



THE NEXUS BETWEEN FINANCIAL DEEPENING AND NON-OIL TAX REVENUE IN NIGERIA

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Abstract

Tax revenues are the major drivers of government revenue sources for many economies all over the world. In Nigeria, the non-oil tax component has been the major source of tax revenue for government, growing by approximately 126% over the last 15 years. Despite the huge amount of non-oil tax revenues in Nigeria, it still constitutes an abysmal portion of government's annual budgets. The extent to which the economy churns tax revenues is intricately connected to the level of financial deepening. In view of this, this study investigated the nexus between financial deepening and non-oil tax revenues in Nigeria over the last fifteen years. The study measured financial deepening using private sector credit and stock market activities while non-oil tax was proxied by total annual tax revenues from non-oil sources. Specifically, private sector credit was measured using Core Credit to the Private Sector (CCPS) and stock market activities were measured using volume of shares traded (VOL). Data was collected on quarterly basis over the period 2010 to 2024. Inferential analysis was conducted using ADF test for unit root, long run form bounds test for cointegration and the ARDL model. The paper documented significant positive effects of CCPS and VOL on non-oil tax revenue in Nigeria. The study concluded that financial deepening in terms of money and capital market activities do influence positively the size of non-oil tax revenues the Nigerian government can realize. It was recommended that government should put in place special credit schemes to promote non-oil private sector credit and equally ease access to the stock market by private firms in Nigeria so as to promote growth in non-oil tax revenues in Nigeria.

Keywords: financial development, credit to private sector, value of shares traded, non-oil tax revenue, Nigeria

1. Introduction

One of the major sources of revenues for governments the world over is taxes, and as a result, taxes have grown over the decades in a complex manner (Oladipo et al., 2023). Taxes are levies of mandatory nature imposed and backed by the law on citizens with a view to facilitating the provision of basic services by governments. It is so indispensable that governments have consistently over the years preoccupied themselves with improving revenues from taxes (Appah, 2023). Despite these continuous efforts by governments, revenues from tax sources have remained as one of the areas that improvement shall continuously be sought.

Extant theories have explained that taxes have supply and demand dimensions. Most of the theories posited that the supply-side dimension is particularly essential to improving an economy's tax revenues and collection efficiencies (Udeh, 2021). Based on

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this line of thinking, tax revenue is seen as basically a function of the financial system with its gamut of markets, instruments and institutions (Ajide & Bankefa, 2017). The strength of financial intermediation thus has far reached implications for capital formation and tax revenue growth since most taxes are based on value-added approach (Onwuchekwa & Aruwa, 2014). Therefore, Nyianzi et al. (2018) argued that the extent of tax revenue efficiency should generally relate to the level of financial development.

Gnangnon (2019) argued that financial development is intricately linked to a country's level of tax collections and efficiency. Therefore, the depth of financial markets as well as access to financial products facilitates intermediation and productive operations within the economy. Such improved operations give rise to the formation of new capital and creation of value within the economy. The increase in the volume of economic activities thus results in more tax payments.

Reliance on tax revenues as source of government finances is an age long practice of public finance. As it is the case with most developing economies, Nigerian government's reliance on tax revenue as a veritable source of financing budgets have been on the rise over the last two decades. According to the Central Bank of Nigeria (CBN, 2024), total tax revenues accruing to government stood at N21.7 trillion, with N5.8 trillion accruing from oil Sources (constituting approximately 27%) while non-oil tax revenues accounted for N15.9 trillion (representing approximately 73% of total tax revenues. It is clear from the foregoing that non-oil tax revenues have continued to assume increased importance in defining government revenue sources in Nigeria.

According to Oladipo et al. (2023) and Oziegbe and Itua (2024), non-oil tax revenues have gained tremendous attention in recent times because they contribute more to government's total tax revenue and are more stable and well-diversified compared to oil-related tax revenues. However, despite their laudable contributions to government revenues in Nigeria, non-oil taxes have also been exhibiting fluctuations in recent times. This fluctuation is particularly unhealthy considering the astronomical increase in government budgets and expenditure profiles over the years in Nigeria. Budgetary expenditure has leapfrogged from a modest N4.079 trillion in 2010 to an unprecedented N28.78 trillion (CBN, 2024). The undulating trend undermines government's revenue expectations and thus affects the level of target growth of the economy. According to scholars like Appah et al. (2023) and Otekunrin et al. (2023), fluctuations in tax revenues are intricately connected to the level of financial development.

In Nigeria, the level of financial deepening at the money and capital markets leaves so much to be desired. It can be argued that while the total amount of credit extended to the private sector has continued to improve over the years, the increase appears to be disproportionate with the level of non-oil tax improvements. The same can be said on the growth of money supply in Nigeria as increase in stock of broad money supply does not significantly stimulate the economy.

