

INTER RELATIONSHIP BETWEEN CONTRIBUTIONS OF NON-OIL SECTORS REVENUE TO ECONOMIC GROWTH IN NIGERIA

AJAYI, Lawrence Boboye (Ph.D.) and OLOWO, Samson Oluwole (Ph.D.)

Department of Finance, Faculty of Management Science, Ekiti State University, P.M.B.

5363, Ado-Ekiti, Ekiti State, Nigeria

Corresponding Author: OLOWO, Samson Oluwole

ABSTRACT

This study investigates the interrelationship between contributions of non-oil revenue to economic growth in Nigeria from 1981 to 2018 with the aim of finding the degree of interrelationship among environmental, information and communication technology, financial, power, health and wholesale, retail sectors' revenue and economic growth in Nigeria. The study employed vector autoregressive estimate and VAR Granger causality test as the major estimation techniques. The time series data for the study on environmental sector revenue, information and communication technology sector revenue, financial sector revenue, power sector revenue, health sector revenue, wholesale and retail sector revenue and real gross domestic product were sourced from the Central Bank of Nigeria's Statistical Bulletin and World Development Index. The study found that there is an interrelationship among environmental, ICT, financial, power, wholesale and retail, health sector revenue and economic growth in Nigeria. Therefore, it can be said that non-oil sector significantly contributed to the growth of Nigerian economy. Based on the findings of the study, it is recommended that Government should be consistent with policies that will bring about sustainable growth in non-oil revenue, thereby enhancing economic growth better.

KEYWORD: Non-oil revenue, economic growth, Nigeria

INTRODUCTION

Nigeria has been a mono cultural economy since 1970s thereby relying heavily on earnings from crude oil export for the growth of the economy. The oil sector is known to contribute more than 90% of export earnings to Nigeria (Onodugo, Ikpe & Anowor, 2013). More so, it is believed that the oil sector earnings are concentrated in the hands of less than one percent of the Nigerian population dominated by expatriates and members of the political class who control production and the proceeds respectively. Worse still, the sector is disconnected from other tiers and sectors of the economy and thus offers little or no linkage and multiplier effect to the economy as a whole (Krmitt, Kanadi, Ndangra & Lado, 2017). Akeem (2011) stated that this mono-culture situation has brought untold hardship on the people of the country. The Nigerian economy swung from the "oil boom era", as exemplified by the buoyant economy of the period with massive infrastructural development, the Udoji award and the neglect of the non-oil sector productive base to the "oil doom" period which arose from oil glut in the world oil market in 1981.

One major problem with the over reliance on oil export is the fact that its price often fluctuates, it is therefore volatile. This implies that the dynamics of the Nigerian economy is at the whims and caprices of the price of oil (Enoma & Isedu, 2011). This means that any structural distortion in the foreign economies capable of causing change in oil price directly affects Nigerian economy. A classic example is what is presently happening to the Nigerian

economy characterised by a fall in exchange earning, a fall in GDP, depletion of external reserve, scarcity of foreign exchange, and high cost of goods (inflation) as the country is also a heavily import dependent economy. This was all as a result of the sudden fall in international oil price. The continued unimpressive performance of the non-oil sectors in the economy and the vulnerability of the external sector thus dictate the urgent need to diversify the economy back to the abandoned non oil sectors in order to boost our foreign earnings through non oil exports. Non oil sectors like the agriculture and the mining sectors were known to have dominated Nigeria's exports in the past. Non oil revenue accounted for more than 66% of Nigeria's total revenue and contributed immensely to the growth of Nigeria's economy in the 1960s (Ogunkola, Bankole & Adewuyi, 2008).

Many attempts by past governments in terms of policy formulations and programmes to boost the non-oil sector and create a broader revenue base have not yielded much result. This has been traced to poor implementation of policies, lack of appropriate funding, lack of political will and of course the continued belief that revenue from oil is guaranteed. Indeed, the need for a change in the policy focus and a shift in the industrialisation strategy is imperative, if Nigerian economy is to be returned to the path of sustainable growth and external viability. This raises the question of the role of the non-oil sector in the economic growth of the country and what factors are responsible for the performance/or otherwise of the non-oil sector.

The findings from literature indicated that the empirical evidence on the impact of non-oil sector is not uniform. While studies like Olurankinse and Fatukasi (2012); Idowu (2016) and Kawai (2017) found significant impact of the non-oil sector on economic growth, Eze (2017) agreed on insignificant and weak impact of the non-oil export on economic growth. Also, there is a controversy on the nature of the relationship between non-oil sector and economic growth. While Olabanji, Fakille, Ese and Oduntan (2017); Onuorah (2018) and Salami, Amusa and Ojoye (2018) agreed on a positive relationship subsisting between non-oil sector and economic growth, others like Abogan, Akinola and Baruwa (2014) and Olayungbo and Olayemi (2018) put forward a negative relationship. The reason for these discrepancies may be linked to the methodologies employed in these previous studies. What is needed to address this issue is the use of a more dynamic model that shows both the long run and short run relationship simultaneously between non-oil sector revenue and economic growth.

Furthermore, Ogba, Park and Nakah (2018) used agricultural revenue contribution, solid mineral revenue contribution, tax revenue contribution and services revenue contribution to study the impact of non-oil revenue on economic growth in Nigeria for the period of 1981–2016. Notably, the component of service sector used in the study was not referenced as if service sector cannot be classified by type (telecommunication service, financial service, tourism service, health service, transportation service and environmental service) and studied individually which could help to determine a functioning activity sector from non-functioning activity sector. Nonetheless, other non-oil sector like power sector, health sector, environmental sector, R & D sectors, ICT sector, financial sector, wholesale and retail sector have not received empirical documentation in literature to the best of the researcher's knowledge which stands as a research gap. Hence, this study empirically investigates the interrelationship between contributions of non-oil sectors revenue to economic growth in

Nigeria during the period 1981-2018, using the Vector autoregressive estimates which have not received frequent usage in the literature.

