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THE EFFECT OF TAX REVENUE ON MACROECONOMIC PERFORMANCE IN NIGERIA

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ABSTRACT:

This study examined the effect of tax revenue on selected macroeconomic indicators in Nigeria. In specific term, the study investigated the effect of petroleum profit tax, company income tax, custom and excise duty, and value added tax on the macroeconomic variables of economic growth (measured using real gross domestic product), inflation and unemployment rate. The study employed annual data from 1985 to 2021, sourcing it from the Central Bank of Nigeria (CBN) Statistical Bulletin, National Bureau of Statistics (NBS) Annual Abstract and Federal Internal Revenue Service (FIRS) database. The study employed unit root, cointegration and autoregressive distributed lag (ARDL) method in examining the relations between tax revenue and the three macroeconomic indicators. The confirmed cointegrating relationship between tax revenue variables and economic growth, and tax revenue variables and unemployment using the bounds test, but not between tax revenue variables and inflation. In the long run, both petroleum profit tax and value added tax had positive and significant effect on economic growth. Also, the study found no evidence of significant relationship between the tax variables and unemployment in the long run. Company income tax and value added tax were significant contributors to soaring inflation level in the short run. Concluding, the study showed that tax revenue plays minimal role in accelerating economic growth and reducing unemployment level in Nigeria. Based on this, the study recommends expanding the tax base of Nigerian by formalizing the informal sector through policy reforms.

KEYWORDS:

Economic Growth, Tax Revenue, Inflation, Unemployment.

1.0 INTRODUCTION

The channels through which tax policy measure has influence on aggregated income, output and prices which reflect directly on economic development of any nation, for instance, a decrease in tax has a effect in raising disposable income thereby increases consumptions, savings and investments in economy (Apiniko 2021), on the other hand an increase in tax reduces aggregate demand , income and prices, that is, it is undisputable fact that tax has influence to improve quality of life, therefore , government can easily control inflationary and deflationary pressure in economy through taxation (Jhingan, 2003). Though, the advent of oil in commercial quantities has turned the economy of Nigeria from revenue generating country to a revenue sharing country, this led to difficulties in implementing tax policy due to government attention to oil. However, tax policy remains one of the major government instrument of controlling economy for the betterment of citizens (kunofiwa 2021) According to Abel (2019); Ajala and Afolabi (2021) and Baiadi (2017) tax is one of the most efficient means of generating revenue which can easily be translated into economic growth and development if well managed by tax administration, since the main objectives of any government is to provide basic amenities such as healthcare, schools, electricity, and safe drinking water among other to improve quality of life, protect lives and property of the citizens and create the enabling environment for individuals and cooperative organization to strive, in most cases for government to carry out these responsibilities, government need to mobilize revenue through taxation, thus the whole essence of tax is to generate revenue to provide efficient and sustainable level of infrastructure in economy (Grace, et al 2016), In Nigeria, the Tax system is lopsided and dominated by oil revenue hence the most viable taxes are being managed by federal government, the major viable taxes are company income tax, petroleum profit tax, value Added tax custom and exercise duties (Awe et al 2020; Ayeni and Afolabi, 2020; Edame and Okoi, 2014). In Nigeria, it is undisputed that the resources of the private sectors are too low to gear the economy out of the low quality of life or poor standard of living trap, actually this is one of the major challenges of developing economies. However, Mobilization of revenue through taxation in Nigeria has been a serious challenge due to Government attention to crude oil revenue, resistance from tax payers, these include evasion and tax avoidance as a result of improper tax administration by government while the challenges of the economic development is attributed to income equality, corruption, unemployment and among others. Therefore, it is justified that the success or failure of any tax policy is a function of government implementation method in the economy.

This study is motivated on the grounds that several efforts that has been made by successive governments to mobilized revenue through tax policy has not yield a significant success in Nigeria in regards to this challenges hence the aim of this study is to examine the effects of tax revenue on macroeconomic performance in Nigeria while the objectives are to:

i. Assess the effects of petroleum profit tax on macroeconomic performance in Nigeria.
ii. Examine the effects of company income tax on Macroeconomic performance in Nigeria
iii. Estimate the impact of value added tax on Macroeconomic performance in Nigeria
iv. Evaluate the effects of custom and exercise duties on Macroeconomic performance in Nigeria.

RESEARCH HYPOTHESES

Ho_1 There is no significant relationship between petroleum profit tax and macroeconomic performance in Nigeria.

Ho_2 There is no significance relationship between company income tax and Macroeconomic performance in Nigeria.

Ho_3 There is no significant relationship between value added tax and Macroeconomic performance in Nigeria.
Ho_4 Custom and Exercise Duties have no relationship with Macroeconomic performance in Nigeria.

This study is significant because the failure of oil prices in the international market sometimes places the Nigeria economy into a state of recession but this problem would have been avoided with good tax policy structures, it will also direct Government on how to increase revenue from taxes and increase tax compliance in Nigeria.