For the capital market, while the value of shares traded appeared to be on the rise, there is little or no evidence to support the notion that these increases have proportionately enhanced tax efficiency in Nigeria in terms non-oil tax revenues. While previous studies such as Appah et al. (2023), Oladipo et al. (2023) and Oziegbe and Itua (2024), have largely focused on the effect of non-oil tax revenues on economic growth of Nigeria, little research attention appeared to have been devoted to examining the effect of financial development on non-oil tax revenues in Nigeria.

It is against this backdrop that this study was conducted to examine the effect of financial deepening on non-oil tax revenue in Nigeria. The current study measured financial deepening with credit to private sector and value of shares traded while non-oil tax revenue was measured using total tax collections from non-oil related channels. Broad money supply was considered as a control variable.

In line with the objective of this study, hypotheses were raised in the null form for testing. The following hypotheses has been formulated to guide the study:

H₀₁: Core credit to private sector has no significant effect on non-oil tax revenue in Nigeria

H₀₂: Volume of shares traded has no significant effect on non-oil tax revenue in Nigeria

2. Literature Review

Conceptualisation

Non-oil Tax Revenue

Tax is defined simply as a compulsory levy imposed by the law on a portion or category of income (Oladipo et al., 2023). It is often sanctioned using the state's machinery and failure to comply with taxes by individuals and institutions leads to the imposition of penalties, fines and charges (Oziegbe & Itua, 2024). Taxes are of different categories, depending on their objective, nature and motive. However, they are generally classified into direct and indirect.

In Nigeria, there has been a consistent pattern of heavy reliance on one pronounced type of tax. As a result of operating a mono economy reliant solely on oil as source of revenue in the past, the most dominant source of tax revenue in Nigeria is oil-related taxes (Otekunrin et al., 2023). However, taxes from non-oil sources have substantially improved over the years, leading to a diversified source of tax revenue for the government. Examining tax revenue from non-oil sources in Nigeria provides a background to understanding the dynamics of government revenue sources in Nigeria, especially considering the instability bedeviling the Nigerian economy in recent years after the 2016 economic recession.

The recent rapid growth in the non-oil component of Nigeria's total tax revenue has promoted debates and research efforts around tax revenue diversification for Nigeria. The increase over the years in non-oil tax revenue is a pointer to its potential as a veritable source of revenue for government if it receives the required attention. Recent research attention has thus been focused on understanding the utility of non-oil tax revenue as a consistent, stable and sustainable source of revenue for the government in relation to oil tax revenues.

Studies that have examined non-oil tax revenue in Nigeria are not commonplace. However, substantial number of such studies such as Oziegbe and Itua, (2024), Oladipo et al. (2023), Otekunrin et al. (2023) and Udeh (2021) among others have used measures that expressed total non-oil tax revenue as a percentage of real GDP. This measure is indeed consistent with the global best practice measures of tax revenue where the total amount of taxes generated are expressed as a proportion of the total monetary value of economic activities for a given period of time. This current paper, in line with the extant literature, measures non-oil tax revenue as the annual non-oil tax to GDP ratio for Nigeria.

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Financial Deepening

Financial system is central and pivotal to the functioning of financial markets and institutions which in turn facilitates seamless intermediation. The level of development of financial system has been proven to be one of the major determinants of not only the financial system but even economic development as a whole (Hussein & Abdallah, 2022). The development of the financial system itself follows a defined pattern that connects with the architecture and configuration of markets and institutions.

In terms of financial markets, the level of financial development can be examined through the two major delineations of the market into money and capital markets. According to Appah et al. (2023), the stock of money in supply that mainly goes into money market institutions, particularly banks and other deposit taking institutions determines the performance and functioning of the money markets while stock market capitalization determines the depth and functioning of capital markets.

Credit to Private Sector

Credit to private sector is globally recognized as an important metric of measuring the extent of financial depth of an economy. According to Abdullah (2022), credit to private sector refers to the quantum of intermediation value by banks and other financial sectors with the private sector of an economy. The private sector acts on the principle of profit and value maximization and thus compel firms to efficiently use resources borrowed for their operations in productive ways (Ebi, 2018).

The extant empirical evidence suggests that the extent to which a country's Gross Domestic Product (GDP) grows is intricately connected to the level of access to credit by the private sector. Appah et al. (2023) argued that private sector firms rely on credit to expand operations, acquire more assets, create additional value and ultimately increase the country's GDP. Since all private sector credit is ultimately expected to result in increased value creation within the economy, credit to private sector is conventionally measured by expressing the value of the credit as a ratio of the GDP for a given year.

In Nigeria, the trend of private sector credit has been steadily on the rise over the years, pointing to growth in efficient intermediation within the financial system. According to the CBN (2024), the Core Credit to the Private Sector (CCPS) in Nigeria has been the major channel for financing growth in the private sector. The CBN developed the CCPS as a more distilled measure of the core portion of private sector credit that goes into its main productive activities. Thus, given the indispensable importance of private sector credit in revealing the depth and sophistication of the financial system, this paper utilized the credit to private sector as an important variable. In order to make informed inferences, this paper, as a departure from previous studies, employed the core credit component of private sector credit in Nigeria as reported by the CBN to measure of credit to private sector.

