



## Impact of Non-Oil tax revenue on economic growth in West Africa: Multivariate panel data approach

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### Abstract

This study examined the impact of non-oil tax revenue on economic growth in West African Countries. Specifically, the study sought to: investigate the impact of value added tax on economic growth in West Africa; examine the impact of company tax revenue on economic growth in West Africa; determine the impact of personal tax revenue on economic growth in West Africa. The variables used in the study were value added tax (VAT), company tax revenue (CIT), personal tax revenue (PIT) and real GDP growth and were collected over period of 1990 to 2020 from World Bank database (WDI) 2021. Sample of five (5) West Africa countries namely Nigeria, Ghana, Mali, Togo and Burkina-Feso out of twenty (20) West Africa countries were used in the study. The method of data analysis was Generalized panel least square. The empirical results showed that value added tax revenue (VAT) has positive and significant impact on economic growth in West Africa; company tax revenue (CIT) has positive and significant impact on economic growth in West Africa; capital gain tax revenue (CGT) has positive and significant impact on economic growth in West Africa and personal tax revenue (PIT) has positive but insignificant impact on economic growth in West Africa. This study concluded that there is positive and significant impact of non-oil tax revenue on economic growth in West Africa. Non-oil tax revenues contribute on the average 46 percent increase in economic growth in West Africa countries. The study recommended that tax authorities of West Africa countries should engage in a complete re-organization of the company tax revenue (CIT) administrative machineries.

**Keywords:** non-oil tax revenue, economic growth and econometric panel data

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### Introduction

The need for African countries to improve tax revenue-GDP ratio has open up debate among policy makers. The need for tax payments has been a phenomenon of global significance as it affects every economy irrespective of national differences (Adegbe, Salawu & Ojutawo, 2020) <sup>[1]</sup>. Taxation is an age long event, obligatory, non-negotiable, binding and compulsory government imposed levy on all citizens of a country regardless of religion and social status.

Tax revenue is frequently considered as an alternative form of sustainable financing within a stable and predictable fiscal environment to promote growth and enable governments to finance their social and infrastructural needs. Present day government needs a great deal of income in order to perform its duties viably because without adequate income, it would result to sluggish legislature and the standard of living of the populace would be in jeopardy. It is necessary for governments to establish various income sources in order to increase its income base that will enable it to fund its obligations (Fineboy & Omodero, 2020) <sup>[6]</sup>.

The purpose of government is to provide basic amenities, protect the lives and property of the citizens and create the enabling environment for individual and corporate organization to thrive. However, for the government to carry out these responsibilities, it needs to mobilize revenue through taxation of the citizens and corporate organizations. Thus, the whole essence of tax is to generate revenue which could be used to advance the welfare of the citizens and to regulate the economy (fiscal policy).

While taxation plays a significant role in income redistribution, protection of weak and infant industry, the revenue generated through it plays a crucial role in promoting economic growth and development (Uzoka & Chiedu, 2018) <sup>[19]</sup>.

West Africa is one of the linguistically most diverse parts of the world, in which hundreds of languages that belong to four different language families are spoken. Because English is one of the languages spoken there, six West African countries have been classified as anglophone namely Gambia, Sierra Leone, Liberia, Ghana, Nigeria and part of Cameroon while the remaining eleven countries are Senegal, Guinea-Bissau, Guinea, Ivory Coast, Mali, Togo, Benin, Burkina Faso, Niger, Chad and the other part of Cameroon - are referred to as francophone. What the anglophone countries have in common is that English is spoken in a highly multilingual setting, in which it enjoys an important status as an official or national language and functions as the language of government, law, business and commerce, education and media. However, not only one form of English exists in these West African countries; typically a whole range of varieties are used side by side (Oboh, Chinonyelum & Edeme, 2018) <sup>[11]</sup>. Over decades, economists have been interested in investigating factors causing different countries to grow at different rates and achieve different levels of wealth accumulation. However, several economists agree that taxation is one of the significant factors that determine the productive capacity of the country (Stoilova, 2017) <sup>[18]</sup>. Therefore, the concern of this study is to verify the impact of non-oil tax revenue on economic growth in West Africa, the significant position of non-oil tax revenue variables on economic growth if any exist and the type of tax that contributes most to economic growth in West Africa.