2.0 LITERATURE REVIEW

2.1 Conceptual Clarifications

This section describes the concept of Non-oil export and economic growth

Non-oil exports are those commodities excluding crude oil (petroleum products), which are sold in the international market for the purpose of revenue generation. According to Akeem (2011), the Nigeria's non exports sector is structured into four broad constituents which are the agricultural exports, manufactured exports, and solid mineral exports and services exports. Abogan, Akinola and Baruwa (2014) buttressed this further that the non-oil export products are unlimited as they include agricultural crops, manufactured goods, solid minerals, entertainment and tourism services etc. This explains non-oil export in the context of this study. Akeem (2011) defined the non oil sector of the Nigerian economy as the whole of the economy less oil and gas sub-sector. It covers agriculture, industry, solid minerals and the services sub-sector, including transport, communication, distributive trade, financial services, insurance, government, etc. Kromtit and Gukat (2016) stated that the non-oil sector comprises those groups of activities which are outside the petroleum and gas industry or those not directly linked to them. It consists of sectors such as manufacturing, agriculture, telecommunication service, finance, tourism, real estate, construction and health sectors.

On the other hand, economic growth has to do with the increase in the output level of an economy which can also mean an increase in income level. Economic growth of a country can be determined in the productivity level, volume of trade and investment in both human and physical capital. Economic growth as used in this study refers to increase in the total goods and services produced in an economy. Pritzker, Arnold and Moyer (2015) identified Gross Domestic Product (GDP) as the economic indicator which measures the value of the goods and services produced in an economy in a given time period. They stated that GDP is a measure of the economy's output and is a measure of current production, not sales. Thus GDP, is the market value of all final goods and services produced in a country in a given time period and it indicates an economy's performance (economic growth). When a GDP is measured using the current market prices, it is called a nominal GDP, but when a certain base year is used for the calculation of a GDP, it is called a real GDP.

2.2 Theoretical Underpinning

This study is anchored on the resource curse theory. The resource curse theory is credited to Przeworski (1991) and Ojo (1982). The theory postulated that paradox occurred when countries like Nigeria with abundance of natural resources specifically non-renewable resources like minerals and fuels, tend to have less economic growth and worse development outcomes than countries with fewer natural resources (Akujuru, 2015). Hitherto, the huge revenue from oil and gas industry in Nigeria has not aided the country to attain a developed state of growth among countries of the world. This implies that larger proportion of its populace still grapple with poverty with its attendant high level of unemployment, corruption and gross mismanagement of government funds. Hence, to bridge this gap in unemployment and level of poverty in Nigeria, diversification into non-oil sector is essential which has the potential to spur economic growth. In the context of this study, the theory assumes that efficient non-oil sector diversification might affect economic growth through six channels,

namely: performance of power sector, health sector, environmental sector, ICT sector, financial sector, and wholesale and retail sector. The implication of this theory is that diversification of non-oil product will help the government in achieving growth in Nigerian economy.

2.3 Empirical Review

Olurankinse and Fatukasi (2012) in seeking to establish the impact of non-oil sector on economic growth from 2002 to 2008 estimated non oil export as a function of exchange rate, interest rate and inflation rate using ordinary least square (OLS) statistical tool. The study found out that non-oil revenue had a positive impact on the growth of the Nigerian economy for the period they reviewed. The study, however, decry the low performances in terms of output level and revenue generation which was below expectation. Abogan, Akinola and Baruwa (2014) investigated the effects of non-oil export on economic growth in Nigeria between 1980 and 2010. ADF test, Philip Perron test, Johansen co-integration test, ordinary least square methods involving Error correction mechanism, over-parametisation and parsimonious were adopted. The study revealed that the impact of non-oil export on the economic growth was moderate and that a unit increase in non-oil export impacted positively by 26% on the productive capacity of goods and services in Nigeria during the period; exchange rate had significant positive effect while inflation rate had insignificant positive effect on economic growth in Nigeria.

Idowu (2016) investigated the role of oil and non-oil exports on the Nigerian economy over the period of 1981 to 2015. The ADF and PP unit root test, Johansen cointegration test, Granger causality test, impulse response functions (IRF) and variance decomposition (VD) were used in the analysis of the study. The cointegration test indicates that GDP, Oil and Non-oil exports were cointegrated. The Granger causality test indicates short run unidirectional causality running from oil export to GDP. There are also bidirectional long run causality relationship between oil export and GDP, and unidirectional long run causality running from non-oil export to GDP. The study's result indicates that oil exports have inverse relationship with economic growth while non-oil exports have positive relationship with economic growth. Kawai (2017) evaluated the impact of Nigeria's non-oil exports as to whether they have been effective in diversifying the productive base of the Nigerian Economy from Crude oil as the major source of foreign exchange. The study adopted the Phillip Perron (PP), the Engel-Granger Model (EGM) for co-integration in its analysis. Findings revealed a strong evidence of cointegration relationship of non-oil exports in influencing rate of change in the level of economic growth in Nigeria.

Eze (2017) investigated the contributions of agricultural sector output to the growth of domestic economy in Nigeria for the period 1980-2014. Cointegration test, Vector Error Correction Model (VECM) and Granger causality tests were utilised in the analysis. A stationarity test was conducted through the application of the Augmented Dickey-Fuller (ADF) stationarity test, and the result showed that all the variables except RGDP were non-stationary at level. The cointegration result indicated long run equilibrium relationship among the variables under study. The VECM result on the other hand showed that value of agricultural output (VAO) has positive and insignificant contribution to real GDP. Thus, it is estimated on average that 1% increase in the value of agricultural sector output (VAO) would lead to 1.9% increase in real GDP. Furthermore, the Pairwise Granger causality result showed

that significant causality exists between the two variables, with causality running from agricultural output to RGDP. It therefore, implies that agricultural sector output contributed positively and insignificantly to the growth of Nigerian domestic economy.

