Exploring the Transmission Impact of Export Diversification to Output Growth via the Agricultural Channel in Nigeria

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Abstract
This study investigated the transmission effect of export diversification on output growth via agricultural channel in Nigeria. The study period spanned between 1986 and 2022, while Structural Vector Autoregressive (SVAR) model was employed as the analytical technique. Result of the transmission effect indicated that agricultural output has negative and significant contemporaneous response to export diversification, while economic growth responded positively and significantly to the instantaneous effect of agricultural output. The study concluded that export diversification does not improve economic growth through agricultural output in Nigeria hence, a weak channel. The study recommends that Nigerian government should strengthen its Agricultural extension services to provide farmers with training and information on modern farming techniques, pest management, and sustainable practices as well as allocation of resources for agricultural research and development to promote the adoption of advanced technologies to sustain the influence of agricultural output on economic growth.

Key words: Export diversification, output growth, agricultural channel, SVAR, Nigeria.

1 Introduction

Export instability has necessitated most countries in the world to diversified their export. Therefore, integration in the global value chain allows countries to specialize in specific stages of production, and promote diversification. Expanding exports is one of the main factor that could enhance economic growth of countries though in the world of unstable demands and risky investments, it is hard to have sustainable export earnings in developing countries (Mania & Rieber, 2019). Export diversification is considered as a remedy for these risks and an important tool to get stable earnings from exports. Exports diversification is seen as an engine that can help low-income countries to enhance their macroeconomic performance, achieve higher income, sustain national competitive advantage, enhance macroeconomic stability, accelerate and sustain economic growth (Owan, *et al*, 2020).

In most developing nations, agriculture is known to be the bedrock of their economies as well as a means of getting rid of poverty in their economies (Mukadam & Alex, 2020). Agriculture remains a huge aspect of any nation's economy given its impact on the performance of other associated economic variables. Research has shown that export diversification affects agricultural output positively through increase in agricultural production with its implications on macroeconomic variables such as investment, employment rate, favourable balance of payments and sustained economic growth (Abdullahi, 2017; Duhu, 2022).

One of the major objectives of macroeconomic policies is achieving economic growth and development and a way through which economic growth and development can be fostered is through export. Prior to oil discovering, Nigeria was a major exporter of agricultural products but the discovery of crude oil in commercial quantity shifted the attention of the country from non-oil exports to petroleum product. While petroleum exports kept growing, agricultural exports have been declining (CBN, 2022). As a result, Nigerian economy has experienced shocks from recessions, oil price dwindling

and foreign reserves among others amidst rising cost of governance which has led to a rethink of diversifying the economy through critical sectors like agriculture as contained in the economic growth plan of 2016 (CBN, 2020). However, the volatility of the international oil price with the attendant unpredictability of government revenue, instability in foreign exchange earnings and unstable economic growth rate gives credence to diversification of exports as alternative which could trigger economic growth in Nigerian (World Bank, 2023).

Furthermore, a meticulous survey into extant studies revealed that though series of studies exist on the nexus between export diversification and economic growth yet these studies are not exhaustive as they are faced with series of methodological issues as well as conflicting results. For example, Murphy-Braynen and Thurman (2019) and Cadot *et al.,* (2011) indicated that the relationship between export diversification follows a U-Curve pattern. While Doki and Tyokohol, (2019); and Abdullahi (2017) envisaged a positive and insignificant effect of exports diversification on economic growth. On the contrary, Siyan and Ojonye (2018); Owan, *et al.* (2020) showed that exports diversification has negative effect on economic growth. The inconsistent in literature has necessitated the investigation of the effectiveness of export diversification on output growth through agricultural output in an agrarian economy like Nigeria using a different methodology (SVAR) model. This study is relevant because it provide an insight to policy makers to identify a dimension that can facilitate growth using export diversification.

2 Literature Review

The export-led growth hypothesis used in this study is based on the views of classical economic theory and neo-classical economic theory. The export-led growth hypothesis as posited by Tyler (1981) held that exports unidirectionally promote economic growth and development. Based on this hypothesis, export is the main determinant for economic growth. This can be explained as an increase in exports leading to an increase in employment of the export-based industry and this increase leads to a higher productivity, which in turn leads to an increase in economic growth. The export-led-growth hypothesis is justified given that it increases the country's demand for output which accelerates real output. Export-led Growth Hypothesis aims at enhancing the productive capacity of the home economy in international markets while achieving the objective of economic growth (Afolabi & Babalola, 2020). The export led growth theory is quite glaring because exports of goods and services are an injection into the circular flow of income leading to a rise in aggregate demand and an expansion of output (Schmidt 2020). Growing export sales provide revenues and profits for businesses which can then feed through to an increase in capital investment spending through the accelerator effect.

