Tax revenue and private domestic investment: Evidence from Nigeria **Richard Umeokwobi** ^(a) **Emeka Nkoro** ^{(b)*}^(a) Department of Economics, University of Port Harcourt, Nigeria^(b) Department of Economics, University of Port Harcourt, Nigeria **ARTICLE INFO***Article history:*

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ABSTRACT

This paper investigated the impact of tax revenue on private domestic investment in Nigeria from 1980 to 2018 using the modified ordinary least squares- Autoregressive distributed lag (ARDL). The paper used oil revenue, non-oil revenue, and Corporate Income Tax (CIT) as the independent variables while Private Domestic Investment (PDI) is the dependent variable. Oil revenue and non-oil revenue were used as a proxy for oil and non-oil tax. These data were obtained from secondary sources- central Bank of Nigeria, World Bank database and Federal Inland Revenue service statistical bulletin. The result showed that a long-run relationship exists between the aforementioned variables. Also, the paper revealed that oil and non-oil do not have a significant impact on PDI but CIT has a positive and significant impact on PDI. The paper recommends that proper measures/reforms should be put in place in order to reduce the impact of tax on private domestic investment in Nigeria.

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Introduction

Investment in an economy has always being the source of development in a country especially the less developed countries. This investment can be from foreign countries either direct or portfolio, it can also be domestic; that is investment done by the citizens of the country. This domestic investment on the other hand can either be public or private. Public domestic investment is by the government of the said country while private domestic investment is by the individuals, who are non-government. Taxation is a source of revenue for the government, which can either be from oil revenue or non-oil revenue. The volume of capital which is to be used for investment by individuals can be reduced by taxation in an economy, in the form of corporate income tax (CIT).

It should be noted that taxation is used by government to provide public goods, maintain law and order, security and defence and regulation of trade (Azubuike, 2009). These factors serve as drivers to foreign and domestic investment. However, in Nigeria, despite the generation of huge revenue from taxation, factors such as road, electricity, security etc are still lacking. This situation has discouraged foreign and domestic investment in Nigeria, even the existing investments are being diverted to other countries with an improved public goods. A reference case is that of machelin that left Nigeria as a result of epileptic power supply. This calls for urgent attention.

Empirical literature has shown conflicting evidence on the relationship between taxation and private domestic investment. An attempt by Edame and Okoi (2014) and Nwokoye and Rollie (2015) to examine the relationship between taxation and investment revealed conflicting results. These conflicting results could be as a result of the choice of methodology, selectivity bias, data quality and specification issues. It is on this backdrop; the paper investigates the impact of taxation and private domestic investment in Nigeria.

The rest of the paper is organised as follows: Section two dwells on the literature review while section three deals with method of analysis. Section four focuses on analysis of results while section five deals on conclusion of the paper.

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Literature Review

Theoretical Background

Tobin Q theory

This theory lays its existence to James Tobin an American Economist, who served on the board of governors of the Federal Reserve System and also on the council of economic advisers. James Tobin also thought in Yale and Harvard universities, He received a noble prize in economic science in the year 1981. The q theory is a theory of investment where q represents the ratio of a company's existing shares (share capital) to the replacement cost of its physical asset, that is the replacement cost of the share capital. According to Tobin (1969), the principal way in which financial policies and events affect aggregate demand is by changing the valuations of physical assets relative to their replacement costs. Monetary policies can accomplish such changes, but other exogenous events can too.

The Brown Model

This theory is linked to Cary Brown an economics who carried out a classical 1948 study in 1948- Business Income Taxation and Investment Incentives. In his study, he outlined a relationship between investment and taxation. This relationship he called partnership analogy. According to Brown (1948), the government partners with a tax payer when there is a disequilibrium in tax payable either by accelerating expense recognition or differing revenue recognition from one transaction year to another. The deferred tax is then invested by the government in the asset or business of the tax payer and receives a return on the investment equal to tax payable on the return generated by the asset or business.

Expectancy Theory

Bhartia (2009) and Ayuba (2014) declare that, the taxation is such that the whole tax proposal goes through the test of practicality and must be the major consideration before the tax authorities goes for tax proposal. It shows that, the economic and social goals of the government are considered not relevant since it is not meaningful to have a tax that cannot be levied and efficiently collected.