Olabanji, Fakille, Ese and Oduntan (2017) examined the long run relationship between agricultural output and economic growth in Nigeria for the period 1981 to 2014 using time series data. Results from Johansen maximum likelihood co-integration approach and Vector error correction model support evidence of long run relationship between agricultural output and economic growth in Nigeria. Granger causality test also confirmed the co-integration results indicating the existence of causality between agricultural output and economic growth in Nigeria. The nature of the causality, however, depends on the variable used to measure Agricultural output. The study concluded that there is evidence of long run positive relationship between agricultural output and economic growth in Nigeria. Onuorah (2018) studied the influence of non-oil exports in the economic growth of Nigeria over the period of 33 years covering 1985 to 2017. The study regressed five selected independent variables of non oil commodities, namely; cassava, groundnut, millet, yam and maize on gross domestic product proxy for economic growth, the annual time series were retrieved from secondary sources, such as the Central Bank of Nigeria Statistical Bulletins and the National Bureau of Statistics. The study made use of judgemental sampling technique and longitudinal survey research design. Ordinary least square analytical method was employed and the study discovered a positive relationship between gross domestic product (GDP) and the explanatory variables: yam, maize, cassava, groundnut and millet exports and they also contribute significantly to GDP having a probability value of 0.00 which is less than 0.05. The study concluded that non-oil export products in Nigeria play an important role in examining the performance of export commodities such as cassava, groundnut, millet, yam and maize in the economic growth of Nigeria.

Olayungbo and Olayemi (2018) investigated the dynamic relationships among non-oil revenue, government spending and economic growth in Nigeria for the period of 1981 to 2015. After establishing a long run relationship among the variables, the error correction model and impulse responses were estimated as well as the granger causality test among the variables. The results of the short run and long run showed negative effects of government's spending on economic growth while non-oil revenue showed positive effect on economic growth. The study also found that non-oil revenue has negative shocks on economic growth while the government spending shock was positive. The Granger causality revealed that government spending granger caused both non-oil revenue and economic growth supporting the Keynesian and spend-tax hypothesis in Nigeria over the period of the study. Salami, Amusa and Ojoye (2018) evaluated the impact of non-oil revenue on government revenue and examined the effects of non-oil revenue on economic growth from 1981 to 2016. The data were analysed using inferential statistics which involve simple regression analysis of the ordinary least square method. The non-oil revenue was the independent variable while economic growth measured by the real gross domestic product was the dependent variable in model 1 and total government revenue was the dependent variable in model 2. The study found and concluded that there was a significant relationship between non-oil revenue and economic growth. Also, there was a significant relationship and impact of non-oil revenue on total government revenue.

Ogba, Park and Nakah (2018) examined the impact of non-oil revenue on economic growth in Nigeria for the period of 1981–2016. Variables of Agricultural revenue contribution (ARC), Manufacturing Revenue Contribution (MRC), Solid mineral revenue contribution (SMRC), Services revenue contribution (SRC), company income tax (CIT) and custom and excise duties Tax (CED) representing the explanatory variables were regressed on the dependent variable of economic growth proxied by gross domestic product (GDP). Regression model was used to determine the relationship between economic growth and the non-oil revenue. The findings revealed that a long run relationship exists between the variables (ARC, MRC, SMRC, SRC, CIT, CED) and economic growth in Nigeria. Among the variables, ARC, MRC, SRC and CIT were found to have contributed substantially to the growth of Nigerian economy within the period under study. On the other hand, SMRC and CIT were found to have negative relationship with GDP. Again, SMRC and CED were statistically insignificant. The result of the error correction model was correctly signed showing that the system returns to equilibrium at the speed of about 80% if the system is exposed to external shock in the longrun. Mukhtarov, Humbatova and Seyfullayev (2019) explored the relationship between bank credits, exchange rate and non-oil GDP in Azerbaijan, utilising FMOLS, CCR and DOLS co-integration methods to the data spanning from January, 2005 to January, 2019. The results from the different cointegration methods are consistent with each other and approve the presence of a longrun relationship among the variables. Estimation results revealed that there is a positive and statistically significant impact of bank credits and exchange rate on the non-oil GDP in the long run for the Azerbaijani case which are in line with the expectations and with the theoretical findings discussed in the theoretical framework section. This finding also indicated that a 1% increase in credit and real exchange rate increases non-oil GDP by 0.51% and 0.56%, respectively.

2.4 Conceptual Framework

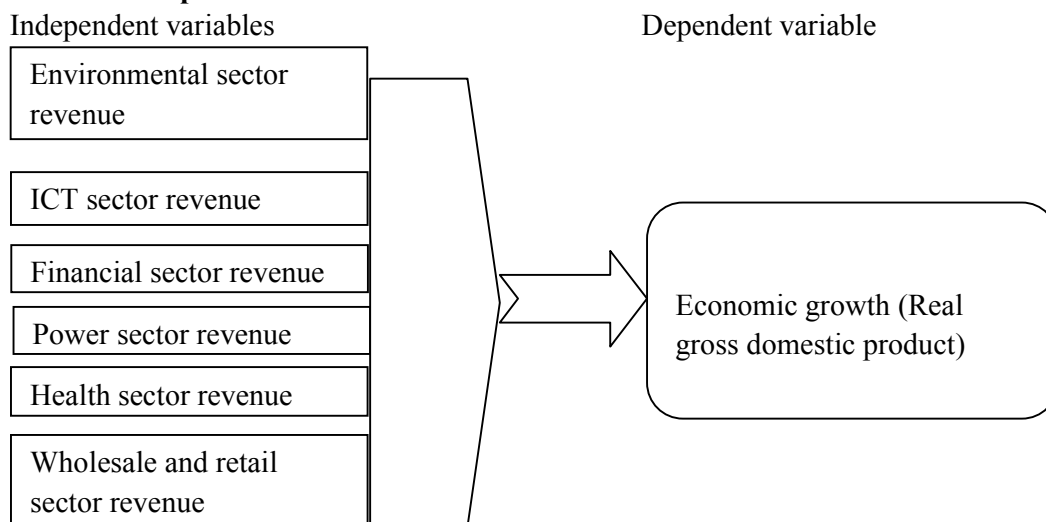


Figure 2.1: Conceptual Framework of interrelationship between contributions of non-oil revenue to economic growth in Nigeria.