Empirical Review

Murphy-Braynen and Thurman (2019) conducted a study on the relationship between export diversification and economic growth among Island state utilizing data between 1970 and 2015. Using panel regression analysis, the results showed a non-linear and U-shaped relationship between export diversification and output growth. In a separate study, Nwosa, *et al.* (2019) examined the relationship between export diversification and economic growth in Nigeria from 1962- 2016. The study employed Auto-regressive Distributed Lag (ARDL) technique and it discovered a positive but not significant influence of export diversification on economic growth in Nigeria.

Similarly, Afolabi and Babalola (2020) looked at the effect of export diversification on economic growth in Nigeria using time series data spanning between 1981 and 2017. Utilizing ARDL method, a positive effects of non-oil exports on economic growth in Nigeria was found. Owan, *et al.* (2020) investigated the impact of diversifying the economy on economic growth in Nigeria between 1981and 2018. The study adopted the Ordinary Least Square (OLS) method and the empirical result indicated that export diversification proxy by non-oil export do not have a significant positive impact on economic growth in Nigeria. Also, Duhu (2022) assessed the impact of export diversification on economic growth in Nigeria with data spanning from 1980-2017. The estimation technique adopted for the study were

Autoregressive Distributed lag model and bounds tests. The empirical results showed that export diversification had positive impact on economic growth both in the short run and in the long run. On the other hand, Oguwuike and Tobechi (2018) studied the effect of agricultural output on economic growth in Nigeria from 1981 and 2016. The used Johansen co-integration method showed that agricultural output improved economic growth during the study period.

Also, *et al.* (2018) investigated agricultural export as a diversification tool for economic growth in Nigeria by employing OLS for a data from 1986-2016. The study outcome revealed a that agriculture export has not exerted the desired effect on economic growth in the country to achieve diversification that will result in food sufficiency, fiscal balance, stabilize exchange rate and conserve foreign exchange. Duru, *et al.* (2018) further investigated the impact of agricultural output in stimulating growth in Nigeria and Ghana. The study employed Vector Error Correction (VEC) Mechanism using data that spanned between 1985 and 2014. The study found agricultural sector in Ghana thrives better in accelerating economic growth than the agricultural sector in Nigeria. The diversification of the Nigerian economy through Agricultural sector was studied by Umeji (2019). Using OLS, result indicated that agriculture contributes to economic development in Nigeria. Most of the reviewed empirical works focused on the nexus of export diversification and economic growth without looking at the channels through which export diversification impacts on the economic growth. This study fill the gap by looking at the channels through which export diversification impacts on the economic growth through agricultural output.

3 Methodology of the Study

Kinds and Sources of Data

This study used annual data between 1986 and 2022. The obtained data was on the following variables; real gross domestic product GDP which is a proxy for economic growth, export diversification proxy as export diversification index and agricultural output, gross. Data of economic growth and agricultural output were sourced from Central Bank of Nigeria (CBN) annual statistical bulletin, while data of export diversification was from World Bank development indicator.

Estimation Technique

This study employed Structural Vector Autoregressive (SVAR) model as its method of data analysis while the stationarity of the series was done using Augmented Dicker-fuller (ADF). The SVAR was utilized to examine the transmission effect of export diversification on output growth via agricultural output channel. The choice of the SVAR is due to the model ability to measure the contemporaneous or transmission effect of variables due to shocks (Sims, 1980; Olea, *et al.* 2020). The study also used impulse response function to explain the dynamic behaviour in SVAR system in response to an external input or shock. By analysing how a system responds to a sudden change (impulse), it help to gain insights into its behaviour of variables over time. In addition, the variance decomposition was also implemented given that the SVAR models allow to decompose the variance of endogenous variables into contributions from different structural shocks. By identifying and quantifying these shocks, it help to understand the underlying economic mechanisms driving fluctuations in the system.