Socio-political Theory of Taxation

Ogbonna and Appah (2012) attest that thinking validates the fraud of taxes for funding state enterprise and for the arrangement of a ground for distributing the tax overload between divisions of the society. They justified that, advocate for a tax system which is not constructed to distribute individuals but one that heals the pains of the community as a whole. The community is made up of individuals but is more than the sum aggregate of its individual members; therefore, the tax system should be focused towards the strength of the society as an entity, since individuals are essential part of the larger society (Chigbu, Akujuobi and Appah, 2012).

Ability to Pay Theory

This theory of taxation confirms that, taxes enforced on tax-payers should be placed on the progressive tax path which cultivates that taxes should be exacted according to a tax-payer's strength to pay. This system of taxation desires that greater earning persons pay taxes higher than those with lower income. The basic assumption of this theory is that, the load of taxation should be communal by the members of the society on the assumption of equity and justice and that this assumption necessitates that tax burden is allocated according to their relative ability to pay. Adam Smith is the intellect behind the principle of equity and justice.

Empirical Literature

Empirical studies show that taxation is negatively related to the level of investment and output of goods and services, this can be seen in Edame and Okoi (2014) who examined the impact of taxation on investment and economic growth in Nigeria from 1980-2010. The ordinary least square method of multiple regression analysis was used to analyze the data. The annual data were sourced from the central bank of Nigeria statistical bulletin and NBS. The result of the analysis showed in conformity with prior expectation because the parameter estimates of corporate income tax (CIT) and personal income tax (PIT) appears with negative signs, this means that an inverse relationship exist between taxation and investment. The economic implication of the result is that a one percent (1%) increase in CIT will result in decrease in the level of investment in Nigeria. Consequently, an increase in PIT will result in decrease in the level of investment. Finally, the result therefore showed that taxation is negatively related to the level of investment and the output of goods and services (GDP) and is positively related to government expenditure in Nigeria. We also observed that taxation statistically is significant factor influencing investment, GDP and government expenditure in Nigeria.

Popoola, Jimoh & Oladipo (2017) examined the effect of oil and non oil tax on the economic growth of Nigeria. Data were collected from Central Bank of Nigeria (CBN) Statistical Bulletin and National Bureau of Statistics (NBS). They utilized both descriptive and Paired Sample T-test with the aid of Statistical Package for Social Science (SPSS) Version 23. The findings showed that, oil and non oil tax revenue were positive and strongly correlated with Real Gross Domestic Product (RGDP). Imoisi, Abuo and Watson (2015) examined the impact of domestic investment on economic growth in Nigeria using annual time-series data from 1970-2013. Multiple

regression and co-integration methods were employed to analyze the data. The result of the analyzed data illustrated that private investment and government productive investment had positive but insignificant impact on economic growth.

Ude and Ekesiobi (2014) focused the empirical issues pertaining to the structure and composition of domestic debt and its impact on private investment in Nigeria. The study employed multiple regression models using secondary data from 1970 to 2012. The study found that domestic debt has inverse significant impact on domestic private investment in Nigeria. Kalu and Mgbemena (2015) investigated the link between domestic private investment and economic growth in Nigeria, using the Cob-Douglas model framework. The model is estimated using Error Correction Modeling (ECM) approach and annual data covering 1970 to 2012 was used. The study shows the significance of investment on real gross domestic product (RGDP). The result of tests reveals equilibrium relationship between real GDP and its determinants in the long run and short run. Nwokoye and Rollie (2015) examined the investment implication of the series of tax reforms in Nigeria, particularly the tax reforms of 2003 and National tax policy of 2012. Annual time series data spanning the years (1981-2012) were utilized. Preliminary diagnostic test was conducted to examine whether the estimated model satisfies the OLS assumptions. The basic assumptions of the OLS were satisfied. The result of the estimated OLS model shows that tax reform as proxied by VAT and CIT, both positively and significantly stimulate investment in Nigeria.

