**The Nexus Of Direct Tax Components And Economic Performance In Nigeria: ARDL Bounding Approach**

**Asian Asian Umobong**

**PhD,** Department of Accounting, University of Port Harcourt, Port Harcourt

Rivers State, Nigeria

Email: aumobong2007@yahoo.com

Abstract

The aim of the study was to determine the effect of Direct tax on economic performance using secondary data derived from Central bank of Nigeria annual bulletin hence the study used secondary data, ex-post facto and longitudinal research design for the period of the study 1993 to 2021. Direct taxes proxied as petroleum profit tax revenue and Company tax revenue whilst real GDP, inflation, unemployment and human development index were the dependent variables representing economic performance Multiple regression method and autoregressive distributive lag were deployed and various diagnostic test were carried out on the data set. Bound testing for cointegration based on ARDL was done. The lag selection for optimality of the model under ARDL was determined using Akaike information criteria and Schwatz Bayesian criterion. Normality test for stability of regression model was conducted using J-B procedures while serial correlation was tested using LM statistics. Unit root test for stationarity was performed using two different methods namely, the Augmented Dickey Fuller and the Kwiatkowski-Phillips-Schmidt-Shin procedure. Nyblom-Hansen statistic tests for parameter constancy against the alternative hypothesis that the parameters follow a random walk process. The ECM model was used to ensure variables are returned from disequilibrium position to equilibrium. Result showed a stable long run relationship between direct tax and economic performance proxies. Also, variance inflation factor for multicollinearity was carried out and Visual test for stability was done using CUSUM of squares in order to eliminate doubts about possible outliners. Probability values form the basis of acceptance or rejection of hypotheses on the short and long run. Granger causality test causality was used for the variables in order to determine any form of reverse causality and effects that may be present among the main variables of the study, including the macroeconomic performance variables and direct taxes. The result of the study indicates that long run and short run effect of direct taxes on macroeconomic performance differ; short run indicate negative effects while long run show positive effects. Study confirm that direct taxes drive economic performance positively in the long run and short run as it impacts on real GDP. Study also revealed that direct taxes influence unemployment by increasing it in the short run and insignificant in the long run. PPT exert significant negative impacts on inflation, implying that both direct taxes are capable of reducing inflationary pressures in Nigeria. Although taxes exert significant negative impacts on human capital development in the short run, the long run impact is positive in Nigeria. By increasing direct taxes in Nigeria, human capital tends to increase in the long run. one percent rise in PPT leads to a 0.18 percent rise in HDI, Based on findings we recommend that tax policy makers should focus on long run outcomes of tax policies, rather than the short run outcomes, when making policies on tax rates and tax revenues in Nigeria. Regulators should obviate the different components of taxes when making decision on their implementation or administration. Also, direct taxes may be used for addressing income and welfare issues in Nigeria, in the long run. Direct taxes need to be deployed when long-term macroeconomic stability is the goal of policy makers.

**Keywords: Petroleum Tax, Corporate Tax, Real Gross Domestic product, Inflation, Unemployment, Human Development Index, Public Debt**

**Introduction**

Globally government is saddled with the responsibility of generating revenue and provision of infrastructure, welfare and social amenities to the citizens**,** provision of goods and services, security of lives and properties, maintenance of law and order and defense against internal and external aggressions. This responsibility extends to the management of the resources and the economy for common good. This economic management responsibility involvesmaximizing revenues collection and minimizing the impact on the populace These functions are generally aimed at improving the citizens’ welfare. However, these functions of the government, among other things, require massive revenue resources.

The capacity to fulfil these responsibilities largely depends on the amount of revenue generated by the government through various means and the prevention of leakages and efficient deployment of the resources for maximum economic benefits. Taxation is a major source of government revenue all over the world and governments use tax proceeds to fulfil its responsibilities to the citizenry and ensure social and economic stability. Whether government is able to judiciously manage the resources for common good an enhance the welfare of its citizens is a subject of debate. Further the relationship between tax structure and economic performance has ignited debate amongst policy makers over the years and studies have shown that the allocation of tax resources in an economy is affected by fiscal policies which often generate behavioral distortions to the various economic agents. There is also an ongoing debate on role of taxation on economic performance. Whilst a school of thought focused on external factors such as technological advancement as drivers of economic performance another school of thought suggest tax revenue and policy have a relationship with economic growth and welfare over time, and economic expansion is determined within the model. Prior empirical studies suggest that the nature of taxation determines its relationship with economic performance while another school of thought argues that tax structure is irrelevant and that the revenue at the disposal and in the hands of government determines economic performance.

Positive economic performance in a country can never take place without sound economic management and this is demonstrated by an array of parameters such as human development index, declining inflation, advancement in technology, infrastructural development such as good rail system, good roads, telecommunication, electricity etc, good exchange rate and good value for the country currency, rising gross domestic product and low level of unemployment. Economic development in Nigeria existed before colonization although partly undocumented. Since colonization Nigeria has undertaken several initiatives towards enhancing economic performance. These developmental programs with the aim of enhancing and producing sound economic performance cannot be achieved without internal generated revenue.

Crude Oil is a major source of revenue for Nigeria. This is largely inadequate in meeting the revenue demands of government hence the need for taxation. The fall in prices of crude oil in the international market, the diversification of energy away from petroleum products by foreign countries, oil theft and inability of the Nigerian National petroleum corporation to meet its OPEC production quota for Nigeria, pipeline vandalization leading to leakages of oil and pollution, poorly developed agricultural sector and economic mismanagement, frauds, embezzlement and corruption largely render the revenue profile of government inadequate to meet its financing need.

Nigeria is presently faced with infrastructural deficit, galloping inflation, poor balance of payment, high exchange rate, high unemployment, poor human development index, high number of out of school children and stagnation in income development, poor gross domestic product growth and lack of advancement in technology. Poor electricity, high debt profile and high debt servicing cost for loans. These are signs of poor economic performance which dovetail to poor welfare and misery index for its citizens

Taxation plays diverse role in economic management and is deployed for various reasons. Prior empirical studies suggest that tax can be used to mitigate inflation by constraining money supply to contain demand, encourage consumption and productivity by increasing money supply through reduction in tax rates, for income redistribution by imposing higher taxes on high income earners. It can also be used to discourage consumption by imposing excise duty and to discourage imports in an attempt to correct imbalance in trade and balance of payment problem. Thus, tax play a role in monetary and fiscal policies of government. Therefore scholars, and practitioners and the government are interested in how the economy is managed through tax as its diverse role affect the welfare of citizens and economic growth and performance.

The problem of underutilization of resources for economic development has been recognized and has generated intense debate amongst scholars, statisticians and the public in general. The reason is not farfetched because of endemic corruption and poor economic performance despite huge resources available. Prior studies on the subject of revenue and economic performance have produced mixed result. The methodology for research is diverse resulting in different outcome. This has ignited further interest on the subject. The role of taxation and its structures on economic performance has also attracted attention as it is a source of revenue to the government. These malaises motivate this study to ascertain the role of Direct taxes on economic performance in Nigeria. There is mixed results from previous empirical studies on the structural role of taxation on economic performance. Most other studies focused on individual tax revenue and its contribution to economic growth while this study departs from other studies by examining the structural effects of direct taxes on economic performance.

**Literature**

**Theoretical Framework**

The debate on how to enhance economic performance dates back many centuries ago and prominent scholars keyed into the raging debate which is not only chronic but relevant because of the challenges facing the modern-day world economy. Keynesian economists would advocate deficit spending on labor-intensive infrastructure projects to stimulate employment and stabilize wages during economic downturns. Keynes suggested a raise in taxes as a panacea to inflation when there is abundant demand-side growth. Keynes further opined that intervention of government in economic processes is important in ameliorating unemployment, underemployment, and low economic demand. This interventionist strategy places Keynesian theorists at odds with opposition who argue for limited government involvement in the markets. Wages and employment, Keynesians argue, are slower to respond to the needs of the market and require government intervention to stay on track. Furthermore, they argue, prices do not react quickly and change gradually when monetary policy interventions are made, If prices are slow to change, this makes it possible to use [money supply](https://www.investopedia.com/terms/m/moneysupply.asp) as a tool and change [interest rates](https://www.investopedia.com/terms/i/interestrate.asp) to encourage borrowing and lending. Lowering interest rates help governments to positively intervene in economic systems, encourage consumption and investment spending. Short-term demand increases initiated by interest rate cuts reinvigorate the economic system and restore employment and demand for services. The new economic activity then feeds continued growth and employment. Keynes proposed that when government spend more money and cut taxes to turn a budget deficit, which would increase consumer demand in the economy. Contrastingly, the Marxist argue that capitalism creates distortions in the economy and suggested obliteration of capitalism and its replacements with welfarism. The Monetarist Theory originated by Milton Friedman (1967) presumes that increase in money supply at a rate faster than economic growth increase inflation and reduces money value .it further argued that increasing interest rate can be a tool in fighting inflationary pressure to mitigate its growth. , Manipulating interest rate also have its detrimental effect as it is an indirect tool which impacts on other economic outlets. Monetary policies aimed at expanding the economy result in a decline in real interest rate, rise in investment spending and a rise in aggregate demand. However, this rise in demand causes rise in prices of goods and service as supply cannot match demand leading to inflation. The rise in aggregate demand leads to an increase in price level economy output. Adam Smith's (1776) classical theory on the other hand presupposes that the economy achieves full employment via the invisible hand, which allows for flexibility of price, wage, and other input price. The full employment proposes an increase in Aggregate Demand as a consequent of monetary policy adjustments with no effect on output level but leads to inflation without correlation of inflation and output demand. Other theoretical proposition includes the Okun’s law and Philips curve. Okun's Law is an empirically observed relationship between unemployment and losses in a country's production. It predicts that a 1% increase in unemployment will usually be associated with a 2% drop in [gross domestic product](https://www.investopedia.com/terms/g/gdp.asp). Okun's Law looks at the statistical relationship between GDP and unemployment. Philip’s curve suggests a negative relationship between inflation and unemployment. It is stated that when there is increase in the price of goods and services, there will be reduction in unemployment and vice versa.

