

Empirical Assessment of the effect of Taxation on the Nigerian Economy, 1992-2019

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Abstract

This paper presents an empirical model using an error correction model (ECM) approach to analyze the effect of direct and indirect taxes on economic growth in Nigeria by using annualized time series data spanning 1992-2019. The regression estimates show that income and capital gain tax is positively but not significantly related to economic growth whereas Value added tax was negatively and significantly associated with economic growth within the reference period. Tax on international trade was also observed be negatively associated with economic growth. These outcomes suggest that although increases in income and capital gain tax seem to influence economic growth positively, it has not been so significant driving growth. On the other hand, the results confirms the notion that increase in value added tax could be detrimental to growth since it has overwhelming impact on both the supply and demand sides of the economy. The error correction term has the right sign and shows that convergence to long-run equilibrium adjusts at the speed of 50.56% on annual basis. In view of the findings, it is noteworthy that fiscal policy implemented by government remains a strong pillar in improving public financial resources, and also in the sustenance of public expenditures in order to attain sustainable economic growth while maintaining economic stability.

Date of Submission: 10-08-2021

Date of Acceptance: 25-08-2021

I. Introduction

Fiscal policies tend to bring about changes in the tax revenues of a country while exerting significant influence on the evolution of public revenues with consequent ramifications on public spending, economic stabilization and consolidation process, allocation of new public financial resources and, ultimately, on the growth of an economy (Bazgan, 2019; Adanma et al., 2019; Stoilova & Patonov, 2012; Odhiambo & Olushola, 2018). Taxation is widely considered the most suitable means of generating needed revenue to finance growing government expenditure. Hosen (2019) argues that as long as economic assiduity is of the essence, fiscal policy, including taxation, is a vital instrument of revenue generation world over. In a similar perspective, Owino (2018) posits that the right selection of the composition as well as level of government taxes has become very crucial for the purpose of attaining a broad-based stable path of economic growth across states and countries. Thus, the decision of the government about how to finance its spending remains critical. Among a number of instruments of taxation, choice of instruments of taxation has been acknowledged to be a key factor (Canavire-Bacarreza, Martinez-Vazquez & Vulovic, 2013; Omesi, Teerah & Nzo, 2014; Oboh et al., 2018).

In the context of developing economies, there is often this speculation concerning the intentions of fiscal authorities to increase government spending by shifting the tax burden from direct taxes (i.e. personal income and corporate taxes) to indirect taxes (i.e. value added tax (VAT) and other consumption taxes, excise duties as well as custom duties (Phiri, 2019; Geetanjali & Venugopal &, 2019; Bhattarai, Nguyen & Nguyen, 2019). It is argued that tax structure where the tax system concentrates on direct taxes cannot induce higher economic growth due to heavy reliance on income taxes and corporate taxes. Hence, it could be argued that, if policymakers were to maintain the reliance on direct taxes as a way of increasing government revenue, then such tax increases would be expected to exert adverse influence on economic growth (Phiri, 2019).

In the specific case of Nigeria, Akhor (2016) is of the view that, over the years, the Nigerian tax system has been observed to have inherent problems in its structure. According to Odusola (2006), the Nigerian tax system focuses mainly on the Petroleum Profit Tax and the Company Income Tax while wide-ranging indirect taxes like the Value-Added Tax and Custom and Excise Duty are largely ignored. As a result, the tax system seems to lack the potential of diversifying the revenue portfolio of the country which is critical in safeguarding against shocks in crude oil prices and foster fiscal sustainability and economic viability in the country (Azaiki & Shagari, 2007; Ogundana et al., 2017; Etale & Bingilar, 2016; Gurama et al., 2015). Therefore, increases in indirect taxes is expected to bring about less tax burden borne by corporations and individuals thereby creating a conducive economic climate for domestic savings and foreign investments in the country, hence economic growth.

Against this backdrop, this paper examines how indirect taxes affected the Nigerian economy using updated data from 1992-2018. The major contribution of this empirical analysis to extant literature is in the disaggregation of forms of taxation especially in examining the income and capital gain tax which extant studies in the Nigerian context seem to have largely ignored. We, therefore, decomposed the variants of direct and indirect taxes under an error correction framework for a better insight and additional evidence on the subject.

