

Effect of Direct Income Tax on Gross Domestic Product: Evidence from the Nigeria Fiscal Policy Framework

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Abstract: The purpose of this study is to examine the effect of direct income tax on gross domestic product with the key focus on the Nigerian fiscal policy framework and adopting time series data dating from 2007 to 2016 and collected from Budget Office of the Federation, Federal Inland Service publications, Central Bank of Nigeria statistical bulletin and the National Bureau of Statistics. The data set was analysed using, Pearson Coefficient Correlation, Granger Causality test, Ordinary Least Square method of regression, Johansen Cointegration test and Error Correction Model. In order to establish the stationarity of the variables, the Augmented Dickey-Fuller unit root test was employed. Findings from this study reveal that direct income tax has significant positive effect on gross domestic product at 5% level. We therefore carefully recommend that government should provide a strong fiscal responsible and transparent system where tax reforms should be such that would encourage increase in investment tended towards fighting corruption on account of the significant and profound effect of fiscal policies on economic growth in Nigeria.

Keywords: direct income tax, gross domestic product, fiscal policy, economic growth.

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Introduction

Fiscal policy can be referred to as the way and manner in which the government manages the economy via changes in income and spending abilities and actions to bring about certain desired macroeconomic objectives. These objectives include but not limited to: economic growth, price stability, balance of payments (BOP) equilibrium, exchange rate stability, etc. (Blanchard, 2009).

Akpakpan (1994) defines fiscal policy, as an instrument for macro-economic management, through a purposeful use of government revenue (mainly from taxes) and expenditure to manipulate the level of economic activities in a country. It a part of government policy relating to the raising of revenue through taxation and other means and choosing on the level and pattern of expenditure for the purpose of manipulating economic activities or achieving some needed macro-economic goals (Anyanwu & Oaikhenan, 1995). These macro-economic goals include increase in per-capita income, low unemployment rate, positive BOP position and price stability.

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The achievement of these goals will definitely lead to economic growth. Government fiscal policy holds two major components which includes government expenditure and taxation. This study focuses on the later component – taxation with emphasis on direct income tax. Government can fine tune each of these two instruments in order to achieve a certain level of economic activity and objectives which would favour the generality of her citizens. The use of fiscal policy is an important economic tool employed by the government to distribute and re-distribute income and welfare in Nigeria (Abata et al., 2012).

In reality, government policy requires fiscal policy instruments to stabilize the economy and consequently improve the economic condition of the country (Huang & Padilla, 2002). According to Jiranyakul & Brahmasrene (2007), the tools or strategies (such as government spending, borrowing and taxation) adopted by the central government to achieve macroeconomic stability present uncertain conclusions because of poor coordination of fiscal policy among the three tiers of government, hence one cannot say the Nigeria economy is performing. This is evidenced in the adverse inflationary trend, government fiscal policies, undulating foreign exchange rates, inflation rate, the fall and rise of gross domestic product, unfavourable balance of payments as well as increasing unemployment rates are all symptoms of growing macroeconomic instability.

As such, the Nigeria economy has been overwhelmed with several challenges over the years. Some of these challenges as identified by several researchers includes: gross mismanagement/misappropriation of public funds (Okemini & Uranta, 2008), corruption and ineffective economic policies (Gbosi, 2007); lack of integration of macroeconomic plans, absence of harmonization and coordination of fiscal policies (Agu et al., 2015) inappropriate and ineffective policies (Osuala & Jones, 2014). It is true that one of Nigeria's greatest problems today is the inability to efficiently manage her enormous human and material endowment together with imprudent public spending and weak sectorial linkages (Abubakar, 2016). However, in line with the above stated issues bedeviling the Nigerian economy, we therefore tend to review the Nigerian fiscal policy in order to ascertaining the effect of Direct Income Tax on Gross Domestic Product.

Methods

The research design employed in this study is the ex-post facto investigation. The work relied mostly on time series data extracted from the publications of Central Bank of Nigeria (CBN), Federal Inland Revenue Service (FIRS) and National Bureau of Statistics (NBS) for a ten (10) year period spanning from 2007-2016. The population consists of the thirty-six (36) states of the Federal Republic of Nigeria including the Federal Capital Territory, Abuja.