Model Specification

This study adopted the neoclassical growth model, endogenous growth theory which explains the long-run growth rate of an economy on the basis of endogenous factors as against exogenous factors of the neoclassical growth theory. It extended Solow-Swan growth model by introducing endogenous technical progress in the growth process. The model state that production function is specified in terms of labour and capital as its traditional inputs. Therefore, one of the simplest versions of the endogenous model is AK model. The AK model is a special case of Cobb-Douglas production function with constant returns to scale (Nwaso, *et al.* 2019)

$Y = AK^{\alpha}L^{1-\alpha}$ ……,.....1

Where; Y = Total production in an economy, A = Total factor productivity, K = Capital, L = Labour, α = Parameter between 0 and 1.

For the special case in which α = 1, the production function becomes a linear function of capital. Thus:

Y = AK …….. 2

Where;

A= is the level of technology which is positive constant and k = represents volume of capital, which embodies both physical capital and human capital.

Various extension of the basic AK endogenous growth model has been worked out, allowing different forms of variables to be productive, (Ojoawe, *et al.*, 2014) argues that agriculture is an engine of growth and added agricultural output (O) to growth equation.

Thus, equation 2 becomes:

$Y = AK^{\alpha}B^{\beta}$ …….. 3

Where: B = f(O, X, P),

$Y = AK^{\alpha}O^{\beta}X^{\delta}P^{\emptyset}$ ……..4

Where: α, β, δ and ϕ are parameters to be estimated. Taking natural logs of equation (4) in order to convert research data from rates and absolute terms into the same numerical structure and to standardize them in relative growth rates and including an error term at time t, yields:

$\ln Y_t = + \alpha_t + \alpha \ln K_t + \beta \ln O_t + \delta \ln X_t + \phi \ln P_t + \varepsilon_t$ …….. 5

Where: ε_t = error term.

In line with the study objective, the re-specification of the model is as follows:

$\ln RGDP_t = + \alpha_t + \alpha \ln K_t + \beta \ln EXPD_t + \delta \ln X_t + \phi \ln AOP_t + \varepsilon_t$ 6

However, in line with the study objective, the transmission effect of export diversification to output growth though agricultural output in Nigeria is re-specified as:

Applying structural vector Autogressive SVAR from the model stated as:

$A_0 Y_1 = A_1 Y_{t-1} + A_2 Y_{t-2} + \ldots + A_p Y_{t-p} + \varepsilon_t$

This transmission can be captured in a SVAR model as follows:

$rgdp_t = f(rgdp_{t-1}, AOP_{t-1}, EXPD_{t-1}, AOP_t, EXPD_t)$ ----------.------7

$AOP_t = f(rgdp_{t-1}, AOP_{t-1}, EXPOV_{t-1}, rgdp_t, EXPD_t)$ ----------..------8

$EXPD_t = f(rgdp_{t-1}, AOP_{t-1}, EXPDIV_{t-1}, rgdp_t, AOP_t)$ ----------..-----9

The use of structural vector autoregressive (SVAR) model in this analysis which help for the estimation in the model.

$r\,gdp_t = f(\beta_{11}^1 rgdp_{t-1} + \beta_{12}^1 AOP_{t-1} + \beta_{13}^1 EXPD_{t-1} + \beta_{12}^0 AOP_t + \beta_{13}^0 EXPD_t + \varepsilon_{1t})$ ----------10

$AOP_t = f(\beta_{21}^1 rgdp_{t-1} + \beta_{22}^1 AOP_{t-1} + \beta_{23}^1 EXPD_{t-1} + \beta_{21}^0 rgdp_t + \beta_{23}^0 EXPD_t + \varepsilon_{2t})$ ----------11

Collecting the contemporaneous effects to the left-hand side (LHS) yields and presented in a matrix form, the over parameterized SVAR model is specified as:

$$\begin{bmatrix} 1 & -\beta_{12}^0 & -\beta_{13}^0 \\ -\beta_{21}^0 & 1 & -\beta_{23}^0 \\ -\beta_{31}^0 & -\beta_{32}^0 & 1 \end{bmatrix} \begin{bmatrix} rgdp_t \\ AOP_t \\ EXPD_t \end{bmatrix} = \begin{bmatrix} \beta_{11}^1 & \beta_{12}^1 & \beta_{13}^1 \\ \beta_{21}^1 & \beta_{22}^1 & \beta_{23}^1 \\ \beta_{31}^1 & \beta_{32}^1 & \beta_{33}^1 \end{bmatrix} \begin{bmatrix} rgdp_{t-1} \\ AOP_{t-1} \\ EXPD_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{bmatrix} \text{----------13}$$

Hence, $A_0 Z_t = A_1 Z_{t-1} + \varepsilon_t$

Where:

$A_0 =$ 3x3 matrix of contemporaneous effects of endogenous parameters

$Z_t =$ 3x1 column vector matrix of estimable endogenous variables

$A_1 =$ 3x3 matrix of estimable endogenous variables

$Z_{t-1} =$ 3x1 column vector matrix of lagged estimable endogenous variables

$\varepsilon_t =$ 3x1 column vector matrix of error terms in the system

To examine how output growth respond to Export-Diversification through agricultural output.