II. Literature Review

This investigation which assesses the linkages between indirect tax and the growth of Nigerian industrial sector is anchored on the endogenous growth framework. The model which was popularized by King and Robelo (1990) basically proposed a dynamic steady growth state. The endogenous growth model presupposes that government policy, including taxation, can permanently foster per capital output growth accompanied with a high level of innovation. Fundamentally, the economic implication of this framework is that taxes and government expenditure can have consistent short-run and long-run effect on output (Ilaboya & Mgbame, 2012; Ojo & Oladipo, 2017; Thaci & Gërshaliu, 2018).

In view of the framework, existing literature have had diverse perspective on indirect tax and growth nexus. For instance, Ukpabi (2019) applied the Vector Error Correction Mechanism to explore the impact of indirect taxation and economic growth as a possible means of diversifying the Nigerian revenue. Time series data were applied in carrying out this research work. The result showed that of the two indirect tax sources, Value Added Tax and Customs and excise duties, Value Added Tax had a significant positive relationship with economic growth. Customs and excise duties on the other were found to have a negative and insignificant effect on growth. This outcome supports the perspective of Geetanjali and Venugopal (2019) in the Indian context.

Bâzgan (2019) evaluated the impact of direct taxes and indirect taxes on the economic growth using the Vector Autoregressive model (VAR) based on quarterly data from 2009-2017. The variables of interest in the analysis include direct taxes as a share of GDP, indirect taxes as a ratio of the GDP and the GDP growth rate over the analysed period of time. The findings revealed that a positive change in the structure of indirect taxes had a strong positive impact on the growth in the medium-term period.

Using the vector error correction technique, Hosen (2019) examined the GDP growth and indirect tax nexus in Bangladesh over the period 1972 to 2015. The results indicated that, if the Government raises the collection of indirect tax revenue by 1% (USD 167.5 million) in the long term, then the GDP will decline by 0.96% (USD 2572 million). The study suggested that the stability of economic growth can be attained through a reformed tax policy in alignment with the country's socio-economic strength and the principles of taxation.

Phiri (2016) examined the effects of direct and indirect taxes on economic growth in South Africa using the smooth transition regression (STR) model. The findings revealed an optimal tax of 10.27% on the indirect tax-growth ratio, of which below this rate indirect taxes are considered positively related to economic growth whereas direct taxes are negatively associated with growth. Above the optimal tax rate, taxation bears insignificant relationship with growth.

Owino (2018) assessed the relationship between direct and indirect tax on economic growth in Kenya. The Co-integration test and the Error correction modeling were utilized in estimating the model. The results showed that direct taxes had a negative relationship with economic growth while indirect taxation was found to be positively related to economic growth.

Ibadin and Oladipupo (2015) employed the Error Correction Model to analysed the impact of indirect taxes on Nigeria's economic growth using annualised data from 1981 to 2014. The findings showed that VAT and PPT had a significant positive relationship with real GDP. It was also found that CED of two period lags exerted a positive relationship with real GDP and VAT of two-period lags revealing a significant negative relationship with real GDP.

Asllanaj, Hajdari & Berisha (2018) analysed the effect of tax structure on Kosovo's economic growth over the period, 2004-2017. To measure this influence, the Ganger test was utilised, and with the ADF unit root test, the paper examined whether the series were stationary. Regression analysis is also employed to determine whether there is a statistically significant relationship between growth and tax structure. The results indicated that Value Added Tax and Personal Income Tax were significant and had a positive impact on economic growth in Kosovo.

ILABOYA and Mgbame (2012) investigated the indirect tax- growth dynamics in Nigeria, and used a combination of cointegration and error correction mechanism to analyse the specified model. The study found a negative and insignificant relation between indirect tax and growth in Nigeria.

Oshoke and Uke (2016) applied the cointegration test and error correction model techniques to assess the effect of indirect tax on economic growth in Nigeria spanning the period 1993 to 2013. The result showed that value added tax had a negative and significant influence on real GDP.