Shares Trading Value

The stock market of every economy plays a critical role in the mobilization of funds on long term basis to financial growth. The market provides a platform for firms and governments to raise long term capital to finance operations and developmental projects and infrastructure (Nyazi et al. 2018). Onwuchekwa and Aruwa (2014) argued that stock markets are capital hubs for the economy, and their level of development relates asymmetrically to the growth of the financial system. Thus, performance of the stock market is correlated directly with the level of capital formation and wealth creation within any given economy.

The performance of stock markets is often measured using standard indices that are largely uniform across the globe. One of such important indices is the total value of shares traded. According to Appah et al. (2023), value of shares is an important metric to gauge the extent of capital market depth because it is the most manifest indicator of the level of liquidity of the stock market. Abdullah (2022) defined value shares traded as the total monetary value of the number of shares traded when expressed in monetary terms for a given period of interest. Put differently, value of shares traded is the total volume traded for a given period multiplied by the respective prices of such securities. It is important to note that value of shares traded covers both the shares bought and those sold at a given time.

The literature is rich with arguments confirming the importance of liquidity to financial markets and by extension to the financial system. The issue of liquidity is particularly more important in the stock market, being a market for mobilizing long term resources to finance long term growth and value creation within the economy. Studies have shown that value of shares traded is better measured in relation to GDP as its percentage will reveal how significant is the contribution of stock market liquidity to the overall growth of the economy (Ebi, 2018).

In Nigeria, the value of shares traded has relatively fluctuated in the past years but the value seemed to have grown steadily in recent times owing to increased patronage of the stock market. Since trading value is an important metric for gauging stock market depth and liquidity in Nigeria, this paper found it expedient to adopt it as an important measure of financial development.

Empirical Review

The relationship between financial deepening and tax revenue has received reasonable attention in the literature over the years. However, preponderance of the studies has paid attention to the effect of financial deepening on oil tax revenue considering the heavy global reliance on oil tax as an important source of tax revenue to economies. However, only a few of such studies have examined the effect of deepening on non-oil tax revenue.

In Nigeria, studies on non-oil tax revenue have almost exclusively concentrated on the effect of non-oil tax revenue on economic development. The recent of such studies is Oziegbe and Itua (2024) who investigated the dynamic long run relationship between non-oil tax revenue and infrastructural development in Nigeria from 1981 to 2021. The study employed Value added Tax, customs and excise duties and company income tax as measures of non-oil tax revenue in Nigeria while infrastructural development was proxied by total electricity consumption in megawatts. Using the ARDL model, the study found that there exists cointegration between the variables. The study also found significant positive effect of VAT, customs and excise duties and company income tax on infrastructural development of Nigeria in the long run. It was thus concluded that the contribution of non-oil tax revenue towards infrastructural development in Nigeria is substantial.

Appah et al. (2023) examined the moderating role of financial development on the relationship between tax revenue and economic development in Nigeria for the period from 1991 to 2020. Tax revenue was proxied by personal income tax, company income tax and petroleum profit tax while economic growth was measured by Human Development Index and Per capita Income. Using the standard ARDL model, the study found that personal

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income tax, company income tax and petroleum profit tax have significant and positive effect on economic development while financial development positively moderates the relationship between tax revenue and economic development. It was concluded that the level of financial development defines the benefits that tax revenue can have on economic development of Nigeria.

Oladipo et al. (2023) examined the effect of non-oil revenue on the economic growth of Nigeria from 1990 to 2021. The study measured non-oil revenue using VAT and company income tax while economic growth was proxied by real GDP. The VECM was used as tool of analysis. Findings of the study revealed that VAT and company income tax have positive and significant effects on economic growth in Nigeria, suggesting the increased importance of non-oil revenue.

Otekunrin et al. (2023) examined the impact of oil and non-oil tax revenue on economic growth in Nigeria from 1980 to 2019. The independent variables considered by the study were Value added tax, petroleum profit tax, company income tax and customs and excise duties. The dependent variable was real GDP. Stationarity test and cointegration analysis were utilized by the study to establish the extent of long run relationship among the variable used in the study, while Error correction model was used as the tool for analysis. The results revealed that petroleum profit tax and customs and excise duties have positive and significant long run relationship with real GDP in Nigeria. However, company income tax and value added tax have negative and significant relationship with economic growth in Nigeria. The study concluded that while oil revenue has positive long run effect on economic growth in Nigeria, non-oil revenue appears to relate negatively with economic growth in Nigeria.

Hussein and Abdallah (2022) analyzed the effect of financial development on tax revenue in Tanzania with a view to determining the extent of financial depth. The study utilized data collected over the period 1996 to 2020 and the Dynamic OLS method was used to analyze the data. The study documented significant effect of financial development on tax revenue profile in Tanzania and concluded that financial development characteristics in Tanzania shape the quantum of tax revenue.

Udeh (2021) evaluated the effect of oil and non-oil revenues on economic growth of Nigeria using data over the period 1981 to 2015. The study employed ADF, cointegration and error correction model to ascertain the relationship. It was found that oil and non-oil tax revenues have significant positive effects on economic growth of Nigeria.