2.0 LITERATURE REVIEW

Tax is a compulsory levy imposed on individuals and organizations by government for the purpose of generating revenue to carry out it functions for the betterment of the citizens (Apinoko, 2021) while taxation is the administrating regulating and implementing of tax within economy.
Ibn Khaldun's theory of taxation in 2006 which related taxation to government spending and advocate for a low tax rate to preserve employment in centres and ensure that taxes are cheerfully paid. Khaldun's stated that taxation provides revenue to the government which enable government to execute projects. Khaldun also examined how government spending influence economic growth and developing of any country hence, he championed effective government spending. He has been regarded as a pioneer of the present advice that high tax rate reduces the revenue base due to decrease in economic activities. Authur Laffer theory of taxation.

Authur Laffer curve theory was used to explained the link between tax rate and the aggregative amount of tax revenue generated by governments. The theory was used to demonstrate how activities such as production is taxed heavily less of it is produced and that more revenue is generated if production tax less, he made the first presentation on a piece of paper however, most economist at the time supported kenyesian solution to the issue which called for the increase in government spending to increase demand for goods. But Laffer argued that the challenge is not demand and that output was hampered by the weight of numerous taxes and regulations, according to Laffer an organization is likely to find the way of shielding its capital from taxation since tax takes part of resources which actually affects its profit.

Groess domestic product is the total monetary market value of goods and services produced within a period of time in a country, particularly a year (Apinoko 2021). Inflation is the persistence general increase in the prices of goods and services that also decreases the purchasing power or value of money in economy. Unemployment is a situation whereby those that are capable and willing to work are not employed in a country.

Oliver et al (2017) The study revealed that tax resources has insignificant effect on infrastructural development but positive relationship exist between the variables for the period of study, hence the study recommended that government should provide human and materials infrastructural facilities needed to increase tax revenue in Nigeria. This study is in line with the studies of Chigbu and Njoki, (2015). Dagwon and Amims, (2018). In 2020 Alhassan, Musa and Mahmud study found a long-run relationship between petroleum profit tax and economic in Nigeria which the studies of Owino, (2019) and John, 2018 affirmed.

The studies of Onodugo et al, (2017), Anowor and Nnaji (2018); Agumubiade and Idebi (2020) examine the effect of tax revenue on economic growth in Nigeria, the studies found that Tax revenue has positive and significant relationship with economic growth in Nigeria.

Alimi et al (2016) studied the relationship between fiscal policy and macroeconomic performance in Nigeria, the study employed ordinary least square technique using vector autogressive, granger casualty and impulse response for the analysis of the data. The study revealed that government revenue has effect on economic growth. The study further revealed that fiscal policy is necessary to enhance macroeconomic variables in Nigeria.Osho et al (2018) studied the effect of company income tax on b economic growth of Nigeria, the study collected data from central bank of Nigeria statistical bulletin and national bureau of statistics and employed ordinary least square technique using autogressive techniques to analyzed the data, the study found that there is a positive and significant relationship between company income tax and economic growth of Nigeria for the period of research, the study concluded that company income tax revenue has the potential to engender economic growth, if well properly managed by government hence the study recommended that government should try as much as a possible to support companies in Nigeria by providing necessary amenities to public and privates organization to enable taxpayers compliance with government tax policy in order to enhance economic development.

Okoli et al (2014) studied the effect taxation and gross domestic product of Nigeria, the study adopted ordinary least square techniques using co-integration and error model as well as granger casualty test. The data collected covered the period from 1994 to 2012, the study disaggregated tax revenue into personal income tax, value adopted tax, company income tax and petroleum profit tax, the study revealed that there is a positive and significant relationship between tax revenue and gross domestic product.\

3.0 METHODOLOGY

This chapter includes research design, model specification, nature/sources of data and method of data analysis. This study covered from 1985-2021. The research design in this study is expost fato design because the study utilized secondary data collected from central Bank of Nigeria statistical bulletin, federal Inland Revenue Service, National Bureau of Statistics and World Bank Indicators (Various Issues)

Model Specification

Thus, the functional relationships are specified as follows:

GDP = f (PPT, CIT, CED, VAT)

INF = f (PPT, CIT, CED, VAT)

UNM = f (PPT, CIT, CED, VAT)

The linear forms of the above functional relationships from equation (1) to equation (3) above are expressed as:

$GDP = \alpha_0 + \alpha_1 PPT + \alpha_2 CIT + \alpha_3 CED + VAT + \mu t$

$INF = \beta_0 + \beta_1 PPT + \beta_2 CIT + \beta_3 CED + VAT + \mu t$

$UNM = C_0 + C_1 PPT + C_2 CIT + C_3 CED + VAT + \mu t$

Where:

GDP = Gross domestic product

INF = Inflation
UNM= Unemployment
PPT = Petroleum Profit Tax
CIT = Company Income Tax
CED = Custom and Excise Duties
VAT= Value Added Tax
$\alpha_1, \alpha_2, \alpha_3$and <0; = Parameter
$\beta_1, \beta_2,$ and β_3>0; = Parameter
C_1, C_2, and C_3>0; = Parameter
μ_t = Error term

Estimation Technique

A major problem associated with time series data is that they often exhibit time characteristic (that is non-stationarity). This may lead to spurious regression result and therefore make statistical inference invalid, spurious results imply obtaining a spurious correlation among series. This involves observing from a regression a large correlation co-efficient that exist merely because the variables share a common trend like movement over time (that is variable are non- stationary). Another consequence is that variable do not lend support to any other theory that ties them together that is variables are not co-integrated (Enders 1995, Johansen & Dinerdo, 1997). Non-stationary if series given that this series are not Co-integrated implies that any regression involving them would yield spurious results. To determine and take into account the time series properties of variables, it is necessary to explore time series analysis.

