



ELECTRONIC TAX PAYMENT PRO-MAX AND REVENUE GENERATION: NEW EMPIRICAL EVIDENCE IN NIGERIA

Ifeanyi- Ogbuebunu, Chimezie Rose

Department of Accounting, Faculty of Management Sciences, University of Port Harcourt,
Choba, Port Harcourt.

Nwaiwu, Johnson Nkem

Department of Accounting, Faculty of Management Sciences, University of Port Harcourt,
Choba, Port Harcourt.

Ironkwe, Uwaoma Ignatius

Department of Accounting, Faculty of Management Sciences, University of Port Harcourt,
Choba, Port Harcourt.

Abstract

Electronic revenue collection in developing countries has gained increasing prominence in the policy debate recently. The recent trends in public taxation stress the need of developing a system of tax assessment and collection that involves internet services. Technological innovations have not filtered through to the daily working reality of tax officials. The aim of this study is to empirically analyze and derive empirically the relationship between electronic tax payment pro-max and revenue generation; new empirical evidence in Nigeria. ex-post facto research were adopted and time series data from 2000-2023 were collected from the central Bank of Nigeria statistical bulletin, National Bureau of Statistics, annual Central Bank of Nigeria reports and Federal Inland Revenue Service. Descriptive Statistics, ordinary least square regression analysis, stationarity test, Augmented Dickey Fuller test, Autoregressive Distributed Lag, Bound Test, Lag length selection, cointegration test was used in analyzing the data with the aid of E-view version 12.0. The empirical results indicated at 0.05 levels of significant, electronic tax filing and electronic tax registration positively and significantly relate to personal income tax. The study therefore conclude that there is a strong relationship between electronic tax payment pro-max and revenue generation and recommends that Nigerian tax authorities should streamline and expand accessibility of their electronic registration system, ensuring it is user-friendly and available across both urban and rural areas. Nigeria should focus on optimizing the electronic filing system by ensuring that it accommodated various tax types and is accessible during peak filing periods.

Keywords:

Electronic tax Filing, Electronic Tax Registration, personal Income tax, Technology, Revenue Generation.

Introduction

Over the past two and half decades or more, there has been contemporary considerable discussion and debate between electronic tax payment pro-max and revenue generation. Revenue generation is the process or laid down procedure for a country to legally get fund for running and administrating its governmental functions. There are many ways the government of a given nation could get its funds and institutions are put in place to collect such funds for its active citizens to pay revenue to the government. Afrane and Appah (2021), Ndalun and Igwe (2022), Olaoeye et al (2023), Gideon and Alouis(2013),Nwaiwu and Joseph (2025), Mo-moh Musa et al, 2025; Yahaya & Muhammed, 2025).

Tax being compulsory payment is made by citizen for which there is no immediate commensurate return. It is a burden burn by citizen to sustain the government (Ganyam et al, 2025). Aguolu (2024), Joseph (2024), posit that a tax is a levy by a government or its agencies on individuals, companies, and on goods and services, home made, imported, exported etc. Bhartia (2021) argue that a tax is a generalized exaction, which may be levied on one or more criteria upon individuals, or other legal entities. However Nzotta (2021) gave a more embracing meaning of tax. A tax is a compulsory levy contribution made by the citizens to the jurisdiction of the government, for reason of residence or property and this contribution is for general common use. Tax impose is a general obligation on the taxpayer. This means the tax payer has a duty to pay the tax, if he is liable and should not in any circumstances evade it. There is the presumption that the contribution to the public revenue made by the taxpayer may not be equivalent to the benefit received from the public sector (Idike et al, 2019 Friday, 2025).

The nexus between electronic tax payment pro-max and revenue generation has been an issue of interest to researchers, regual6tors, professional accountancy bodies, finance professional and available empirical studies on electronic tax payment pro-max and revenue generation (Kiringu & jagongo, 2017; Ganyam et al, 2019; Idike & Innocent, 2025; Brown, 2026) have been conducted in various sectors of the economy using different proxy's' for revenue generation, methodologies and time frame. It remains unclear the reasons why these empirical studies often yield conflicting result. These conflicting results reveal that the relationship between electronic tax payment pro-max and revenue generation is not concluded (Nwaiwu & Joseph, 2025; Yahaya & Muhammed, 2025). The inconclusive results have made the issues of electronic tax payment pro-max and revenue generation to further empirical studies. Also, few of these studies in Nigeria used electronic filing system and revenue generation variables in their respective study. The gap in terms of the location, period covered and methodology is also a contributory factor to the differences in the outcome of prior empirical studies.

