

Revenue Generation in Nigeria: Diversifying from Primary Sectors to Non-Primary Sectors

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Abstract: This study tried to identify non-primary sectors as an alternative sector for revenue generation in Nigeria. The Nigerian economy over the years had anchored only on primary sectors for revenue generation, neglecting the non-primary sectors. Studies had shown that there is need to diversify the economy away from oil and expand its revenue base given the volatile nature of the prices of the primary sectors products in the world market. Applying econometrics analysis, specifically Vector Autoregression (VAR) estimate and subjecting the estimate to various diagnostic test, alongside ascertaining the order of integration of the variables and their cointegration status, the study revealed that there is no causal relationship between non-primary sectors and revenue. The implication is that non-primary sectors had not contributed to revenue in Nigeria. The potentials in non-primary sectors had not been explored for revenue generation and revenue generated from crude oil sales had also not been invested in these sectors. The study therefore identified the non-primary sector as an alternative source of revenue generation. It was recommended among others that a long-term development plan be made to achieve the set goal of harnessing the potentials in the non-primary sectors.

Keywords: Secondary Sector; Tertiary Sector; Vector Autoregression; Structural Change Model

JEL Classification: H27; H29

1. Introduction

Over the years, Nigerian economy had revolved round the primary sectors (Agriculture, mining, and drilling of crude oil). In the 1960s Nigerian economy was mainly an agrarian economy accounting for over 80% of export earnings, over 63% of GDP, and about 50% of total government revenue. (Olaniyi, Adedokun, Ogunleye & Oladokun, 2015; Oji-Okoro, 2011) Its contribution to GDP in 2003 was 34% and in 2015, it fell below 30%. (Olaniyi, et.al. 2015) Its value added to GDP in 2016 was 21.2%. Crude oil was discovered in Olobiri in 1959 and since the commencement of its exploitation and exportation, it became the major export product, accounting for over 90% of total export, 80% of total government revenue

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and 70% of GDP. One common factor affecting the primary sector is the volatile nature of the prices of its product in the world market. The price of agricultural produce is known to be volatile, so also that of crude oil. The recent drop in the price of crude oil in the world market affected the revenue considerably in 2015 and 2016. Available data showed that total revenue dropped from N10,068.85 billion in 2014 to N6,912.50 billion in 2015 and N5,679.03 billion in 2016, because of the fall in oil revenue from N6,793.83 billion in 2014 to N3,830.10 billion in 2015 and N2,693.91 billion in 2016. (Central Bank of Nigeria, 2016) Even the GDP growth rate declined from 6.2% in 2014 to 2.8% in 2015 and declined further to -1.5% in 2016 which pushed the economy into recession. Policies made to diversify the economy away from oil still centered on agriculture (primary sector). Only the agricultural sector is being given attention, invariably going back to where it started from in the 1960s. Government had made little effort to revamp the other sectors of the economy especially manufacturing and this made its contribution to GDP low. This is not healthy for the economy as its efforts are geared only towards the primary sectors given the volatile nature of its prices in the global market. The overreliance of the economy on primary sectors for revenue generation, had affected all other sectors of the economy, causing them to experience crises. This view was corroborated by Achugbu, Monogbe and Ahiakwo (2017) who noted that the overreliance on oil for revenue generation has ditched the level of development in Nigeria and paralysed other sectors. This has affected the development and growth of the Nigerian economy. Economic growth theorists argued that for a country to grow and, it must undergo various stages of growth. (Rostow, 1960; Lewis, 1954) The Structural Change Growth Model postulated that for an economy to grow, it must shift from the primary sector (Agriculture- crop production, fishery, forestry; Mining) to secondary (Manufacturing, Building and Construction, Power) and tertiary (Services-transport, health, financial sector, hotels, insurance) sectors. (Clark, 1940; Kuznets, 1966; Chenery & Syrquin, 1975; Matsuyama, 1991) With the recent economic crises Nigeria experienced, it became paramount to shift from the revenue driven primary sectors (Agriculture and oil) to non-primary sectors (manufacturing, building and construction, power, services, entertainment industry, tourism, software industries, hoteling, telecommunication, information technology, wholesale and retail trade, etc), as this will go a long way in not only expanding the revenue base of the economy but also cushion the effect of the external shock on oil revenue. This view was shared by Akpan, Nwosu and Eweke (2017) who stated that there is need to search for other means of revenue generation given the fact that Nigerian economy recently experienced crises due to the oil price that nosedived in the world market. Therefore, the focus of this study is to identify the non-primary sector as an alternative source of generating revenue, ascertain if non-primary (secondary and tertiary) sector had affected revenue generation in Nigeria

over the years, and determine how government can generate more revenues from these sectors for the growth and development of the Nigerian Economy.