III. Methodology and Data

This study exclusively sourced secondary data between 1992 and 2019 from the ICTD/UNU-WIDER Government Revenue Dataset 2020 and the Central Bank of Nigeria Statistical Bulletin. Various empirical works applied different tools while assessing the relation between taxation and economic growth. Our choice of base year is dependent on the availability of data whereas the choice of analytical model will be based on the stationarity status of the model series. Hence this study will be patterned after the work of Bezgan (2019) which examined the impact of direct taxes and indirect taxes on the economic growth of Romania. The model is of the form;

$$gdp_growth_rate_{it} = \alpha + \beta_1 dir_taxes_{t-1} + \beta_1 Indir_taxes_{t-2} + \varepsilon_t \tag{1}$$

Where *gdp_growth_rate* is GDP growth rate, *dir_taxes* is direct taxes, *Indir_taxes* rate is indirect taxes, α is a constant term, ε_t represents the stochastic error term and β represent the coefficients that can have proportionally an impact on economic growth.

For the Nigerian case, we modified the model above to adjust for our distinct variables of interest as follows;

$$GDPGR_t = \beta_0 + \beta_1 ICGT_t + \beta_2 VAT_t + \beta_3 TOINT_t + \varepsilon_t \tag{2}$$

Where, GDPGR = growth rate of real GDP growth rate; ICGT = income and capital gain tax (% of GDP); VAT = Value Added tax (% of GDP); TOINT = taxes on international trade (% GDP); β_0 is the intercept, $\beta_1 - \beta_3$ = parameter estimates, ε = error term, and t = years that ranging from 1992 – 2019.

Modifying our baseline model in Equation (2) to account for seed of adjustment, the error correction model can therefore be expressed as follows:

$$\begin{aligned} \Delta GDPGR_t = & \beta_0 + \sum_{i=0}^n \beta_1 \Delta GDPGR_{t-1} + \sum_{i=0}^n \beta_2 \Delta ICGT_{t-1} + \sum_{i=0}^n \beta_3 \Delta VAT_{t-1} \\ & + \sum_{i=0}^n \beta_4 \Delta TOINT_{t-1} + \beta_5 ECT_{t-1} + \varepsilon_t \end{aligned} \tag{3}$$

Where: Δ is change, n is number of lags, and ECT_{t-1} is error correction term (and speed of adjustment), β_0 is constant term, $\beta_1 - \beta_5$ are coefficients and ε_t is error term.