Source: Author's Design (2020).

Figure 2.1 shows the relationship between the non-oil sector revenue and economic growth in Nigeria. The essence is to ascertain whether revenues from these non oil sector influence

economic growth or not. Again, it will establish the specific non-oil revenue sector component that has greater contributions to economic growth, thereby assisting government to concentrate on the productive and active component of the non-oil sector that pronounce greater revenue to the government.

3.0 METHODOLOGY

3.1 Research Design and Model Specification

This study adopted ex-post-factor research design in which investigation starts after the fact has occurred without interference from researcher. Therefore, historical facts about non-oil sector revenue and economic growth were obtained through the use of secondary data.

The study adapts the model used by Ogba, Park and Nakah (2018) on the impact of non-oil revenue on economic growth in Nigeria. However, with modifications, the model becomes:

$$RGDP = f(ESR, ICTSR, FSR, PSR, WRSR, HSR) \text{ --- 3.1}$$

Where:

$RGDP$ = Index of Gross Domestic Product (Real GDP) expressed in constant term

ESR = Environmental sector revenue

$ICTSR$ = ICT sector revenue

FSR = Financial sector revenue

PSR = Power sector revenue

$WRSR$ = Wholesale and retail sector revenue

HSR = Health sector revenue

f = Functional notation

3.2 Estimation Techniques

Vector autoregressive model (VAR) is the main econometric techniques employed in the study. VAR is defined as a system of ARDL equations describing dynamic evolution of a set of variables from their common history (here, vector implies multiple variables involved). The VAR model is defined as follows. Suppose we have two series, in which Y_t is affected by not only its past (or lagged) values but current and lagged values of X_t , and simultaneously, X_t is affected by not only its lagged values but current and lagged values of Y_t . This simple VAR model is specified as:

$$RGDP_t = Y_{10} + y_{11}ESR_{t-1} + y_{12}ICTSR_{t-1} + y_{13}FSR_{t-1} + y_{14}PSR_{t-1} + y_{15}WRSR_{t-1} + y_{16}HSR_{t-1} + U_{10t} + \sum RGDP_t \text{ --- 3.2}$$

$$ESR_t = Y_{20} + y_{21}RGDP_{t-1} + y_{22}ICTSR_{t-1} + y_{23}FSR_{t-1} + y_{24}PSR_{t-1} + y_{25}WRSR_{t-1} + y_{26}HSR_{t-1} + U_{20t} + \sum ESR_t \text{ --- 3.3}$$

$$ICTSR_t = Y_{30} + y_{31}RGDP_{t-1} + y_{32}ESR_{t-1} + y_{33}FSR_{t-1} + y_{34}PSR_{t-1} + y_{35}WRSR_{t-1} + y_{36}HSR_{t-1} + U_{30t} + \sum ICTSR_t \text{ --- 3.4}$$

$$FSR_t = Y_{40} + y_{41}RGDP_{t-1} + y_{42}ESR_{t-1} + y_{43}ICTSR_{t-1} + y_{44}PSR_{t-1} + y_{45}WRSR_{t-1} + y_{46}HSR_{t-1} + U_{40t} + \sum FSR_t \text{ --- 3.5}$$

$$PSR_t = y_{50} + y_{51}RGDP_{t-1} + y_{52}ESR_{t-1} + y_{53}ICTSR_{t-1} + y_{54}FSR_{t-1} + y_{55}WRSR_{t-1} + y_{56}HSR_{t-1} + U_{50t} + \sum PSR_t \text{ --- 3.6}$$

$$WRSR_t = y_{60} + y_{61}RGDP_{t-1} + y_{62}ESR_{t-1} + y_{63}ICTSR_{t-1} + y_{64}FSR_{t-1} + y_{65}PSR_{t-1} + y_{66}HSR_{t-1} + U_{60t} + \sum WRSR_t \text{ --- 3.7}$$

$$HSR_t = Y_{70} + y_{71}RGDP_{t-1} + y_{72}ESR_{t-1} + y_{73}ICTSR_{t-1} + y_{74}FSR_{t-1} + y_{75}PSR_{t-1} + y_{76}WRSR_{t-1} + U_{70t} + \sum HSR_t \text{ --- 3.8}$$

$Y_{10} - Y_{70}$ = Intercept / Constant Parameter

$Y_{11} - Y_{76}$ = Coefficients

U = Stochastic Term

3.3 Sources of Data

The data that this study proposed to employ are chiefly based on secondary data. The variables are Real GDP and environmental sector revenue, ICT sector revenue, financial sector revenue, power sector revenue, wholesale and retail sector revenue and health sector revenue and were sourced from the Central Bank of Nigeria Statistical Bulletin, National

Bureau of Statistics, The International Monetary Fund (IMF) and The World Bank respectively.

4.0 RESULTS AND DISCUSSION

4.1 Lag Order Selection

The vector autoregressive lag order that can help in computing the VAR estimate was determined to choose the appropriate lag for the autoregressive model. To determine the vector autoregressive lag order selection, Akaike information criterion, Schwarz information criterion and Hannan-Quinn information criterion was used. The result is presented in Table 4.1.

Table 4.1: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1532.716	NA	6.18e+30	87.92663	88.19326	88.01867
1	-1280.553	403.4607	2.76e+25	75.57446	77.44088	76.21875
2	-1190.215	113.5676	1.50e+24	72.46944	75.93564	73.66597
3	-982.2545	190.1355*	1.42e+20*	62.64311*	67.70910*	64.39189*

Source: E-view 9, Statistical Package

Table 4.1 showed the result of the vector autoregressive lag order to be selected for this research. From the result, vector autoregressive lag order of three is statistically significant at Akaike information criterion, Schwarz information criterion and Hannan-Quinn information criterion. Since AIC, SIC and HIC with the critical values of 62.64311, 67.70910 and 64.39189 respectively are statistically significant, therefore lag order three (3) was selected for the study. Thus, lag order three (3) were required for this study.