2. Literature Review

Primary sector economy is that sector economy that deals primarily with production of raw materials for manufacturing. It is based on natural resources like petroleum, solid minerals, agricultural produce. Chete, Adeoti, Adeyinka and Ogundele (2016) identified primary sectors in Nigeria to include agricultural sector, oil and gas sector. International Monetary Fund (2015) noted that mining sector, agricultural sector, among others are primary sectors. Nubar and Yan (2013) identified agriculture and mining in china as primary sectors while manufacturing and industries as non-primary sectors (secondary sector). On the other hand, Non-Primary sectors are other sectors not categorized under primary sector. They include secondary sector (manufacturing, construction, industries, etc), tertiary sector (services, trade, tourism, information technology, etc). The concept of diversification of the economy and revenue sources of government had been a national issue in recent time. Several studies relating to this study had been carried out. The need for diversification in developing countries is paramount, for the attainment of the growth objectives of these countries, Nigeria inclusive. Suberu, Ajala, Akande and Olure-Bank (2015) opined that there is need to diversify the Nigerian Economy away from its mono-cultural nature (oil based economy) to break loose from the challenges of a mono-economy. Achugbu, et.al (2017) carried out a study on diversification of the Nigerian economy through non-oil sector and their findings revealed among others that diversifying away from oil to non-oil sector will increase total revenue generated by over 35%. Riti, Gubak and Madina (2016) in their study on diversification and economic performance observed that manufacturing sector exhibited a negative relationship with growth. This was attributed to the un-explorative nature and total neglect of the sector by government. Exploring this sector would help in the diversification process for better economic performance. Bassey (2012) noted that for Nigerian economy to experience rapid growth and sustainable development, savings and revenue from crude must be channeled into infrastructure and manufacturing industries. This view was shared by Anyaehie and Areji (2015) who opined that the huge revenue generated from crude oil should be used to diversify the economy.

2.1. Theoretical Framework

The theoretical framework for this model was anchored on the structural change model of economic growth. The structural change model showed how a country migrates from the subsistence agricultural level to industrial level leading to an increase in output growth. Lewis (1954) postulated that during the process of

growth, labour moves from agricultural sector to industrial sector, with the income fixed and significantly not different from what was earned in the primary sector, and the excess profit made by the industry is ploughed back into production, thereby enhancing output level. Chenery (1960) modified Lewis theory by incorporating human and physical capital accumulation. His model was based on the following strategies; production transformation (agriculture to industry), change in consumers demand from consumables (food) to manufactured goods, creation of market for export of the manufactured goods and distribution of the country's population base on resource usage and socio-economic issues. The structural change model laid emphasis on shifting from primary sector to secondary and tertiary sectors for the attainment of economic growth and development. This study therefore hinged on this model in trying to determine how the economy can grow by shifting or diversifying its revenue sources from primary sector to non-primary sectors for the attainment of the countries growth objectives.

3. The Method

Vector Autoregression (VAR) estimate was used to analyse the annual time series data ranging from 1981 to 2016. The use of VAR for this study lied in its usefulness in describing the dynamic behaviour of economic time series. Given the nature of time series data, it is paramount to test for the presence of unit root, and ascertain the order of integration of the variables and their cointegration status. It is important to note that the use of VAR will be appropriate if the variables at levels are not cointegrated. For this study, two models were specified; secondary sector model and tertiary sector model. The secondary sector model was proxied by share of manufacturing and Construction to GDP, while the tertiary sector was proxied by share of trade (wholesale and retail) and service to GDP. These variables were used since the study is based on revenue generation. Data was sourced from Central Bank of Nigeria Online Statistical Bulletin. The model is thus specified;

Model I

$$\text{Rev} = b_0 + b_1\text{Manuf} + b_2\text{Constr} + U_i \quad (1)$$

where;

Manuf = share of manufacturing to GDP,

Constr = share of construction to GDP,

Rev = total government revenue.