### Statement of the Problem

Revenue Statistics of Africa report that 56 percent of West Africa countries are indebted to World international development banks on the account to finance government budget deficits with public borrowing instead of internal generated income tax revenue. As of 2021, the total external public debt in West Africa amounted to around 164 billion U.S. dollars. Nigeria and Ghana recorded the highest levels of debt in the region, at approximately 79.54 billion U.S. dollars and 21.91 billion U.S. dollars, respectively. On the other hand, Gambia and Guinea-Bissau registered the lowest values, at 823 million U.S. dollars and 381 million U.S. dollars, respectively. Overall in Africa, a total external public debt of around 727 U.S. dollars was reached at the said date. Whereas trending position of total revenue Nigeria shows that the tax-to-GDP ratio in Nigeria has decreased by 1.0 percentage points, from 7.3 percent to 6.3 percent in 2018. The highest tax-to-GDP ratio in Nigeria was 9.6 percent in 2011, with the lowest being 5.3 percent in 2016 while Ghana shows that the tax-to-GDP ratio in Ghana has increased by 1.0 percentage points, from 11.4 percent to 12.2 percent in 2015. The highest tax-to-GDP ratio in Ghana was 13.7 percent in 2017 and 14.1 percent in 2018 (Revenue Statistics in Africa, 2016). But all these increase in tax revenue in Ghana and up and down fluctuation in Nigeria tax revenue have reduce the countries national borrowing, which leads to their national debt. It means that Nigeria, Ghana, Gambia Guinea-Bissau and many other West Africa countries have not generated enough tax revenue to finance their national budgets and this stands as impediment to

actualize desired and sustainable economic growth in West African countries. The reasons for the inadequacy of tax revenue created in West Africa countries may be due to many different factors including dearth of statistical data, unimpressive tax administration, double taxation, inability to prioritize tax effort and endemic corruption (Gbato, 2017) <sup>[7]</sup>. After a review on 51 empirical studies, it was noticed there were limited studies on impact of non-oil tax revenue on economic growth in West Africa covering 31 years across 6 countries starting from 1990 to 2020. Scholars like Margareta and Åsa, (2012) <sup>[8]</sup> examined impact taxation of income on Economic Growth in 25 Rich OECD Countries; N'Yilimon, 2014 investigated effect of taxation on economic growth in West Africa Economic and monetary Union; Oboh, Chinonyelum and Edeme, 2018 <sup>[11]</sup> evaluated the impact of tax revenue on Economic Growth in selected ECOWAS Countries, have paid less attention on area of the research interest taking cognizant cross sectional econometrics study.

### Objectives of the Study

The broad objective of the study is to examine the impact of non-oil tax revenue on economic growth in West African Countries. The specific objectives are to:

1. Investigate the impact of value added tax on economic growth in West Africa.
2. Examine the impact of company tax revenue on economic growth in West Africa.
3. Determine the impact of personal tax revenue on economic growth in West Africa.

### Conceptual Literature

#### Taxes Revenue

A tax is a compulsory payment from firms and household to the government (Egbunike, Emudainohwo & Gunardi, 2018) <sup>[5]</sup>. Every tax must be based on a valid statute. If there is no valid statute, no legitimate tax can be imposed (Okafor, 2012) <sup>[12]</sup>. It is a financial charge or other levy imposed upon a taxpayer (an individual or legal entity) by a state or the functional equivalent of a state, usually considered a major source of government revenue for the funding of various public expenditures (Edame & Okoi, 2014) <sup>[3]</sup>.

#### Economic Growth

Economic growth is defined as a rise in national income or output per capita over a long period of time. It's an economic condition in which the rate of rise in national output must outpace the rate of population growth. Economic growth is the long-term expansion of the economy's productive potential. It entails a gain in Real GDP, which translates to increased national output and wealth. The market worth of all products and services produced in a country during a given time period is known as real GDP. Real GDP is a measure of a society's wealth since it shows how quickly profits can expand and the expected return on investment (Okerekeoti, 2022) <sup>[13]</sup>.