**Empirical Review**

Balasolu, Chifu and Oancea (2023) employed fixed effect models and dynamic GMM methods to investigate the effect of direct taxation components (personal and corporate income taxes) on economic growth of27 EU countries covering the period 2008–2020. The results revealed that corporate income taxes significantly negatively impact economic growth for both clusters of high- and limited fiscal efficiency countries. Also,personal income tax was associated with lower economic growth for countries in the limited fiscal efficiency group.

Andrea and Mihai (2022) investigated the impact of tax revenue and social security contributions on the gross domestic product of Cee countries Random effect strategy was employed on panel regression, on the basis of which it was demonstrated that there are significant and positive correlations between the fiscal variables and the gross domestic product. Ikharo-Kadiri (2021) examined the impact of tax policy on inclusive growth in Nigeria. The ex post facto analysis design was adopted in this study reveals that CIT has a negative and statistically significant impact on HDI at 5% level. The result implies that an increase in CIT has a negative impact on inclusive growth and with a 1% rise in CIT resulting in a 4.7% decrease in HDI

Awa and Ibeanu (2020) ascertained the influence of tax revenue on economic development of Nigeria. The result showed that petroleum profit tax and company income tax have significant effect on economic development while value added tax does not significantly influence economic development. Efanga *et al.* (2020) examined impact of tax revenue on economic development in Nigeria using Auto regressive lag. Result confirmed company income tax and petroleum profit tax had significant positive impact on gross fixed capital formation in Nigeria. Customs and excise duties showed negative significant effect on gross fixed capital formation in Nigeria.

.Onwuchekwa (2019) examined the relationship between taxation and the economic growth of Nigeria. The findings indicate that petroleum profit tax (PPT) and company income tax (CIT) show positive and significant effect on the Real Gross Domestic Product (RGDP) in Nigeria. Obaretin and Monye-Emina (2019) examined the impact of petroleum profit tax on Nigeria’s economic growth. Outcome of the study show Petroleum income tax, foreign direct investment has positive and significant impact on Nigeria’s economic growth .Alexander *et al.* (2019) used annual time series data to examine the effect of taxation on economic growth in Nigeria over a period of 1980 to 2018. Findings reveal that in Nigeria, Petroleum Profit Tax, Personal Income Tax and Value Added Tax selected have significant effects on economic growth process. The effect of these taxes on economic growth in Nigeria is even more pronounced in the long-run than in the short-run

Adenola and Olarewaju (2018) evaluated the effect of petroleum profit tax and company income tax on Nigerian economy growth. It was found that petroleum profit tax (PPT) and company income tax (CIT) have positive significant impact on gross domestic product (GDP) in Nigeria. The study then concluded that PPT and CIT serves as the major source of revenue to the Nigeria economy, and contribute to the growth of Nigeria economy. Manukaji (2018) determined the effect of tax structure on economic growth in Nigeria. The study found that tax components (Value added tax revenue, personal income tax revenue, petroleum profit tax revenue and company income tax revenue) has significant effect on economic growth in Nigeria. Peter *et al.* (2018) examined the impact of company income tax on economic growth in Nigeria. The findings indicated that company income tax has significant influence over economic growth in Nigeria. Uzoka and Chiedu (2018) studied effect of tax revenue on the growth of the economy in Nigeria between 1997 -2016. Result confirmed CGT and EDT have no major effect on economic growth but there is a significant effect from PPT, CIT, VAT and CED on the growth of Nigeria economy.

Oladimeji (2017) explored the relationship between tax revenue in Nigeria and her economic growth. Some components of tax revenue examined are Petroleum Profit Tax (PPT), Company Income Tax (CIT), Value Added Tax (VAT) and Custom Duty (CD) while Gross Domestic Product (GDP) was used to measure the economic growth and these indices were studied for the period of 30yrs (1987-2016). The findings revealed that petroleum profit tax, company income tax, value added tax and custom duties have a positive impact on GDP and overall, a significant relationship between tax revenue and the Nigerian economic growth exists.

**Methodology**

The study adopted ex-post facto and longitudinal design based on data obtained from Central Bank of Nigeria for the period 1993 to 2021 to examine taxation and economic performance. The taxes under consideration are direct taxes; Petroleum and corporate taxes. The dependent variable were economic performance yardsticks, inflation, real Gross domestic product, unemployment, human development index. Autoregressive distributive lag and Multiple regression was adopted in the study. Granger causality test was used to test the direction of the relationship of the variables.

The Keynesian economist linked inflation to demand factors of a surplus in aggregate demand over aggregate supply and recognized the role of government in its interventionist agenda and suggested a raise in taxation as a fiscal measure to curtail inflation. Milton Friedman linked inflation to monetary factors while the classical economist perceive inflation has a connection to monetary demand and supply. Okun’s tried to link inflation to its effect on macro-economic performance while Philip’s curve attempts to depict the nature of relationship between inflation and unemployment. However, Economist generally recognize that taxation, interest rate, demand and supply, money supply, wage increases, savings, investments, government spending, socio and economic infrastructural development, borrowings and debt, direct foreign investment, production of goods and services, fiscal policies of government all play a role in economic performance and advancement. We therefore use some of the variables as proxies for this study

The definition of the variables of the study is summarized on the table below:

Measurement of Variables summarized on Table 3.1 below:

|  |  |  |
| --- | --- | --- |
| **Independent Variable** | **Measurement** | **Expected Sign/Apriori Expectation** |
| Petroleum Profit Tax (PPT) | Natural log of total revenue from petroleum profit tax | Positive |
| Corporate income Tax (CIT) | Natural log of total revenue collected from corporate tax | Positive |
| Dependent |  |  |
| Real Gross domestic product (GDP) | Real Gross domestic Products (RGDP)  Defined as the rate of growth in the value of the goods and services produced by the nation’s economy less the value of the goods and services used up in production | Positive |
| Inflation (INF) | Changes in prices of goods and services over a certain base year as published by Federal office of statistics | Negative |
| Unemployment rate (UNR) | Defined as total number of Nigerians unable to find job as a percentage of Nigerians of workable age published by Federal office of statistics | Negative |
| Human Development index |  |  |
| **control Variables:** |  |  |
| Public debt (PUD) | Total domestic and foreign debt published by CBN annual bulletin 2021 | Negative/positive |

**Model Specification**

RGDP=β0+β1*Log*PPT+β2*Log*CIT+β3*LogP*UD+ + U1, t

INF=β0+β1*Log*PPT+β2*Log*CIT+β3*LogP*UD+ U2, t

UNE=β0+β1*Log*PPT+β2*Log*CIT+β4*LogP*UD+ U3,t

HDI=β0+β1*Log*PPT+β3*Log*CIT+β4*LogP*UD+ U4,t

**Autoregressive distributed lag (ARDL)**

Following the unit root test, the study proceeds to examine short- and long run relationship among the variables. This is done using autoregressive distributed lag (ARDL) known as the bound test approach to co-integration. In line with Pesaran et al. (2001), the unrestricted error correction mechanism for testing co-integration among the variables used in this study is stated as follows:

∆RGDPt= β0+∑β1*∆Log*PPTt-1+∑β2*∆Log*CITt-1+∑β3*∆LogP*UDt-1α0 +α1*∆Log*PPTt-1+α2*∆Log*CITt-1+α3*∆Log*PUDt-1 + U1, t

∆INFt = β0+∑β1*∆Log*PPTt-1+∑β2*∆Log*CITt-1+∑β3*∆LogP*UDt-1α0 +α1*∆Log*PPTt-1+α2*∆Log*CITt-1+α3*∆Log*PUDt-1 + U2, t

∆UNEt = β0+∑β1*∆Log*PPTt-1+∑β2*∆Log*CITt-1+∑β3*∆LogP*UDt-1α0 +α1*∆Log*PPTt-1+α2*∆Log*CITt-1+α3*∆Log*PUDt-1 + U3, t

∆HDIt = β0+∑β1*∆Log*PPTt-1+∑β2*∆Log*CITt-1+∑β3*∆LogP*UDt-1α0 +α1*∆Log*PPTt-1+α2*∆Log*CITt-1+α3*∆Log*PUDt-1 + U4, t