IV. Results and Discussions

4.1. Descriptive Statistics

Table 1. Descriptive Statistics

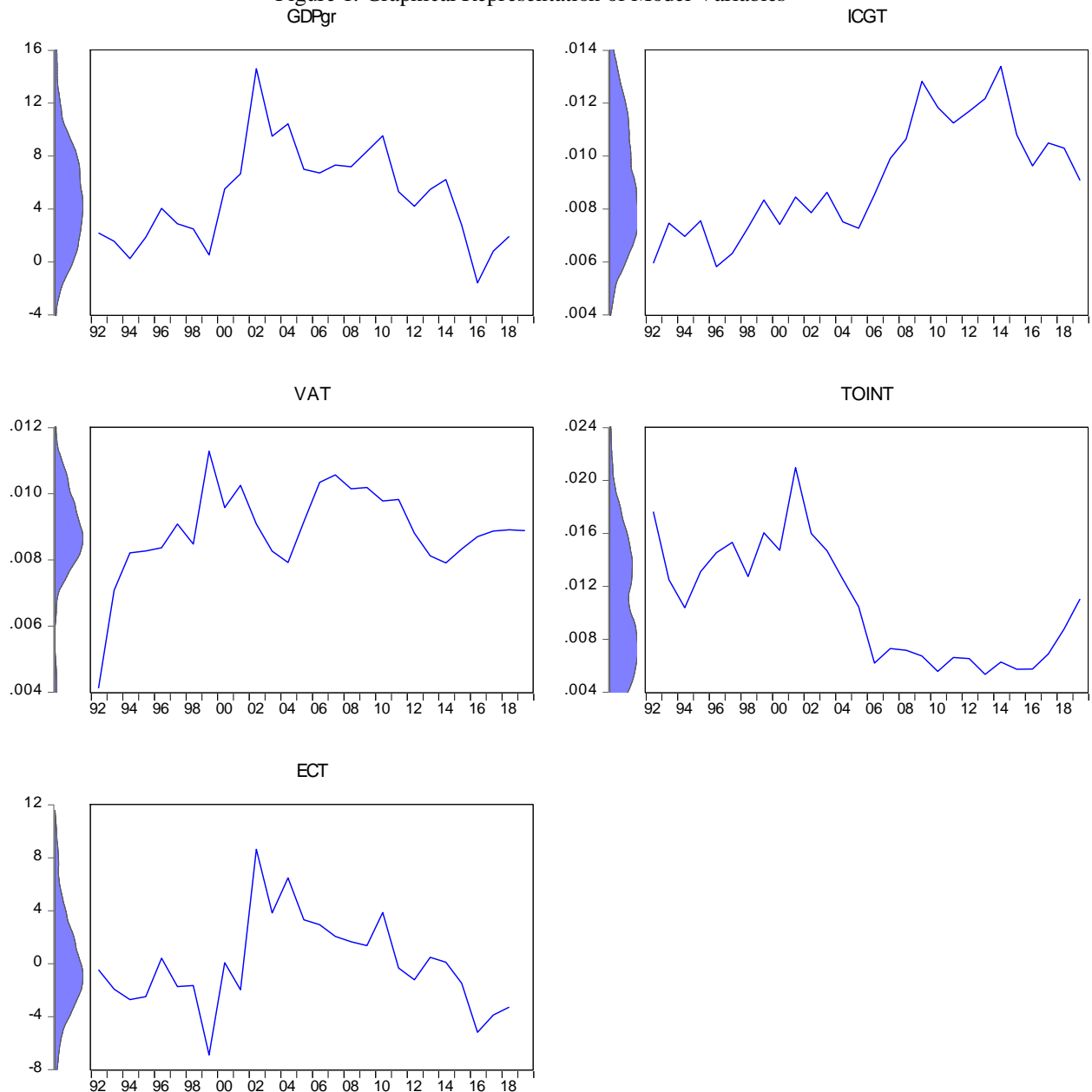
Statistic	GDPGR	ICGT	VAT	TOINT
Mean	4.959547	0.009124	0.008877	0.010632
Median	5.307924	0.008588	0.008878	0.010420
Maximum	14.60438	0.013391	0.011284	0.020967
Minimum	-1.583065	0.005821	0.004118	0.005345
Std. Dev.	3.697189	0.002136	0.001342	0.004435
Skewness	0.497786	0.323605	-1.340904	0.471865
Kurtosis	3.013287	2.032177	6.898421	2.128364
Jarque-Bera	1.115256	1.581490	26.12140	1.925440
Probability	0.572566	0.453507	0.000002	0.381853
Sum	133.9078	0.255467	0.248547	0.297699
Sum Sq. Dev.	355.3993	0.000123	4.86E-05	0.000531
Observations	27	28	28	28

Source: Authors' 2020.

Table 1 explains the statistical descriptions of the variables in our model. The results revealed that GDP growth averaged 4.96% and ranged between -1.58% and 14.60% between 1992 and 2019. The mean of ICGT and VAT as a share of GDP was 0.0091% and 0.0089%, respectively. The Maximum ICGT for Nigeria was 0.013%, and lowest at 0.0058%. VAT also ranged between 0.0041% and 0.011% over the coverage period. The

exchange rate (EXR) ranged between 50.16845 and 486.7959 to the dollar over the period 1985-2018. TOINT averaged 0.011% with a peak at 0.021% within the period. The movements in the variables are further illustrated in Figure 1. The descriptive statistics results also showed that GDPGR, ICGT and TOINT are normally distributed which is indicated by the p-value of the Jarque-Bera (J-B) statistics all of which are greater than 5%. However, VAT did not provide evidence of normal distribution, with the p-value of J-B statistics being less than 5%.

Figure 1. Graphical Representation of Model Variables



4.2 Stationarity Test

Table 2. Augmented Dickey-Fuller (ADF) Unit root test Result

Variable	ADF test statistic	5% Critical value	Order of Int.	Inference
GDPGR	-5.743128	-2.986225	I(1)	stationary
ICGT	-5.442914	-2.981038	I(1)	stationary
VAT	-4.177196	-3.658446	I(1)	stationary
TOINT	-3.411793	-2.986225	I(1)	stationary

Source: Authors' 2020.

Results of the stationarity test in Table 2 show that our variables have no unit root, and are all stationary after first differencing. Given that we have all I(1) in our stationarity test result, it becomes appropriate we employ the error correction model technique in estimating our model.

4.3 Engle and Granger Residual Based Cointegration Test

Table 3 Residual Based Unit Root Test ($\Delta\mu_t = \alpha\mu_{t-1} + \epsilon_t$)

Variable	ADF test stat.	Critical value @1%	Critical value @5%	Critical value @10%	P value
Residual (μ_t)	-5.467157	-3.456364	-2.7464530	-2.433546	0.0052

Source: Authors' 2020.