It has been noted that model 13 cannot be estimated using SVAR because the number of parameters are more than the number of equations. Since we cannot estimate an overparameterized model, based on economic theory and institutional knowledge, certain restrictions are imposed on some parameters of the A_0 matrix in order to resolve the problems of identification in SVAR.

In other words, we set $-\beta_{12}^0 = -\beta_{13}^0 = -\beta_{21}^0 = \beta_{23}^0 = \beta_{31}^0 = \beta_{32}^0 = 0$

Following the recursive approach, we can impose restrictions on the upper elements above the matrix diagonal to zero.

$$A_0 Z_t = A_1 Z_{t-1} + A_2 Z_{t-2} + \cdots + A_p Z_{t-p} + \varepsilon_t \text{ ----------14}$$
$$\Longrightarrow A_0 Z_t = A_1 Z_{t-1} + \varepsilon_t$$

Where:

$A_0 =$ matrix of coefficients of contemporaneous effects

$Z_t =$vector matrix of estimable endogenous variables

$A_1 =$ matrix of coefficients of parameters

$Z_{t-1} =$vector matrix of lagged endogenous variables

$\varepsilon_t = B\eta_t =$ vector matrix of uncorrelated structural shocks to the system

With var (ε_{1t}) set to unity and A_0 being chosen to capture the contemporaneous interactions among the Z_t, along with the standard deviation of the structural shocks in the model.

Since most macroeconomic variables are recursive in nature, restricting A_0 matrix in the recursive specification yields:

$rgdp_t = lags + \varepsilon_{1t}$

$AOP_t = \beta_{21}^0 gdp_t + lags + \varepsilon_{2t}$

$EXP_t = \beta_{31}^0 rgdp_t + \beta_{32}^0 AOP_t + lags + \varepsilon_{3t}$

Thus, the parsimonious form of equations 4.26 – 2.26 is specified in a triangular matrix

$$A_0 = \begin{bmatrix} 1 & 0 & 0 \\ -\beta_{21}^0 & 1 & 0 \\ -\beta_{31}^0 & 0-\beta_{32}^0 & 1 \end{bmatrix} \begin{bmatrix} rgdp_t \\ AOP_t \\ EXPD_t \end{bmatrix} = \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{bmatrix} \text{----------15}$$

From our equation (4.24 to 4.26),

Where

$A_0 = A_0 Z_t = A_1 Z_{t-1} + \varepsilon_t$

We know that: $\varepsilon_t = B\eta_t$

And $B = \begin{bmatrix} \sigma_1^2 & 0 & 0 \\ 0 & \sigma_2^2 & 0 \\ 0 & 0 & \sigma_3^2 \end{bmatrix}$ = unit variance, i.e., var $(\eta_t) = 1$

$$A_0 = \begin{bmatrix} 1 & 0 & 0 \\ -\beta_{21}^0 & 1 & 0 \\ -\beta_{31}^0 & 0-\beta_{32}^0 & 1 \end{bmatrix} \begin{bmatrix} rgdp_t \\ AOP_t \\ EXPD_t \end{bmatrix} =$$

$$\begin{bmatrix} \sigma_1^2 rgdp & 0 & 0 \\ 0 & \sigma_2^2 AOP & 0 \\ 0 & 0 & \sigma_3^2 EXPD \end{bmatrix} \begin{bmatrix} \mu_t rgdp \\ \mu_t AOP \\ \mu_t EXPD_t \end{bmatrix} \text{----------16}$$

One of the restrictions used in this work is by making the system recursive. This was proposed by Wold (1960), it assumes that A_0 is typically lower triangular and the structural shocks are uncorrelated. This is a method of identifying the parameters of structural equations. Wold's suggestion reduces the number of unknown parameters to exactly the number estimated in the summative model.

More so, A_0 which is a lower triangular matrix, measures the contemporaneous effects or long run path.

