they have a long-run relationship. Hence the result validates the use of vector error correction mechanism.

Vector Error Correction Model (VECM) Results

The table presents the VECM results given that the variables of interest met the preconditions for the analysis as follows:

Vector Error Correction Model (VECM) Results

Table V

Variables	Coefficients	St. Error	Test-Statistics	P-values
ECM _{t-1}	-0.685988	0.321557	-2.133332	0.0498
LGDPC	0.508476	0.427337	1.189870	0.1521
LAGO	6.311857	12.15202	0.519408	0.6111
LSSO	2.518076	15.63478	0.161056	0.8742
LTRS	-161E-05	1.74E-05	0.921348	0.3715
LRMTU	-1.69E-07	6.47E-08	-2.610002	0.0197
LODAC	35.66811	13.32698	2.676384	0.0173
Constant	19.16585	38.92093	0.492430	0.6295

From table five, the VECM result shows the short-run dynamics and the error correction term (ECM_{t-1}) which how the system can adjust to its long-run state of equilibrium. Accordingly, the coefficient of the error term

should be negative and statistically significant if the long-run equilibrium status is to be restored in the subsequent period. Thus, our model has met made this condition given that the one-period lag coefficient of the error term (ECM_{t-1}) is negative (-0.6860 approximately) and is statistically significant (0.0498). By implication, the negative sign shows that the system is capable of adjusting to its long-run equilibrium condition after some shocks in the system.

The value 0.6860 reveals that about 68% of the adjustments are corrected annually to converge back to equilibrium. This indicates that the speed of adjustments will take 2 years on average for the Nigerian economic system to converge to its long-run equilibrium condition after some disorder in the economic policy system. The policymakers and government need to take active policy measures to achieve the countries long term economic performance that can withstand global competitiveness.

The short-run coefficient shows that only remittance and official development assistance have more impact on economic growth in Nigeria. This explains the developing and dependence nature of the Nigerian economy which needs to be addressed for the betterment of the country. Overall, the short-run coefficient is highly significant because of the goodness of fit from the R-squared (R^2), i. e. $R^2 > 60\%$ and adjusted R^2 of the model. The f-statistics and the probability value are statistically significant at 5% as explained in table 7

VEC Granger Causality/Block Exogeneity Wald Test

Table VI

Dependent Variable: D(LGDPPC)			Eq1 of Eq6
Excluded	Chi-sq	Df	Probability
D(LAGO)	0.599891	2	0.7409
D(LSSO)	0.069015	2	0.9661
D(LTRS)	1.276940	2	0.5305
D(LRMTU)	14.64314	2	0.0007
D(LODAC)	8.082484	2	0.0176
All	26.54374	10	0.0031

Table six shows Vector error correction granger causality result using block homogeneity wald test indicate that Using LGDPC as a dependent variable, individually, it was only LODAC and LRMTU can granger cause LGDPC, but jointly all the variables can granger cause LGDPC at 5% level of significance. This calls for active policy engagements that can improve other sectors such as agric, tourism, and service to address the dependence culture

on monocultural export, foreign aids, and development assistance from abroad which are based or attached with severe conditions. However, the full table that contains the remaining five equations is presented in the appendix. Using LAGO as a dependent variable, individually, LGDPC can granger cause LAGO at 5% level of significance, but jointly, all the variables can only granger cause LAGO at 10% level of significance. So also, using LSSO as a dependent variable, individually, LGDPC and LRMTU can granger cause LSSO at 5% level of significance, but jointly all the variables can granger cause LSSO at 5% level of significance. Taking LTRS as a dependent variable, individually and jointly none of the variables can granger cause LTRS at all levels of significance. Furthermore, using LRMTU as a dependent variable, individually, only LAGO can granger cause LRMTU at 5% level, but jointly all the variables can granger cause LRMTU.

Finally, using LODAC as a dependent variable, individually, LGDPC, LAGO, LRMTU can granger cause LODAC, but collectively, all the variables can granger cause LODAC at all levels of significance. Therefore, we conclude that the variables can granger cause each other hence out of six variables, jointly four have probability values less than 5% level of significance.