Model II

$$\text{Rev} = C_0 + C_1\text{Trade} + C_2\text{Servi} + U_i \quad (2)$$

where

Trade = share of wholesale and retail (trade) to GDP,

Servi = share of service to GDP.

4. The Result

The result from the analysed data is shown below;

4.1. Result for Model I (Secondary Sector).

Table 1. Unit Root Test: Augmented Dickey Fuller Test

Variables	Levels	1st Diff.	Decision
Lrev	-1.326053	-5.789476	I(1)
Lmanuf	0.697100	-5.091045	I(1)
Lconstr	1.257572	-3.264530	I(1)

ADF Test Critical Value at 5% = 2.95

The ADF test result showed that all the variables are integrated of order one, judging from the values of their first difference which is greater than the 5% ADF critical value of 2.95.

Table 2. Unrestricted Cointegration Rank Test (Trace Statistic and Maximum Eigen Statistic).

Hypo. No. of CE(s)	Eigenvalue	Trace Statistics	0.05 Critical value	Prob.	Max-Eigen Statistic	0.05 Critical Value	Prob.
None	0.352086	26.29743	29.79707	0.12	14.75593	21.13162	0.3066
At most 1	0.227145	11.54150	15.49471	0.18	8.760570	14.26460	0.3066
At most 2	0.078536	2.780928	3.841466	0.95	2.780928	3.841466	0.0954

Trace Test and Max-Eigen Test indicates no Cointegration at 0.05 level

The Cointegration result (Trace and Max-Eigen Test) revealed that there is no long-run relationship between the variables. In other words, the variables are not cointegrated at levels. The application of VAR model becomes useful at this point.

Table 3. Vector Autoregression (VAR) Estimates

	d(lrev)	d(lmanuf)	d(lconstr)
d(lrev(-1))	-0.017666 (0.17975) [-0.09828]	0.068041 (0.05934) [1.14668]	0.030859 (0.03477) [0.88740]
d(lmanuf(-1))	-0.581361 (0.50767) [-1.14516]	0.062767 (0.16759) [0.37453]	0.391186 (0.09822) [3.98291]

d(lconstr(-1))	0.136567 (0.54456) [0.25078]	0.364769 (0.17977) [2.02910]	0.542118 (0.10535) [5.14572]
C	0.25884 (0.07311) [2.81610]	0.009958 (0.02413) [0.41262]	-0.001968 (0.01414) [-0.13914]
R ²	0.043262	0.166882	0.616410
R ⁻²	-0.052412	0.083570	0.578051
F-Stat.	0.452180	2.003101	16.06950

Log likelihood = 62.98760, AIC = -2.999271, SC = -2.460555, Lag Length = 1

Table 4. VAR Granger Causality Test

Dependent Variables	Other variables	Chi-sq	Df	Prob.
d(lrev)	d(lmanuf)	1.311390	1	0.2521
	d(lconstr)	0.062893	1	0.8020
	All	1.333206	2	0.5134
d(lmanuf)	d(lrev)	1.314875	1	0.2515
	d(lconstr)	4.117260	1	0.0424
	All	5.611927	2	0.0604
d(lconstr)	d(lrev)	0.787480	1	0.3749
	d(lmanuf)	15.86357	1	0.0001
	All	17.07076	2	0.0002

The VAR Granger Causality Test showed that manufacturing and construction sectors do not granger cause revenue, judging from the probability values (0.25 and 0.80). Revenue does not granger cause manufacturing (0.25) and construction (0.37), implying that revenue generated by government had not been used to enhance these sectors productivity. On the other, a bidirectional relationship exists between manufacturing and construction, judging from their probability values (0.04 and 0.0001).