This implied that $var(\varepsilon_{1t}) = \sigma_1^2, var(\varepsilon_{2t}) = \sigma_2^2,\ var(\varepsilon_{3t}) = \sigma_3^2,$

such that $cov(\varepsilon_{1t}\varepsilon_{2t}\varepsilon_{3t}) = 0.$

The zeros at the upper diagonal imply that there must be no serial correlation among the structural shocks in the model. The B matrix measures the structural shocks in the SVAR system. Note that, the lower triangular matrix of variances of the parameters changes to zeros. Furthermore, it is also set to avoid spillover effects of the shocks on other variables in the model. That is Ω_S *and* Ω_S is a diagonal matrix.

This implies that our normalized SVAR of the form $A_0 Z_t = A_1 Z_{t-1} + \varepsilon_t$ reduces to $A_0 e_t = B\eta_t$. But we know that $B\eta_t = B\mu_t$. Hence, the baseline for our estimable SVAR model can be specified in the reduced form as:

$A_0 e_t = B\mu_t$

In the matrix form, we have:

$$\begin{bmatrix} 1 & 0 & 0 \\ -\beta_{21}^0 & 1 & 0 \\ -\beta_{31}^0 & 0-\beta_{32}^0 & 1 \end{bmatrix} \begin{bmatrix} rgdp_t \\ AOP_t \\ EXPD_t \end{bmatrix} =$$

$$\begin{bmatrix} \sigma_1^2 rgdp & 0 & 0 \\ 0 & \sigma_2^2 AOP & 0 \\ 0 & 0 & \sigma_3^2 EXPD \end{bmatrix} \begin{bmatrix} \mu_t rgdp \\ \mu_t AOP \\ \mu_t EXPD_t \end{bmatrix} \text{---------- 17}$$

$A_0\ e_t = B\ \mu_t$

Where: A_0 = matrix of long run contemporaneous effects

e_t = column vector matrix of errors for the respective variables

B = matrix of structural shocks in the model

μ_t= column vector matrix of structural shocks in the model

Hence the B matrix is specified as:

$$e_t = A_0 B\mu_t = \begin{bmatrix} e_t rgdp \\ e_t AOP \\ e_t EXPD_t \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ -\beta_{21}^0 & 1 & 0 \\ -\beta_{31}^0 & -\beta_{32}^0 & 1 \end{bmatrix} \begin{bmatrix} \mu_t rgdp \\ \mu_t AOP \\ \mu_t EXPD_t \end{bmatrix} \text{----------18}$$

This represents the initial impact of shocks in the SVAR model. The impulse responses will however determine the final impact of shocks in the SVAR model.

Thus, the effect of export diversification on the output growth can be seen through the following channels.

i. $-\beta_{21}^0$ is expected to measure the causal relationship between Export diversification, agricultural output and economic growth.
ii. $-\beta_{31}^0$ is expected to measure the effect of agricultural output on output growth
iii. $-\beta_{32}^0$ is expected to measure the effect of export diversification on output growth

4 Result and Discussion

The unit root tests were conducted to ascertain the staionarity of variables in models before estimation. The Augmented Dicker-fuller (ADF) unit root test was used in this study to check the stationary of the data and the result is in Table 1

Table 1: Results of the ADF Unit Root Test and Philips-Perron Unit Root Test

Variable	@level	1st Difference	1% Critical Level	5% Critical Level	10% Critical Level	Order of Integration
LNRGDP	-3.589523		-4.273277	-3.557759	-3.212361	I(0)
P-value	0.0468					
EXPD	-4.056533		-4.234972	-3.540328	-3.202445	I(0)
P-value	0.0154					
LNAOP	-4.534509		-3.626784	-2.945842	-2.611531	I(0)
P-value	0.0326					

Source: Extracts from E-Views 10

Results of the PP Unit Root Test

Variable	@Level	1st Difference	1% Critical Level	5% Critical Level	10% Critical Level	Order of Integration
LNRGDP	-3.690396		-4.243644	-3.544284	-3.204699	**I(0)**
P-value	0.0364					
EXP	-3.982870		-4.234972	-3.540328	-3.202445	**I(0)**
P-value	0.0184					
LNAOP	-5.609189		-4.243644	-3.544284	-3.204699	**I(0)**
P-value	0.0003					

Source: Extracts from E-Views 10

The ADF and PP unit root results showed integration of the series at level which is to say all thevariables were stationary without differencing. Result of the optimal lag that yielded robust results is in Table 2.