To the best of our knowledge, it can be seen that most scholars have failed to examine the impact of taxation on private domestic investment rather they investigated the effect of private domestic investment on economic growth. Scholars like Nwokoye and Rollie (2019) examined the effect of taxation on investment and not private domestic investment. Hence, the model for this paper anchors on Nwokoye and Rollie (2019) but with little modification. Nwokoye and Rollie (2019) used aggregate investment while this paper uses private domestic investment. Also, this paper extended the time frame to 2018 as Nwokoye and Rollie (2019) stopped at 2012. In terms of variables used, Nwokoye and Rollie (2019) used value added tax and corporate income tax to capture taxation while this paper uses non-oil revenue, oil-revenue and corporate income tax to capture tax revenue.

This study uses private domestic investment as the dependent variable while oil (oil tax), non-oil (non oil tax) and corporate income tax are the independent variables of the model.

Research and Methodology

Data Sources and Method of Analysis

The data for this were obtained from secondary sources- central Bank of Nigeria, World Bank database and Federal Inland Revenue service statistical bulletin from 1980 to 2018.

Analytically, this paper adopts the modified ordinary least square. The estimation starts with examining the time series characteristics of the variables included in the model, then proceed to estimating the cointegration analysis in order to test for the existence of a cointegrating relationship among the variables. Next is the examination of the relationship between tax revenue and private domestic investment using Autoregressive distributed lag (ARDL) Model and finally, the post-diagnostic tests of the model.

Model Specification and Statement of Hypothesis

Analytically, this paper is premised on Nwokoye and Rollie (2019) but with little modification. Nwokoye and Rollie (2019) used aggregate investment while this paper uses private domestic investment. Also, Nwokoye and Rollie (2019) stopped at 2012 while this paper extended to 2018 as a result of policy changes that have taken place in the country. In terms of variables used, Nwokoye and Rollie (2019) used value added tax and corporate income tax to capture taxation while this paper uses non-oil revenue, oil-revenue and corporate income tax to capture tax revenue.

Model Specification

Functional Relationship:

$$Pdi = f(\text{oil, non_oil, cit})$$

Mathematical Relationship

$$Pdi = b_0 + b_1\text{oil} + b_2\text{non_oil} + b_3\text{cit}$$

Econometric Relationship

$$pdi_t = b_0 + b_1pdi_{t-1} + \dots + b_2pdi_{t-n} + b_3oil_t + b_4oil_{t-1} + \dots + b_5oil_{t-n} + b_6non_oil_t + b_7non_oil_{t-1} + b_8non_oil_{t-n} + b_9cit_t + b_{10}cit_{t-1} + b_{11}cit_{t-n} + u_t$$

Economic apriori: oil<0, non_oil<0, cit<0.

Where:

Pdi=Private domestic investment, oil= taxation on oil, non-oil= tax on non-oil,

cit= Corporate income tax.

b₀= intercept or constant, b₁, b₂, b₃, b₄, b₅, b₆, b₇, b₈= Parameters.

H₀= Tax revenue has no significant impact on Private domestic investment in Nigeria.

Result and Discussion

Descriptive Analysis

Table 1: Descriptive Statistics

Variable	Mean	Median	Maximum	Minimum	Standard deviation
PDI	2301.786	1308.84	8338.87	-443.92	2631.95
OIL	2210.87	570.61	8878.97	7.2500	2714.70
NON_OIL	792.90	195.38	3275.03	2.980	1066.77
CIT	243.92	39.75	1204.80	0.4000	363.53

Source: Authors' computation using Eviews 9

The descriptive statistics shows that PDI has a mean value of 2301.786 and a standard deviation of 2631.95, the difference is not much which means it is likely to be stationary at level or first difference the same goes to oil which has a mean value of 2210.87 and a standard deviation of 2714.70, these shows that the likelihood of it being stationary at level is high while NON_OIL and CIT have a higher difference between the mean and their respective standard deviation compared to PDI and oil. NON_OIL has a mean value of 792.90 and a standard deviation of 1066.77, cit has a mean value of 243.92 and a standard deviation of 363.53. The maximum value of PDI in the time series data is 8338.78, its minimum value is -443.92 and it has a median of 1308.84. oil has a maximum value of 8878.97, a minimum value of 7.2500 and a median value of 570.61. NON_OIL has a maximum value of 3275.03, a minimum value of 2.980 and a median value of 195.38. CIT has a maximum value of 1204.80, minimum value of 0.4000 and a median value of 39.75.