The E-views econometrics package is use to test for stationarity of series and existence of Co-integration among series as well as to estimate an error correction model. In order to establish the integration of the variables, we employ the Augmented Dickey-Fuller (ADF) Unit Root Tests.
The ADF procedure involve testing whether variables in a model are stationary or testing the order of integration through Unit Root Tests. All these tests are based on the series in equations as presented below:

$\Delta Y_t = \alpha Y_{t-1} + \sum_{i=1}^{m} \beta Y_{t-1} + \delta Y_t + \varepsilon_t$(for levels) 3.7

$\Delta\Delta Y_t = \alpha \Delta Y_{t-1} + \sum_{i=1}^{m} \beta \Delta\Delta Y_{t-1} + \delta Y_t + \varepsilon_t$(for first differences) 3.8

ΔY are the first differences of the series, M is the number of lags and t is the time.
The procedure tests a data generating process for difference stationarity against trend stationary, Given a variable Y, for example, the following regressions are employed.

$\Delta Y_t = \alpha_0 + Y_{t-1} + \sum_{i=1}^{m} \alpha_{t-1} + \varepsilon_t$(t=1, …,n) 3.9

Where Δ is the first difference operator, α are constant parameters and ε_t is a stationary stochastic process. The number of lags(n) is determined base on the minimum Akaike Information Criterion (AIC) to determine the order of integration of the series, equation 3 is modified to include second difference on lagged first and n lags of second differences. This is

$\Delta Y_t = \Delta Y_{t-1} + \sum_{t}^{\theta} \Delta^2 Y_{t-1} + \varepsilon_t$(*i*=1, …,n) 3.10

The constant parameters and ε_{it} is a stationary stochastic process. The n lagged difference term ε_t and ε_{it} in both equations are serially independent. To test for stationarity, the Augmented Dickey Fuller (ADF) least is applied to equation 3 and 4, essentially, the Augment Dickey Fuller (1981) test procedure is specified when $\varepsilon_t$is auto-regressive to elimate serial correlation of errors. A stationary

time series is said to be integrated of order Zero or (0) and a time series Y_t is defined to be integrated of order one or (1) if ΔY_t is a stationary time series.

4. Result and Discussion

Table 1: Descriptive Statistics of Variables

	GDP	INF	UNM	PPT	CIT	CED	VAT
Mean	39894.15	18.5164	13.3343	1057.555	417.9807	293.4778	490.4420
Median	33004.80	12.2641	10.8000	683.5000	113.0000	181.4000	345.6500
Maximum	72393.67	72.9796	35.0000	3201.320	1747.990	1214.936	1900.797
Minimum	16997.52	5.3877	5.3000	4.8110	1.0040	1.7280	7.2600
Std. Dev.	20195.37	16.5959	8.1421	1054.265	520.5427	338.0560	488.1670
Skewness	0.4353	1.9402	1.0879	0.5185	0.9576	1.3266	1.1042
Kurtosis	1.5615	5.7124	3.1022	1.8948	2.5280	3.8910	3.7739
JB.	4.3583	34.5580	7.3146	3.5409	5.9985	12.0776	6.3888
Prob.	0.1131	0.0000	0.0258	0.1702	0.0498	0.0023	0.0409
Obs.	37	37	37	37	37	37	28

Source: Author's computation (2023)

As documented in Table 1, real gross domestic product averaged N39,894.15 billion and ranged from N16,997.52 to N72,393.67 billion. Inflation during the period averaged 18.51% with prices of goods and services increasing from 5.3877% to 72.9796%. Unemployment level averages 13.33% every year, with the level of unemployment rising from 5.3% to 35% during the period studied. The study observed that petroleum profit tax, company income tax, custom and excise duties and value added tax (VAT) averaged N1057.555 billion, N417.9807 billion, N293.4778 and N490.4420 billion, respectively. These statistics show that the bulk of Nigeria's tax revenue comes from petroleum profit tax, followed by value added tax. During the period, Table 1 revealed that Nigerian earned between N4.8110 billion and N3,201.320 billion in petroleum profit tax; between N1.0040 billion and N1,747.990 billion in company income tax; between N1.7280 and N1,214.936 billion in custom and excise duties; and between N7.26 billion and N1900.797 billion in value added tax. The study observed increases in real gross domestic product, inflation, unemployment rate, petroleum profit tax, company income tax, custom and excise duty and value added tax as revealed by the skewness statistics of 0.4353, 1.9404, 1.0879, 0.5185, 0.9576, 1.3266 and 1.1042, respectively. The jarque-bera statistics revealed that real GDP and PPT are normally distributed, while the null hypothesis of normal distribution was rejected for inflation, unemployment, company income tax, custom and excise duty and value added tax.