Table 2: Optimal Lag Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-44.52823	NA	3.673287*	5.795778	2.930457	2.841707*
1	78.47668	13.0675	4.03e-06	-3.010393*	-1.371678*	-3.726676
2	79.24919	12.26921	6.64e-06	-3.426423	-2.483671	-3.104917
3	90.16333	15.40820	6.15e-06	-3.539020	-2.192231	-3.079726

Source: Extracts from E-views 10

Based on AIC AND SIC result, lag one (1) was the optimal lag for the model based and given that, VAR models perform best with lags, optimal lag of one was considered. Result of the contemporaneous response of the Model is presented underneath.

Table 3: Contemporaneous Response Result

	RGDP	AOP	EXPD
RGDP	1	0	0
AOP	1.312905 (0.0000)	1	0
EXPD	12.66829 (0.0617)	-7.972229 (0.0068)	1

Source: Extract from E-views 10

The result of the contemporaneous indicated that agricultural output has negative and significant contemporaneous response to export diversification but agricultural output has positive and significant instantaneous effect on output growth at 5% level of significance. It means that export diversification has adverse effect on agricultural output during the study period. This suggests that changes in agricultural output due to export diversification does not improve output growth in Nigeria and the result is not theoretically plausible but in line with Jiang, *et al.* (2022). Finding also showed that agricultural output had positive and significant instantaneous influence on output growth and the result is statistically significant at 5% level. The outcome implied that even though export diversification adversely affect agricultural output, but the instantaneous impact of agricultural output on output growth was positive which could be due to a combination of other factors that affect the agricultural sector. This result is similar collaborate with Ismail and Kabuga (2017) who found positive influence of agricultural output on output growth. The instantaneous impact of export diversification on output growth was also positive and significant at 5% level of significance implying that the diversification policy would not take longer time to reflect on economic growth during the study period even with the weak channel via agricultural output.

The fact that the standard errors of unstandardized VAR estimates generally are not reliable; therefore, the study relied on impulse response and variance decomposition. Of importance, however, was the contemporaneous response of the variables to their shocks and shocks in the other variables. Results of the SVAR contemporaneous effects are presented in Figure 5.4