Statistical and Diagnostic Tests

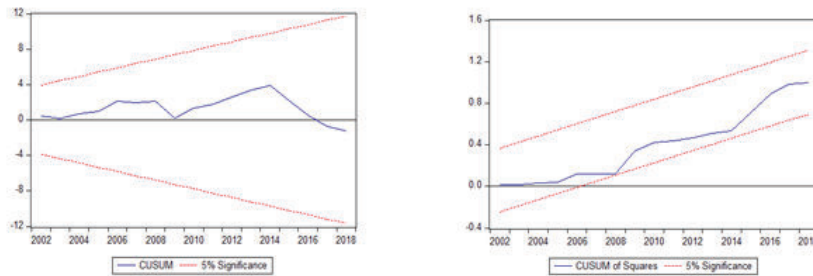
Table VII

Statistical Tests		Diagnostic Tests	
R ²	0.712246	B-G Serial Corr. Lm Test	0.2109
Adjusted R ²	0.462858	B-G-P Het-TEST	0.7802
Schwarz Criterion	14.40306	R-Reset Test	0.1941
F-Statistic	2.855983	Jarque - Bera Test	29.43246
Probability	0.027553	Q-Statistics: See Appendix	>0.05

Table seven shows the estimated results based on the goodness of fit and diagnostics which validates the goodness of fit of our model since it has passed all the major econometric tests such as serial correlation, heteroscedasticity, normality, and Ramsey reset tests. Also, the results show evidence of the goodness of fit of the model, no serial correlation, no specification error in the model given the coefficients of the power of the fitted dependent variable is greater at all significance level. These are supported by the residual stability robustness checks from Cusum and Cusum of squares in figure 2 below.

Cusum and Cusum Squares Test

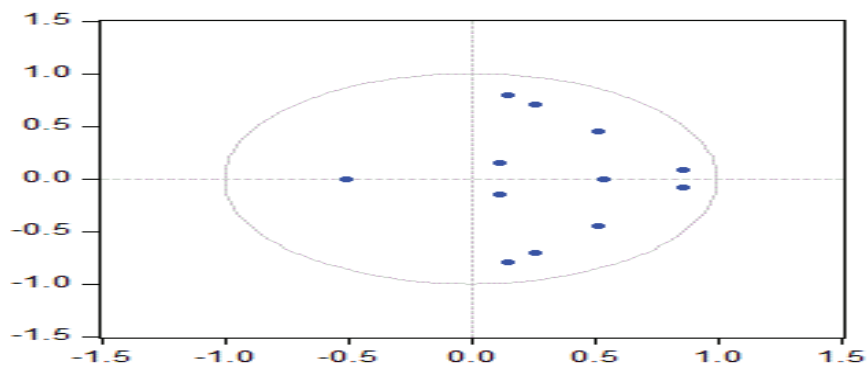
Figure II



Where the decision requires the plots statistics to fall within the significance level boundary of 0.05 as specified in Brown, Durbin, And Evans (1975). The study concludes that the ECM model is stable overtime because the plots from both tests satisfied the above 0.05 stability condition.

The root of AR Polynomials

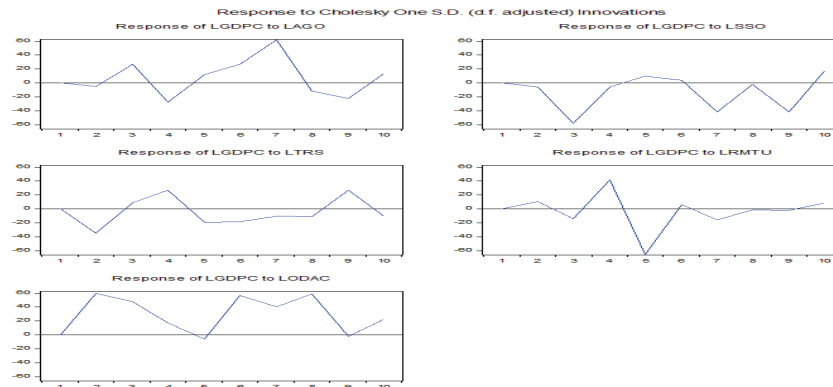
Figure III



The characteristics polynomials show the roots of the VAR are stationary since they all lie within the unit circle which shows they are stable within the sample period.

Impulse Response Result

Figure IV



Impulse response traces the effect on present and future values of the exogenous variable of one standard deviation shocks to one innovation. Figure 4 Shows the innovation shocks for 10 years.

One standard deviation shock on LAGO will have a negative effect on LGDPC in the first year until half of the second year where it becomes positive up to half of the third year, then negative until the fifth year, then it reverts to positive up to the eight-year through the ninth year and lastly positive in the tenth year. Also, one deviation shock on LSSO has a negative effect on LGDPC in the first quarter until half of the fourth quarter where it becomes positive through the fifth quarter up to sixth quarter where it becomes negative until half of ninth quarter and positively in the tenth quarter. One standard deviation shock has a negative effect on LGDPC in the first quarter until the third quarter where it becomes positive up to half of the fourth quarter, then it becomes negative till half of the eight quarter and positive till half of the ninth quarter and negative in the last quarter.