Unit Root Test

The norm in econometric analysis has been to understand the order at which employed variables are stationary, as the determination is essentially in order to avoid a case of spurious regression. In testing for degree of integration, the augmented Dickey-Fuller was employed and the result presented in Table 2.

Table 2: Univariate Unit Roots Result

Variable	ADF			I(d)
	Level	1st Diff	5% Critical Value	
$lnGDP_t$	-0.6264	-3.9372***	-2.9484	I(1)
INF_t	-2.3270	-4.2638***	-2.9639	I(1)
$lnUNM_t$	-0.4496	-6.5368***	-2.9458	I(1)
$lnPPT_t$	-1.6513	-6.1851***	-2.9458	I(1)
$lnCIT_t$	-2.0952	-5.1522***	-2.9458	I(1)
$lnCED_t$	-2.1564	-6.6469***	-2.9458	I(1)
$lnVAT_t$	-3.2245**		-2.9762	I(0)

Note: *, **, and *** denote significance at 10%, 5% and 1%, respectively
Source: Authors' compilation (2023)

The study learned from applying the augmented Dickey-Fuller method to unit root testing that, real gross domestic product (GDP), inflation (INF), unemployment (UNM), petroleum profit tax (PPT), company income tax (CIT), and custom and excise duty (CED) are non-stationary in their observed form. As these series were unstable in their level form, the study differenced their distribution once and tested the differenced series for unit root. The outcome of the test shows stability of the differenced series of GDP, INF, UNM, PPT, CIT and CED, indicating that these series attained stability after first difference, thus, are classified as I(1) series. Only value added tax (VAT) was stationary in level form. With the explanatory value mix of I(1) and I(0) series, the study proceeded to testing for cointegration, using Pesaran, et al., (2001) bounds test.

Cointegration Test

Following the modeling of non-stationary series with I(1) integration, cointegration test was performed to determine if the combination of the series in linear form is appropriate. The results are presented in the tables below.

Table 3: Bound Test Result for GDP Model

Estimated Model		F-statistics
$F_{GDP}(gdp/lnppt, lncit, lnced, lnvat)$ K = 4		41.87652***
Critical Value	I(0)	I(1)
1%	3.29	4.37
5%	2.56	3.49
2.5%	2.88	3.87
10%	2.2	3.09

Note: No level relationship is the null hypothesis; *K* is what informs on the regressors used; *, ** and *** informs on 10%, 5% and 1% significance, respectively.
Source: Author's computation (2023)

The result of Table 3 was performed to determine whether long run relationship exist between petroleum profit tax, company income tax, custom and excise duty, value added tax and real gross domestic product. With bounds employed to ascertain this, the F-statistics of 41.87652 revealed that there is long run equilibrium relationship among the variables, as the F-statistics calculated to be 41.87652 is higher than 3.49, as the study tested the null hypothesis of no level cointegrating

relationship at 5%. Hence, petroleum profit tax, company income tax, custom and excise duty, value added tax and real gross domestic product are bound by a long run relationship.

Long and Short-run GDP Model

Table 4 portrays the result of long and short run model for the gross domestic product, that gives insight into how petroleum profit tax, company income tax, custom and excise duty, value added tax affect real gross domestic product.

Table 4: ARDL Long and Short Run Results

Dependent Variable: $lnGDP_t$				
Panel A: Long Run Results				
$Variable$	$Coefficient$	$Std.Error$	$t-Stats$	$Prob.$
$lnPPT_t$	0.0860***	0.0242	3.5526	0.0029
$lnCIT_t$	0.0538	0.0534	1.0087	0.3291
$lnCED_t$	0.0017	0.0387	0.0457	0.9641
$lnVAT_t$	0.1697**	0.0732	2.3192	0.0349
C	8.9814	0.0866	103.6876	0.0000
Panel B: Short Run Results				
$Variable$	$Coefficient$	$Std.Error$	$t-Stats$	$Prob.$
$D(lnPPT_t)$	0.0029	0.0042	0.6801	0.5067
$D(lnPPT_{t-1})$	-0.0258***	0.0044	-5.8006	0.0000
$D(lnCIT_t)$	-0.0218*	0.0116	-1.8741	0.0805
$D(lnVAT_t)$	-0.0490***	0.0124	-3.9294	0.0013
$D(lnVAT_{t-1})$	0.0541***	0.0082	6.5263	0.0000
ECM_{t-1}	-0.3496***	0.0191	-18.3033	0.0000
$R^2 = 0.9429$		Adjusted $R^2 = 0.9286$		

Note: *, ** and *** denote significance at 10%, 5% and 1% level.
Source: Author's computation (2023)

Table 4 revealed that real gross domestic product or economic growth is significantly affected by changes in petroleum profit tax in the long run. In the long run, an increase in petroleum profit tax by 1% increases real GDP by 0.0860%, holding changes in company income tax, custom and excise duty and value added tax constant. This positive relationship established between petroleum profit tax and economic growth is not consistent with the negative relationship suggested by economic theory. The reason why increase in petroleum profit tax drives economic growth in the long run could be that, this variant of tax revenue contributes more to government revenue, which are used to fund government projects that facilitate growth. The study found that decrease in petroleum profit tax significantly enhance economic growth in the short run, causing real GDP to increase by 0.0258% when such tax decreases by 1%. This negative effect which petroleum profit tax exerts on economic growth only manifest after the first lag.