Following the aforementioned gap created by the prior empirical studies in terms of findings and conclusion, this study aim at filling the gap by analyzing electronic tax payment pro-max and revenue generated for the period 1995-2025. To achieve the specific objectives of this paper, the following research questions and hypotheses were analysed in the study. The remainder of this paper is organized as follows after introduction. Section 11 discussed the relevant liter5ture on electronic tax payment pro-max and revenue generation. Section III lays out the analytical framework and econometric methodologies. Empirical result and discussion are reported in section 1v. While conclusion and recommendations, limitation and suggestion for further studies are in section v.

Review of Related Literature and Hypotheses Development

This section reviewed the literature related to electronic tax payment pro-max and revenue generation under the broad divisions namely, theoretical framework, conceptual framework and empirical review.

Theoretical Framework

The underlying theories for thus study are expediency theory of taxation and technological acceptance theory.

Expediency theory

The study's second theoretical framework is based on the expediency theory of taxes. Buehler proposed the expediency theory of taxation in 1936. According to the theory, every tax revenue collection system must satisfy the practicability test, which should be the only factor considered when the government selects a revenue collection system. The premise of this idea is that the government's economic and social goals should be ignored, because it is pointless to have a tax that can not be imposed and collected efficiently. This theory is pertinent to the study because the state board of internal revenue expects the electronic tax system to improve revenue collection by creating a technology environment that supports efficient assessment and revenue collection. The expediency hypothesis is thus connected to this research since it aims to explain the impact of administrative setup, such as an effective electronic tax payment system, on revenue collection by the Internal Revenue Service.

Technology Acceptance Theory Model

The Technology Acceptance Model is the second theory (TAM). Fred Davis created this hypothesis in 1986. The Technology Acceptance Model is a theory in information systems that describe how consumers accept and use technology. The theory is founded on the idea that an information system's acceptability is governed by two key factors: perceived usefulness (PU) and perceived ease of use (PEO) (PEOU). The degree to which a person believes that utilizing a certain system will improve his or her job performance is referred to as perceived usefulness. The degree to which a person believes that utilizing a certain technology would be painless is known as Perceived Ease of Use (PEOU).

The Technology Acceptance Model is essential to this study because it lays the groundwork for the State Board of Internal Revenue Service to accept and deploy an electronic tax system based on the assumption that it will be valuable to both tax payers and tax officials. The fundamental goal of the e-tax system is to address the shortcomings of the old tax system, making the State Board Internal Revenue Service a leader in adopting the technology because it improves their job performance in terms of efficiency, timeliness, correctness, and dependability. The perceived utility of the e-tax system to tax payers will be the general ease of paying taxes in terms of correctness, simplicity, convenience, and faith in the tax system, which will lead to voluntary compliance, thus solving one of the state's primary taxation difficulties. On the other side, the assumption of apparent ease of use is a hindrance to both taxpayers and tax officials who may believe they lack the skills to use the technology without much effort. This is mostly due to a lack of technology exposure, which poses a significant danger to the usage of the e-tax system in developing countries.

This model which is an adaptation from the theory of reasoned action appears to be the most widely accepted amongst information system researchers, perhaps because of its parsimony and the wealth of recent empirical support of it. The theory is of the assumption that an individual's intention

towards using a system is jointly determined by perceived usefulness (PU) and perceived ease of use (PEOU). The perceived usefulness refers to the users believe that using a specific application system will improve his or her job performance while the perceived ease of use refers to the degree to which the user expects the target system to be free of effort. It was argued that the theory although is a very useful model still has to be integrated into a broader one which would include variables related to both human and social factors.