Unit Root Test

Properties of a time series data: Time series are generally known for having unit root when plotted at levels or using the actual value as sourced from secondary sources. Therefore, using time series without formally confirming if there exist a unit root may lead to estimating a wrong model that will be tagged spurious. The first step taken for unit root test is to determine the properties (random walk of time series) of the time series. Time series are either having trends, intercept, both, or even none.

Table 2: Properties of Time Series Data

VARIABLES	INTERCEPT	TREND	DECISION
PDI	-111.13 (0.87)	137.88* (0.000)	Trend
OIL	-1530.44* (0.00)	213.78* (0.00)	Trend and Intercept
NON_OIL	-740.31* (0.00)	87.61* (0.00)	Intercept and Trend
CIT	-257.48* (0.00)	28.65* (0.00)	Intercept and Trend

Source: Author's Computation using Eviews 9

NB: * shows significance at 5% level.

Table 3: Unit Root Test Results

Test Methods: Augmented Dickey-Fuller (1979)				
Variables	Calculated Values		Critical Values	Order of Integration
	Level	1 st diff.	5%	I(d)
PDI	-1.35	-5.21	-3.54	I(1)
OIL	-3.67	-	-3.58	I(0)
NON_OIL	-1.13	-6.31	-3.54	I(1)
CIT	1.408	-7.60	-3.59	I(1)

Source: Author's Computation using Eviews 9

The unit root test was conducted by using Dickey & Fuller (1979) technique and the result is summarized in Table 3. It reveals that only OIL is stationary at level while are at first difference. Hence, the variables in the model are I(0) and I(1). Also, the line graph of the variables was examined. The line graph of the variables is shown below.

Figure 1: Line graph of PDI

Figure 2: The Line Graph of Oil

This graph shows that PDI has a trend and a constant variance but not that much, which means it is likely to be stationary at level or first difference, it reached its peak in the year 2015. Figure 2 shows that oil has a trend and constant. The graph shows a constant trend from 1980 to 2000. This means oil has a combination of both trend and intercept.

Figure 3: The Line Graph of NON_Oil

Figure 4: The Line Graph of CIT

This graph shows a combination of trend and intercept and, this could be seen in the movement of the graph. It also achieved its peak in 2014. Non_oil has been almost in a constant level from 1980 to almost 2000.

In figure 4, CIT has a combination of both intercept and trend. This could be seen in the movement of the graph. From 1980 to 2000 is almost in a constant level, as about 2001 and above it starts to increase and fluctuates at the same time.

Cointegration Test

Since the ADF test shows that the variables are I(0) and I(1) therefore the Autoregressive distributed lag (ARDL) bound test was carried out to examine the long run relationship of the variables in the model.

Table 4: ARDL Bounds Test Result

Computed F-statistic	5% Lower Critical Value Bound [I(0)]	5% Upper Critical Value Bound [I(1)]
2.91	3.23	4.35

Source: Author's Computation using Eviews 9

Table 4 shows that the computed F-statistics is lower than both the lower critical value bound and upper critical value bound, hence, there is no long run relationship among the variables in the model. Since this is the case, there is no need estimating the static and

ECM model of the variables. It is on this basis, the paper examined the relationship between the variables using short run Autoregressive Distributed Lag model.

Model Estimation

The result of the short run ARDL model is presented in Table 5.