The study found that company income tax and custom and excise duty are long run growth enhancers, but differ in terms of the marginal effect on economic growth. While company income tax causes 0.0538% increase in real GDP when tax from this source increases by 1%, the marginal effect of custom and excise duty was estimated to be 0.0017%. In the long run, the positive effect of company

income tax and custom and excise duty are insignificant. In the short run, company income tax negatively affects economic growth, with the effect only significant at 10%.

Regarding the relationship between value added tax and economic growth, it was found that increase in value added tax stimulate economic growth, a result which runs contrary to economic theory. For every 1% increase in VAT, real GDP is expected to increase significantly by 0.1697%. In the short run, VAT had significant negative contemporaneous effect on economic growth, with one period lag of VAT having positive and significant effect on economic growth. The study estimated that every year, 34.96% of the discrepancy between short run economic growth and long run economic growth is corrected.

In Table 5, the post-estimation results for the economic growth model are presented to determine if the OLS assumptions are met, as it is necessary that the model complies with the OLS assumptions for policy prescription to be make from the estimated economic growth model. Table 5 shows that estimated economic growth model is free from the problem of serial correlation heteroscedasticity and the errors are normally distributed. This is because, the probability value of the Chi-square statistics for the respective tests are greater than 0.05. Also, the CUSUM and CUSUM of Squares plots of Figure 1 and 2 indicates a stable model and one devoid of structural break.

Table 5: Diagnostic Test Results

Tests	CLRM Problem	χ^2 Value	χ^2 Prob.	Decision
Breusch-Godfrey LM	Serial Correlation	1.6788	0.4320	Serial independence
ARCH	Heteroscedasticity	0.0120	0.9126	Constant Variance
Jarque-Bera	Normality	0.5739	0.7505	Normal residuals
CUSUM	Stability	-	-	Stable Model
CUSUM of Squares	Stability	-	-	Stable Model

Note: CLRM stands for classical linear regression model
Source: Authors' compilation (2023)