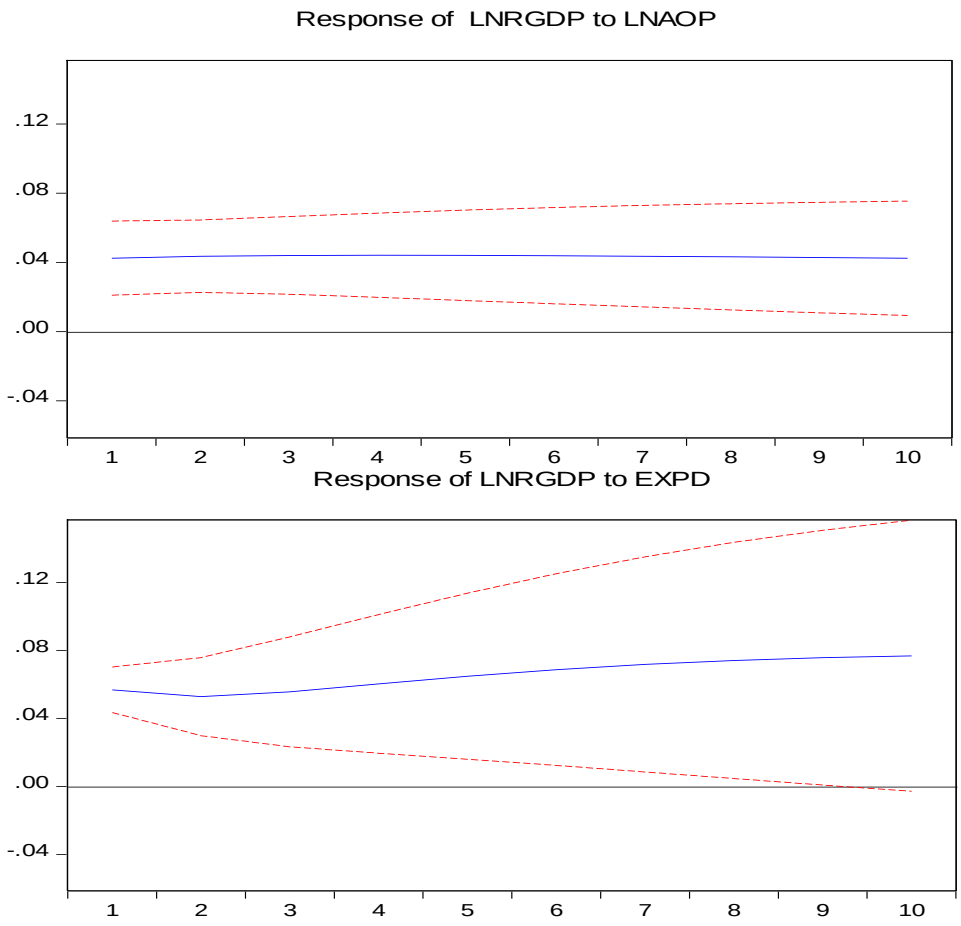

Figure 1: Response of LNRGDP to LNAOP shocks, Figure 5.5: Response of LNRGDP to EXPD shocks,

The impulse response of output growth to shock in agricultural output in Nigeria in ten years forecast period is depicted in Figure 1. It showed that output growth would respond positively to shocks in agricultural output in the first, second period and the third period without converging towards zero or negative. This means a strong and significant response of output growth to agricultural output which implied that the level of agricultural output in Nigeria would improve economic growth significantly based on the current trend. Figure 2 showed that economic growth would respond positively to any shocks of export diversification throughout the forecasted period. The positive response of output growth to export diversification indicated improved output in the traditional sector better determines the performance of the Nigerian economy.

The result of the accumulated forecast error variance of output growth to shocks in agricultural output and export diversification is presented in Table 4.

Table 4: Result of the Accumulated Forecast Error Variance

	Period	S.E.	LNRGDP	LNAOP	EXP01
Initial (1st Year)	1	0.031029	100.0000	0.000000	0.000000
	2	0.044822	96.76508	1.270422	1.964499
Short Term (3rd Year)	3	0.059290	86.24688	7.094756	6.658361
	4	0.075354	74.04146	16.24940	9.709137
Medium Term (5the Year)	5	0.092710	63.22731	25.61909	11.15361
	6	0.110733	54.64418	33.66228	11.69353
	7	0.128853	48.07736	40.12165	11.80099
	8	0.146656	43.07152	45.20910	11.71938
	9	0.163873	39.21778	49.21847	11.56375
Long term (10th Year)	10	0.180338	36.20744	52.40587	11.38670
	Decision		Decrease	Increase	Increase

Source: Extract from E-views 10

The results of accumulated forecast error of output growth to own shock would account for 100% at the initial period, 86.25% in the short-term, 63.23% in the medium-term and 36.21% in the long-term. This result implied that variation in output growth in Nigeria due to own shock would decline overtime and would not be viable in the long run. The results also revealed that innovation in agricultural output and export diversification explained about 7.09% and 6.66% of the accumulated forecast error variance of economic growth in Nigeria in the short-term from zero variations at the initial period respectively. The accumulated forecast error variance of economic growth to shock in agricultural output and export diversification further explains about 25.62% and 11.15% in the medium term respectively indicating improved influence on economic growth, while the accumulated forecast error variance of economic growth due to innovation in agricultural output and export diversification are 52.40587% and 11.39% in the long-term respectively. The result signified that agricultural output is a good and strong predictor of economic growth in Nigeria within the forecasted period while export diversification weakly predicts the level of economic growth in Nigeria within the forecasted period.

Diagnosis Test

The post estimation test was conducted to ascertain the reliability of the estimates. In terms of stability test results for the model, the study used the inverse roots of AR characteristics polynomial test. The results are presented in Figure 3