One standard deviation shock on LRMTU has a positive effect on LGDPC in the first quarter up to half of the second quarter where it becomes negative till half of the third quarter where it becomes positive up to half of the fourth quarter where it maintains negative effect until sixth quarter. It becomes positive up to half of the sixth, then becomes negative until ninth quarter and positive in the tenth quarter. One standard deviation shock of LGDPC to own sock maintains positive effect until the fifth quarter and positive again up to ninth quarter through the tenth quarter.

Variance Decomposition of LGDPC

Table VIII

Period	S.E.	LGDPC	LAGO	LSSO	LTRS	LRMTU	LODAC
1	200.2199	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	289.9181	94.04846	0.030266	0.042867	1.454904	0.128297	4.295210
3	331.1689	89.31688	0.695939	3.129346	1.184402	0.273766	5.399662
4	357.6816	88.02927	1.203150	2.707675	1.574828	1.617794	4.867286
5	383.1347	86.23918	1.146107	2.420382	1.628252	4.301463	4.264618
6	438.6123	87.23830	1.244384	1.854559	1.427354	3.302958	4.932441
7	472.9558	85.63691	2.808587	2.370818	1.277379	2.947181	4.959129
8	499.2848	85.59125	2.577416	2.128999	1.198592	2.645781	5.857965
9	514.5343	85.30905	2.618279	2.665282	1.396395	2.493368	5.517627
10	538.5366	86.19542	2.449742	2.534266	1.314051	2.297995	5.208527

Cholesky Ordering: LGDPC LAGO LSSO LTRS LRMTU LODAC

Variance Decomposition

From table 8 where **LGDPC is the dependent variable**, the third year represents a short run horizon and seventh to tenth year as the long-run horizon in Cholesky variance decomposition ordering in this study. In the short run horizon, the innovation own shock of LGDPC accounts for 89.3% variation in LGDPC. Apart from its shock of LGDPC, the innovation shock of LAGO accounts for 0.69% variation in LGDPC. While innovation shocks to LSSO, LTRS, LRMTU, and LODAC can account for 3.12%, 1.18%, 0.27%, and 5.39% in LGDPC respectively.

In the long-run horizon, innovation shocks to LGDPC account for 86,2% variation in its shock. While innovation shocks in LAGO, LSSO, LTRS, LRMTU, and LODAC can account for 2.45%, 2.53%, 1.31%, 2.29%, and 5.21% to LGDPC respectively.

CONCLUSION

The paper investigates the role of diversification on economic growth in Nigeria using annual data from 1986 to 2018. Our key contribution to the literature is the investigation of the role of diversification on growth and the answer to how does the level of agriculture production, service sector output, official development assistance, remittance inflow, and tourism affect growth in Nigeria because the need for diversification has been acknowledged as well as put forward in major globally established development goals such as the Sustainable Development Agenda for 2030 among other programs which are seldom considered. The techniques applied showed that only remittances and official development assistance can affect economic growth in the short run. However, the coefficients of one period lagged indicated that the system is capable of adjusting to its long-run equilibrium condition after some shocks in the system. The findings from variance decomposition indicated that

diversification plays a positive role in economic growth in both the short and long-run horizons. Thus, agricultural output and remittances have a greater impact on LGDPC in the short run, while official development assistance has a higher and positive role on LGDPC in the long-run.

By overall implication, the study concludes that agricultural output, service sector output, tourism, official development assistance, and remittances have long-run impacts on Nigeria's economic growth. Therefore, the study recommends the need for government to provide active policies such as soft loans and commercial agriculture to improve its export of agricultural output competitiveness, improve supervisory and regulatory frameworks in the financial to ease remittances inflow. On a final note, Nigeria is an oil-dependent economy which suffered both the previous and current global oil price shocks. For this reason, diversifying the economy from oil revenue is the ultimate goal for achieving sustainable economic growth and development goals or targets by the year 2030.

Possible Limitation and Extention of Research:

The possible limitation of this research includes the inability of the researchers to use qualitative research technique because of the financial constraint of the researchers. Further area of studies includes specific concentration on areas such as manufacturing, mining, technology and other related area of economy.

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