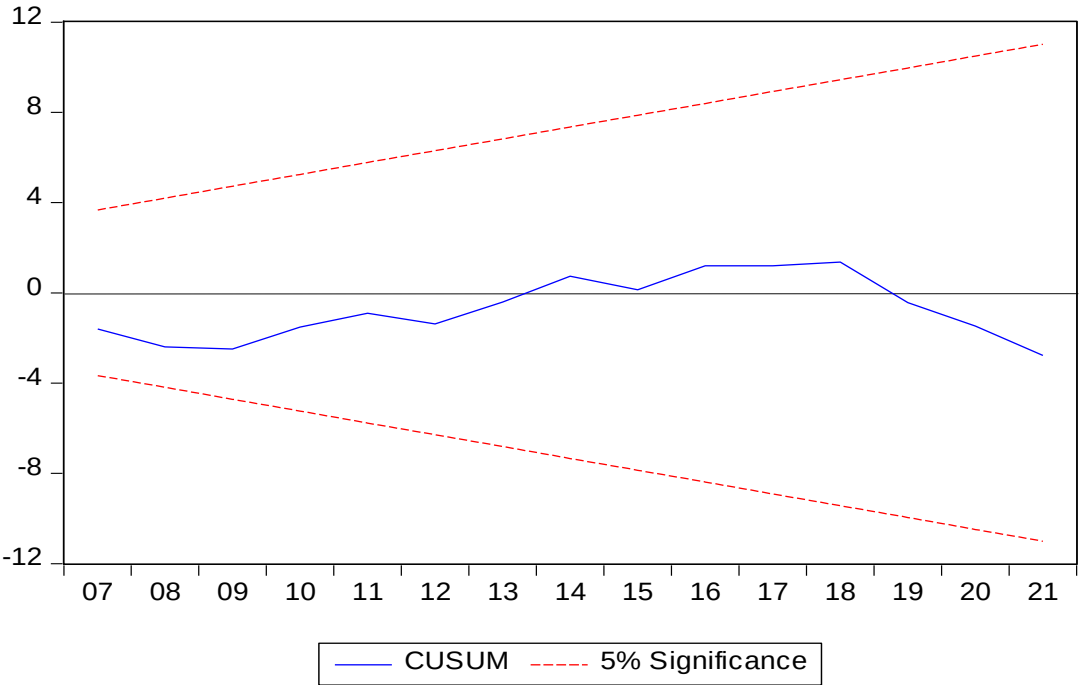

Figure 1: CUSUM Plot

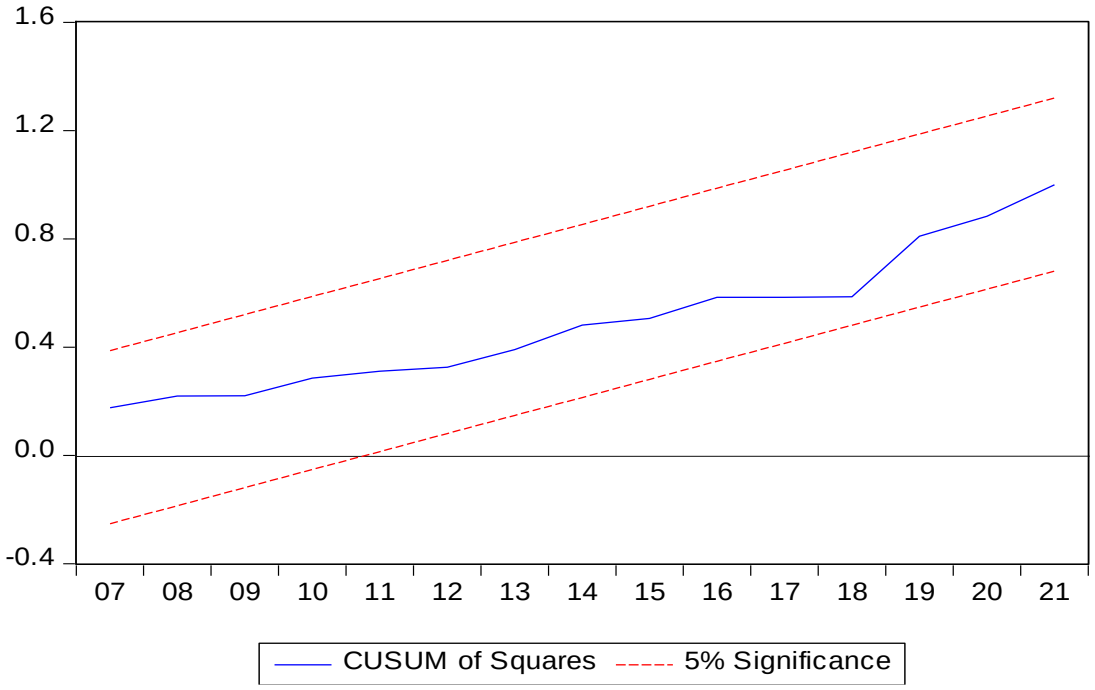

Figure 2: CUSUM of Squares Plot

Inflation Model

Results pertaining to the inflation model are presented and discussed in this section.

Table 6: Bound Test Result for Inflation Model

Estimated Model		**F-statistics**
$F_{INF}(inf/lnppt, lncit, lnced, lnvat)$ K = 4		1.904516
Critical Value	I(0)	I(1)
1%	3.29	4.37
5%	2.56	3.49
2.5%	2.88	3.87
10%	2.2	3.09

Note: No level relationship is the null hypothesis; *K* is what informs on the regressors used; *, ** and *** informs on 10%, 5% and 1% significance, respectively.
Source: Author's computation (2023)

The null hypothesis tested is that there is no long run relationship among the series included in the inflation model. With the bounds test developed by Pesaran, et al., (2001) applied to testing for cointegration, the study estimated an F-statistics of 1.904516 for a model of four regressors. Comparing the F-statistics of 1.904516 with the 5 percent bound test value of 3.49, the study observed that the F-statistics of 1.904516 is less than 3.49, the I(1) critical value. The study reached the resolution that the null hypothesis cannot be rejected, indicating that petroleum profit tax, company

income tax, custom and excise duty, value added tax and inflation are not bound by a long run relationship.

Short Run Inflation Model

Due to cointegration not confirmed between petroleum profit tax, company income tax, custom and excise duty, value added tax and inflation, the short run model was estimated and the result presented in Table 7.

In the short run, the study found positive and significant relationship between company income tax and inflation in Nigeria. The result suggests that company income tax is a significant contributor to rising inflation levels in Nigeria in the short run. This relationship is consistent with economic theory as the burden of increased tax liability is pushed, partly or wholly, from manufacturers to the end users of the product. The proportion of tax liability pushed to the end users will depend on the elasticity of the product sold. In the short run, it was discovered that value added tax is a significant contributor to soaring inflation level in the short run. Though rising value added tax induces rising level of prices in the short run, this effect is only felt in the economy after two years.