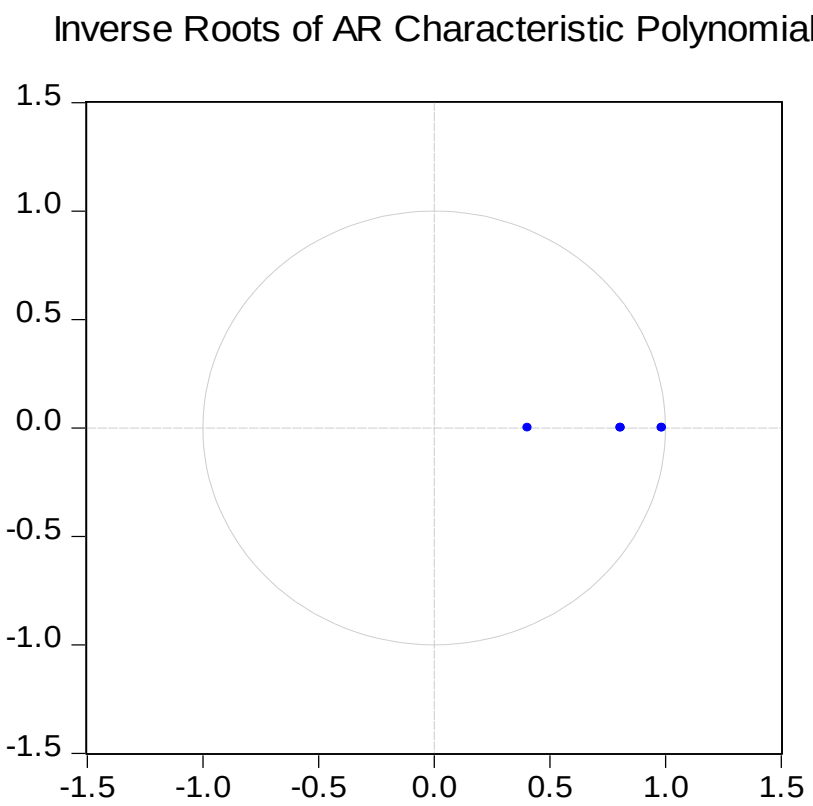

Figure 3: Inverse Roots of AR Characteristic Polynomial
Source: Extract from E-views 10 Output

The stability condition for the model as evidenced by the inverse roots of the characteristic AR polynomial have modulus less than one and lie inside the unit circle implying that the SVAR estimates are stable. However, if the estimated SVAR models were not stable, it would have led to invalid estimates and its impulse response standard errors may be invalid. From Figures 5.1, the results showed that all the points lie within the unit circle and none of the point is outside the point. Since none lied outside the unit circle of the polynomial, the results connoted that the stability condition was adequately met by the SVAR model. The study also examines the VAR residual serial correlation test to determine the interdependence of the residuals. The results are presented in Table 5.

Table 5: VAR Residual Serial Correlation LM Tests

Lag	LRE* stat	df	Prob.	Rao F-stat	Df	Prob.
1	10.24427	9	0.3311	1.168984	(9, 56.1)	0.3325

Source: Extract from E-views 10 Output

The results of the VAR residual serial correlation LM tests presented in Table 5 indicated that there were no incidences of serial correlation among the variables as all the probability values are greater than 0.05 at 5% level of significance. It implied that the observations of the residuals were uncorrelated with each other. The study also checked the VAR residual normality test to determine the normality of the residuals.

Table 6: VAR Residual Heteroskedasticity Tests Result

Dependent	R-squared	F(12,22)	Prob.	Chi-sq(12)	Prob.
res1*res1	0.405365	1.249792	0.3131	14.18779	0.2889
res2*res2	0.455064	1.530973	0.1864	15.92723	0.1946
res3*res3	0.276288	0.699902	0.7353	9.670070	0.6449
res2*res1	0.490319	1.763684	0.1199	17.16115	0.1436
res3*res1	0.444684	1.468089	0.2098	15.56393	0.2120
res3*res2	0.422086	1.338994	0.2664	14.77300	0.2541

Source: Extract from E-views 10

The results of the VAR residual heteroskedasticity tests in Table 6 revealed insignificant p-values for heteroscedasticity tests of the model. The probability values for all the residuals are greater than 0.05 at 5% level of significance implying that there was no incidence of heteroscedasticity in the model (that is, there is constant covariance of the error term with the explanatory variables.

5 Conclusion and Recommendations

The result of the contemporaneous effect indicated that agricultural output has negative and significant contemporaneous response to export diversification. Output growth responded positively and significantly to the instantaneous effect of agricultural output. The study concluded export diversification does not improve output growth through agricultural output in Nigeria hence, a weak channel. The study therefore, concluded that Nigerian government should strengthen it agencies like Agricultural Extension Services to provide farmers with training and information on modern farming techniques, pest management, and sustainable practices among others as well as allocate and monitor resources for agricultural research and development to promote the adoption of advanced technologies and practices to sustain the influence of agricultural output on economic growth as discovered in the study. This strategy will assist to the country to sustain and increase output in agriculture that could be used for export.

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