4.1.1. Relevant Diagnostics

Table 5. VAR Residual Portmanteau Tests for Autocorrelations and Serial Correlation LM Tests

Lags	Portmanteau Tests	Prob.	LM Tests	Prob.
	Q-Stat		LM Test	
1	4.719807	NA*	23.86525	0.0045
2	12.57187	0.7038	9.867690	0.3613
3	18.38601	0.8256	6.856346	0.6521
4	25.97621	0.8363	7.000212	0.6371
5	29.84889	0.9360	4.064518	0.9071
6	39.28915	0.9030	11.24202	0.2595
7	41.84231	0.9711	2.648775	0.9766
8	43.44724	0.9947	1.663246	0.9957
9	45.48275	0.9991	1.905725	0.9929

10	51.30892	0.9994	5.900342	0.7498
11	52.06716	0.9999	0.788280	0.9998
12	55.57118	1.0000	3.651595	0.9328

Table 6. VAR Residual Normality Test

Component	Skewness	Chi-sq	Df	Prob
1	0.151703	0.151703	1	0.151703
2	0.570098	0.570098	1	0.570098
3	-0.794981	-0.794981	1	-0.794981
Joint		5.553447	3	0.1355

Table 7. VAR Residual Heteroskedasticity Tests: No Cross Terms

Joint:

Chi-Sq	Df	Prob
45.10744	36	0.1420

The diagnostic result from portmanteau test and LM test revealed that there is no autocorrelation and serial correlation in the model. For the normality test (skewness) the residuals are multivariate normal while the heteroskedasticity test revealed no heteroskedasticity in the residual. Thus, we do not reject the null hypotheses of the diagnostic tests.

4.2. Result for Model II (Tertiary Sector)

Table 8. Unit Root Test: Augmented Dickey Fuller Test

Variables	Levels	1st Diff.	Decision
Lrev	-1.326053	-5.789476	I(1)
Ltrade	0.360791	-3.100582	I(1)
Lservi	-1.053912	-9.652323	I(1)

ADF Test Critical Value at 5% = 2.95

The unit root result showed that all the variables are stationary at first difference given their values which is greater than the ADF critical value of 5%.

Table 9. Unrestricted Cointegration Rank Test (Trace Statistic and Maximum Eigen Statistic)

Hypo. No. of CE(s)	Eigenvalue	Trace Statistics	0.05 Critical value	Prob.	Max-Eigen Statistic	0.05 Critical Value	Prob.
None	0.374433	26.63299	2.979707	0.11	15.94931	21.13162	0.2278
At most 1	0.179900	10.68367	15.49471	0.23	6.743188	14.26460	0.5199
At most 2	0.109433	3.940484	3.841466	0.05	3.940484	3.841466	0.0471

Trace Test and Max-Eigen Test indicates no Cointegration at 0.05 level

The cointegration test (Trace and Max-Eigen) revealed that the variables are not cointegrated. Thus, no longrun relationship exists between the variables.

Table 10. Vector Autoregression (VAR) Estimates

	d(lrev)	d(lmanuf)	d(lconstr)
d(lrev(-1))	0.003351 (0.20674) [0.01621]	0.001118 (0.03298) [0.03389]	-0.208454 (0.17262) [-1.20760]
d(lrev(-2))	-0.134999 (0.20846) [-0.64760]	-0.046427 (0.03325) [-1.39620]	-0.064786(0.17405) [-0.37222]
d(lrev(-3))	0.062296 (0.21073) [0.29563]	0.006754 (0.03361) [0.20094]	0.019158(0.17595) [0.10889]
d(ltrade(-1))	0.424088 (1.25547) [0.33779]	0.346405 (0.20027) [1.72971]	1.235326 (1.04826) [1.17845]
d(ltrade(-2))	0.571743 (1.32916) [0.43015]	0.279780 (0.21202) [1.31958]	-6.473128 (1.10979) [-5.83276]
d(ltrade(-3))	-1.885024 (1.34729) [-1.39912]	-0.047339 (0.21491) [-0.22027]	6.475912(1.12492) [5.75677]
d(lservi(-1))	-0.076345 (0.15967) [-0.47813]	-0.012690 (0.02547) [-0.49823]	-0.352738(0.13332) [-2.64580]
d(lservi(-2))	-0.135341 (0.16686) [-0.81108]	-0.008926 (0.02662) [-0.33534]	-0.254437 (0.13932) [-1.82623]
d(lservi(-3))	0.140340 (0.14635) [0.95893]	0.002123 (0.02335) [0.09092]	-0.160821(0.12220) [-1.31609]
C	0.262063 (0.13698) [1.91317]	0.036956 (0.02185) [1.69135]	0.087438 (0.11437) [0.76452]
R ²	0.211670	0.363305	0.804781
R ²	-0.110829	0.102839	0.724919
F-Stat.	0.656342	1.394828	10.07711