### Theoretical Literature

#### Laffer curve theory of taxation

The Laffer curve theory of taxation is a theory formalized by supply-side economist Arthur Laffer in 1974 to show the relationship between tax rates and the amount of tax revenue collected by governments. The Laffer curve describes the relationship between tax rates and total tax revenue, with an optimal tax rate that maximizes total government tax revenue.

The Laffer curve states that if tax rates are increased above a certain level, then tax revenues can actually fall because higher tax rates discourage people from working. If taxes are too high along the Laffer curve, then they will discourage the taxed activities, such as work and investment, enough to actually reduce total tax revenue. In this case, cutting tax rates will both stimulate economic incentives and increase tax revenue. The Laffer curve is based on the economic idea that people will adjust their behavior in the face of the incentives created by income tax rates. Higher-income tax rates decrease the incentive to work and invest compared to lower rates. If this effect is large enough, it means that at some tax rate, and further increase in the rate will actually lead to a decrease in total tax revenue. For every type of tax, there is a threshold rate above which the incentive to produce more diminishes, thereby reducing the amount of revenue the government receives.

The first presentation of the Laffer curve was performed on a paper napkin back in 1974 when its author was speaking with senior staff members of President Gerald Ford's administration about a proposed tax rate increase in the midst of a period of economic malaise that had engulfed the country. At the time, most believed that an increase in tax rates would increase tax revenue.

Laffer countered that the more money was taken from a business out of each additional dollar of income in the form of taxes, the less money it will be willing to invest. A business is more likely to find ways to protect its capital from taxation or to relocate all or a part of its operations overseas. Investors are less likely to risk their capital if a larger percentage of their profits are taken. When workers see an increasing portion of their paychecks taken due to increased efforts on their part, they will lose the incentive to work harder. Put together these could all mean less total revenue coming in if tax rates were raised. Laffer further argued that the economic effects of reducing incentives to work and invest by raising tax rates would be damaging in the best of times and even worse in the midst of a stagnant economy. This theory, supply-side economics, later became a cornerstone of President Ronald Reagan's economic policy, which resulted in one of the biggest tax cuts in history. During his time in office, annual federal government current tax receipts from \$344 billion in 1980 to \$550 billion in 1988, and the economy boomed. The Laffer Curve was used as a basis for tax cuts in the 1980's with apparent success but criticized on practical grounds on the basis of its simplistic assumptions, and on economic grounds that increasing government revenue might not always be optimal.

### Empirical Literature

The link between income tax and economic growth in West African Countries has attracted the attention of the researchers and scholars. This section presents the empirical review of related:

Egbuhuzor and Adokiye (2021) <sup>[4]</sup> examined the effect of indirect taxes on economic growth in Nigeria from 2003 to 2018. Specifically, the study investigated the effect of value added tax and custom/excise tax on economic growth in Nigeria. The descriptive statistics and multiple regression were used to test the postulated null hypotheses with the aid of EViews10 statistical software. The study revealed a negative and insignificant effect of value-added tax on gross domestic product. It also revealed a positive and significant effect of value-added tax on human development index. Also,

it revealed a positive and insignificant effect of custom and excise duties on gross domestic product. Finally, the study revealed a positive and insignificant effect of custom and excise duties on human development index. The study therefore recommends that the government should put in place mechanism to close up the loopholes in the VAT collection system since its effect on gross domestic product is negative and insignificant.

Onuselogu and Onuora (2021) <sup>[15]</sup> examined the effect of e-tax payment on revenue generation in Nigeria (2012-2018). The specific objectives of the study are to: determine the effect of e-company income tax payment on revenue generation in Nigeria; ascertain the effect of e-capital gain tax payment on revenue generation in Nigeria. The study applied secondary data obtained from Federal Inland Revenue Service tax report and CBN Statistical release and Quarterly Economic Reports. The data collected were analysed using Ordinary Least Squares Method. The results show that e-company income tax payment has an insignificant positive effect on revenue generation in Nigeria at 5 percent level of significance. The positive effect means that increase in company income tax payment increases revenue generation in Nigeria, though the impact is statistically insignificant at 5 percent. Whereas e-capital gain tax payment have negative impact on revenue generation and was statistically insignificant at 5 percent level of significance. The negative effect means that decrease in e-capital gain tax payment will decrease revenue generation in Nigeria, though the impact is statistically insignificant at 5 percent. The study recommended that in order to maximize the positive effect of the e-company income tax payment, Nigerian government should set modalities on how to sensitize companies on the importance of E-tax payment.