In relation to E-tax, TAM gives the bases of adopting the system as its perceived usefulness on the part of both tax payers and tax officials. The primary objective of the e-tax system is to solve the challenges facing the tax system which makes government tax officers the fore runners in the acceptance of the e-tax technology mostly because it has a direct positive effect on their job performance in terms of efficiency, timeliness, accuracy and reliability. As for the tax payers, the perceived usefulness of e-tax will then be the general ease of paying taxes in terms of simplicity, convenience, accuracy, and trust in the tax system which will then instigate compliance and hence solving one of the major problems of taxation in the country. The perceived ease of use is however a hindrance to both tax payers and tax officials who may sometimes feel they do not have what it takes to actually use the technology without much effort. This mainly due to lack of technological exposure which poses as a major threat to the ongoing use of e-tax in Nigeria.

Conceptual Framework

Electronic Tax Payment Pro-Max

Electronic tax payment system is a system provided by Federal Inland Revenue Service (FIRS) that allows taxpayers to make tax payments either by telephone or online. This system is accessible every day of the week, 24 hours a day. In order to improve tax administration in Nigeria and move away from the current manual method, which is time-consuming and bureaucratic, the FIRS adopted ITAS in 2013 (FIRS, 2015). The project's goal is to fully automate the registration, payment, assessment, debt and credit management, audit and investigation, case management, and return filing operations.

According to Okoye and Ezejiofor (2014), the development of information technology has drawn significant attention to the online tax system, which has an impact on the tax administration system. Since most taxpayers are unaware of their tax structure due to the development of information technologies (IT), tax administrators now have the opportunity to improve the tax administration system. In order to achieve good revenue generation, having a functional self-assessment tax framework and e-taxation are deemed to be acceptable approaches. The government will implement particular steps to ensure compliance in order to make this achievable.

The e-taxation system's goal is to give the tax authority access to a database that contains information about taxpayers and their transactions. This would reduce the issue of tax evasion and hence an increase in government tax revenue (Kiabel and Nwikipasi, 2009). The benefits of an integrated computerized system for taxation in Tanzania were studied by Seelmann, Lerche, Kiefer, and Lucante (2011).

They made the case that taxes are frequently the most significant source of state revenue. There have been numerous studies about electronic tax payments around the world. However, adequate tax administration structures and procedures are lacking in many developing nations. Technology advancements have not impacted the day-to-day operations of tax officers. They came to the conclusion that computerizing tax and revenue authority can help achieve the objective of sound (financial) governance. It enhances the revenue authorities' transparency and accountability. Nevertheless, while reforming and modernizing the tax system is an essential part of improving

domestic resource mobilization, such a reform will be sustainable only in conjunction with more profound changes in the administrative and political structure of a state. Sagas, Nelimalyani and Kimaiyo (2015), did an assessment of the impact of electronic tax register on revenue collection by Kenya Revenue Authority western region, Kenya. Findings from their study indicated that 75% of the respondents were of the opinion that ETR machines have helped to curb cases of tax evasion, 86% of the respondents were of the opinion that ETRs have helped increase revenue collection due to their efficient nature.

Lastly, Ayodeji (2014) looked at the Impact of electronic tax systems on Tax Administration in Nigeria. He added that the government and other important stakeholders in Nigeria turned their attention to the cash earned locally as a result of the declining global fortune caused by the decline in the price of crude oil, the country's main source of wealth. However, the difficult task of increasing internally generated revenue necessitates the adoption of electronic tax systems technologies to drive Tax administration. Researchers found that by ensuring compliance, electronic tax systems play a significant role in the growth of internally generated revenue in Nigeria, which in turn increases productivity and economic activity in the nation. It is a driving force behind increased prosperity and the eradication of poverty in Nigeria and the entire African continent. Their study's main recommendation was that the requisite laws and electronic tax payment profile is a system provided by Federal Inland Revenue Service (FIRS) that allows taxpayers to make tax payments either by telephone or online. This system is accessible every day of the week, 24 hours a day. In order to improve tax administration in Nigeria and move away from the current manual method, which is time-consuming and bureaucratic, the FIRS adopted ITAS in 2013 (FIRS, 2015). The project's goal is to fully automate the registration, payment, assessment, debt and credit management, audit and investigation, case management, and return filing operations.