The ARDL long-run model is estimated if cointegration is found while the short-run model is estimated if otherwise

∆RGDP=β0+β1*Log*PPTt-1+β2*Log*CITt-1+β4 +β3*LogP*UDt-1+ U1, t

∆INF=β0+β1*Log*PPTt-1+β2*Log*CITt-1+β4 +β3*LogP*UDt-1 + U2, t ∆UNE= β0+β1*Log*PPTt-1+β2*Log*CITt-1+β4 +β3*LogP*UDt-1 + U3, t

∆HDI = =β0+β1*Log*PPTt-1+β2*Log*CITt-1+β4 +β3*LogP*UDt-1+ U4, t

∆RGDP = α0 + ∑α1 *∆Log* PPTt-1+∑α2*∆Log* CITt-1 +α3∑*∆Log*PUDt-1 +ECM+ U1

∆INF = α0 + ∑α1 *∆Log* PPTt-1+∑α2*∆Log* CITt-1 +α3∑*∆Log*PUDt-1 +ECM + U2

∆UNE = α0 + ∑α1 *∆Log* PPTt-1+∑α2*∆Log* CITt-1 +α3∑*∆Log*PUDt-1 +ECM + U3

∆HDI = α0 + ∑α1 *∆Log* PPTt-1+∑α2*∆Log* CITt-1 +α3∑*∆Log*PUDt-1 +ECM + U4

**Results and Discussion**

**Trend Analysis**

The pattern of data characteristics is initially highlighted by presenting trends in relevant variables and the related summary statistics. The trends in the structure of tax composition are considered by evaluating the respective shares of each of the two direct tax components in total tax revenues of government. The trend presented in Figure 4.1 shows that the share of petroleum profit tax in total taxes has been the highest among the tax components over the years, with the share reaching 85 percent of total tax revenue in 2005. The share of PPT has however declined gradually since 2012, which follows the trend in poor international price of oil resources. There is therefore evidence that PPT has dominated tax revenue inflows for the government in Nigeria, although the trend has declined in recent periods. It is also seen that before 2012, the shares of CIT revenue stream in total taxes moved *in tandem* with very rapid upward increases and declines

Source: Author’s computation based on data from CBN

The trends in real GDP growth, inflation rate and unemployment rate are presented in Figure 4.2. The chart depicts that the three variables moved in similar patterns between 2001 and 2014. These is the era of one of the best economic growth patterns in the country. Thus, the rate of economic growth tends to drive the other macroeconomic factors in Nigeria. There were also periods of wide disparities in the variables. For instance, between 1994 and 1997, inflation was very high, reaching 72.5 percent in 1995, while both GDP growth and unemployment rates were relatively low. Also, from 2015, all three variables took different patterns, with inflation maintaining a steady flat level, while unemployment rose significantly and real GDP growth declined.

Source: Author’s computation based on data from WDI

The trend in HDI is shown in Figure 4.3. There is clear upward movement over the period. While this pattern of movement is beneficial for HDI (indicating that human capital has improved over the period),

# **4.1.2 Descriptive Statistics**

The descriptive statistics of the time series data for the variables used in the study are reported in Table 4.1. The Table shows the mean and other moment conditions for each of the variables. for the period in the study, average real GDP growth rate was 4.95 percent, which is moderate and suggests that the Nigerian economy has not performed too well on average between 1993 and 2021. The maximum value of 14.6 percent however indicates that there were periods of very high growth in the economy. Average unemployment rate is 14.79 and it is very high. In addition to the two-digit average inflation rate of 14.77 percent in the economy over the period, it can be seen that Nigerians faced a very high misery index (combination of inflation and unemployment) during the period of the study. Thus, it is seen that macroeconomic performance over the period was not impressive. Indeed, inflation rate was as high as 72.8 percent at a certain period, while unemployment rate was up to 35 percent as a maximum.

**Table 4.1: Descriptive Statistics**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Mean** | **Max.** | **Min.** | **Std. Dev.** | **Skew.** | **Kurt.** | **J-B** | **Prob.** |
| RGDPG | 4.95 | 14.60 | -1.92 | 3.78 | 0.34 | 3.08 | 0.53 | 0.77 |
| UNEM | 14.78 | 35.00 | 1.90 | 8.35 | 0.67 | 3.31 | 2.12 | 0.35 |
| INF | 14.77 | 72.80 | 5.40 | 12.58 | 3.84 | 18.17 | 325.20 | 0.00 |
| HDI | 0.49 | 0.54 | 0.39 | 0.04 | -0.45 | 2.59 | 1.11 | 0.58 |
| CITR | 20.84 | 39.74 | 6.32 | 9.25 | 0.15 | 1.89 | 1.49 | 0.48 |
| PPTR | 58.90 | 85.67 | 34.45 | 15.67 | 0.12 | 1.77 | 1.77 | 0.41 |
| PUD | 22.33 | 61.51 | 7.01 | 17.2 | 1.27 | 5.54 | 5.65 | 0.98 |

Source: Author’s computation

Direct tax variables are measured in terms of their respective shares in total tax revenues in order to provide a more nuanced analysis of the description of the various tax revenues instead of the total taxes. On average, petroleum profit taxes have had the highest share of total tax revenue in the country over the period while CIT have average ratio, indicating that tax structures have remained the same in terms of shares in total tax revenues. Maximum CIT share of 39.74 percent. The ratio of public debt to GDP is 22.33 percent on average, with a maximum value of 61.5 percent. This shows that public debt to GDP ratio is high with implications on debt overhang in the country.

For the other measures of moment conditions, an important statistic is the Jacque-Bera (J-B) statistic which indicates pattern of normality of probability distribution of the datasets. This pattern of probability distribution is important for the system of estimation adopted in the analysis. In Tables 4.1 the J-B statistic for all the variables except inflation which is insignificant, which means that the hypothesis of non-normality of the data series can be rejected at the 5 percent level. Thus, it can be seen that most of the series are normally distributed and the data can therefore be estimated within a time series-based estimation framework like the one employed in this study.

The initial patterns of relationship among the variables are observed through the computed correlation matrix which is shown in Table 4.2. Moreover, it is necessary to observe the dataset in terms of any estimation problems that may arise from the use of the dataset. A positive correlation exists among the tax components, indicating that they all move in the same direction.

The other variables in the model also have interesting correlation outcomes. There is a strong positive correlation between real GDP and unemployment, which is a surprising outcome. This is because rising GDP should lead to decline in unemployment. However, as Adegboye (2020) has found, economic growth in many African economies does not reflect in the employment rate. Rather growth has co-existed with rising unemployment (especially youth unemployment) in many African economies, including Nigeria. Inflation rate is negatively correlated with both real GDP and unemployment.

**Table 4.2: Correlation Matrix**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | CIT | PPT | RGDP | UNEM | INF | HDI |
| CIT | 1 |  |  |  |  |  |
| PPT | 0.638 | 1 |  |  |  |  |
|  | (0.00) |  |  |  |  |  |
| RGDP | 0.979 | 0.617 | 1 |  |  |  |
|  | (0.00) | (0.00) |  |  |  |  |
| UNEM | 0.615 | 0.419 | 0.692 | 1 |  |  |
|  | (0.00) | (0.03) | (0.00) |  |  |  |
| INF | -0.268 | -0.404 | -0.248 | -0.370 | 1 |  |
|  | (0.16) | (0.03) | (0.20) | (0.05) |  |  |
| HDI | 0.867 | 0.733 | 0.857 | 0.615 | -0.466 | 1 |
|  | (0.00) | (0.00) | (0.00) | (0.00) | (0.01) |  |

Source: Author’s computation

To ascertain extant contribution of tax structure in Nigeria macroeconomic performance in a distributional form we use scatterplots along with fitted regression equations. Given that the logs of the variables are used for plotting the relationship curves, the coefficients of the slopes could be considered as the elasticities among the tax and revenue variables.

The plot of the relationship between petroleum profit taxes and company income taxes is shown in Figure 4.6, where a strong positive plot is exhibited. The slope coefficient of the relationship between PPT and CIT (0.939) is larger. The slope also shows that every one percent increase in PPT may lead to a 0.93 percent rise in CIT in Nigeria.

The patterns of relationships among the dependent variables that measure macroeconomic performance are also plotted in this section. In Figure 4.8, the relationship between GDP growth and unemployment rate is presented. A non-linear and indirect relationship is plotted by the regression line. The chart shows that at different stages of economic growth, unemployment may respond differently. For instance, it is seen that at very low level of economic growth the relationship is positive, while the relationship becomes negative at high levels of economic growth. This implies that for economic growth to lead to lower unemployment rates, the rate of growth needs to be quite high.

Figure 4.9 also shows the plot of the relationship between economic growth and inflation rate. A parabola is also plotted by the scatterplot and shows that inflation rates tend to be negatively related with economic growth at higher levels of growth.

Moreover, the relationship real GDP growth rate and the human development index is reported in Figures 4.11. The relationship is shown to be direct and positive, indicating as human development improves in the country, economic growth also increases.