Arowoshegbe and Uniamakogbo (2021) <sup>[2]</sup> examined the effect of tax revenue on the economic development of Nigerian (1995-2015). Specifically, the study aimed at ascertaining whether there is any difference in using Human Development Index (HDI) and GDP in establishing the relationship. The study employed exploratory and ex-post facto research designs. The methods of data analysis were ordinary least squares (OLS) regression technique and error correction model (ECM). Findings from the study show a positive and significant relationship between tax revenue and economic development. The result also discloses that measuring the effect of tax revenue on economic development using HDI gives lower relationship than when the relationship is measured using GDP. This suggests that using gross domestic product (GDP) to measure economic development gives a particular view of the relationship between tax revenue and economic development in Nigeria. Though, both have a positive and significant relationship but the results obtained using GDP to measure Economic growth differs from that obtained using HDI for economic development. The study recommended that policy formulation on tax revenue for economic development should better be based on human development index rather than GDP.

Adegbie, Salawu and Ojutawo (2020) <sup>[11]</sup> investigated tax revenue volatility on economic growth in Nigeria cover a period of 1981 to 2017. Specifically, the study examined the impact of tax revenue, inflation and exchange rates on economic growth in Nigeria. This study adopted ex post facto research design. Pre-estimation tests were conducted using Pearson correlation and stationarity tests. The post-estimation tests included linearity, Heteroskedasticity,



Breusch-Godfrey serial Correlation Lagrangian Multiplier and stability test. Data were analyzed using both descriptive and inferential statistics. Findings revealed that tax revenue volatility moderated by inflation rate and exchange rate had significant effect on economic growth (EG) in Nigeria. This study concludes that tax revenue volatility affects economic growth in Nigeria. It is recommended that government should formulate tax policies that will encourage steady tax revenue. In addition, government should ensure prudent application of tax fund to the development of infrastructure that would translate into economic growth.

Ngu-Kumai (2020) <sup>[10]</sup> examined the effect of capital gains tax on total tax revenue and economic growth in Nigeria (2005-2018). Specifically, the study investigated the impact of capital gain tax, inflation rate, and interest rate on real gross domestic product (RGDP) in Nigeria. Ex-post facto research design was adopted and secondary data were collected from the Federal Inland Revenue Service annual reports, CBN statistical bulletins, and the National Bureau of Statistics. The simple regression technique was adopted and analyzed using E-views to establish the effect of the independent variables (capital gains tax, interest rate, and inflation rate) on the dependent variables (Total Tax Revenue, Gross Domestic Product) from 2005-2018. Findings indicate an insignificant positive relationship between capital gains tax and total tax revenue/economic growth in Nigeria. The study recommends that the administration and collection mechanisms of capital gains tax should be strengthened to ensure the tracking and collection of this form of tax in any part of the country where capital assets are disposed.

Fineboy and Omodero (2020) <sup>[6]</sup> examined the relationship between government revenues and the economic growth of Nigeria. The study employs exploratory and ex-post facto research designs while using secondary form of data spanning from 1981 to 2018 collected from the Federal Inland Revenue Services (FIRS), National Bureau of Statistics and CBN statistical bulletin. The relationship is tested by using Ordinary Least Squares (OLS) regression technique. The result reveals that federally received revenue and Value Added Tax (VAT) have a moderate positive relationship with the economic growth. The study provides evidence that there is a need for the government to formulate relevant revenue policies that will boost government income in order to have more favourable implication on the economy.