Yahaya and Yusuf (2019) analyzed the long run relationship between non-oil tax revenue and economic growth in Nigeria over the period 1980 to 2017. The measures of non-oil tax revenue utilized by the study were customs and excise duties, companies' income tax, value added tax and GDP. The study employed the ADF test to examine the level of stationarity among the variables, the results showed a mixture of levels and first difference in terms of stationarity. Thus, cointegration test and ARDL model were used as tools of analysis by the study. The study documented positive long run effect of company income tax on economic growth while customs and excise duties and value added tax have negative long run effect on economic growth in Nigeria. The study concluded that non-oil tax revenues play a significant role on economic growth in Nigeria.

Ebi (2018) employed aggregate annual time series data from 1993 to 2017 to examine the effect of financial sector development on tax revenue in Nigeria. The study relied on the World Bank indicators of financial development as it measures. The measures

cover depth, access efficiency and stability of financial markets and institutions. In more specific terms, bank credit to private sector was used as measure of depth of financial institutions, number of banks per 100,000 persons as measure of financial institutions' access, and banks' lending to deposit rates spread as measure of financial institutions' efficiency. For financial markets, ratio of stock market capitalization to GDP was used to measure financial market depth, stock market value traded as measure of financial market access, and stock market turnover ratio as indicator of financial market efficiency.

On the other hand, tax revenue in Nigeria was proxied by annual tax to GDP ratio over the period of the study. The study utilized ADF unit root test, cointegration analysis and error correction model to analyze the data and test hypotheses. It was found that financial development has significant long run effect on tax revenue in Nigeria. Specifically, access to and depth of financial institutions in Nigeria contributes more significantly to tax revenue growth in Nigeria. The study thus concluded that the extent of tax revenue generation and remittance is strongly dependent on the depth and access to financial institutions in Nigeria.

Olayungbo and Olayemi (2018) investigated the relationship between non-oil revenue, government expenditure and economic growth in Nigeria over the period 1981 to 2015. The study estimated a long run error correction model, impulse response and Granger causality among the variables. The results showed the existence of positive long run relationship between non-oil revenue and economic growth in Nigeria. On the other hand, the study found negative and significant long run relationship between government spending and economic growth. Results from Granger causality test reveal that government spending Granger cause both non-oil revenue and economic growth in Nigeria. It was thus concluded that the findings support the Keynesian and spend-tax hypothesis.

Theoretical Framework

This paper is underpinned by the supply-leading theory of financial development developed by Patrick (1966) and popularized by Goldsmith (1969) and Xu (2000). The supply-leading theory is based on the assumption that there are well-functioning organs in every financial system. These organs consist of markets, institutions and instruments. The theory also assumes that the major aim of financial systems is to promote efficient resource allocation through financial intermediation.

In its simplest form, the theory holds that financial institutions within the financial system play a critical role of stimulating intermediation and formation of economic resources within the system. According to the theory, the financial system acts as productive input in the production process through which the volume of activities increases. This increase in the volume and level of productive economic activities in turn provides means for generating tax revenues for governments to further deploy the necessary infrastructure to stimulate long term future growth and development.

The choice of this theory to underpin this study is justified by the fact that the means of financial development activities in the Nigerian financial system such as private sector credit and stock market activities lead to increase in economic activities and accrual of tax revenue to the government in general and non-oil tax in particular. Thus, as the financial system expands and develops through increased intermediation, tax revenue increases in the same direction.

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3. Methodology

This paper employs the ex post facto research design since the data employed was based on past events relating to the financial system and oil tax revenue in Nigeria. In terms of the nature of relationship, this paper is based on the correlational research design. According to Kumar (2013), the correlational design seeks to establish relationships and incidences between variables. The data is of aggregate macroeconomic form, and therefore, population and sampling become immaterial over the period of the study.

The paper relies purely on secondary data collected from documentary sources. Precisely, data relating to non-oil tax revenue in Nigeria was collected from the website of the National Bureau of Statistics and annual reports of the Nigeria Revenue Service (NRS). Furthermore, data on credit to private sector and value of shares traded were collected from the Central Bank of Nigeria (CBN) annual statistical Bulletin for 2024. Data on annual real GDP was also extracted from the NBS website. The data was collected on quarterly basis from first quarter of 2010 to the fourth quarter of 2024, giving rise to a total of 60 time series observations.

Data for the study was analyzed using Augmented Dickey-Fuller (ADF) test for stationarity and the Autoregressive Distributed Lag (ARDL) model. The ADF test statistic is based on the following model:

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \dots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t \dots \dots \dots (1)$$

Where α is a constant, the coefficient on a time trend and the lag order of the autoregressive process. The stationarity tests have H_0 : y_t is stationary versus H_1 : y_t is non-stationary. So, by default, under the null, the data will appear stationary. The ADF was employed because it is the most popular and commonly used among the stationarity test family models.