4.2 Vector Autoregressive (VAR)

In order to achieve the VAR model technique, Vector autoregressive model was estimated to determine the interrelationship among ESR (Environmental sector revenue), ICTSR (information communication technology sector revenue), WRTSR (wholesale and retail sector revenue) FSR (Financial sector revenue), PSR (Power sector revenue) HSR (Health sector revenue) and RGDP real gross domestic product in Nigeria. The VAR results is given in Table 4.2.

Table 4.2: Vector Autoregressive (VAR) Model Result

	RGDP	ESR	ICTSR	FSR	PSR	WRSR	HSR
RGDP(-1)	0.934813 [3.43789]	0.018976 [0.95533]	0.031077 [0.80121]	-0.001748 [-0.08932]	0.049420 [0.18659]	0.030583 [0.49529]	-0.001000 [-0.33198]
RGDP(-2)	-0.020907 [-0.06936]	-0.016683 [-0.75759]	-0.027168 [-0.63181]	0.002147 [0.09892]	-0.019396 [-0.06606]	0.028163 [0.41141]	0.003403 [1.01846]
ESR(-1)	-7.739698 [-2.00025]	1.255860 [4.44304]	-0.245147 [-0.44415]	0.727914 [2.61339]	-11.33659 [-3.00790]	3.005769 [3.42079]	-0.039672 [-0.92512]
ESR(-2)	3.104738 [0.87843]	0.188473 [0.72998]	1.654986 [3.28263]	0.517021 [2.03214]	-1.120474 [-0.32546]	0.313095 [0.39009]	0.026372 [0.67325]
ICTSR(-1)	0.242823 [0.14897]	-0.055994 [-0.47025]	1.164466 [5.00822]	0.239254 [2.03908]	0.528409 [0.33281]	1.707809 [4.61382]	0.015168 [0.83966]
ICTSR(-2)	-0.684619 [-0.35351]	0.212423 [1.50153]	-0.246638 [-0.89281]	-0.396938 [-2.84735]	-1.577423 [-0.83623]	-1.593411 [-3.62321]	-0.006909 [-0.32192]
FSR(-1)	0.502632 [0.15156]	-0.198316 [-0.81860]	0.039066 [0.08258]	-0.418504 [-1.75307]	-4.187561 [-1.29634]	-2.050104 [-2.72222]	-0.006245 [-0.16991]

FSR(-2)	-2.484087 [-0.94957]	0.466852 [2.44296]	0.545887 [1.46287]	0.666132 [3.53738]	-6.069608 [-2.38199]	1.204921 [2.02828]	-0.054402 [-1.87639]
PSR(-1)	-0.089292 [-0.28517]	0.023331 [1.02002]	0.089584 [2.00572]	0.060444 [2.68169]	-0.303420 [-0.99485]	0.215723 [3.03389]	-0.001677 [-0.48320]
PSR(-2)	0.242506 [0.89497]	0.055671 [2.81252]	0.235423 [6.09091]	0.130510 [6.69104]	-0.561311 [-2.12673]	0.138972 [2.25853]	0.001097 [0.36529]
WRSR(-1)	-0.452298 [-0.41160]	0.037455 [0.46659]	-0.295208 [-1.88330]	0.158348 [2.00181]	1.683703 [1.57302]	0.729862 [2.92482]	-0.008841 [-0.72597]
WRSR(-2)	1.077729 [1.05712]	-0.239099 [-3.21048]	0.134556 [0.92525]	-0.103107 [-1.40496]	2.698553 [2.71747]	-0.401439 [-1.73398]	0.016132 [1.42774]
HSR(-1)	13.34745 [0.71139]	2.530947 [1.84660]	-1.700188 [-0.63526]	-1.015476 [-0.75187]	-12.52383 [-0.68528]	-4.576202 [-1.07406]	1.288563 [6.19680]
HSR(-2)	20.63350 [0.99056]	-3.475141 [-2.28381]	-2.505581 [-0.84326]	-1.842352 [-1.22870]	37.34044 [1.84038]	1.713495 [0.36224]	-0.355605 [-1.54037]
C	1750.749 [0.82659]	-40.97573 [-0.26483]	-58.84580 [-0.19477]	20.11804 [0.13195]	-598.2192 [-0.28997]	-886.4494 [-1.84303]	-35.68781 [-1.52033]
R-squared	0.998603	0.998344	0.999366	0.998224	0.931528	0.999433	0.998985
Adj. R-squared	0.997672	0.997239	0.998943	0.997041	0.885880	0.999055	0.998308
Sum sq. resids	18791508	100277.5	382358.7	97372.20	17828746	969036.0	2308.129
S.E. equation	945.9565	69.10225	134.9354	68.09384	921.4054	214.8129	10.48384
F-statistic	1072.242	904.1329	2364.258	843.2965	20.40676	2644.108	1476.473
Log likelihood	-288.0589	-193.8610	-217.9525	-193.3318	-287.1123	-234.6915	-125.9739
Akaike AIC	16.83661	11.60339	12.94181	11.57399	16.78401	13.87175	7.831884
Schwarz SC	17.49641	12.26319	13.60161	12.23379	17.44381	14.53155	8.491684
Mean dependent	34758.76	791.2689	2798.750	934.5000	2478.628	5150.329	205.5428
S.D. dependent	19604.29	1315.220	4150.888	1251.739	2727.532	6988.002	254.9081

Source: E-view 9, Statistical Package

The result of vector autoregressive model on the effect of environmental sector revenue (ESR), information and communication technology sector revenue (ICTSR), financial sector revenue (FSR), power sector revenue (PSR), Wholesale and retail sector revenue (WRSR) and health sector revenue (HSR) on economic growth (RGDP) in Nigeria is presented in Table 4.2 with the coefficient of the variables or estimated parameters and [*t*- statistics]. The result revealed that RGDP (-1), ESR (-2), ICTSR (-1), FSR (-1), PSR (-2), WRSR (-2), HSC (-1) and HSC (-2) have direct relationship with the current level of RGDP. This implies that a proper management of RGDP (-1), ESR (-2), ICTSR (-1), FSR (-1), PSR (-2), WRSR (-2), HSC (-1) and HSC (-2) will lead to improvement of the RGDP by 0.93, 3.10, 0.24, 0.50, 0.24, 1.07, 13.34 and 20.63 percent respectively. However, RGDP (-2), ESR (-1), ICTSR (-2), FSR (-2), PSR (-1) and WRSR (-1), have inverse relationship with the current of RGDP.