Table 5: Short Run ARDL Model Estimation

ARDL Short Run		
Variable	Coefficient	Probability
pdi(-1)	0.40	0.10
pdi(-2)	0.05	0.84
pdi(-3)	-0.17	0.53
pdi(-4)	0.41	0.07
oil	-0.39	0.18
oil(-1)	-0.00	0.99
oil(-2)	0.42	0.13
oil(-3)	-1.17	0.21
oil(-4)	-1.36	0.05
non_oil	-1.03	0.49
non_oil(-1)	-0.99	0.45
non_oil(-2)	2.02	0.13
non_oil(-3)	3.88	0.07
cit	12.12	0.03
cit(-1)	14.32	0.03
cit(-2)	34.07	0.21
cit(-3)	-20.92	0.67
cit(-4)	-44.92	0.12
c	23.29	0.95
Adj R squared: 0.97		
Durbin Watson: 1.68		
F-statistics: 24.22		
F(prob): 0.000		

Source: Author's Computation using Eviews 9

Table 5 shows that PDI of previous years has a positive but insignificant relationship with current PDI, except lag 4 that is significant at 10 percent. The result shows that the Oil revenue was not significant in the previous years except at year four where it became significant at ten percent. NON_OIL revenue was not significant except at the third year, at ten percent significant level. On the other hand, CIT of current and first previous year has a positive and significant impact on PDI whereas the CIT of the second, third and fourth previous years were not significant. The R-squared shows that 97 percent variation in dependent variable is explained by the independent variables. The Durbin Watson statistics shows that there is absence of autocorrelation because its value is approximately two. The F-statistics shows that the model is robust because the F-probability is significant at five percent.

Table 6: Post Estimation Test

Test	Prob.	Decisions
Heteroskedasticity	0.8977	Homoscedastic
Normality test	0.0503	Normally distributed
Ramsey Reset Test	0.5448	Model is stable
Serial Correlation LM Test	0.313	Not serially correlated
Correlogram of Residuals	>0.05	Absence of autocorrelation

Source: Authors' computation using Eviews 9

From Table 6, it could be seen that the model is free from heteroskedasticity, it is normally distributed, stable, not serially correlated and there is absence of autocorrelation.

Discussion

The Oil revenue tax exhibits actual sign in current and previous years except in year two and, it is not significant except at year four where it became significant at ten percent. The insignificant of Oil tax revenue implies that oil tax revenue does not retard private

domestic investment in the short run. This could be as a result of tax holidays and waivers/concessions given in order to woo private domestic investors into investing in Nigeria's key sectors. Also, the huge returns in the oil industry investment make it possible for private domestic investment not being affected oil revenue taxes. However, at the long run when the tax holidays and waivers/concessions have elapsed and taxes imposed the private domestic investment will start retarding. This is the implication of year four (lag 4) becoming significant.

The NON_OIL revenue tax exhibits actual sign in current and year one while year two and three are wrong signs. It is not significant except at year three (lag 3) where it became significant at ten percent but with a wrong sign. The insignificant of NON_OIL tax revenue implies that NON_OIL tax revenue does not retard private domestic investment in the short run. This could also be as a result of tax holidays and waivers/concessions to woo private domestic investors into investing in Nigeria's key sectors in order to grow the economy. The significant of lag three shows that NON_OIL tax revenue increases private domestic investment rather than reducing it. This also gives credence to what was earlier adduced.

On the other hand, CIT failed to exhibit actual sign except the third and fourth previous years are. The positive sign of the CIT contradicts with Edame and Okoi (2014). This implies that a change in corporate income tax would bring about a positive increase in PDI. CIT of the second, third and fourth previous years are not significant while CIT of the current year and first previous year are significant. This further gives credence to what was earlier adduced.

Conclusions

The study examined the impact tax revenue on private domestic investment in Nigeria using ARDL method of analysis. Based on the analysis, the following findings were made;

- (i) The Oil revenue tax exhibits actual sign in current and previous years except in year two and, it is not significant except at year four where it became significant at ten percent.
- (ii) The NON_OIL revenue tax exhibits actual sign in current and year one while year two and three are wrong signs. It is not significant except at year three (lag 3) where it became significant at ten percent but with a wrong sign.
- (iii) On the other hand, CIT failed to exhibit actual sign except third and fourth previous years are. CIT of the second, third and fourth previous years are not significant while CIT of the current year and first previous year are significant.

Based on the findings, the study suggests that; policy measures/reforms should be put in place in order to reduce the impact of tax on private domestic investment in Nigeria.

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