The independent variable in this study is Fiscal Policy, which is captured with Direct Income Tax extracted from Federal Inland Revenue Service (FIRS) Statistical Bulletin (various issues). While the dependent variable is economic growth, which is proxied by Gross Domestic Product sourced from Central Bank of Nigeria Statistical Bulletin, World Bank Statistical Bulletin and National Bureau of Statistics (several issues).

Inferential statistics of the data used in this study were conducted via the aid of E-Views 9.0 statistical software using: 1) Stationarity Test: The first step in any time series analysis is to test whether or not a variable is stationary and also determine the order of integration of the variable. To do this, the Augmented Dickey Fuller (ADF) test for unit root was applied. 2) Coefficient of correlation: which is a good measure of relationship between two variables tell us about the strength of relationship and the direction of relationship as well. 3) Regression analysis: predicts the value of a variable based on the value of the other variable and explains the effect of changes in the values of variable on the values of the other variables. Ordinary Least Square (OLS) regression analysis was used for this study.

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In order to verify the quality of the data used, the following diagnostic tools were used: 1) Causality test: was used to prove the causality or the direction of influence of one variable on other variables. 2) Cointegration test: was carried out to determine the existence of long-run relationship between the dependent variable and independent variable. 3) Error Correction Model: was formulated to show the speed at which the dependent variable adjusts to changes in the explanatory variables in an effort to achieve long run equilibrium.

The model of this study is hinged on the model of Shuaib & Ahmed (2015), which enables the examination of the effect of direct income tax on gross domestic product. Going by the model, a simple regression equation was set up to investigate the hypothesized relationship between the dependent variable and the independent variables. The econometric version of the model is given as:

$$GDP = \beta_0 + \beta_1 DIT + \varepsilon$$

Where:

GDP = Gross Domestic Product (Proxy for Economic Growth)

DIT = Direct Income Tax (Proxy for Fiscal Policy)

ε = Error Term

β_0 = Constant Term

β_1 = Coefficient of Fiscal policy

The decision will be based on 5% (0.05) level of significance. The null hypothesis (H₀) will be accepted, if probability value (i.e. p-value or sig.) calculated is greater than or equal to (\geq) the stated 5% level of significance, otherwise reject.

Results and Discussion

The time series data extracted from the publications of Federal Inland Revenue Services, Central Bank of Nigeria and National Bureau of Statistics from 2007 to 2016 (Table 1). The researchers tested for stationarity unit root test in order to fulfill the economic theory which states that variables that must enter a regression model must undergo a stationarity test in order to achieve a realistic (non spurious) result at 1%, 5% or 10% level of significance. The result for the test is shown in Table 2. The data used in this study had unit root problem, consequently, the data were detrended using Augmented Dickey-Fuller Test. The result of the differenced data in order to solve the unit root problem is shown in Table 2.

Table 1 Operational Data of Variables

Year	GDP Growth (Annual %)	Direct Income Tax (Billion Naira)
2007	9.06	1,846.90
2008	8.01	2,972.20
2009	8.97	2,197.60
2010	9.97	2,839.30
2011	4.89	4,628.50
2012	4.28	5,007.70
2013	5.39	4,805.60
2014	6.31	4,714.60
2015	9.19	3,741.80
2016	8.24	3,315.20

Table 2 Differenced Result

Variables	Test Statistic	Test Critical Values			Status	Prob.
	ADF	1% level	5% level	10% level	Stationary	
DIT	-8.448323	-5.119808	-3.519595	-2.898418	1(1)	0.0040
GDP	-8.116235	-4.803492	-3.403313	-2.841819	1(1)	0.0043

From Table 3, the mean serves as a tool for setting benchmark. The median re-ranks and takes the central tendency. While the maximum and minimum values help in detecting problem in a data. The standard deviation shows the deviation/dispersion/variation from the mean. It is a measure of risk, the higher the standard deviation, the higher the risk.

The standard deviation is a measure that summarizes the amount by which every value within a dataset varies from the mean. It is the most robust and widely used measure of dispersion. When the values in a dataset are pretty tightly bunched together, the standard deviation is small. When the values are spread apart the standard deviation will be relatively large.

In many datasets, the values deviate from the mean value due to chance and such datasets are said to display a normal distribution. In a dataset with a normal distribution, most of the values are clustered around the mean, while relatively few values tend to be extremely high or extremely low. Many natural phenomena display a normal distribution.