Source: Author’s computation based on data from CBN

**4.2 Tests of Time Series Properties of the Variables**

**4.2.1 Unit Root**

The Augmented Dickey Fuller (ADF) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) procedure are used. Result is a disclosed on table 4.3 . While the ADF test is an indirect process of testing for unit roots, the KPSS tests are more direct in terms of the null hypothesis. The results of the unit root tests are presented in Table 4.3. From the results of the ADF tests reported in the first panel of the Table, it can be seen that the ADF test statistics for each of the variables in levels (except for INFL) are less than the 95 percent critical values. On the other hand, the test statistic values for the series in first differences are greater than the critical values at the 5 percent significance level (please, refer to Appendix 10 for the t-statistics). Thus, those variables are non-stationary in levels but their first differences were found to be stationary. This implies that most the variables in the study are integrated of order one (or I[1]). On the other hand INFL, are integrated of order zero (or I[0]).

**Table 4.3: Unit Root test for Variables**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **ADF Test** | | **KPSS** | | **Order of Integration** |
| *Levels* | *First Difference* | *Levels* | *First Difference* |
| *RGDP* | -1.79 | -4.044\* | 0.686\* | 0.336 | I[1] |
| *UNEM* | -0.471 | -4.326\* | 0.515\* | 0.153 | I[1] |
| *INF* | -3.407\* | -5.193\* | 0.341 | 0.249 | I[0] |
| *HDI* | -2.537 | -20.96\* | 0.674\* | 0.226 | I[1] |
| *CIT* | -0.331 | -15.46\* | 0.648\* | 0.155 | I[1] |
| *PPT* | -1.58 | -4.415\* | 0.556\* | 0.248 | I[1] |
| *PUD* | -1.152 | -7.067\* | 0.632\* | 0.232 | I[1] |

*Note: \* indicates signifies at 5 percent; 95% critical values are reported in parentheses below each test value*

Source: Author’s computation

The KPSS test for stationarity (which helps to improve on the robustness of the unit root test by ADF) “is more relevant in capturing the actual stationarity patterns of the series since the test hypothesis particularly show whether the series are stationary or not and not in reference to the possession of unit roots”. The interpretation of the test outcomes is as follows: a significant KPSS coefficient for a variable indicates non-stationarity. In other words, the null hypothesis for the test is that the data is stationary; while the alternate hypothesis for the test is that the data is not stationary. The result shown in the second panel of Table 4.3 indicates that for each of the series (except INF), the null hypotheses of stationarity cannot be rejected for the variables in first differences (the tests statistics fail the test). This indicates that the series are difference-stationary and that all the variables are actually I[1]. Thus, a dynamic long run relationship may be estimated based on the ARDL approach to cointegration for the dynamic analysis (Ighodaro & Adegboye, 2020).

**4.2.2 Cointegration Result**

The unit root test suggests that most of the variables are I(1) while one is I(0). This suggests that the traditional test for common stochastic trends in the data series (or cointegration test) may not be sufficient for determining the long run relationship. Hence, following Pesaran et al (2001), an ARDL approach to cointegration is conducted in the study. In this direction, the Bounds testing procedure for cointegration is adopted. Moreover, the application of error correction processes (based on the ARDL approach to cointegration) further indicates the relevance of the cointegration tests. The results of the Bounds test for cointegration are shown in Table 4.4 and the evaluations are based on the critical F-statistic values for the lower and upper bounds.

**Table 4.4: Results of Bounds Approach to Cointegration Test**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Equation (Dependent variable)** | **F-stat** | **I0 Bound (5%)** | **I1 Bound (5%)** | **Cointegration** |
| Real GDP | 9.72 | 2.27 | 3.28 | Yes |
| Unemployment rate | 4.597 | 2.27 | 3.28 | Yes |
| Inflation rate | 48.96 | 2.27 | 3.28 | Yes |
| HDI | 16.43 | 2.27 | 3.28 | Yes |

Source: Author’s computations

In the Bounds test result in Table 4.4, the following procedure is used for evaluation: if at the 5 percent significance level, the estimated F-value is greater than both the lower test (I0 Bounds) and the upper test (I1 Bounds) values, then there is no cointegration among the variables. If the estimated F-value lies between the two Bounds values, then there is need to proceed with a lesser structure of the ECM analysis by applying the Josselius procedure. From the Table, the F values for the tests are all greater than both the lower and upper Bounds values at the 5 percent levels. According to the empirical output of the F-values in all the panels of Table 4.4 therefore, it can be seen that the null hypothesis of no long-run relationship between macroeconomic variables and tax structure composition is rejected at the 5 percent level. These results reveal that for each of the equations for the tax structure components and the control variable have strong long run relationships with the dependent variable.

**ARDL Results**

In this section, the results of the estimated ARDL model for the relationships are presented and analyzed. It should be noted that the dynamic from of the ARDL estimates suggests that both the long run and short run estimates are presented. The stable estimates are however based on the long run relationships.

**Lag Length Selection**

Generally, cointegration-based analyses (such as the ARDL) are susceptible to variations and instability on the basis of their lag structures. This is more serious for autoregressive estimations (Greene, 2011). Hence, given that the collection of variables in the study have been demonstrated to be cointegrated (based on the Bounds tests in Table 4.4), the lag selection test is also performed to determine the maximum lags that can generate optimum estimates for the coefficients in the ARDL estimation. In the lag selection, optimality of the model was determined using both the Akaike Information Criterion (AIC) and Schwarz–Bayesian Criterion (SC). The optimum lag length is determined by considering the least values for the test coefficients. The result is shown in Table 4.5 and indicates that, for each of the equations, the second lag possesses the minimum values. This implies only the first lag is expected to be retained for the ARDL estimation since each of the selection tests indicates the first lag as the optimum lag length. Thus, a lag structure of two periods is selected as representing the structure that will ensure more stable coefficient estimates. The low optimal lag structure may be related to the small sample used in the study as suggested by Ighodaro and Adegboye (2020).

**Table 4.5: Lag Length Selection Criteria**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ***No of Lags*** | **RGDP** | | **UNEM** | | **INF** | |
| *AIC* | *SC* | *AIC* | *SC* | *AIC* | *SC* |
| 0 | 3.88 | 4.18 | 3.12 | 1.34 | 2.42 | 1.04 |
| 1 | -1.81 | -1.74 | -2.89 | -1.52 | -2.93 | -1.56 |
| 2 | -2.68\* | -3.83\* | -4.29\* | -3.41\* | -2.98 | -3.02\* |
| 3 | -2.09 | -2.11 | -3.47 | -1.03 | -3.98\* | -2.47 |

Note: \* indicates selected lag. Source: Author, computation.

**4.3.2 Regression Result**

The regression result is presented in this section. the cointegrated results were obtained based on the lag selection test performed earlier. The diagnostic test in each of the equations in based on the adjusted R-squared values. This provides a consistent structure for the investigation of the dynamic relationship between the tax structure variables and each of the measures of macroeconomic performance in Nigeria. each of the measures of macroeconomic performance has implications for the pattern of interaction with the economy. While GDP growth and unemployment are more related to personal incomes and welfare, inflation is related to macroeconomic stability.

**(i) Tax Structure and Real GDP Growth**

In Table 4.7, ARDL analysis result for both the short run and long run results are reported about tax structure and real gdp growth. the R-squared value is very large at 0.896 which shows that the tax components and the other variables explain over 89 percent of short-term variations in economic growth in Nigeria. This provides a background to demonstrate that the models exhibit impressive predictive capacity. The impacts of the tax structure variables on economic growth are captured by considering the coefficients of the explanatory variables in terms of signs and significance. A close look at the individual coefficients of the tax variables in the short run estimates reveals that the coefficient of PPT is significant at the 5 percent level (P-value is less than 0.05) and it is positive. This shows that in the short run, petroleum profit taxes have significant positive impact on economic growth in Nigeria.

**Table 4.6: Results for tax structure and Gdp growth**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Coefficient** | **t-Statistic** | **Prob.** |
| Long run |  |  |  |
| LPPT | 0.538 | 2.359 | 0.041 |
| LCIT | -1.005 | -0.805 | 0.435 |
| LPUD | 0.299 | 0.688 | 0.503 |
| HDI | 14.342 | 1.075 | 0.302 |
| Constant | 0.986 | 0.198 | 0.846 |
| Short run |  |  |  |
| ΔLPPT | 0.032 | 2.324 | 0.045 |
| ΔLCIT | -0.116 | -3.040 | 0.014 |
| ΔLCITt-1 | 0.114 | 4.404 | 0.002 |
| ΔLPUD | -0.046 | -5.961 | 0.000 |
| ΔHDI | 5.228 | 9.549 | 0.000 |
| ΔHDIt-1 | 2.178 | 4.747 | 0.001 |
| ECMt-1 | -0.040 | -11.798 | 0.000 |
| Adj. R-sq. | 0.896 |  |  |

Source: Author’s computation

The coefficient of CIT is reported in both current and lagged form, indicating that CIT has a delayed short run effect on economic growth. The coefficient of the current estimate is negative while that of the lagged is positive. The result therefore shows that the immediate impact of CIT on economic growth is to reduce it, while the delayed impact is positive. For instance, the coefficient of public debt is negative and significant at the 1 percent level, indicating that public debt has significant negative impact on short run economic growth in Nigeria. This is an indication of debt hangover in the Nigerian economy. The coefficients of HDI both current and lagged forms are positive and significant which show that human development significantly improves economic growth in the long run.