This showed that RGDP (-2), ESR (-1), ICTSR (-2), FSR (-2), PSR (-1) and WRSR (-1), have inverse relationship with the current of RGDP worsen the current level of RGDP by 0.02, 7.73, 0.68, 2.48, 0.08, and 0.45 percent respectively. The *t*- statistics value of the estimated parameters of the ESR, ICTSR, FSR, PSR, WRSR and HSR and economic growth variables at various lags revealed the individual statistical significance of the estimated parameters for the sectorial contribution of non-oil revenue variables.

Also, RGDP (-1), ESR (-1) and ESR (-2), ICTRS (-2), FSR (-2), PSR (-1) and PSR (-2), WRSR (-1), and HSR (-1) have direct relationship with the current level of environmental sector revenue while, RGDP (-2), ICTSR (-1), FSR (-1), WRSR (-2), and HSR (-2) have inverse relationship with the current level of environmental sector revenue. RGDP at (-1),

ESR (-2), ICTRS (-1), FSR (-1) and (-2) and PSR (-1) and (-2) and WRSR (-1) have direct relationship with the current level of information and communication technology sector revenue while RGDP (-2), ESR (-1), ICTRS (-2), WRSR (-1), HSR (-1) and HSR (-2) have inverse relationship with current level of information and communication technology sector revenue.

It was further discovered from this study that RGDP (-2), ESR (-1) and (-2), ICTRS (-1), FSR (-2), PSR (-1), PSR (-2), and WRSR (-1) directly related with the current level of financial sector revenue while RGDP (-1), ICTRS (-2), FSR (-1) and WRSR (-2) inversely related with the current level of financial sector revenue. RGDP (-1), ICTRS (-1), WRSR (-1), and (-2), and HSR (-2) have direct relationship with the current level of power sector revenue while RGDP (-2), ESR (-1) and (-2), ICTRS (-2), FSR (-1), and (-2), and HSR (-1) have inverse relationship with the current level of power sector revenue.

This study further revealed that RDGP (-1), and (-2), ESR (-1) and (-2), ICTSR (-1), FSR (-2), PSR (-1), and (-2), WRSR (-1) and HSR (-2) have positive relationship with the current level of wholesale and retail sector revenue while ICTRS (-2), FSR (-1), WRSR (-2) and HSR (-1) have negative relationship with the current level of wholesale and retail sector revenue in Nigeria. Lastly, RGDP (-1), ESR (-2), ICTRS (-1), PSR (-2), WRSR (-2), and HSR (-1) have positive relationship with current level of health sector revenue while RGDP (-1), ESR (-1), ICTRS (-2), FSR (-1), and (-2), PSR (-1), WRSR (-1), and HSR (-2) have negative relationship with current level of health sector revenue during the period under investigation in Nigeria.

An examination of the significance of VAR model using R^2 revealed that 99.86, 99.83, 99.93, 99.82, 93.15, 99.94 and 99.89 percent variations or changes in the current level of RGDP, ESR, ICTRS, FSR, PSR, WRSR and HSR respectively can be explained by the lags of these sectorial non-oil sector revenue variables in Nigeria. Moreover, the test for the overall significance or the adequacy of the model was done using F -statistics. The F -statistics values of 1072.242, 904.1329, 2364.258, 843.2965, 20.40676, 2644.108 and 1476.473 > 2.48, the critical value at 5 percent level of significance revealed that the fitted vector autoregressive model is adequate in determining the contributions of non-oil revenue to economic growth in Nigeria. To also validate the adequacy of the model, a test for the exclusion of the vector autoregressive lags was done using Wald Test statistics, an asymptotic Chi-square test statistics and VAR stability test, the result is presented in Tables 4.3 in this study.

4.3 Impulse Response Functions

Impulse response functions provide information to analyse the dynamic behaviour of a variable due to a random shock or innovation in other variables. The impulse response traces the cross effect of shocks on current and future values of the endogenous variables of one standard deviation shock to the variables. Thus, for each variable from each equation, a unit shock to the error is analysed in order to determine the effects upon the vector autoregressive system over time using cholesky decomposition. However, it should be noted that in this approach, the ordering of the variables in the vector autoregressive (VAR) model is important. In this study, the responses of RGDP, ESR, ICTSR, FSR, PSR, WRSR and HSR were observed as depicted in Fig. 4.1.