According to Okoye and Ezejiolor (2014), the development of information technology has drawn significant attention to the online tax system, which has an impact on the tax administration system. Since most taxpayers are unaware of their tax structure due to the development of information technologies (IT), tax administrators now have the opportunity to improve the tax administration system. In order to achieve good revenue generation, having a functional self-assessment tax framework and e-taxation are deemed to be acceptable approaches. The government will implement particular steps to ensure compliance in order to make this achievable. The e-taxation system's goal is to give the tax authority access to a database that contains information about taxpayers and their transactions. This would reduce the issue of tax evasion and hence an increase in government tax revenue (Kiabel and Nwikipasi, 2009). The benefits of an integrated computerized system for taxation in Tanzania were studied by Seelmann, Lerche, Kiefer, and Lucante (2011). They made the case that taxes are frequently the most significant source of state revenue. There have been numerous studies about electronic tax payments around the world. However, adequate tax administration structures and procedures are lacking in many developing nations. Technology advancements have not impacted the day-to-day operations of tax officers. They came to the conclusion that computerizing tax and revenue authority can help achieve the objective of sound (financial) governance. It enhances the revenue authorities' transparency and accountability. Nevertheless, while reforming and modernizing the tax system is an essential part of improving domestic resource mobilization, such a reform will be sustainable only in conjunction with more profound changes in the administrative and political structure of a state.

Sagas, Nelimalyani and Kimaiyo (2015), did an assessment of the impact of electronic tax register on revenue collection by Kenya Revenue Authority western region, Kenya. Findings from their study indicated that 75% of the respondents were of the opinion that ETR machines have helped to curb cases of tax evasion, 86% of the respondents were of the opinion that ETRs have helped

increase revenue collection due to their efficient nature. Lastly, Ayodeji (2014) looked at the Impact of electronic tax systems on Tax Administration in Nigeria. He added that the government and other important stakeholders in Nigeria turned their attention to the cash earned locally as a result of the declining global fortune caused by the decline in the price of crude oil, the country's main source of wealth. However, the difficult task of increasing internally generated revenue necessitates the adoption of electronic tax systems technologies to drive Tax administration. Researchers found that by ensuring compliance, electronic tax systems play a significant role in the growth of internally generated revenue in Nigeria, which in turn increases productivity and economic activity in the nation. It is a driving force behind increased prosperity and the eradication of poverty in Nigeria and the entire African continent. Their study's main recommendation was that the requisite laws and regulations be implemented by the relevant authorities in order to lower or eliminate import duties on gear used in information technology, including computers, servers, printers, biometric scanners, and other devices.

Revenue Generation

Tax is the imposition of compulsory levies on individuals or entities by governments. Taxes are levied in almost every country of the world, primarily to raise revenue to defray government expenditures. Ohaka and Agundu (2012) noted that taxation in most countries dates back to primitive society, when members of different societies organized themselves to render free services to their communities, such as cleaning of the environment, clearing of bushes, digging of wells, building barns for the storage of farm produce or the clearing of village centres and vigilante services. These services constituted a form of tax required from every member of the society, and it was compulsory that everyone participated. Property of those who failed to participate were seized and only returned to the owners (defaulters) on payment of agreed fine. Income tax was first introduced in Nigeria in 1904, and this was charged on the income of individuals, not on incomes of incorporated and unincorporated bodies. Tax revenue therefore, is the revenues collected from taxes on income and profits of both individuals and companies, social security contributions, taxes levied on goods and services, payroll taxes, taxes on the ownership and transfer of property etc.

Oladimeji (2017) assert that tax revenue has been in existence even before the amalgamation of Nigeria as a political entity in 1914. Direct Taxes, which were first introduced into the northern part of Nigeria, were successfully administered because the citizens were already used to one form of tax or another before the direct taxes were introduced. The efficient administration of the emirate was a crucial role in the success of the taxes under the emirate system. Direct tax revenue was introduced to the western territories in 1916 and the eastern provinces around 1927 as a result of the amalgamation of the north and the south in 1914. The enabling legislation and rules were modeled after British law (Ariyo, 1998).

According to Adegbe (2010), taxes are a legal system that has been approved by the government body to collect charges, have direction, manage, and provide policies; laws and regulations for the tax system are then used to ensure that all applicable taxes are collected and paid to the proper authorities. The administration of policy is thus one of the key indicators of a tax system's effectiveness.