The coefficient of the error correction term (ECM) has the expected negative sign and is significant at the 1 percent level (p-value less than 0.01). This indicates the presence of long run stability in the GDP growth estimate based on movements in the tax and other factors. The coefficient of the ECM term is -0.04, which is very low and suggests slow adjustment to long run equilibrium after any initial shock in the system. The result shows that only 4 percent of the adjustment to long run equilibrium is completed in the first period. Thus, there is evidence that taxes may not be very efficient in achieving rapid long-term GDP adjustment in Nigeria.

The results of the long run estimates are also reported in the upper panel of the result in Table 4.5. It should be noted that the long run estimates report more stable characteristics of the relationships (Stock & Watson, 2020). In the result, the coefficients of PPT pass the significance test at the 5 percent level while that of CIT fails the significance test. This result therefore indicates that PPT have significant long run impacts on economic growth in Nigeria, while CIT does not exert significant long run impacts. Note that both PPT and CIT are direct tax components, this result therefore suggests that the PPT and CIT (direct tax) have long run relevance for driving real GDP growth in Nigeria. The coefficients of public debt and HDI both fail the significance test even at the 5 percent level. This shows that after all adjustments have been made in the economy, the impacts of debt and human development are insignificant in driving economic growth in Nigeria.

**(ii) Direct Tax and Unemployment**

The results of the impact of direct tax variables on unemployment are presented in Table 4.7. The adjusted R-squares value is 0.812, which shows that the estimated model has an impressive predictive capability. In terms of the individual performance of the explanatory variables, the short run results show that PPT has a significant and positive short run impact on unemployment in Nigeria. This shows that increased PPT revenue generates more unemployment in Nigeria in the short run. Indeed, the coefficients of the other tax structure variables are also positive and are significant at the 5 percent level. These results show that tax revenues, irrespective of the structure, tend to promote unemployment in the short run. The coefficients of lagged public debt and HDI are however negative and significant, suggesting that rising debt and improved human capital may significantly reduce unemployment in the short run.

**Table 4.7: Results for Direct Tax and unemployment**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Coefficient** | **t-Statistic** | **Prob.** |
| *Long run* |  |  |  |
| LPPT | -22.04 | -1.09 | 0.30 |
| LCIT | -13.36 | -0.47 | 0.64 |
| LPUD | -10.02 | -0.64 | 0.53 |
| HDI | 833.23 | 1.01 | 0.33 |
| Constant | -347.91 | -1.07 | 0.31 |
| *Short run* |  |  |  |
| ΔLPPT | 0.303 | 2.892 | 0.018 |
| ΔLCIT | 0.906 | 3.767 | 0.004 |
| ΔLCITt-1 | 1.475 | 6.665 | 0.000 |
| ΔLPUD | -0.023 | -0.408 | 0.693 |
| ΔLPUt-1 | -0.133 | -2.428 | 0.038 |
| ΔHDI | 11.201 | 2.539 | 0.032 |
| ΔHDIt-1 | -21.764 | -4.787 | 0.001 |
| ECMt-1 | -0.019 | -8.086 | 0.000 |
| Adj. R-sq. | 0.812 |  |  |

Source: Author’s computation

The coefficient of the error correction term also has the expected negative signs and is significant in the unemployment equation. The result therefore shows that there is long run adjustment to equilibrium following any short run deviation. The coefficient of the ECM is also very low at -0.019 and it shows that the adjustment to long run equilibrium is slow.

For the long run relationship, the result in the upper panel of Table 4.6 shows that none of the tax structure variables has a significant impact on unemployment in the long run. Thus, although tax structure factors tend to influence unemployment by increasing it, the effect of these tax factors after all adjustments have been made is not significant. This result therefore shows that tax revenues in all forms do not matter for addressing the problem of unemployment in Nigeria. Similarly, the other control variables in the model fail the significance test at the 5 percent level. This also shows that neither public debt nor human capital development help to reduce unemployment over time in Nigeria.

**(iii) Direct Tax and Inflationary Pressure**

The structure of direct tax in Nigeria may be reflected in changes in prices over the years. As Gale and Samwick (2014) has noted, the tax structure can generate wage influences that spill over to the price level in the economy. The results of the tax structure and inflation relationship are presented in Table 4.8. The short run results (in the lower panel of the Table) indicates that PPT does not feature as a factor that influences inflation in the short run. Rather, it is CIT that significantly influence inflation rate in the short run. CIT has a negative impact. This means that short run changes in inflation is reduced by higher CIT. The result shows that direct taxes help to reduce short-term instabilities in the economy. ECM term is also negative and significant at the 1 percent level. This shows that long run adjustment to equilibrium occurs with changes in the explanatory variables. The adjustment is also swift as shown by the large coefficient of the ECM term, indicating that over 78 percent of the adjustment to long run equilibrium occurs in the first period.

**Table 4.8: Results for Direct Tax and inflation**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable |  | Coefficient | t-Statistic | Prob. |
| Long run |  |  |  |  |
| LPPT |  | -5.822 | -2.475 | 0.031 |
| LCIT |  | 1.081 | 0.190 | 0.852 |
| LPUD |  | 6.665 | 2.546 | 0.027 |
| constant |  | 29.332 | 0.770 | 0.457 |
| *Short run* |  |  |  |  |
| ΔLCIT |  | -4.802 | -2.543 | 0.027 |
| ΔLCITt-1 |  | -12.548 | -7.992 | 0.000 |
| ΔLPUD |  | -0.558 | -1.370 | 0.198 |
| ΔLPUDt-1 |  | -1.918 | -4.365 | 0.001 |
| ECMt-1 |  | -0.781 | -25.318 | 0.000 |
| Adj. R-sq. |  | 0.979 |  |  |

Source: Author’s computation

For the long run results, the coefficients of PPT is significant at the 5 percent level, while that of CIT fails the significance test. This outcome is similar to that of real GDP growth, which suggests that taxes in Nigeria exert the same pattern of effects on economic growth and inflation rate in Nigeria. The coefficients of PPT and CIT in the long run result are also both negative, indicating that any increase in their values will lead to reduction in inflationary pressures in Nigeria.

**(v) Direct Tax and Human Development**

In Table 4.10, the results of the impacts of direct tax on human development index is reported. The model appears to be well estimated with high predictive relevance, given that the adjusted R-squared value is 0.946. The short run result shows that all the variables are significant and exert mostly negative impacts on HDI. Thus, in the short run, the tax components have significant negative impacts on HDI in Nigeria. The coefficient of the ECM term is also significant and negative, which shows that a long run stability exists in human capital development in the country when the tax and other variables are put into consideration. The speed of long run adjustment is also very high, considering that the ECM term has a coefficient of -0.907. This shows that over 90 percent of the adjustment to long run equilibrium is completed in the first period.

**Table 4.10: Results for Direct Tax and Human development index**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Coefficient** | **t-Statistic** | **Prob.** |
| Long run |  |  |  |
| LPPT | 0.018 | 2.470 | 0.041 |
| LCIT | 0.036 | 3.410 | 0.007 |
| LPUD | -0.010 | -1.452 | 0.177 |
| Constant | 0.338 | 9.794 | 0.000 |
| Short run |  |  |  |
| ΔLPPT | 0.007 | 2.425 | 0.036 |
| ΔLPPTt-1 | -0.011 | -3.805 | 0.004 |
| ΔLCIT | -0.025 | -4.049 | 0.002 |
| ΔLCITt-1 | -0.033 | -6.154 | 0.000 |
| ΔLPUD | -0.003 | -2.134 | 0.059 |
| ΔLPUDt-1 | 0.006 | 5.117 | 0.001 |
| ECMt-1 | -0.907 | -13.566 | 0.000 |
| Adj. R-sq. | 0.946 |  |  |

Source: Author’s computation

The long run estimates present more interesting outcomes. The coefficients of all the tax structure variables are significant at the 5 percent level and all positive. This shows that although taxes exert significant negative impacts on human capital development in the short run, the long run impact is positive. The long run coefficients are also all positive, indicating that taxes exert significant positive impact on human development in Nigeria. The result therefore indicates that irrespective of the structure of taxes in Nigeria, the long run effects of their increases on HDI is positive. By increasing all taxes in Nigeria, human capital tends to increase in the long run. In particular, a one percent rise in PPT leads to a 0.18 percent rise in HDI, while a percentage rise in CIT lead to a 0.036 percent rise in HDI. In general, the results indicate that the most relevant positive impact of all tax components on macroeconomic performance is via improvement in human capital

**4.3.3 Test of Causality**

The causality tests for the variables is to determine any form of reverse causality and effects that may be present among the main variables of the study, including the macroeconomic performance variables and direct tax. The results are shown in Table 4.12 where the tests are based on the F-statistic test outcomes for each of the null hypotheses. If the coefficient of the Granger causality test is significant, then the associated null hypothesis is rejected at the level of significance from the F-test. From the results, the F-statistic values for the null hypothesis that causality does not run from unemployment to GDP growth or reverse are insignificant at the 5 percent level. This shows that there is no causality between the two variables. As noted earlier the lack of causality between economic growth and unemployment can be linked to the “jobless growth” phenomenon that has been explained in literature. The hypothesis that causality does not runs from inflation to GDP growth is rejected at the 5 percent level, meaning that causality runs from inflation to GDP growth. However, the reverse causality does not hold. Hence, there is a unidirectional causality running only from inflation to GDP growth in the economy.