Table 7: Short Run ARDL Results

Dependent Variable: INF_t				
Variable	***Coefficient***	***Std. Error***	***t − Stats***	***Prob.***
$D(INF_{t-1})$	0.0715	0.1528	0.4676	0.6457
$D(lnPPT_t)$	2.1047	3.3220	0.6335	0.5343
$D(lnCIT_t)$	19.3503**	8.8201	2.1938	0.0416
$D(lnCED_t)$	13.8697	10.2719	1.3502	0.1937
$D(lnVAT_{t-1})$	-3.4114	11.9713	-0.2849	0.7789
$D(lnVAT_{t-1})$	-28.1384*	13.6107	-2.0673	0.0534
$D(lnVAT_{t-2})$	33.3588***	7.3233	4.5551	0.0002
C	-10.0121	9.8157	-1.0200	0.3212
R^2 = 0.6687		Adjusted R^2 = 0.5399		

Note: *, ** and *** denote significance at 10%, 5% and 1% level.
Source: Author's compilation (2023)

Unemployment Model

Cointegration Test

Table 8: Bound Test Result for Unemployment Model

Estimated Model		**F-statistics**
$F_{UNM}(unm/lnppt, lncit, lnced, lnvat)$ K = 4		5.202785***
Critical Value	I(0)	I(1)
1%	3.29	4.37
5%	2.56	3.49
2.5%	2.88	3.87
10%	2.2	3.09

Note: No level relationship is the null hypothesis; *K* is what informs on the regressors used; *, ** and *** informs on 10%, 5% and 1% significance, respectively.Source: Author's computation (2023)

The Pesaran, et al., (2001) decision for testing for cointegration is that, the F-statistics must be higher than the I(1) series critical values for cointegration among the variables to exist. An F-statistics value below the I(0) series critical value suggest the null hypothesis cannot be rejected and cointegration does not exist. An F-statistics value that lies between the I(0) and I(1) critical values, tested at 5% error margin, indicates an inconclusive result. The result of Table 8 meets the first scenario as the F-statistics of 5.202785 is greater than the I(1) critical value of 3.49, when the hypothesis is tested at 5%. This finding indicates cointegrating relationship exist between petroleum profit tax, company income tax, custom and excise duty, value added tax and unemployment.

Long- and Short-run relationship among variables

Table 9: ARDL Long and Short Run Results

Dependent Variable: $lnUNM_t$				
Panel A: Long Run Results				
□□□□□□□□	□□□□□□□□□□(□□□.□□□□	□	□□□□.	
		– □□□□□		
□□□□□□	-0.4478*	0.2398	-1.8671	0.0830
□□□□□□	-2.1098*	1.1258	-1.8740	0.0820
□□□□□□	-1.5476*	0.8664	-1.7861	0.0957
□□□□□□	4.1667*	1.9800	2.1042	0.0539
C	3.3114	1.4576	2.2717	0.0394
Panel B: Short Run Results				
□□□□□□□□	□□□□□□□□□□(□□□.□□□□	□	□□□□.	
		– □□□□□		
□(□□□□□□ $_{-1}$)	-0.3368**	0.1290	-2.6106	0.0205
□(□□□□□□)	0.1095	0.0623	1.7549	0.1011
□(□□□□□□ $_{-1}$)	0.1861**	0.0665	2.7962	0.0143
□(□□□□□□)	-1.1885***	0.1851	-6.4178	0.0000
□(□□□□□□)	1.3279***	0.1975	6.7225	0.0000
□(□□□□□□ $_{-1}$)	-0.3840***	0.1252	-3.0655	0.0084
□□□ $_{-1}$	-0.4584***	0.0704	-6.5088	0.0000
R^2 = 0.7617		Adjusted R^2 = 0.6865		

Note: *, ** and *** denote significance at 10%, 5% and 1% level.
Source: Author's computation (2023)

In Part A of Table 9, it was documented that the petroleum profit tax appeared with the wrong negative sign, indicating that the relationship between petroleum profit tax and unemployment in Nigeria is negative. From this result, 1% increase in petroleum profit tax reduces long run unemployment level in Nigeria by 0.4478%. As the negative relationship established between petroleum profit tax and unemployment defies economic theory, the study found the relationship insignificant. Also, company income tax had negative and insignificant impact on unemployment in

the long run. In addition, evidence suggest that custom and excise duty is negatively related to unemployment in the long run, with the relationship found to be insignificant. Value added tax appears to be correctly signed as the study positive relationship between value added tax and unemployment, suggesting that increased value added tax exacerbate the unemployment level in Nigeria. Like other variables, this relationship established between value added tax and unemployment is insignificant. The insignificant nature of these variable in explaining unemployment may be due to the small formal sector of the economy which lack the fundamentals to create new jobs. In the short run, increasing level of petroleum profit tax significantly increases the level of unemployment, after one lag. The study found that value added tax in the current period and after one lag affect unemployment differently, though their individual effects are significant. Increase in value added tax in the current period induces higher unemployment level, but unemployment level begins to decline after one year. It was observed that 76% of the changes in unemployment level was explained by petroleum profit tax, company income tax, custom and excise duty, and value added tax, indicating that the model has a good fit. In correcting short run disequilibrium from long run equilibrium level, the estimated error correction term of -0.4584 suggests that, 45% of such discrepancies are corrected every year.

The study examined the validity of these estimated coefficients by subjecting the estimates and errors to diagnostic test. As reported in Table 10, the probability value of Breusch-Godfrey LM Chi-square statistics, ARCH Chi-square statistics and Jarque-Bera F-statistics are above 0.05, indicating that the errors are serially independent, the variance of the errors are constant and the errors follow a normal distribution. Figure 3 and 4 suggests stable coefficients and absence of structural break.