The ARDL model developed by Pesaran (1999) and Pesaran et al. (2001). The ARDL model employs the bounds test to determine the extent of cointegration among variables in the long run and subsequently estimate the appropriate model. The result of ARDL bound test will be interpreted using the I (1) upper critical bound value and I (0) lower critical bound value I (0) as suggested by Pesaran et al. (2001). If the estimated F-statistic value is greater than I (1) value, it signifies that there exists a cointegration vector, null hypothesis is rejected. Thus, long-run relationship exists between the dependent and explanatory variables, whereas if the F-statistic value falls in between the upper and lower critical bounds, the analysis is inconclusive.

Conversely, if the estimated F-statistic value is less than the lower critical bound then it signifies that that there exists no cointegration vector and the null hypothesis is accepted, therefore no long-run relationship exists among the variables. In addition, lag selection test will be conducted, and the optimal lag will be determined based on the selection criteria of LR statistics, Final Prediction Error (FPE) statistics, Akaike Information Criteria (AIC), Schwarz Information Criteria (SC) and Hannan-Quinn Criteria (HQ).

To perform bound test for cointegration, the conditional ARDL (p, q1,q2) models as adapted is specified in the following logarithmic form:

$$NTX_t = \alpha_0 + \sum_{i=1}^p \beta_1 CCPS_{t-i} + \sum_{i=1}^p \beta_2 VOL_{t-i} + \sum_{i=1}^p \beta_3 MOS_{t-i} + ECM_{t-1} + \mu_t \dots \dots \dots (2)$$

Where NTX_t is non-oil tax revenue, CCPS is total core credit to private sector, VOL is volume of shares traded, MOS is money supply, and U_t is the population random disturbance term.

The variables employed in this study and their respective measures are presented in the table below:

Table 1

Variables Measurement

S/N	Variable	Nature	Measurement	Source
1.	Non-Oil Tax Revenue	Dependent variable	Measured as ratio of annual non-oil tax revenue to real GDP	Oziegbe and Itua (2024), Hussein and Abdallah (2022)
2.	Core Credit to Private Sector	Independent variable	Measured as ratio of total credit to private sector to real GDP	Nyanzi et al. (2018), Otekunrin et al. (2023)
3.	Value of Shares Traded	Independent variable	Measured as ratio of stock market capitalization to real GDP	Oladipo et al. (2023)
4.	Money Supply	Control variable	Measured as ratio of M2 to real GDP	Appah et al. (2023), Ajide and Bankefa (2017)

Source: Author's Compilation, (2025)

4. Results and Discussion

The paper commenced its analysis by examining the characteristics and behaviour of the data utilized. The summary of the essential descriptive statistics for the study is presented in Table 2

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Table 2

Descriptive Statistics of Variables

	NTX	CCPS	VOL	MOS
Mean	0.22	0.57	0.55	0.53
Max.	0.77	0.64	0.69	0.69
Min.	0.06	0.08	0.09	0.27
Std. Dev.	0.27	0.21	0.10	0.45
Skewness	0.05	4.93	0.47	1.66
Kurtosis	2.41	28.39	2.27	5.18
J-B	0.80	2.03	2.48	7.35*
Obs	60	60	60	60

Source: Extracted from E-views 13 Output, 2025

It can be seen from Table 2 that the mean values or average values for NTX, VOL, and MOS are respectively less than their standard deviations, which are measures of the rate of dispersion around the mean. However, the mean or average value of CCPS has standard deviation value that is greater than the average value, implying that there is high degree of dispersion for CCPS as a variable.

Furthermore, the relatively small difference between the maximum and minimum value for MOS suggests the presence of small range, pointing towards less variability in the respective series of the variables. This markedly contrasts with the relatively wide difference between the maximum and minimum values of NTX, CCPS, and VOL. This wide range is suggestive of the existence of higher range and variability in these three series. The evidence of higher variability in the latter group of variables further lends credence to their high level of dispersion earlier observed from examining their respective standard deviations.

In terms of distributional characteristics, all the variables appear to be skewed positively to the right. This is pattern of skewness implies that the tail of the distribution for all the variables under consideration is longer on the right side and therefore has more positive than negative values. The table further reveals that only NTX has a kurtosis value that is less than the standard threshold of 3. This implies that the series NTX depicts flatness at the surface of its distributions around the mean and therefore suffers from platykurtosis.

For the remaining variables of CCPS, VOL, and MOS, they all have excess kurtosis above the set threshold value of 3. This means that the distributions for these variables are peaked around the mean and therefore shows the signs of leptokurtosis. It can also be seen from the table that the test for overall normality of the variables shows that only MOS rejected Jarque-Bera's null hypothesis of normality of the series whereas the other three variables, namely NTX, CCPS and VOL failed to reject the null hypothesis. This is suggestive of the fact that only MOS was found to be not normally distributed, as the other three variables passed the test of normality. By implication, the remaining series of NTX, CCPS and VOL are normally distributed because they all failed to reject the null hypothesis of normality at the 1% level of significance.