**Table 4.12: Granger Causality Results**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Null Hypothesis:** | **Obs** | **F-Statistic** | **Prob.** | **Direction of Causality** |
| UNEM does not Granger Cause LGDP | 27 | 2.09 | 0.15 |  |
| LGDP does not Granger Cause UNEM |  | 1.31 | 0.29 | None |
| INFL does not Granger Cause LGDP | 26 | 3.88 | 0.04 |  |
| LGDP does not Granger Cause INFL |  | 0.52 | 0.60 | Unidirectional |
| HDI does not Granger Cause LGDP | 26 | 0.30 | 0.75 |  |
| LGDP does not Granger Cause HDI |  | 12.78 | 0.00 | Unidirectional |
| LCIT does not Granger Cause LGDP | 27 | 4.41 | 0.02 |  |
| LGDP does not Granger Cause LCIT |  | 2.67 | 0.09 | Unidirectional |
| LPPT does not Granger Cause LGDP | 27 | 1.37 | 0.27 |  |
| LGDP does not Granger Cause LPPT |  | 0.50 | 0.61 | None |
| LVAT does not Granger Cause LGDP | 26 | 0.16 | 0.85 |  |
| INFL does not Granger Cause UNEM | 26 | 3.40 | 0.04 |  |
| UNEM does not Granger Cause INFL |  | 0.67 | 0.52 | Unidirectional |
| HDI does not Granger Cause UNEM | 26 | 1.24 | 0.31 |  |
| LUNEM does not Granger Cause HDI |  | 0.46 | 0.64 | None |
| LCIT does not Granger Cause UNEM | 27 | 3.69 | 0.04 |  |
| UNEM does not Granger Cause LCIT |  | 1.36 | 0.28 | Unidirectional |
| LPPT does not Granger Cause UNEM | 27 | 0.42 | 0.66 |  |
| UNEM does not Granger Cause LPPT |  | 2.47 | 0.11 | None |
| HDI does not Granger Cause LINFL | 26 | 1.69 | 0.21 |  |
| LINFL does not Granger Cause HDI |  | 2.12 | 0.14 | None |
| LCIT does not Granger Cause INFL | 26 | 0.84 | 0.45 |  |
| INFL does not Granger Cause LCIT |  | 0.86 | 0.44 | None |
| LPPT does not Granger Cause INFL | 26 | 0.02 | 0.98 |  |
| INFL does not Granger Cause LPPT |  | 0.16 | 0.85 | None |
| LCIT does not Granger Cause HDI | 26 | 4.22 | 0.03 |  |
| HDI does not Granger Cause LCIT |  | 0.13 | 0.88 | Unidirectional |
| LPPT does not Granger Cause HDI | 26 | 0.94 | 0.40 |  |
| HDI does not Granger Cause LPPT |  | 0.17 | 0.84 | None |
| LPPT does not Granger Cause LCIT | 27 | 4.09 | 0.03 |  |
| LCIT does not Granger Cause LPPT |  | 0.87 | 0.43 | Unidirectional |

The causality between HDI and economic growth only runs from HDI to economic growth and not the reverse case. A unidirectional causality also exists between CIT and GDP growth with causality running from the tax component to GDP growth. Thus, the result shows that it is company income taxes that stimulated economic performance. In terms of tax structure therefore, the results show that direct taxes stimulate economic growth. There is also a unidirectional relationship between inflation and unemployment rate, with causality running from inflation rate to unemployment.

**4.4 Post Estimation Tests**

**4.4.1 Multicollinearity Tests**

Multicollinearity tests are conducted on each of the models to ensure that the explanatory variables are not excessively collinear. Apparently, high collinearity tends to amplify the standard errors of the estimates and render the reliability of the estimated models quite low. In Table 4.13, the results of the multicollinearity test for the each of the model results are presented. In the result, only the centered variance inflation factors (CVIF) variables are reported since each of the equations contains a constant term. The VIF value must be less than 10 for the variable in an equation to be free from collinearity. In the report on Table 4.12, the Centred VIF values for all the variables are less than 10. Thus, it can be seen that the estimated coefficients for the equations do not integrate excessively among themselves and the estimates are therefore reliable.

**Table 4.13: Post Estimation Test Results**

|  |  |  |
| --- | --- | --- |
| **Variable** | **Coefficient Variance** | **Centered VIF** |
| LPPT | 0.027 | 5.354 |
| LCIT | 0.256 | 6.263 |
| LPUD | 0.021 | 9.801 |

Source: Author’s computations

**4.4.2 Tests for Stability of Regression**

The estimated coefficients in the study are further examined for any form of serially correlated errors or non-normally distributed probability densities. The normality test is conducted using the J-B procedure while the serial correlation tests are performed using the LM statistics. The results for all the estimates are presented in Table 4.13. From the results, none of the J-B and LM statistics passed the significance test even at the 5 percent level which implies that the null hypothesis is accepted in both cases. The null hypothesis is the absence of non-normality and serial correlation respectively. Thus, the tests indicate that the residuals are normally distributed and are devoid of serial correlation. Thus, each of the estimated equations can be adjudged to be stable and effective for long term prediction and analysis. In order to test the initial stability of cointegration parameters for the estimates, the Nyblom-Hansen (*Lc*)tests are also included in Table 4.14. The “Nyblom-Hansen statistic tests for parameter constancy against the alternative hypothesis that the parameters follow a random walk process” (Balcilar et al, 2013). From the results it is seen that the coefficients are all insignificant at the 5 percent level. Thus, there is a stable long run relationship between tax revenue and performance.

**Table 4.14: Post estimation test results**

|  |  |  |
| --- | --- | --- |
| ***Model*** | ***Test*** | *Stat. (prob)* |
| *GDP* | *Lc value (Bootstrap p value)* | 1.033  (0.611) |
| *Normality test (J-B)* | 0.455  (0.79) |
| *Serial Correlation LM Test* | 1.121  (0.35) |
| *UNEM* | *Lc value (Bootstrap p value)* | 1.14  (0.72) |
| *Normality test (J-B)* | 1.301  (0.52) |
| *Serial Correlation LM Test* | 0.667  (0.53) |
| *INF* | *Lc value (Bootstrap p value)* | 2.00  (0.27) |
| *Normality test (J-B)* | 2.295  (0.72) |
| *Serial Correlation LM Test* | 0.291  (0.75) |
| *HDI* | *Lc value (Bootstrap p value)* | 1.156  (0.37) |
| *Normality test (J-B)* | 2.232  (0.33) |
| *Serial Correlation LM Test* | 1.218  (0.34) |

Note: p-values in parentheses. Source: Author’s computation

A visual test of the stability of the estimates is also conducted using the CUSUM of squares tests. This helps to eliminate doubt about possible outlier regression for any of the groups in the sample. The charts in Figure 4.15 show the result of the CUSUM of squares test for recursiveness of error accumulation for the five categories of revenues that were performed in the study. It can be seen that the CUSUM of squares line lies entirely within the dotted 5 percent significance bound line throughout the chart for each of the charts. This reveals that the estimations are all stable within the analysis and there are no issues of structural breaks or outlier effects in the estimations.

**Fig 4.15: Parameter Stability Charts for the equations**







Source: Author’s computations

**4.5 Discussion of Findings**

The results obtained from the study highlight particular issues for discussion in terms of policy implications. In the study, it was demonstrated that differentiation of macroeconomic performance variables into four components as well as the differentiation of tax structure components provide more nuanced pattern of analysis in establishing the relationship between taxes and macroeconomic performance in Nigeria. Essentially, it was demonstrated that the macroeconomic performance indicators employed in the empirical analysis of the study can be considered in terms of overall income levels and welfare as well as in terms of macroeconomic stability. In this direction, while real GDP growth and unemployment identify the direction of income and welfare, inflation rate demonstrate the pattern of macroeconomic stability. These patterns of evaluations are also provided in studies by Arora (2013), Araújo and Cunha (2014), Rajkarnikar, Goodwin and Roach (2019), Aitken (2019) and Quiros-Romero and Reinsdorf (2020) for both developing and developed economies. Thus, in this study, role of overall tax revenue on improving economic performance, welfare improvements and ensuring macroeconomic stability has been well established.

An important outcome of the study is the realization that the two tax components in the study were found to be high in relation to total tax revenues but very low in relation to GDP in the economy. The average value of PPT and CIT to total revenue compare favorably with other global outcomes. The ratio of CIT to GDP was found to be 0.752 on average. Compared with a tax to GDP ratio of 34.2 percent for OECD economies and 21.3 percent for Latin American economies (Adegboye, Arodoye & Irughe, 2019), the overage tax rate for Nigeria indicates a far cry from the actual capacity that can be generated from an economy like Nigeria. None of the tax components examined in this study has a contribution of up to 1 percent of total GDP on average over the period, although CIT have maximum values that are greater than 2 percent. This implies that the tax revenues are generally low in the country as also found by IMF (2018), OECD (2020), and AfDB (2020).