Table 10: Diagnostic Test Results

Tests	CLRM Problem	□□ Value	□□ Prob.	Decision
Breusch-Godfrey LM	Serial Correlation	2.1430	0.3425	Serial independence
ARCH	Heteroscedasticity	1.2068	0.2720	Constant Variance
Jarque-Bera	Normality	0.1536	0.9626	Normal residuals
CUSUM	Stability	-	-	Stable Model
CUSUM of Squares	Stability	-	-	Stable Model

Note: CLRM stands for classical linear regression model. Source: Authors' compilation (2023)

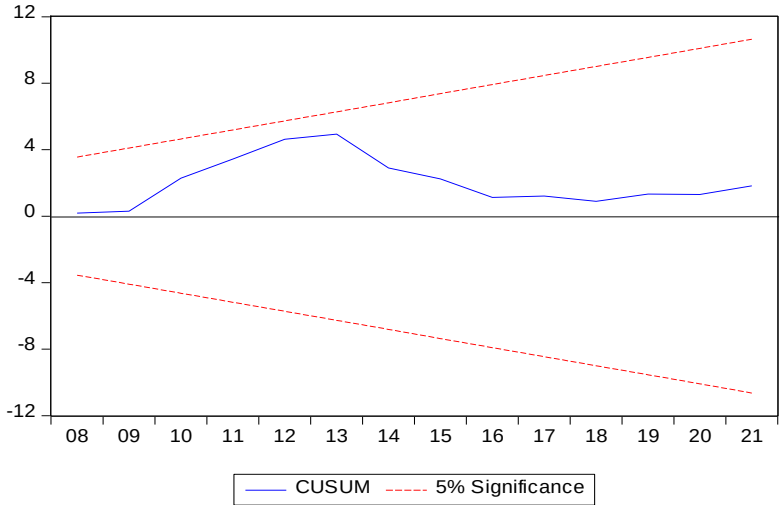

Figure 3: CUSUM Plot

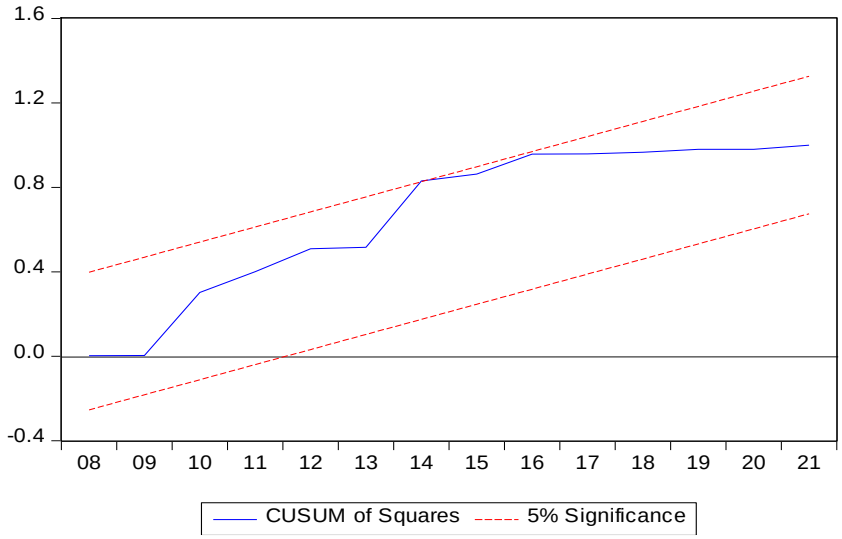

Figure 4: CUSUM of Squares Plot

5. Conclusion and Recommendations

The issues of meeting some macroeconomic objectives have been burning concern for successive government focused on identifying the path to accelerating economic growth, ensuring price stability and reducing unemployment level. This study examined the role of tax revenue on certain macroeconomic indicators, by investigating the effect of petroleum profit tax, company income tax, custom and excise duty, and value added tax on the macroeconomic indicators of economic growth (measured using real gross domestic product), inflation and unemployment rate. This relationship was examined from 1985 to 2021 and investigated within the autoregressive distributed lag (ARDL) framework. The study found that petroleum profit tax and value added tax had positive and significant impact on real GDP. The study found no evidence of significant impact of petroleum profit tax, company income tax, custom and excise duty, and value added tax on unemployment in Nigeria. Conclusively, it was evident that, tax revenue is not a determinant of economic growth and unemployment level in Nigeria. Following this, the following recommendations were made;

1. To accelerate economic growth and reduce unemployment level, there is need for the Nigerian government to implement tax cut, as such will stimulate consumption and investment spending.
2. The government should increase the tax base, incorporating the informal sector, a sector that contributes over 65% to the economy, into the formal sector in order to widen the tax base and not necessarily increasing the tax rate. This will reduce the deadweight loss of increasing tax rate.
3. Tax administrators should incorporate the use of information and communication technology (ICT) in its process. The application for taxpayers' identification number (TIN), payment of tax liability and filing of tax returns should be done electronically as such will reduce leakages, encourage voluntary payment of tax liabilities and make the tax process effective and efficient.

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