### Methodology

This study made use of ex post-facto research design. The pre-estimation and post-estimation tests were descriptive statistics, correlation matrix, ADF-Fisher Unit Root test statistic, Panel Johansen co-integration test, Ramsey Reset test, Jarque Bera, Breuch-Godfrey Serial Correlation LM Test respectively while the data analytical techniques were Hausman test and generalized Panel Ordinary least squares (GOLS) technique. A number of variables were considered in this study. These variables consist of real GDP (RGDP), Added Tax Revenue (VAT), Company income Tax (CIT), Personal Income Tax (PIT) were sourced from online World Bank Data indicators. All the variables were sourced for a period of 1991 to 2021 as defined in our model specification. The study samples five (5) Anglophone and Francophone West Africa countries out of twenty (20) West Africa countries. The countries were selected based on availability of detailed data on the study. The study countries were Nigeria, Ghana, Mali, Togo and Burkina-feso. The study

employed e-view version (9) statistical application software to analysis the data because it is user- friendly software.

### Theoretical Framework

The study adopted Laffer curve theory of taxation. The theory explained that taxation cutting tax rates will both stimulate economic growth and increase tax revenue.

$$Y = f(Tcr, Tr) \quad (1)$$

Where Y stands as economic growth, Tcr is taxation cutting tax rates and Tr is increase tax revenue. The Laffer curve theory of taxation was propounded by a supply-side economist Arthur Laffer in 1974 who established a threshold for tax collection. The Laffer curve is based on the economic idea that people will adjust their behavior in the face of the incentives created by income tax rates. Higher-income tax rates decrease the incentive to work and invest compared to lower rates. The theory shows the relationship between tax rates and the amount of tax revenue collected by governments. The Laffer curve describes the relationship between tax rates and total tax revenue, with an optimal tax rate that maximizes total government tax revenue. The choice for this type of theory among other taxation theories is because the theory was able to establish threshold for tax collection and its resultant effect of any change below and above the threshold point on income tax revenue and economic growth.

### Model Specification

This study specifically adopts the model of Onakoya, Afintinni and Ogundajo, (2017) <sup>[14]</sup> who investigated the impact of taxation on economic growth in Africa. The functional relationship is expressed as:  $GDP = (TAXR, FDI, INF)$  (1)

Where: *GDP* is the Gross Domestic Product; *TAXR* is the Tax Revenue, *FDI* is the foreign direct investment; *INF* is the inflation rate. Specifically, to achieve the objective of this study and based on the property of the linearity of variables, the functional relationship is modeled in a linear equation to yield Equation 2:

$$GDP_{it} = a_0 + \beta_1 \sum_{k=1}^p TAXR_{it} + \beta_2 \sum_{k=1}^p FDI_{it} + \beta_3 \sum_{k=1}^p INF_{it} + \mu_{it} \quad (2)$$

Where:  $\mu_{it}$  is the error term which denotes other variables that are not specified in the model; *i* represent the number of countries and *t* is the number of years.

### Model Specification for the Study

Thus, the model of this study is represented in a functional form as shown below:

$$GDP = F(VAT, CIT, PIT, EXCHR, INFLA) \quad (3.1)$$

Where: *GDP* is the Gross Domestic Product; was a dependent variable, *VAT* is the Value Added Tax, *CIT* is the company income Tax, *PIT* is the Personal Income Tax, exchange rate, inflation rate were independent variables. Specifically, to achieve the objective of this study and based on the perfect linearity of variables, the functional relationship is modeled in a panel linear equation to yield Equation 3.2:

$$\text{LogGDP}_{it} = \alpha_0 + \beta_1 \sum_{k=1}^p \text{LogVAT}_{it} + \beta_2 \sum_{k=1}^p \text{LogCIT}_{it} + \beta_3 \sum_{k=1}^p \text{LogPIT}_{it} + \beta_4 \sum_{k=1}^p \text{EXCHR}_{it} + \beta_5 \sum_{k=1}^p \text{INFLA}_{it} + \mu_{it} \tag{3.2}$$