Moreover, a very strong and similar trend movement was noticed for both tax components that were used in the study both in the trend analysis and in the correlation matrix, a percent rise in PPT is accompanied by an increase in CIT by 0.93 percentage point. The relationship was found to be strong in Nigeria and also suggests that tax revenue in Nigeria is linked. As noted by IMF (2018) this pattern of interaction may present some risk to the tax system since a shock to one tax component may directly lead to decline in the other. More importantly, the result suggest that both taxes tend to have a similar base.

Furthermore, the study found evidence of differences in the impacts of taxation on the basis of short run or long run outcomes as well as on the basis of the tax components under consideration. In particular, the effects of tax revenues on macroeconomic performance were demonstrated to be clearer in the long run than in the short run. The study therefore found that the effect of direct tax on macroeconomic performance are long run affairs and may not be fully determined in the short run. Similar findings were made by Gale and Samwick (2014), Chen et al (2017) and Madsen et al (2021).

In the same vein, the study found that direct taxes improved income levels and inflation rate in Nigeria,. This implies that direct taxes may be effective in maintaining macroeconomic stability in Nigeria The study therefore establishes that direct taxes may deliver macroeconomic effects that are divergent from the Ricardian Equivalence proposition of the tax effects as also shown by Arodoye and Iyoha (2019), Finkelstein and Notowidigdo (2018). Direct taxes appear to be more capable of providing better capacity for enhancing distribution of resources and improvement in national income levels in Nigeria.

In terms of the distributional effects, the study showed that Petroleum profit tax significantly improved macroeconomic performance in Nigeria, both in terms of income or welfare as well as macroeconomic stability. Thus, the study demonstrated that only PPT has the unequivocal capacity to both promote welfare and improve stability in Nigeria economy. The other direct tax component CIT only improve human capital development but is not capable of promoting economic growth or reducing inflation. Many previous studies have found similar results for both developed and developing economies. For instance, Ferede and Dahlby (2012) found that increased corporate income tax rates among sub-national levels in Canada resulted in lower private investment and slower economic growth. These outcomes are far-reaching and indicate that the tax structure is a critical issue in drawing the role of taxes on the Nigerian economy as also shown in Phiri (2016), Ogundana et al. (2017), and Nguyen (2019).

The study also found that none of the tax components significantly influenced unemployment rate in Nigeria. The result essentially showed that the reduction of unemployment in Nigeria is not to be attained by changing tax rates, base or overall tax revenues. Similarly, the plague of unemployment in Nigeria is not influenced by direct tax components in Nigeria. There is therefore evidence that tax-targeted spending may not by targeted at improving employment in the country. Given that taxes are a major component of government spending capacity, the study has found evidence that employment is not a major focus of fiscal policy in Nigeria. In general, taxes and unemployment are a dilemma for government. The main macroeconomic prescription for reducing high unemployment is the reduction of tax rates (Rendahl, 2016; Gehrke, 2018). However, lower tax rates will result in lower tax revenues. Thus, the outcome of this study is in line with previous studies that demonstrated that the effects of taxes on unemployment is ambiguous (Abubakar, 2016; Gehrke, 2018).

**Summary of Findings**

Revenue mobilization through diversification and expansion of the tax system has become more relevant in the current economic situation in Nigeria. This has strong implication for the tax system which needs greater clarification in terms of the structural composition and implications for different macroeconomic outcomes. In this study, the impact of tax structure on macroeconomic performance in Nigeria was examined. These aspects of fiscal policy and the economy were argued to mainly concern policy and structural transformation of the economy required for delivering greater welfare and stability in the Nigerian economy. The study therefore focuses on evaluating the distributional outcomes of tax structure in terms of the macroeconomy of Nigeria. Thus, macroeconomic performance was measured in terms of income and welfare (real GDP growth and unemployment, human development index), macroeconomic stability (inflation). The direct tax components included in the study are petroleum profit taxes (PPT), company income taxes (CIT),

A dynamic framework was devised for analyzing the relationships in the study based on the autoregressive distributed lag (ARDL) approach to cointegration. From the analytical framework, both the long run and short run impacts of tax structure components on macroeconomic performance were obtained. In general, the results from the study confirmed that both direct taxes are likely to improve macroeconomic performance in Nigeria over time. In particular, the following findings were made:

1. That long run impacts of the tax structure components on macroeconomic performance often differ from the short run impacts in Nigeria. In most of the cases, while the short run outcomes were negative, the long run outcomes were positive. Moreover, the distributional effects of the tax structures also appear to differ in terms of the short and long run impacts.
2. That the different structures of taxes have long run relevance for driving real GDP growth in Nigeria.
3. That, although tax structure factors tend to influence unemployment by increasing it in the short run, the effect of these tax factors in the long run is insignificant. Thus, tax revenues in all forms do not matter for addressing the problem of unemployment in Nigeria.
4. That PPT have significant negative impacts on inflation, implying that direct tax components are capable of reducing inflationary pressures in Nigeria.

.

1. That irrespective of the structure of taxes in Nigeria, the long run effects of tax increases on human development index are positive.

**5.3 Recommendations**

Based on the empirical results from the study, the following recommendations are made:

1. Given that the study found that the long run impacts of the tax structure components often differ from the long run effects in Nigeria and that the distributional effects of the tax structures also appear to differ in terms of the short and long run impacts, tax policy makers need to focus on the expected long run outcomes of tax policies, rather than the short run outcomes, when making policies on tax rates and tax revenues in Nigeria.
2. Moreover, the authorities need to effectively obviate the different components of taxes when making decision on their implementation or administration. This is because the effects of different tax structure components were found to differ in terms of their impacts on macroeconomic performance in Nigeria.
3. The direct component of tax revenue in Nigeria must be made more efficient in terms of revenue generation and also be put into more efficient use. It is clear that contributions to direct taxes can be more easily traced to the taxpayers. Hence, proper returns of government may be focused on the sectors where higher revenue of direct taxes is received. This will encourage other sectors to sit up to their tax responsibilities.
4. A major prescription from this study is that a combination of direct taxes may be used for addressing income and welfare issues in Nigeria, in the long run. Direct taxes can also be employed when long-term macroeconomic stability is the goal of policy makers.

**5.3 Conclusions**

The need for promoting long run economic growth and overall macroeconomic stability has heightened in Nigeria, especially given recent development in the economy that has perpetuate difficulty in lifting away from macroeconomic stagnation. Two critical aspects in stimulating growth which both domestic policy makers and international bodies have agreed on is with respect to raising funds for growth and expanding infrastructure through investment. This has made the role of taxation very crucial for attaining growth, especially in the long run in Nigeria. In this study, the focus on discriminating the impact of the direct tax structure components and determining their distributional impacts on macroeconomic performance in Nigeria. There is evidence that although the tax components generally promote macroeconomic performance, there effects may differ when individual performance indicators are considered. This therefore calls for more dexterity in the application of tax revenues as a fiscal tool for managing the economy in Nigeria, especially for generating long run welfare and economic stability.

**References**

Abidemi C. Adegboye, (2020). [**Macroeconomic policies and sustainable employment yields in sub‐Saharan Africa**](https://ideas.repec.org/a/bla/afrdev/v32y2020i4p515-527.html)," [African Development Review](https://ideas.repec.org/s/bla/afrdev.html), African Development Bank, vol. 32(4), 515-527, December.

Abubakar, A.B. (2016). Dynamic effects of fiscal policy on output and unemployment in

Nigeria: An econometric investigation. *CBN Journal of Applied Statistics*, 7(2), 101-122.

(Adegboye, Arodoye & Irughe, 2019

Adaramola, A. O., & Ayeni-Agbaje, A. R. (2015). Tax structure and economic growth in Nigeria: A disaggregated empirical evidence (1986–2012). Research Journal of Finance and Accounting, 6(14), 1-12.

Adewale Mathew Adekanmbi, Amos Dauda, Shallie and Oladimeji Abeeb Olaniyi (2017) Tax Revenue and Sustainable Development in Nigeria: A Disaggregated Analysis, Global Journal of Arts, Humanities and Social Sciences, 10(3), 43-54

Alexander, A. A., Keyi, M. D., & Alfa, Y. (2019). Taxation and Economic Growth in Nigeria: Evidence from Autoregressive Distributed LAG (ARDL) Model. International Journal of Innovative Finance and Economics Research, 7(4):143-151

Aitken, A. (2019). Measuring Welfare Beyond GDP. *National Institute Economic Review*,

249(1), R3-R16.

Arora, V. (2013). Alternative measures of welfare in macroeconomic models. U.S. Energy

Information Administration Working Papers No. 20585.

Aitken, A. (2019). Measuring Welfare Beyond GDP. *National Institute Economic Review*, 249(1), R3-R16.