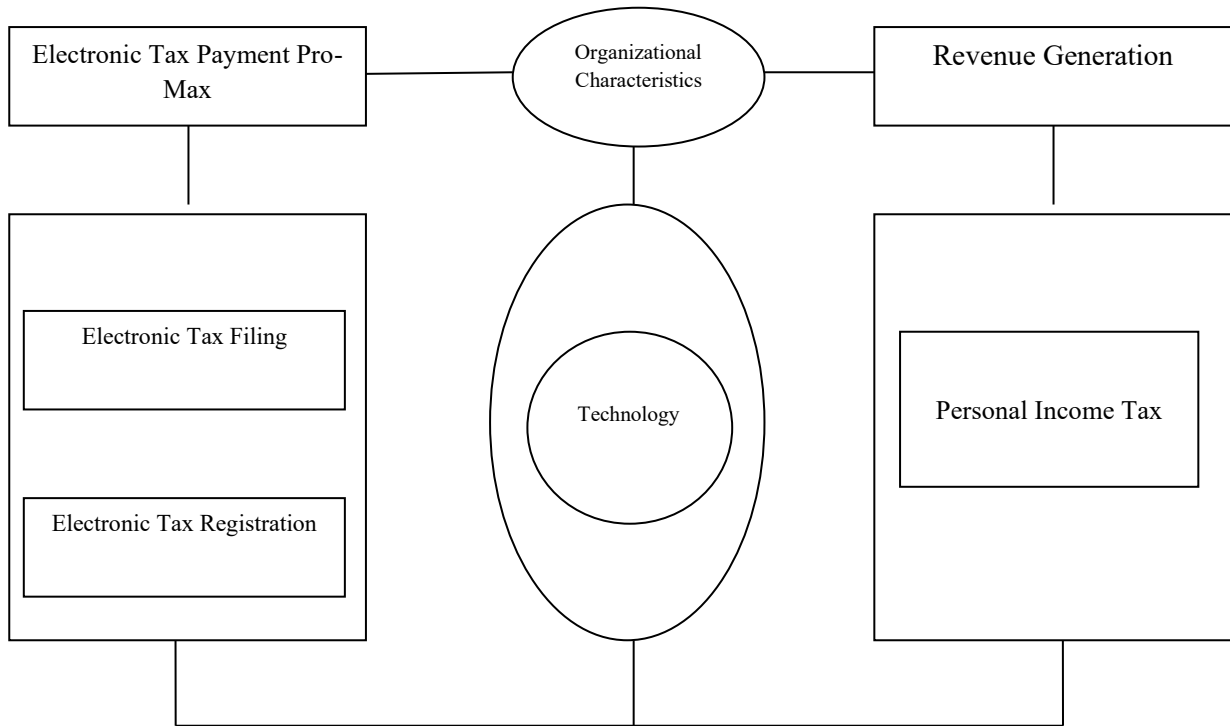


Figure 1: Conceptual Framework of Electronic tax Payment Pro-Max and Revenue Generation: New Empirical Evidence in Nigeria.

Source: Electronic Filing (Mo-Moh Musa & Nwaiwu, 2025), Electronic Registration (Nwaiwu & Joseph, 2025), Personal Income tax (brown, 2025), Technology (best & Brown, 2025).

Table 1: Wbometric Analysis of Electronic tax Payment Pro-Max and Revenue Generation