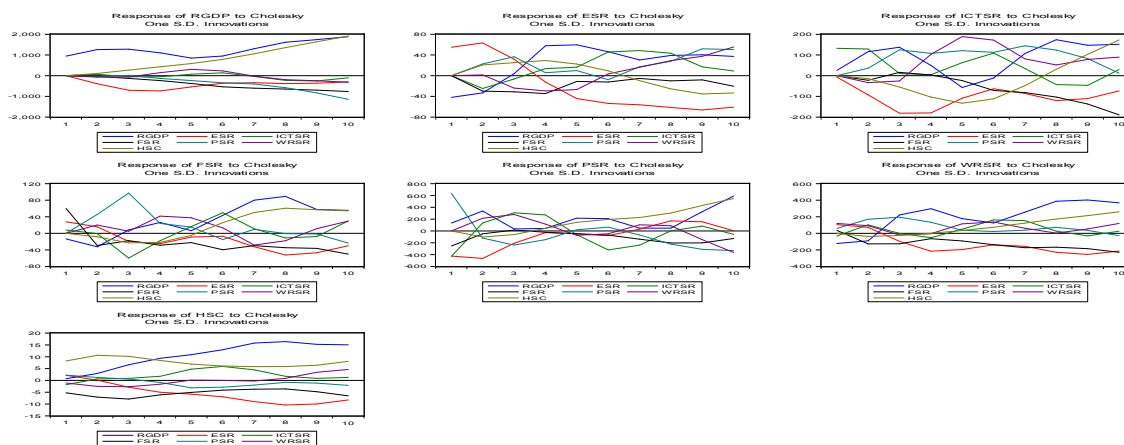


Fig. 4.1: Impulse Response Result

Source: E-view 9, Statistical Package

The responses of ESR, ICTSR, FSR, PSR, WRSR and HSR to changes in RGDP in Nigeria were established in all the ten periods as depicted in Figure 4.1. The response of ESR to shocks in RGDP was negative in all the period beginning from the 2nd to the tenth period. The response of ICTSR to shocks in RGDP was negative in the 3rd, 4th, 7th, 8th, 9th and 10th period while it remained positive in the 1st, 2nd, 5th, and 6th period respectively. The response of FSR to shock in RGDP was negative throughout the ten periods except in the 1st period where it was not meaningful. The response of PSR to shocks in RGDP was negative throughout the ten periods except in the 3rd period where it recorded positive response. The response of WRSR to shock in RGDP was negative in the 1st and 2nd period as well as in the 7th, 8th, 9th and 10th period while it was positive in the 3rd, 4th, 5th and 6th period respectively.

The response of HSR to shocks in RGDP was positive throughout the ten periods. The result indicates that, an increase in RGDP improves an access to HSR in Nigeria. In summary, the results demonstrate that RGDP has different implications, both expansionary and contractionary impact on the contributions of sectorial non-oil revenue variables under investigation. In other words, it indicated that all the non-oil revenue variables investigated responded to shocks in economic growth in direct or inverse manner in Nigeria for the period under consideration.

4.4 VAR Granger Causality

Granger causality test was used to examine the interrelationship among environmental sector, ICT sector, financial sector, power sector, health sector, wholesale and retail sector revenue on economic growth in Nigeria. The result of the causality test was presented in Table 4.4.

Table 4.4: VAR Granger Causality/Block Exogeneity Wald Tests

Dependent variable: RGDP	Chi-sq	Df	Prob.
ESR	12.34813	2	0.0021
ICTSR	13.72571	2	0.0010
FSR	18.10265	2	0.0001
PSR	53.62997	2	0.0000
WRSR	10.27817	2	0.0059
HSC	15.36328	2	0.0005
All	205.7513	12	0.0000
Dependent variable: ESR			
RGDP	0.973361	2	0.6147
ICTSR	8.324195	2	0.0156
FSR	6.359870	2	0.0416

PSR	8.149288	2	0.0170
WRSR	11.38048	2	0.0034
HSC	9.404363	2	0.0091
All	105.6655	12	0.0000
Dependent variable: ICTSR			
RGDP	0.688144	2	0.7089
ESR	11.22245	2	0.0037
FSR	2.179908	2	0.3362
PSR	37.82435	2	0.0000
WRSR	5.157706	2	0.0759
HSC	3.297829	2	0.1923
All	130.3139	12	0.0000
Dependent variable: FSR			
RGDP	25.65161	2	0.0000
ESR	16.17705	2	0.0003
ICTSR	10.68817	2	0.0048
PSR	46.79479	2	0.0000
WRSR	7.164883	2	0.0278
HSC	5.962575	2	0.0507
All	187.9572	12	0.0000
Dependent variable: PSR			
RGDP	18.10265	2	0.0001
ESR	10.97329	2	0.0041
ICTSR	12.94509	2	0.0015
FSR	7.896562	2	0.0193
WRSR	8.641255	2	0.0133
HSR	9.404363	2	0.0091
All	40.13360	12	0.0001
Dependent variable: WRSR			
RGDP	18.10265	2	0.0001
ESR	14.25978	2	0.0008
ICTSR	24.35188	2	0.0000
FSR	10.71256	2	0.0047
PSR	12.12028	2	0.0023
HSR	9.527365	2	0.0085
All	114.1259	12	0.0000
Dependent variable: HSR			
RGDP	2.921575	2	0.2321
ESR	1.009302	2	0.6037
ICTSR	2.193812	2	0.3339
FSR	3.623518	2	0.1634
PSR	0.451380	2	0.7980
WRSR	3.012790	2	0.2217
All	27.32265	12	0.0069

Source: E-view 9, Statistical Package

Table 4.4 showed the direction of causal relation between each pair of the variables. From the result, it was discovered that there is a unidirectional causality between ESR and RGDP; ICTSR and RGDP; HSR and RGDP in Nigeria. Also, there is a bi-directional causality between FSR and RGDP; PSR and RGDP; and WRSR and RGDP. This is evident from estimated Chi-square statistics values given as 12.34813, 13.72571, 18.10265, 53.62997, 10.27817, 15.36328 $> \chi^2_{0.05}(2) = 5.100$. Thus, all the non-oil sector revenue variables used in the study granger cause RGDP. Based on the result of VAR granger causality, it can be established that there is an interrelationship among ESR, ICTSR, FSR, PSR, WRSR and HSR on RGDP. This, thereby, implies that non-oil sector can be used to determine the growth of Nigerian economy.

4.5 Discussion of the Findings

In order to evaluate the interrelationship among environmental, ICT, financial, power, wholesale and retail and health sector revenue in Nigeria, VAR granger causality was applied and began with Vector autoregressive estimate, variance decomposition of the parameters and impulse response function. The result from the VAR estimates showed that $RGDP(-1)$, $ESR(-2)$, $ICTSR(-1)$, $FSR(-1)$, $PSR(-2)$, $WRSR(-2)$, $HSR(-1)$ and $HSR(-2)$ directly relates with current level of economic growth in Nigeria while $RGDP(-2)$, $ESR(-1)$, $ICTSR(-2)$, $FSR(-2)$, $PSR(-1)$ and $WRSR(-1)$ indirectly relate with current level of economic growth in Nigeria. Thus, it can be said that all the explanatory variables relate with economic growth positively and negatively on different lags. The shock resulting from variance decomposition of all the variables contributed largely to respective variable with $RGDP$ shocks constituting the main source of variation to its own variable. The impulse response denoted that ESR , FSR and PSR negatively responded to $RGDP$ while $ICTSR$, $WRSR$ and HSR positively responded to $RGDP$ respectively.