The standard deviation in this study for the period 2007-2016 is 2.04 and 11.47 for GDP and DIT respectively. For such distributions, it is the case that 2.04% and 11.47% of values are less than one standard deviation (1SD) away from the mean values of GDP and DIT respectively. Skewness and Kurtosis are contained in Jarque-Bera. Positively skewed is an indication of a rise in profit while negatively skewed is an indication of loss or backwardness. Jarque-bera is used to test for normality to know whether data are normally distributed. Table 3 shows that GDP and DIT are negatively skewed with the values of 0.375 and 0.162.

Table 3 Descriptive Statistics

	GDP	DIT
Mean	7.431000	3606.940
Median	8.125000	3528.500
Maximum	9.970000	5007.700
Minimum	4.280000	1846.900
Std. Dev.	2.037435	11.47406
Skewness	-0.375295	-0.161743
Kurtosis	1.601423	1.607387
Jarque-Bera	10.49751	6.851673
Probability	0.001629	0.042223
Sum	74.31000	36069.40
Sum Sq. Dev.	37.36029	11848855
Observations	10	10

Table 4 Pearson Correlation Matrix

	GDP	DIT
GDP	1.0000	-0.6579
DIT	-0.6579	1.0000

Table 3 reveals that GDP and DIT with probability value of 0.002 and 0.042 respectively are less than 10%. So invariably, they are significantly normally distributed. Table 4 indicates that a negative moderate relationship exist between DIT and GDP. The effect of direct income tax on economic growth in Nigeria is evaluated based on the result of Table 5. From Table 5, DIT with a

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positive coefficient of 0.002008 has a significant effect on GDP as indicated by the t-statistic of 3.643642 and its associated probability value of 0.0082. The R squared which examines the extent to which the predictor explain the variations in the dependent variable (GDP) shows that the R Squared figure of 0.654766 indicates that, reliance on this model will account for 65% of the variations in the dependent variable (GDP). The Durbin-Watson value of 1.604590 buttressed the fact that the model does not contain auto-correlation, thereby, making the regression fit for prediction purpose. The analysis resulted in F-value of 13.27613 with corresponding p-value of 0.008247. This confirms that, the model is significantly reliable; therefore, one can rely on the model to predict GDP with high accuracy. Since the p-value of the test is less than the critical value of 5%, thus H_1 is accepted and H_0 rejected. This implies that DIT has a statistically significant effect on GDP of Nigeria Economy at 5% level.

Table 5 Ordinary Least Square Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.236485	0.479051	0.493653	0.6367
DDIT	0.002008	0.000551	3.643642	0.0082
R-squared	0.654766	Mean dependent var		-0.091111
Adjusted R-squared	0.605447	S.D. dependent var		2.247312
S.E. of regression	1.411614	Akaike info criterion		3.720474
Sum squared resid	13.94857	Schwarz criterion		3.764302
Log likelihood	-14.74213	Hannan-Quinn criter.		3.625894
F-statistic	13.27613	Durbin-Watson stat		1.604590
Prob(F-statistic)	0.008247			

Table 6 Granger Causality Test

Null Hypothesis:	Obs.	F-Statistic	Prob.
DDIT does not Granger Cause DGDP	7	15.4783	0.0127
DGDP does not Granger Cause DDIT		13.7447	0.0385

Table 7 Johansen Co-Integration Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.950763	23.11218	15.49471	0.0029
At most 1	0.252214	2.034470	3.841466	0.1538
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon et al. (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.950763	21.07771	14.26460	0.0036
At most 1	0.252214	2.034470	3.841466	0.1538
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon et al. (1999) p-values				

Table 6 shows that there is a bilateral causality between DDIT and DGDP since the P-value (0.0127) is significant at 5% level. Moreover, at two (2) lags there is a statistically significant relationship between DIT and GDP. On the other hand, there is no "reverse causation". This

reinforces the fact that DIT Granger Causes GDP. Consequently, the null hypothesis is rejected for the alternative which states that Direct Income Tax has significant effect on Gross Domestic Product of Nigeria Economy at 5% level.