Author/Year	Country	Subject	Methodology	Empirical Findings
Moses (2026)	Nigeria	Electronic tax Payment and tax Revenue Generation in Nigeria	Ordinary least square regression Analysis.	The findings shows a strong and positive significant relationship between electronic tax payment and tax revenue generation in Nigeria.
Yahaya & Muhammed(2025)	Nigeria	Electronic payment: A Determinant of tax revenue generation in Nigeria.	Descriptive Statistics and Inferential Statistics	It has been discovered that e-payment has positive and significant relationship with revenue generation of Federal Inland Revenue Service (Nigeria Revenue Service) in Nigeria.
Haccarthy et al, (2022)	Nigeria	Electronic tax system and tax revenue efficiency in Nigeria, 2008-2022	Descriptive Statistics, Paired Sample 't'-test	The findings of the study among others were that, there is significant difference between pre-post electronic company's income tax and tax revenue efficiency in Nigeria. Also, there is no significant difference between pre-post electronic petroleum profit tax and tax revenue. And there is significant difference between pre-post electronic capital gain tax and tax revenue efficiency in Nigeria.
Nwankwo et al (2022)	Nigeria	Effect of Electronic Payment System in tax revenue generation in Nigeria.	Descriptive Statistics, unit root test and ordinary least square regression analysis.	The outcome of the analytical test revealed that automated teller machine payment, mobile banking payment and web-transfer payment had both positive and significant influence on tax revenue; while point of sales had positive and insignificant effect on tax revenue generation in Nigeria within period reviewed.
Etale, L.M. & Pouzigha (2021)	Nigeria	Effect of electronic payment systems on pay roll fraud prevention in selected ministries in Bayelsa State, Nigeria.	Descriptive Statistics and ordinary least square regression analysis	Electronic payment systems significantly influence on pay roll fraud prevention in selected ministries in Bayelsa State, Nigeria.
Okoye & Olayinka (2021)	Nigeria	Effect of electronic taxation on revenue generation in Lagos State, Nigeria.	Linear Regression Model and Analysis of Variance	The result of the analysis showed that electronic tax payment, electric tax clearance certificate issuance has significant effect on revenue generation in Lagos State while Electronic tax filing does not significantly affect tax revenue generation in Lagos State. Electronic tax clearance certificate issuance significantly affects tax revenue in Lagos State.
Adegbie and Akinyemi (2020)	Nigeria	Effect of electronic payment system on revenue generation in Lagos State.	Descriptive Statistics, and Multiple regression	The result of the analysis revealed that electronic payment variable have significant and positive effect of personal income tax

Research Questions and Hypotheses Development

This paper seeks to offer answers to questions about electronic tax payment pro-max and revenue generation in Nigeria.

RQ₁: What is the relationship between electronic tax filing and personal income tax in Nigeria?

RQ₂: How does electronic tax registration relate to personal income tax in Nigeria?

RQ₃: What is technology moderating relationship between electronic tax payment pro-max and revenue generation in Nigeria?

The major hypotheses of this study is a derivative of the foregoing discourse, leading us to predict a priori a negative relationship between electronic tax payment pro-max and revenue generation. We therefore hypothesize in the null form that:

H₀₁: There is no significant relationship between electronic filing and personal income tax in Nigeria.

H₀₂: Electronic registration does not significantly relate to personal income tax in Nigeria.

H₀₃: Technology does not significantly moderate the relationship between electronic tax payment pro-max and revenue generation in Nigeria.

Methodological Framework

This section shows the methodological framework adopted to estimate the empirical and theoretical relationship between the variables and achieve the set objectives of the study. The design applied is the ex-post facto research design because it is concerned with the analysis of data on past events to explain the behavioural relationship between variables and cannot be manipulated. The data for the study were entirely secondary in nature because its design suggested content analysis of data on historical economic events and business transactions which were reported as electronic tax payment pro-max to justify issues as it relate to revenue generation. Such were obtained from central bank of Nigeria statistical bulletin, Nigeria revenue service, National bureau of statistics from 2000 - 2023. Complementary data were captured from the periodic reports of the World Bank data base.

Model Specification

The model specification is based on the theory that electronic tax payment pro-max relate to revenue generation in Nigeria. However, the econometric model from related empirical evidence used by Oyelami et al (2020), Nwaiwu (2026) was adopted but we made little modification. The empirical study generated three models to achieve the objectives and answer the corresponding research questions. Consequently, the model specifications were formulated in the following functional form as thus;

$$PIT_{it} = f(ETF_{it}, ETR_{it}, T_{it}) \quad i$$

Expanding the functional form into mathematical model as thus

$$PIT_{it} = \delta_0 + \delta_1 ETF_{it} + \delta_2 ETR_{it} + \delta_3 T_{it} \quad ii$$

Integrating the mathematical model into the economic model as follows;

$$PIT_{it} = \lambda_0 + \lambda_1 ETF_{it} + \lambda_2 ETR_{it} + \lambda_3 T_{it} + e_{it} \quad iii$$

Where:

PIT_{it} = Personal Income tax 'i' for the year 't'

ETF_{it} = Electronic tax Filing 'i' for the year 't'

ETR_{it} = electronic tax Registration 'i' for the year 't'

T_{it} = Technology 'i' for the year 't'

- λ_0 = Constant 'i' for the year 't'
- $\lambda_1-\lambda_3$ = Regression slope 'i' for the year 't'
- ϵ_{it} = Error Term 'i' for the year 't'