Given the time series nature of the data, it is fundamental to examine the existence of unit root in the series of the individual variables of the study. Based on the analysis, results for the ADF unit root test are presented in Table 3

Table 3*ADF Unit Root Test Results*

Variable	ADF Statistics	Test Order Integration	of Stationarity
NTX	-2.933**	I(0)	Yes
CCPS	-2.680	N/A	No
CCPS(-1)	-4.935**	1(1)	Yes
VOL	-1.210	N/A	No
VOL(-1)	-3.847**	1(1)	Yes
MOS	-2.935**	1(0)	Yes

Source: E-views 13 Output, 2025

** denotes significance at 5%

It can be seen from Table 3 that the test result for ADF rejected the null hypothesis of presence of unit root in the level values of NTX and MOS at the 5% level of significance. This implies that the series were found to be stationary at levels and are therefore integrated of the order I (0). The table also revealed that CCPS and VOL failed to reject the ADF test null hypothesis of presence of unit root in the series at levels, but rejected the same null hypothesis at first difference under the 5% significance level. This implies that the variables were found to be stationary at first difference and are integrated of the order I (1).

The mixed level of stationarity for the variables at levels and first difference implies that the variables relate at the short and long run levels respectively. Based on this pattern of behaviour, the Autoregressive Distributed Lag (ARDL) model becomes the appropriate tool to use for inferential analysis. This is because the tool is designed to capture short and long run dynamics at the same time (Pesaran & Shin, 2012)

In order to address the possibility of collinearity among the variables, the paper also established the correlation among the variables employed for analysis. Table 4 presents the bivariate correlation loadings for all the variables with a view to identifying the severity of cross-correlations among the variables.

Table 4*Variables Correlation Matrix*

	NTX	CCPS	VOL	MOS
NTX	1.00			
CCPS	-0.12	1.00		
VOL	0.42	0.22	1.00	
MOS	0.57	-0.15	0.63	1.00

Source: E-views 13 Output, 2025

Table 4 shows that the absolute minimum bivariate correlation between the dependent variable OTX and all the regressors is approximately -0.12 for CCPS, and the maximum correlation is 0.57 for MOS. The association between the dependent variable and independent variables, on the whole, appears to be fairly reasonable since the values are less than the maximum threshold of 0.7 advocated by Hair et al. (2017). Also, the association between CCPS with the minimum being -0.15 and the maximum being 0.22.

Similarly, the correlation loadings among the other variables, VOL and MOS is also within acceptable bounds of less than the threshold of 0.7. The results on the whole

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suggest that there is no potent reason to suspect the likelihood multicollinearity among the regressors. To be sure that there are no traces of collinearity in the variables, the Variance Inflation Factors (VIF) test was conducted as a confirmatory test. Results for the VIF test on the regressors are presented in Table 5.

Table 5

Variance Inflation Factors Test Results

Variable	Centered VIF
CCPS	3.55
VOL	2.70
MOS	2.45
Mean VIF	2.28

Source: E-views 13 Output, 2025

It can be seen from Table 5 that CCPS has a VIF value of less than four while VOL and MOS both have values of less than three. The mean or average VIF value is 2.23, which is by far below the threshold value of 5.00 recommended by Brooks (2014). The results further confirm that there is no possibility of collinearity among the variables in the model since the tendency of the variance being inflated is very low.

Based on the stationarity properties of the variables, the ARDL bounds test for cointegration was conducted to ascertain whether the variables converge at an equilibrium in the long run. Table 6 presents the results from the test.

Table 6

Bounds Test Results for Variables' Cointegration

Bounds Statistics	Statistics Value	I(0) Bound	I(1) Bound	Decision
F-Bounds Statistic	15.99	2.00	3.09	Long run Cointegration
t-Bounds Statistic	-7.90	-2.62	-4.45	Long run Cointegration

Source: E-views 13 Output, 2025

Table 6 shows that the bounds test returned F-statistics and t-statistics. While the F-statistics was approximately 15.99, the t-statistics on the other hand was -7.90. The table also shows that the lower I (0) bound for the F-statistics is approximately 2.00 while the corresponding upper I (1) bound for the same statistics is 3.06. Similarly, the table depicts t-statistics I (0) lower bound value of -2.62 and I (1) upper bound value of -4.45.

Given that the F-statistics value of 15.99 is greater than the upper I(1) bound value of 3.09, the null hypothesis of no cointegration is strongly rejected by the bounds test. Similarly, a higher absolute t-statistics value of -7.90 when compared to the upper I(1) bound value of -4.45 also supports the reject of null hypothesis of no cointegration among the variables. Rejection of the null in both cases suggests that there is long run cointegration among the variables in the model. Therefore, the estimated ARDL model includes a long run Error Correction Term (ECT) obtained based on residuals from an estimated long run model with the different variables.

The existence of long run cointegration among the variables requires that the appropriate number of lags for estimating the model be determined. Table 7 presents the lag selection results.