**Results and Discussion**

**Table 1:** Descriptive Statistics of the Variables

	<b>RGDP</b>	<b>VAT</b>	<b>CIT</b>	<b>PIT</b>	<b>EXCHR</b>	<b>INFLA</b>
Mean	6.66E+10	521016.2	7.79E+09	38182.35	212.9466	12.23795
Median	7.94E+09	10.14475	27.91273	20.23535	97.01772	7.551911
Maximum	5.47E+11	4890270.	1.19E+11	369369.0	733.0385	80.75458
Minimum	9.83E+08	0.000000	0.000000	0.000000	0.000000	-7.594284
Std. Dev.	1.30E+11	1116988.	2.24E+10	84595.65	249.7644	14.73595
Skewness	2.356595	2.069580	3.105958	2.306521	0.661553	2.066083
Kurtosis	7.238292	6.111215	12.36672	7.513041	1.806254	8.429282
Jarque-Bera	207.5826	138.5303	652.6702	215.1798	16.40746	240.5181
Probability	0.000000	0.000000	0.000000	0.000000	0.000274	0.000000
Sum	8.25E+12	64606013	9.66E+11	4734612.	26405.38	1517.506
Sum Sq. Dev.	2.08E+24	1.53E+14	6.19E+22	8.80E+11	7673019.	26709.23
Observations	124	124	124	124	124	124

Source: e-view's Result

The table shows descriptive statistics of the variables. In the model established in the study, there is one dependent variable and six independent variables. The descriptive

statistics of the variables show the nature and status of mean, median, maximum, minimum, sum of the variable respectively.

**Table 2:** Result of Correlation Matrix

	<b>RGDP</b>	<b>VAT</b>	<b>CIT</b>	<b>PIT</b>	<b>EXCHR</b>	<b>INFLA</b>
RGDP	1.000000	0.732822	-0.166269	0.802795	-0.287710	-0.034670
VAT	0.732822	1.000000	-0.163170	0.913878	-0.232517	0.052656
CIT	-0.166269	-0.163170	1.000000	-0.157830	0.006462	-0.246731
PIT	0.802795	0.913878	-0.157830	1.000000	-0.230808	0.039576
EXCHR	-0.287710	-0.232517	0.006462	-0.230808	1.000000	-0.353223
INFLA	-0.034670	0.052656	-0.246731	0.039576	-0.353223	1.000000

Source: e-view's Result

This correlation matrix presents a table showing correlation coefficients between sets of variables. This result of correlation matrix helps to identify which pairs of variables have the highest correlation. This test is to detect whether

exact or perfect relationship exist among explanatory variables (multicollinearity). The result of correlation matrix showed that every explanatory variable in the study is linearly independent of each other.

**Unit Root Test using Augmented Dickey-Fuller Fisher Test**

**Table 3:** Results of Stationarity (Unit root) test

<b>Variables</b>	<b>ADF-Fisher Chi-Square Statistics</b>	<b>P-Value</b>	<b>Lag Number</b>	<b>Order of integration</b>
RGDP	63.6159	0.0000	1	I (1)
CIT	49.2001	0.0000	1	I (1)
PIT	59.8431	0.0000	1	I (1)
VAT	42.8482	0.0000	1	I (1)
EXCHR	57.4320	0.0000	1	I (1)
INFLA	51.4271	0.0000	1	I (0)

Source: Author's computation

In the table 3, the variables that were tested with unit root are shown, the values for Fisher Augmented Dickey Fuller (ADF) Fisher statistics are presented, the lag level of each variable was identified, and the P-values at 5% level of significant were pointed out. The order of integration of each variable was enumerated. The test detected that Real GDP

(RGDP), Value Added Tax (VAT), Capital Income Tax (CIT), Personal Income Tax (PIT), Exchange Rate (EXCHR), were stationary at difference one while Inflation (INFLA) was stationary at level. It is now referable to use Hausman test to identify best panel model specification to estimate the parameters.

**Co-integration Test Results****Ho = There is no co-integration (no long run relationship among Variable)****Table 4:** Co-integration Test Results

Johansen Fisher Panel Cointegration Test				
Series: RGDP VAT CIT PIT EXCHR INFLA				
Date: 10/13/22 Time: 08:42				
Sample: 1991 2021				
Included observations: 155				
Trend assumption: Linear deterministic trend				
Lags interval (in first differences): 1 1				
Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)				
Hypothesized	Fisher Stat.*		Fisher Stat.*	
No. of CE(s)	(from trace test)	Prob.	(from max-eigen test)	Prob.
None	47.24	0.0000	26.53	0.0009
At most 1	25.92	0.0011	10.96	0.2042
At most 2	18.07	0.0207	11.86	0.1577
At most 3	10.57	0.2276	9.941	0.2692
At most 4	5.469	0.7065	5.106	0.7462
At most 5	8.701	0.3681	8.701	0.3681

\* Probabilities are computed using asymptotic Chi-square distribution.