From the cointegration test result presented in Table 7, the decision rule is to reject the null hypothesis of no cointegration if the computed trace statistic is greater than the 5% critical value. The test result indicates the rejection of no cointegration under null. We could thus say that there exists the presence of one cointegrating equation among the variables, hence, indicating the presence of long run relationship among the variables.

The result of the VECM analysis in Table 8 reveals that the value of the error correction coefficient is 2.23%. This indicates that 2.23 of the short run errors of the GDP is corrected each year. In other words, GDP adjusts to its long run equilibrium at a speed of 2.23. The VECM analysis indicates that DIT is significant in determining economic growth in the long run. 1% increase in DIT leads to an increase of 0.22% in GDP.

Table 8 Vector Error Correction Model

Cointegrating Eq:		CointEq1	
DGDP(-1)		1.000000	
DDIT(-1)		0.002204	
		(0.00025)	
		[8.83422]	
C		-0.538211	
Error Correction:		D(DGDP)	D(DDIT)
CointEq1		-0.022594	127.8171
		(0.92355)	(429.152)
		[-2.19002]	[0.29784]
C		0.012500	-193.9875
		(0.97730)	(454.128)
		[0.01279]	[-0.42717]
R-squared		0.444249	0.014569
Adj. R-squared		0.351624	-0.149669
Sum sq. resids		45.84544	9899138.
S.E. equation		2.764219	1284.467
F-statistic		4.796200	0.088707
Log likelihood		-18.33484	-67.46558
Akaike AIC		5.083711	17.36639
Schwarz SC		5.103572	17.38625
Mean dependent		0.012500	-193.9875
S.D. dependent		3.432882	1197.944
Determinant resid covariance (dof adj.)			1992319.
Determinant resid covariance			1120679.
Log likelihood			-78.42080
Akaike information criterion			21.10520
Schwarz criterion			21.16478

Studies by Trebicka (2015) in Albania; Babalola & Aminu (2011) in Nigeria, have substantiated evidence that a good and veritable fiscal policy will positively impact on economic growth. However, the present study which revealed that Direct Income Tax has a statistically significant effect on the Gross Domestic Product of Nigeria. Okorie et al. (2017), proved that that monetary and fiscal policy had positive and significant impact on income; but the pace at which monetary policy affects income is faster than that of fiscal policy.

The findings are consistent with the study by Iyeli & Azubuike (2013) in Nigeria's growth between 1970 and 2011; that revealed that there exist a long run equilibrium relationship between economic growth and fiscal policy variables in Nigeria. The study results are contrary to that of

Matallah & Matallah (2017) in Algeria; that reported a significant positive effect for indirect taxes, while direct taxes, had a negative and significant effect on economic growth in the long run. Babalola (2015) in Nigeria; when he reported that tax revenue had an inverse significant impact on real per capita income in both short and long run.

Conclusions

Economic growth represents the expansion of a country's potential Gross Domestic Product (GDP) or output. However, overtime, economic growth in Nigeria has been dependent on aid and debt due to mismanagement of fiscal policies. In spite of many, and frequent changing of fiscal and other macro-economic policies, Nigeria is yet to tap her economic potentials for rapid economic growth.

Fiscal policies are extremely linked in macro-economic management; growth in one sector of the economy directly affects growth in the other. Notably, fiscal policy is central to the health of any economy, as government's has power to raise revenue (tax) and expend revenue. These actions affect the disposable income of citizens and corporations which in turn affects the general economy as well. Fiscal policy has conventionally been associated with the use of taxation and public expenditure to influence the level of economic activities.

The implementation of fiscal policy is essentially routed through government's budget. It involves the use of government spending, taxation and borrowing to influence the pattern of economic activities and also the level and growth of aggregate demand, output and employment. This includes sustainable economic growth, high employment creation and low inflation. Thus, fiscal policy aims at stabilizing the economy.

Consequently, this study explored the Nigerian fiscal policy with a view to ascertaining the effect of Direct Income Tax on Gross Domestic Product. The finding indicates clearly that DIT is significant in determining economic growth in the long run as 1% increase in DIT leads to an increase of 0.22% in GDP.

From the finding of the study, the researchers hereby recommend that government should establish a strong fiscal responsibility and transparency system in the country to foster stability in the economy; and that government should adopt tax reforms that would encourage increase in investment and sincerely fight corruption in order to boost economic growth.

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