Table 7*Results for Optimum Lag Selection*

Lag	LR Statistic	Final Prediction Error(FPE) Statistic	Akaike Criteria (AIC)	Info Criteria (SC)	Hannan-Quinn InfoCriteria (HQ)
0	NA	1936010	17.36	17.72	17.49
1	7.54	1626862	17.18	17.59	17.33
2	1.70*	1624135*	17.18*	17.62*	17.34*
3	15.00	861192.11	16.59	17.12	16.78

Source: E-views 13 Output, 2025

** denote significance at the 5% level

From Table 7, it can be seen that the model was estimated based on a maximum lag length of 3 which the software selected by default based on the density of data points. It can also be seen that the lag selection criteria results were essentially based on five different statistics, namely the LR statistics, Final Prediction Error (FPE) statistics, Akaike Information Criteria (AIC), the Schwarz Criteria (SC) and Hannan-Quinn (HQ) criteria. The table further reveals that the values of the statistics for all the five lag selection criteria are statistically significant at the 5% level under the second lag.

The significance of all the values at lag 2 as can be seen from the table implies that the test results have selected the lag as the most optimal for all the variables. Thus, the estimated ARDL model was composed of two lags of all the variables estimated in order to account for short run dynamics. The test of hypothesis for each of the variables was therefore be based on the significance of either first, the second or both the two lags of a given variable as the case may be.

Flowing form the selected lag, the parsimonious ARDL model with error correction term was estimated. The results from the model are presented in Table 8.

Table 8*ARDL Short Run Model Results with Error Correction*

Variable	Coefficient	t-Statistics
NTX(-2)	0.99 (0.28)	4.03**
CCPS(-2)	28.81 (10.40)	2.83**
VOL(-1)	5.00 (1.76)	2.95**
MOS(-2)	221.74 (103.62)	2.19*
ECT(-1)	-1.62 (0.34)	-5.36***
R-Squared		0.68
Durbin-Watson Statistics		1.99
F-Statistics		29.01***

Source: E-views 13 Output, 2025

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The figures in parenthesis are standard errors

*, ** and *** denote significance at the 10%, 5% and 1% levels respectively

It can be seen from Table 8 that the table is divided into two main sections. While the first section presents results for test of significance of the independent variables of the study, the second segment presents summary of the model fitness and specification results. The first segment of the table showed that the second lag of the dependent variable NTX has a positive short run effect of 0.90 on the dependent variable.

The table further revealed that the second lag of CCPS has a positive long run effect of 28.81 on current NTX, which is the dependent variable, and was found to be significant at the 5% percent level. Furthermore, the table also depicted that the first lag of VOL has positive long run effect on the dependent variable. Similarly, the table also showed evidence that the second lag of MOS has positive long run effect on NTX. The corresponding t-statistics of 2.19 was found to be statistically significant at the 10% level.

In addition, the table revealed that the negative coefficient value of -1.62 for the one lag of ECT was found to be strongly significant at the 1% level. The significance can be seen based on the t-statistics value of -5.32. Accordingly, the null hypothesis of no long run relationship between the independent variables and current values of NTX was rejected in favour of the alternative hypothesis.

In terms of model fitness, the second segment of Table 8 presents some important statistics. First and foremost, the table showed R-squared of approximately 0.68, suggesting that the explanatory variables in the model explain approximately 66% of the variation in oil tax revenue in Nigeria. However, the table revealed that the Durbin-Watson statistics is 1.99.

As a Rule of Thumb, the value of Durbin-Watson is expected to be as close as possible to the value of 2. Thus, a value of 1.99 could be considered reasonably close to 2. The closer the value is to 2, the more unlikely is the possibility of serial dependence or auto-correlation in the value of the model's residuals. Thus, as far as the Rule of Thumb is concerned, the value of Durbin-Watson conveniently leads to the conclusion that there is no evidence to suspect the existence of auto-correlation or serial dependence in the model's residuals.

The last and perhaps most important indicator of model fitness is the F-statistics. The table showed that the estimated model has an F-value of approximately 28.11, which was found to be strongly significant at the 1% level. The significant value of F-statistics is a pointer to the fitness of the model and proof that the scatter plot of the residuals tightly fit around the regression line. In short, it shows that the model is well specified as it is.

To be further sure of the absence of serial dependence, the serial correlation LM test was conducted. The results are presented in Table 9.