**Source:** E-view Results

The co-integration results in table 4.2.1 for the model (VAT, CIT, PIT, EXCHR, INFLA) reveals that both trace test and the Max-eigenvalue test indicates 2 co-integrating equation(s) at the 5 percent level of significance. Thus there is a long-run relationship among the variables (VAT, CIT,

PIT, EXCHR, INFLA). We therefore reject the null hypothesis of no co-integration amongst the variables and accept the alternative hypothesis.

**Estimation (Hausman Test)****Null Hypothesis: Random Effects are independent of explanatory variables.****Alternative Hypothesis: Null hypothesis is not true.****Table 5:** Results of Hausman Test

Correlated Random Effects - Hausman Test			
Equation: Untitled			
Test period random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	20.527706	5	0.0010

\*\* WARNING: estimated period random effects variance is zero.

The Hausman Test (also called the Hausman specification test) detects endogenous regressors (predictor variables) in a regression model. Endogenous variables have values that are determined by other variables in the system. The Hausman test helps to choose between fixed effects model or random effects model. The null hypothesis is that the preferred model is random effects. The alternate hypothesis is that the model

is fixed effects. In the test above, the Chi-square statistics was 20.52 and P-value was (0.000). Owing to the result, the null hypothesis was rejected and alternative hypothesis was accepted that null hypothesis is not true because the p-value of Chi-square statistics was small (less than 0.05). It means that fixed effect model was the best model specification.

**4.6 Fixed Effect Panel Data Estimation****Table 4.6:** Results of Fixed Effect Panel Data Estimation

Dependent Variable: LogRGDP				
Method: Panel Least Squares				
Date: 10/13/22 Time: 09:11				
Sample: 1991 2021				
Periods included: 31				
Cross-sections included: 4				
Total panel (balanced) observations: 124				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LogVAT	32376.67	8376.035	3.865393	0.0002
LogCIT	0.218976	0.110017	1.990379	0.0485

LogPIT	0.156505	0.141929	1.102701	0.2720
EXCHR	-1.44E+08	45222139	-3.177841	0.0018
INFLA	-1.32E+09	5.18E+08	-2.541241	0.0121
C	2.77E+10	1.90E+10	1.453577	0.1496
Effects Specification				
Period fixed (dummy variables)				
R-squared	0.771461	Mean dependent var	6.66E+10	
Adjusted R-squared	0.680565	S.D. dependent var	1.30E+11	
S.E. of regression	7.34E+10	Akaike info criterion	53.11474	
Sum squared resid	4.74E+23	Schwarz criterion	53.93354	
Log likelihood	-3257.114	Hannan-Quinn criter.	53.44736	
F-statistic	8.487290	Durbin-Watson stat	0.300940	
Prob(F-statistic)	0.000000			

Source: E-view Results

The fixed effect model specification was carried out to examine parameters estimates. In testing this hypothesis, Value Added Tax (VAT), Capital Income Tax (CIT), Personal Income Tax (PIT), Exchange Rate (EXCHR), and Inflation (INFLA) were regressed against Real GDP (RGDP). The empirical result shows that the coefficient of Value Added Tax (VAT) has positive significant impact on Real GDP (RGDP) because [P-value (0.0002) was less than its significant value (0.05)]. The empirical result shows that the coefficient of Capital Income Tax (CIT) has positive significant impact on Real GDP (RGDP) because [P-value (0.0485) was less than its significant value (0.05)]. The empirical result shows that the coefficient of Personal Income Tax (PIT) has positive insignificant impact on Real GDP (RGDP) because [P-value (0.2720) was greater than its significant value (0.05)]. The result of the F – statistical test shows that the overall regression of the variables was statistically insignificant. This is because observed values of the F – statistics (8.489) was greater than its critical value (3.830). Again, our empirical result shows that the R-squared ( $R^2$ ) is 0.7710.