Log likelihood = 43.90251, AIC = -0.868907, SC = 0.505221, Lag Length = 3

Table 11. VAR Granger Causality Test

Dependent Variables	Other variables	Chi-sq	Df	Prob
d(lrev)	d(ltrade)	2.037925	3	0.5646
	d(lservi)	3.732733	3	0.2918
	All	5.535822	6	0.4771
d(ltrade)	d(lrev)	2.152746	3	0.5413
	d(lservi)	0.369566	3	0.9465
	All	2.276677	6	0.8926
d(lservi)	d(lrev)	1.599769	3	0.6594
	d(ltrade)	47.05248	3	0.0000
	All	51.80300	6	0.0000

The VAR causality test showed that trade and service do not granger cause revenue, revenue and service do not granger cause trade, but trade granger causes service. Revenue does not granger cause service. Thus, a unidirectional relationship exists between service and trade.

4.2.1. Relevant Diagnostics

Table 12. VAR Residual Portmanteau Tests for Autocorrelations and Serial Correlation LM Tests

	Portmanteau Tests		LM Tests	
Lags	Q-Stat	Prob.	LM Test	Prob.
1	1.302397	NA*	6.994093	0.6377
2	9.657962	NA*	14.19776	0.1155
3	11.35273	NA*	7.262041	0.6099

4	18.21268	0.0328	8.739499	0.4617
5	21.91531	0.2358	6.834218	0.6544
6	28.86888	0.3673	10.88052	0.2840
7	31.50111	0.6824	3.078491	0.9611
8	37.09869	0.7927	6.013534	0.7386
9	42.93685	0.8604	6.429584	0.6963
10	46.98840	0.9343	3.675457	0.9314
11	58.21258	0.8800	14.13382	0.1176
12	63.50061	0.9244	6.906954	0.6468

Table 13. VAR Residual Normality Test

Component	Kurtosis	Chi-sq	Df	Prob
1	2.699006	0.123963	1	0.7248
2	14.45783	7.195811	1	0.0073
3	3.276357	1.635799	1	0.2009
Joint		8.955573	3	0.0299

Table 14. VAR Residual Heteroskedasticity Tests: No Cross Terms

Joint:

Chi-Sq	Df	Prob
119.6772	108	0.2082

The diagnostic test revealed that there is autocorrelation and serial correlation in the model. The normality test (kurtosis) showed that the residuals are not multivariate normal. This can be attributed to the small observation of 35 (sample size). Thus, it can be ignored since all other diagnostic result are in order. The heteroskedasticity test showed that there is no heteroskedasticity in the residual.

5. Conclusion and Recommendation

This study had revealed that the non-primary sectors had made no significant impact on total revenue in Nigeria, neither had revenue generated being used to invest in these sectors. Anchoring on the structural change growth model, Nigeria need to grow by diversifying its revenue base from primary sector revenue generating economy into non-primary sector revenue generating economy, unlocking the untapped potentials in the non-primary sectors and harnessing them for growth and development. This aligned with the opinion of Riti, Gubak and Madina (2016) that government had not explored the manufacturing sector. One of the ways through which these potentials can be unlocked is to invest in human capital. The strength of every nation lies in its human resources, Nigeria is endowed with human and natural resources which if properly harnessed can spur the growth and development of the economy. Revenue from crude oil can be used

to invest in human capital (education) focusing more on technical (welding, fabricating, molding e.t.c) and other related basic engineering courses in high (secondary) schools. This will help lay a solid foundation for the future of the manufacturing and construction sectors. Also, revenue from oil can be used to enhance the service and trade sectors through the development of the tourism and entertainment industries. Therefore, it is recommended that;

- i. A long-term development plan/policy should be made towards the harnessing the potentials in the non-primary sectors.
- ii. Government should invest in tourism sector to attract foreigners as this will not only spur domestic (wholesale and retail) trade and services but also increase the country's foreign earnings. Entertainment industry can also attract tourist which will increase the total revenue generated.
- iii. Government should create enabling environment for all these to strive by ensuring security of lives and property.

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