Cointegration test result in Table 3 is based on Engle and Granger residual based approach. Under this technique, the residual has to be stationary at level for the null hypothesis of no cointegration to be rejected. The results indicate that the residual (μ_t) is stationary at 1%, 5% and 10%, and at level. This outcome reveals a long-run relationship between taxation and economic growth in Nigeria.

4.4 Regression Result: Error Correction Model (ECM).

Table 3 ECM Estimation

Table 4. Error Correction Model. Dependent Variable: D(GDPGR)

Dependent Variable: D(GDPGR)

Method: Least Squares

Date: 08/21/20 Time: 09:49

Sample (adjusted): 1993 2018

Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICGT)	598.5025	397.4658	1.505796	0.1470
D(VAT)	-1012.500	418.0002	-2.422249	0.0246
D(TOINT)	-234.3301	174.3108	-1.344323	0.1932
ECT(-1)	-0.505571	0.130098	-3.886088	0.0009
C	0.060440	0.438125	0.137951	0.8916
R-squared	0.521587	Mean dependent var		-0.010134
Adjusted R-squared	0.430461	S.D. dependent var		2.865510
S.E. of regression	2.162538	Akaike info criterion		4.551483
Sum squared resid	98.20796	Schwarz criterion		4.793425
Log likelihood	-54.16928	Hannan-Quinn criter.		4.621154
F-statistic	5.723788	Durbin-Watson stat		1.779006
Prob(F-statistic)	0.002814			

The regression estimate in Table 4 reveals that income and capital gain tax (ICGT) is positively but not significantly related to GDP growth whereas VAT is found to be negatively and significantly associated with GDP growth. It can be observed that when ICGT credits increase by one-unit, annual growth GDP increases by 598.5 units. On the other hand, one-unit change in VAT brings about 1012.5 units decline in GDP growth. Tax on international trade is also observed to exert negative influence on the explained variable. Moreover, the results indicate that all the regressors are significant in explaining economic growth. The error correction term (ECT) in Table 4 has the right sign and is significant at 5%. The result therefore shows that the error correction term adjusts with the previous period's disequilibrium at the speed of 50.56% on annual basis.

4.4 Validity Test

4.4 Validity and stability tests

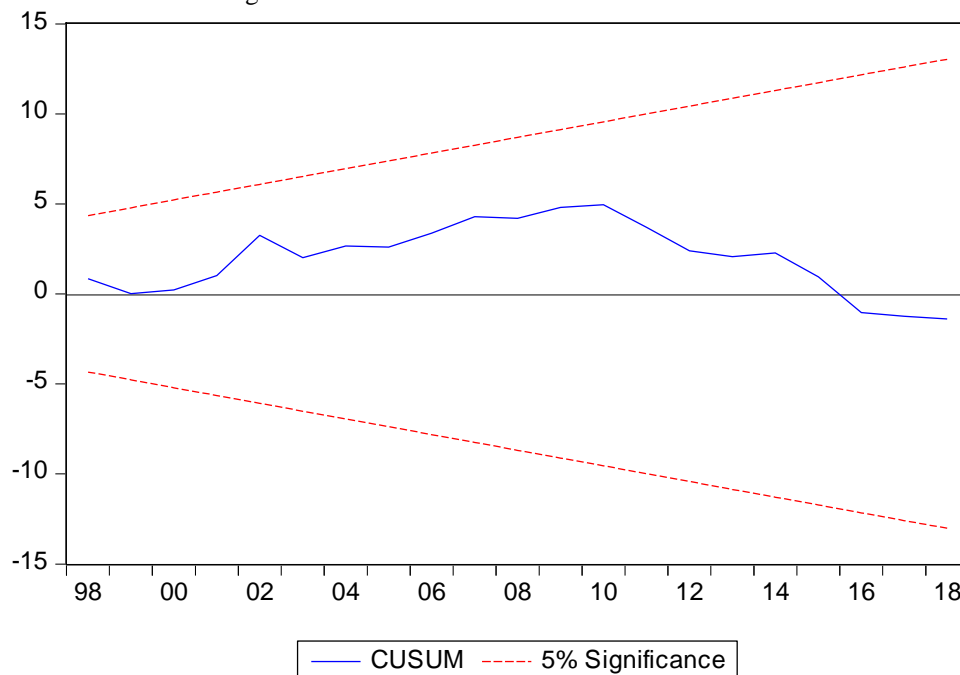
Table 5 Test for Serial Autocorrelation, and Heteroskedasticity Test