### Econometric /Second Order Test

#### The null hypothesis; No cross-section dependence (correlation) in residuals

Table 4.7: Result of Breuch-Pagan LM Test

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	0.81021	6	0.6778
Pesaran scaled LM	0.73267		0.6780
Pesaran CD	0.677410		0.4981

Source: E-view Results

The Breuch-Pagan Serial correlation LM Test was used to identify whether the model suffers from cross section dependence (correlation) in residuals problem. The result of Breuch-Pagan LM Test was 0.81021 and its P-value (0.6778 > 0.05), we conclude that the model is free from cross section dependence (correlation) in residuals problem. This denotes that prediction base of the Ordinary Least Square estimates were efficient and unbiased.

### Summary of the Findings

The following are the major findings of the study:

Value added tax (VAT) has positive and significant impact on economic growth in West Africa (P-value 0.0002 < 0.05). Value added tax (VAT) has 32 percent positively significant impact on economic growth in West Africa. A percent change in value added tax result to 32 percent increase in economic

growth in West Africa.

Company tax revenue (CIT) has positive and significant impact on economic growth in West Africa (P-value 0.0485 < 0.05). Company tax revenue (CIT) has 21 percent positively significant impact on economic growth in West Africa. A percent change in company tax revenue (CIT) result to 21 percent increase in economic growth in West Africa.

Personal tax revenue (PIT) has positive but insignificant impact on economic growth in West Africa (P-value 0.2720 > 0.05). Personal tax revenue (PIT) has 15 percent positive insignificant impact on economic growth in West Africa. A percent change in personal tax revenue (PIT) results to 14 percent increase in economic growth in West Africa.

### Conclusion

This study concludes that there is positive and significant impact of non-oil tax revenues on economic growth in West Africa. Non-oil tax revenues contribute on the average 46 percent increase in economic growth in West Africa countries. Value added tax (VAT) and company income tax have positive and significant impact on economic growth in West Africa while personal income has positive but insignificant impact on economic growth in West Africa. The study provided empirical evidence to support that value added tax, company income tax, are most important sources of revenue capable of boosting economic growth in West Africa while personal income is yet to be developed to give maximum income contribution to economic growth in West Africa countries. The study provided empirical evidence to support of position of Laffer curve theory of taxation who explained that reduce tax rates will both stimulate economic growth and increase tax revenue. The Laffer curve is based on the economic idea that people will adjust their behavior in the face of the incentives created by income tax rates. Higher-income tax rates decrease the incentive to work and invest compared to lower rates. If this effect is large enough, it means that at some tax rate, and further increase in the rate will actually lead to a decrease in total tax revenue. For every type of tax, there is a threshold rate above which the incentive to produce more diminishes, thereby reducing the amount of revenue the government receives. With the help of this theory, it is assumed that personal income tax and custom/excise income tax that is not significant in the study is attributed to absent of reduce tax rates to stimulate economic growth and increase tax revenue.

### Recommendations of the Study

Based on the findings of this study, the following

recommendations were made.

1. Tax authorities of West Africa countries should put in place mechanism to close up the loopholes in the Value added tax (VAT) collection system in order to discourage tax avoidance. The suggested mechanism from tax authorities of West Africa countries should involve rewarding tax officials according to performance so as to boost their moral and spur them into better efficiency and effectiveness performance towards their duties. The suggested mechanism from tax authorities of West Africa countries should involve increment in tax incentives so as to encourage voluntary compliance. Again, the suggested mechanism should involve continuous improvement in logistics for better record keeping, reliable transportation for tax officials and better conditions of service to also alleviate the challenges faced by tax authorities.
2. Tax authorities of West Africa countries should engage in a complete re-organization of the company income tax (CIT) administrative machineries. The re-organization in tax administrative should involve punitive measures to sanction corrupt officials who refuse to remit collected tax funds. This is to reduce problems of tax evasion and avoidance in company income tax. This will help to establish the culture of good governance in tax administration so as to secure the loyalty of the populace.
3. Tax authorities of West Africa countries should cautiously manage the financial resources generated from personal income tax taxes. This will help to reduce common waste of funds. Tax authorities of West Africa countries should use the tax revenue to solving problems surrounding welfare of the citizen such as safe drinking water, no good road network, improved healthcare system and educational system. This will help the citizens to pay tax voluntarily and generate more of tax revenue for economic development.

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