Table 9

Model Serial Correlation LM Test Results

Test Statistic	Test Statistic Value
F-Statistics	3.09
Obs*R-squared	2.80

Source: E-views 13 Output, 2025

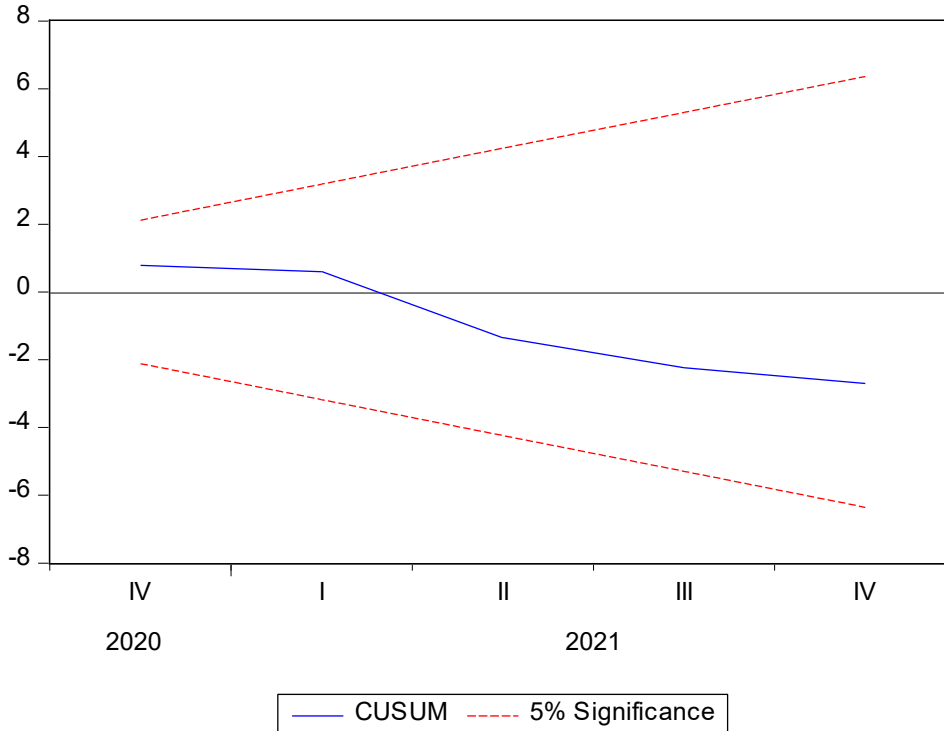
Table 9 shows that the test was based on two statistics, the F-statistics and the Obs*R-squared statistics. It can be seen from the table that the F-statistics value of 3.09

was not statistically significant at any of the conventional levels. This means that the model failed to reject the null hypothesis that there is no serial correlation in the residuals.

Similarly, the statistically insignificant value of 2.80 for the Obs*R-squared statistics suggests that the null hypothesis of absence of serial correlation was also not rejected. Thus, the residuals were found to be free from serial correlation based on the F-statistics and the values of Obs*R-squared statistics. This implies that there is absence of serial correlation in the residuals of the model.

To test for model stability, the Cumulative Sum of Squares (CUSUM) test was employed. Figure 1 presents the plot of the results.

Figure 1 CUSUM Test Results



It can be seen from Figure 1 that the CUSUM plot for the model lies conveniently within the upper and lower bound plots at the 5% level of significance. This implies that the model is dynamically stable and therefore does not suffer from any form of structural break. The stability of the model also suggests that the model does not suffer from any form of mis-specification.

Discussion of Findings

This paper examined the nexus between financial development and non-oil tax revenue in Nigeria. Results based on the ARDL model estimated showed that credit to private sector has significant positive effect on non-oil tax revenue in Nigeria. The result is consistent with the notion that private sector credit deepens the Nigerian economy and promotes efficiency in capital formation, and that ultimately results in higher revenues for government from non-oil tax sources.

This finding is a pointer to how important non-oil tax sources such as VAT custom and excise duties, stamp duties bad capital gains tax among others significantly improves as a result of improvements in credit extension and utilization by the private sector to finance the production of goods and the provision of services. The finding of positive effect

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of credit to private sector on non-oil tax revenue is consistent with the findings of Appah et al. (2023) and Oladipo et al. (2023).

The study also found positive and significant effect of stock market activities on non-oil tax revenue in Nigeria. The finding is consistent with the argument that non-oil firms in Nigeria access their capital through the stock market to finance their operations, which in turn increases total non-oil tax revenue for the government. This finding conforms to those of Oziegbe and Itua (2024), Hussein and Abdallah (2022). On the whole, the study found evidence that the deepening of the financial system has positive effect on non-oil tax revenue in Nigeria.

5. Conclusion and Recommendations

This study investigated the effect of financial development on non-oil tax revenue in Nigeria over a period of 15 years spanning 2010-2024. Flowing from the findings, the study concludes that private sector credit in Nigeria is important to the long run growth of non-oil tax revenue in Nigeria. Thus, extension of more private sector credit can bolster performance of the non-oil sector as the major revenue earner for the government in the form of taxes. The study also concluded that the positive effect of stock market activities on non-oil tax revenue is as a result of the access to finance by non-oil private sector firms in Nigeria.

In line with the conclusions of the study, it was recommended that Nigerian government should set up credit incentive schemes and intervention programmes for non-oil firms as major revenue earners to promote access to credit and improved operations. The improvement in operations will result in increased non-oil tax revenue to the economy. The study also recommended that the stock market should further ease access to the market by private sector non-oil firms in Nigeria to finance growth and expansion. Long term capital from the stock market is essential for financing long term growth of the Nigerian non-oil sector, which will in turn increase total non-oil tax revenue.

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