The result of VAR Granger causality depicted that there is a unidirectional causality between ESR and $RGDP$; $ICTSR$ and $RGDP$; HSR and $RGDP$ in Nigeria. Also, there is a bi-directional causality between FSR and $RGDP$; PSR and $RGDP$; and $WRSR$ and $RGDP$. It is concluded that there is an interrelationship among ESR , $ICTSR$, FSR , PSR , $WRSR$ and HSR on $RGDP$. This thereby implies that non-oil sector can be used to determine the growth of Nigeria economy.

The implication emanating from this finding is that government cannot deny the contributory effects of these sectors to the growth of Nigeria; the more attention and resources allocated to these non-oil sectors, the more revenue can be generated from them which in turn increases economic stability and growth in Nigeria. In other words, a shift from oil sector to non-oil sector will be an added advantage to the government in Nigeria as evidenced from the significant contributions of these variables. This is because revenue and proceeds from oil sector cannot alone increase economic growth and stability hence the need for non-oil diversification.

5.0 CONCLUSION AND RECOMMENDATIONS

Evidence from the study reported that there is a long run relationship between the non-oil sector revenue (environmental, ICT, financial, power, wholesale and retail, health sector revenue) and economic growth in Nigeria. It was also evidenced that all the variables co-move with each other, that is, environmental, ICT, financial, power, wholesale and retail, health sector revenue granger cause economic growth in Nigeria.

Theoretically, the study agrees with the speculation of Ojo (1982) and Przeworski (1991) in resource curse theory that revenue from oil and gas industry in Nigeria has not aided the country to attain a developed state of growth among countries of the world. Hence, the need for diversification into non-oil sector is essential which has the potential to spur economic growth. Empirically, the study agrees with Kawai (2017) that non-oil sector positively and significantly relates with economic growth in Nigeria while it disagrees with Olayungbo and Olayemi (2018) that found negative and insignificant relationship between non-oil sector and economic growth in Nigeria. Thus, in the light of agreement with empirical and existing finding, the study concluded that non-oil sector has positive and significant contributions to

economic growth in Nigeria. The study recommends that Government should be consistent with policies that will bring about sustainable growth in non-oil revenue.

REFERENCES

- Abogan, O. P., Akinola, E. B., & Baruwa, O. I. (2014). Non-oil export and Economic growth in Nigeria (1980-2011). *Journal of Research in Economics and International Finance (JREIF)*, 3(1), 1-11.
- Akeem, O. U. (2011). Non oil export determinant and economic growth. *European Journal of Business Management*, 3(3), 236-257.
- Enoma, A., & Isedu, M. (2011). The impact of financial sector reforms on non-oil export in Nigeria. *Journal of Economics*, 2(2), 115-120.
- Eze, O. M. (2017). Agricultural sector performance and Nigeria's economic growth. *Asian Journal of Agricultural Extension, Economics & Sociology* 15(1), 1-13.
- Idowu, R. (2016). Analysis of the effects of oil and non-oil export on economic growth in Nigeria. *Hal archives-ouvertes*, 2, 1-15.
- Kawai, V. (2017) An analysis of the impact of non-oil exports and economic growth in Nigeria from 1980–2016. *International Journal of Innovative Research in Social Sciences & Strategic Management Techniques*, 4(2), 83-94.
- Kromtit, M. J., Kanadi, C., Ndangra, D. P., & Lado, S. (2017). Contribution of non oil exports to economic growth in Nigeria (1985-2015). *International Journal of Economics and Finance*, 9 (4), 253-261.
- Ogba, L. J., Park, I., & Nakah, M. B. (2018). The impact of non-oil revenue on economic growth in Nigeria. *International Journal of Advanced Research in Accounting, Economics and Business Perspectives, IJ ARAEBP*, 2(1), 1-14.
- Ogunkola, E. O., Bankole, A. S., & Adewuyi, A. (2008). China, Nigeria economic relations: Scoping studies on China, Africa Relations. African Economic Research Consortium. Retrieved from <http://www.aercafrica.org/documents/2-3> (accessed on 9 Oct 2014).
- Ojo, J. A. T. (1982). *Financial sector maladaptation and Nigeria economic transformation problem*. An Inaugural lecture delivered at the University of Lagos April 1992. University of Lagos Press.
- Olabanji, E., Fakille, A., Ese, U., & Oduntan, E. (2017). Agricultural output and economic growth in Nigeria. *Journal of African Research in Business & Technology*, 2(7), 1-11.
- Olayungbo, D. O., & Olayemi, O. F. (2018). Dynamic relationships among non-oil revenue, government spending and economic growth in an oil producing country: Evidence from Nigeria. *Future Business Journal*, 4, 246-260.
- Olurankinse, F., & Fatukasi, B. (2012). Analysis of the impact of non-oil sector on economic growth. *Canadian Social Science* 8(4), 244-248.
- Onodugo, V. A., Ikpe, M., & Anowor, O. F. (2013). Non-oil export and economic growth in Nigeria: A time series econometric model. *International Journal of Business Management & Research (IJBM)*, 3(2), 115-124.
- Onuorah, A. C. (2018). Role of non oil exports in the economic growth of Nigeria. *Journal of Emerging Trends in Economics and Management Sciences (JETEMS)* 9(3), 132-140.
- Pritzker, S. P., Arnold, K., & Moyer, C. (2015). *Measuring the economy: A primer on GDP and the national Income and product accounts*. Washington: Bureau of economic analysis (bea).
- Przeworski, A. (1991). *Democracy and the market: Political and economic reforms in Eastern Europe and Latin America, studies in rationality and social change*. Cambridge. Cambridge University Press.
- Salami, G. O., Amusa, B. O., & Ojoye, O. F. (2018). Empirical analysis of the impact of non-oil revenue on economic growth: Nigerian experience. *International Journal of Economics, Commerce and Management*, VI (6), 263-276.