Test	Obs*R-squared	Prob. Chi-Square	F-statistic	P value
Breusch-Godfrey Serial Correlation LM Test	0.526224	0.7687	0.196246	0.8235
Heteroskedasticity Test: Breusch-Pagan-Godfrey	5.305552	0.2574	1.345972	0.2861

Source: Authors’ 2020

In the results reported in table 5, Breusch-Godfrey Serial Correlation LM Test indicates that our model has no serial correlation. This confirms the result of Durbin-Watson (DW) result in table 3 which confirms this result. The second test for Heteroskedasticity reveals that our model is homoskedastic. These results are desirable and confirms that our overall results are non-spurious hence reliable. Moreover, the Recursive CUSUM result in Figure 2 below confirms the stability of our model as indicated by the Ramsey test.

Figure 2. Recursive Estimate’s Cusum Test Result



V. Conclusion

This paper presented an empirical model using an error correction estimation technique to analyze the effect of the change in the value of direct and indirect taxes on economic growth by using annualized time series data related to Nigeria over the period of 1992-2019. The regression estimate showed that income and capital gain tax is positively but not significantly related to economic growth whereas Value added tax was negatively and significantly associated with economic growth within the reference period. Tax on international trade was also observed be negatively associated with economic growth. These outcomes suggest that although increases in income and capital gain tax seem to influence economic growth positively, it has not been so significant driving growth. On the other hand, the results confirms the notion that increase in value added tax could be detrimental to growth since it has overwhelming impact on both the supply and demand sides of the economy. Although the endogenous variables presented in the ECM model are jointly relevant and significant explain the econometric model analysed, the variation in direct and indirect taxes should not be considered as the only factors that may influence economic growth due to the fact that economic growth could be influenced by other decisive factors. However, the fiscal policy implemented by government remains a strong pillar in improving public financial resources, and also in the sustenance of public expenditures in order to attain sustainable economic growth while maintaining economic stability.

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Appendix – Dataset

Year	GDPgr	ICGT	VAT	TOINT
1992	2.193493	0.005953	0.004118	0.017647
1993	1.568807	0.007467	0.007084	0.012505
1994	0.256575	0.006963	0.008212	0.010378
1995	1.872348	0.007557	0.008269	0.013114
1996	4.052034	0.005821	0.008371	0.014554
1997	2.885916	0.006324	0.009088	0.015322
1998	2.495602	0.0073	0.008477	0.012742
1999	0.521844	0.008336	0.011284	0.016049
2000	5.5185	0.007415	0.009583	0.014719
2001	6.666848	0.008449	0.010255	0.020967
2002	14.60438	0.007863	0.009084	0.016008
2003	9.502606	0.008628	0.008262	0.014695
2004	10.442	0.007513	0.00792	0.012537
2005	7.008457	0.007274	0.009153	0.010463

2006	6.725974	0.008548	0.010343	0.00621
2007	7.318081	0.00991	0.010568	0.007304
2008	7.199287	0.010649	0.01015	0.007176
2009	8.353344	0.012826	0.010186	0.006729
2010	9.539786	0.011844	0.00978	0.005571
2011	5.307924	0.011254	0.009826	0.006623
2012	4.20589	0.011694	0.008809	0.006543
2013	5.487793	0.012171	0.008122	0.005345
2014	6.222942	0.013391	0.007906	0.006279
2015	2.786398	0.010811	0.008329	0.005737
2016	-1.58307	0.009632	0.008702	0.005753
2017	0.823987	0.010496	0.008873	0.006894
2018	1.93	0.010296	0.008911	0.008785
2019	-	0.00908	0.008882	0.011051

Sources: ICTD/UNU-WIDER Government Revenue Dataset 2020 and the Central Bank of Nigeria Statistical Bulletin (Various years).

Ifeoma M. Ihegboro Ph.D, et. al. "Empirical Assessment of the effect of Taxation on the Nigerian Economy, 1992-2019." *IOSR Journal of Economics and Finance (IOSR-JEF)*, 12(4), 2021, pp. 11-18.