Araújo, E. & Cunha, A.B. (2014). Simple macroeconomic policies and welfare: A quantitative

Alfred A., Lan P (2011). “Empirical Evidence on Inflation and Unemployment in the long run” University of Otago Eco-nomics Discussion Papers No 1109.   
[Google Scholar](https://scholar.google.com/scholar?q=Alfred%20A.,%20Lan%20P.,%20(2011).%20)

Akintoye, I. R. (2003). Reducing Unemployment through the Informal Sector: A case Study of Nigeria”, European Journal of Economics, Finance and Administrative Sciences, 1450-2275.

Appah, E., & Ebiringa, O. T. (2012). Petroleum profit tax and economic growth in Nigeria. International Journal of Management Science and Business Research, 1(9), 12-22.

Awa, F.N and Ibeanu, R.I (2020) **Impact of Tax Revenue on Economic Development in Nigeria (1997-2018** European Journal of Accounting, Auditing and Finance Research 8(7), 18-32,

**Balasolu.N, Chifu.i AND Onacea, M(2023). Impact of Direct Taxation on Economic Growth: Empirical Evidence Based on Panel Data Regression Analysis at the Level of Eu Countries. MPDI**

.Balcilar, M., Demirer, R., and Hammoudeh, S. (2013). Investor herds and regime-switching: Evidence from Gulf Arab stock markets. Journal of International Financial Markets, Institutions & Money 23, 295-321

[Clement A.U. Ighodaro and Abidemi C. Adegboye](https://www.inderscienceonline.com/doi/abs/10.1504/IJEPEE.2020.109047?journalCode=ijepee) (2020) **Long run analysis of tourism and economic growth in Nigeria** [International Journal of Economic Policy in Emerging Economies](https://www.inderscienceonline.com/journal/ijepee) [13(3](https://www.inderscienceonline.com/toc/ijepee/13/3)),286-301<https://doi.org/10.1504/IJEPEE.2020.109047>

Chen, P., Chu, A.C., Chu, H., & Lai, C. (2017). Short-run and long-run effects of capital taxation on innovation and economic growth. *Journal of Macroeconomics*, 53, 207-221

Chigbu, E.E., Akujuobi, L.E., and Appah, E. (2012). An Empirical Study on the Causality between Economic Growth and Taxation in Nigeria.Current Research Journal of Economic Theory, Vol.4 (2):29-38.

CHITOIU Loredana Andreea & UNGUREANU Dragos Mihai(2022). [**The Relationship Between Taxation And Economic Growth. Study Case: Cee Countries**](https://ideas.repec.org/a/blg/reveco/v74y2022i3p23-34.html).  [Revista Economica](https://ideas.repec.org/s/blg/reveco.html), Lucian Blaga University of Sibiu, Faculty of Economic Sciences, vol. 74(3), pages 23-34, Octobe

Chiumia, A. and Simwaka, K. (2012).Tax Policy Development, Donor Inflows and Economic Growth in Malawi,Journal of Economics and International FinanceVol.4(7):159-172

CBN Statistical Bulletin. (2020). Decisions of Monetary Policy Meetings. https://www.cbn.gov.ng/MonetaryPolicy/decisions.asp DataBank. (2021). World Development Indicators. <https://databank.worldbank.org/source/world-development-indicators>

Chaudhry, S., & Munir, F. (2010). Determinants of low tax revenue in Pakistan, Pakistan Journal of Social Sciences, 30(2), 439-452.

Dibia N. O. & Onwuchekwa J. C. (2019). Taxation and economic growth in. Nigeria. Accounting and Taxation Review, 3(2): 111-. 1

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. Journal of the American Statistical Association, 74(366a), 427–431. https://doi.org/10.1080/01621459.1979.10482531

Efanga, Udeme Okon1, Ugwuanyi, Georgina Obinne , Ogochukwu, Chinelo Okanya (2020). Analysis of the Impact of Oil Revenue on Economic Growth of Nigeria between 1981 And 2018 IOSR Journal of Economics and Finance (IOSR-JEF) e-ISSN: 2321-5933, p-ISSN: 2321-5925. 11(2) Ser. I (Mar – Apr 2020), 25-34 [www.iosrjournals.org](http://www.iosrjournals.org). DOI: 10.9790/5933-

Efuntade, A.O., Efuntade, O.O., & Akinola, A.O. (2020). Tax revenue and its effect on government expenditure in Nigeria. *The International Journal of Business & Management*, 8(9), 111-125.

Engen, E. & Skinner, J. (1996). Taxation and Economic Growth. National Tax Journal, 49 (4): 617-642.

Finkelstein, A. & Notowidigdo, M. (2018).. [**Take-up and Targeting: Experimental Evidence from SNAP**](https://ideas.repec.org/p/nbr/nberwo/24652.html)," [NBER Working Papers](https://ideas.repec.org/s/nbr/nberwo.html) 24652, National Bureau of Economic Research, Inc.

Ferede, Ergete and Dahlby, Bev (2012). The Effect of Corporate Income Tax on the Economic Growth Rates of the Canadian Province). The School of Public Policy Publications, 2019, Available at SSRN: <https://ssrn.com/abstract=3472384>

Folster, S., & Henrekson, M. (2001). Growth effects of government expenditure and taxation in

rich countries. *European Economic Review*, 45(8), 1501-1520.

Gale, W.G., & Samwick, A.A. (2014). Effects of income tax changes on economic growth. *Brookings Economic Studies*, September.

Gehrke, B. (2019). Fiscal rules and unemployment. *Macroeconomic Dynamics*, 23(8), 3293 – 3326.

Goslinga, S., van der Hel-Van Dijk, L., Mascini, P., & van Steenbergen, A. (2018). Tax and trust: Institutions, interactions and instruments

Hauwa L. Ikharo-Kadiri.(2021). Tax-Structure-And-Inclusive-Growth-In-Developing-Countries-A-Case-Of-Nigeria.Igbinedion University Okada, Edo State, Nigeria.Dowloaded 12/12/2022

Madsen, J.B., Minniti, A., & Venturini, F. (2021). The long-run investment effect of taxation in OECD countries. National Institute of Economic and Social Research Discussion Paper No. 527

Manukaji, I.J. (2018). Effect of tax structure on economic growth in Nigeria. *International Journal of Innovative Finance and Economics Research*, 6(1), pp. 1-11.

Mathe, M. and Phiri, A. (2016) The Impact of Mining on the Environment in Gwanda District Zimbabwe: A Case Study of Blanket Mine. Imperial Journal of Interdisciplinary Research, 2, 503-512

.Nwakanma, P.C. and Nnamdi, K.C. (2013).Taxation and National Development.Research Journal of Finance and Accounting,Vol.4(19): 176-180.

Obaretin, O. & Monye-Emina, H. E. (2019). Petroleum profit tax and economic growth in Nigeria. Amity Journal of Economics, 4(2):72-82.

Orji, Anthony, Okafor (2015). Inflation And Unemployment Nexus In Nigeria: Another Test Of The Phillip’s Curve” Asian Economic and Financial Review ISSN(e): 2222-6737/ISSN(p): 2305-2147 journal homepage: http://www.aessweb.com/journals/5002   
[Google Scholar](https://scholar.google.com/scholar?q=Orji,%20Anthony,%20Okafor%20(2015).%20)

Quiros-Romero, G. & Reinsdorf, M.B. (2020). Measuring economic welfare: What and how? IMF Policy Papers. <https://www.imf.org/en/Publications/Policy-Papers/Issues/2020/05/18/Measuring-Economic-Welfare-What-and-How-49438>

Oluyomi, A. & Ogunrinola, O. I. (2011). Employment and economic growth nexus in Nigeria”, International Journal of Business and Social Sciences 2(11), 12-17

Ojong, C. M., Anthony, O., & Arikpo, O. F. (2016). The impact of tax revenue on economic growth: Evidence from Nigeria. Journal of Economic and Finance, 7(1), 32-38.

Okun, A. M. (1962).. Potential GNP: Its Measurement and Significance. Proceedings of the Business and Economics Section of the American Statistical Association, Washington, DC”, American Statistical Association: 98-104.

Okwara, C. C., & Amori, O. M. (2017). Impact of tax revenue on economic growth in Nigeria. International Journal of Advanced Scientific Research, 2(2), 90-102. Retrieved from <http://internationalpolicybrief.org/journals/ijasr-online-journals/intl-jrnl-of-sci-research-in-social-sciencesmgt-studies-vol2-no2-dec-2017>

Pesaran, M.H., Shin, Y. and Smith, R. (2001) Bounds Testing Approaches to the Analysis of Level Relationships. Journal of Applied Econometrics, 16, 289-326.   
https://doi.org/10.1002/jae.616

Rajkarnikar, P. Goodwin, N., & Roach, B. (2019). Macroeconomic Measurement: Environmental and Social Dimensions. Global Development and Environment Institute Module.

Rendahl, P. (2016). Fiscal Policy in an unemployment crisis. *The Review of Economic Studies*, 83(3), 1189-1224.

Worlu, C.N and Emeka, N. (2012).Tax Revenue and Economic in Nigeria: A Macroeconomic Approach.Academic Journal of Interdisciplinary Studies,Vol.1(2):211-223