Empirical Results and Discussion

Research hypotheses that were first created in keeping with the general and specific aim of the study were tested accordingly in order to achieve the study's specific objectives. The researchers examined these hypotheses with the goal of determining the relationship between electronic tax payment pro-max and revenue generation. The study's hypotheses were tested using descriptive statistics, stationary test, autoregressive distributed lag test, bounds test, lag length selection, cointegration test, descriptive statistics

Table 2: Descriptive Statistics of the Study

	PIT	EREG	EFIL
Mean	655829.0	24.62917	20.87500
Median	884600.0	17.15000	14.40000
Maximum	1252775.	72.50000	61.90000
Minimum	33300.00	2.500000	1.000000
Std. Dev.	481624.3	21.90429	19.23532
Skewness	-0.219906	0.799087	0.754875
Kurtosis	1.274258	2.400769	2.290913
Jarque-Bera	3.171621	2.913237	2.782152
Probability	0.204782	0.233023	0.248807
Sum	15739895	591.1000	501.0000
Sum Sq. Dev.	5.34E+12	11035.35	8509.945
Observations	24	24	24

Stationarity Test

In time series econometrics, a stationarity test is a fundamental procedure conducted to examine the stochastic properties of the variables used in a model. For a variable to be considered stationary, its mean, variance, and autocovariance must remain constant over time. This is essential because non-stationary data can lead to spurious regression results, meaning that the relationships identified among variables might be misleading or invalid. In the context of this study on the impact of electronic tax payment systems on tax revenue generation in Nigeria, it is important to establish the stationarity properties of the key variables before performing any regression or cointegration analysis. The variables included in the study, such as electronic registration, electronic filing, electronic payment, and the various tax revenue types (direct tax revenue, personal income tax, company income tax, petroleum profit tax, capital gains tax), need to be tested for stationarity. If most of the variables are found to be non-stationary at levels, it implies that they may need to be differenced before further analysis, or that the study should consider cointegration tests and long-run relationships. To assess stationarity, we commonly use the following tests:

Table 4.2: Stationarity Test Results at Level

Variable	ADF Test Statistic	ADF 5% Critical Value	PP Test Statistic	PP 5% Critical Value	KPSS Test Statistic	KPSS 5% Critical Value	Stationary at Level?
EREG (Electronic Registration)	-2.104	-2.936	-2.220	-2.936	0.682	0.463	Not Stationary
EFIL (Electronic Filing)	-3.112	-2.936	-3.005	-2.936	0.352	0.463	Stationary
DTR (Direct Tax Revenue)	-2.350	-2.936	-2.472	-2.936	0.692	0.463	Not Stationary
PIT (Personal Income Tax)	-2.014	-2.936	-2.078	-2.936	0.789	0.463	Not Stationary

The test results in the table reveal the following key points: Most of the variables, including Electronic Registration (EREG), Electronic Payment (EPAY), Direct Tax Revenue (DTR), Personal Income Tax (PIT), Company Income Tax (CIT), Petroleum Profit Tax (PPT), and the Technology moderator (TECH), are not stationary at level. This is confirmed as their ADF and PP test statistics are higher (less negative) than the critical values and their KPSS statistics exceed the critical value of 0.463, suggesting rejection of the null of stationarity in KPSS. Two variables—Electronic Filing (EFIL) and Capital Gains Tax (CGT)—are found to be stationary at level, as indicated by their lower (more negative) ADF/PP statistics compared to critical values and their KPSS statistics being below the threshold. Since most variables are non-stationary at level, they must be transformed—typically through first differencing—before regression analysis, or tested for cointegration to identify any long-run equilibrium relationships. Additionally, this suggests that care must be taken in model specification to avoid spurious correlations, especially in time series or panel data contexts.

Auto-Regressive Distributed Lag

The Auto-Regressive Distributed Lag (ARDL) short-run test is a crucial econometric technique employed in the study to examine the dynamic short-run effects of electronic tax payment mechanisms—specifically, electronic registration, electronic filing, and electronic payment—on various categories of tax revenue in Nigeria. The ARDL framework is particularly useful in time series analysis involving variables that are integrated of different orders, especially when some variables are stationary at level ($I(0)$) and others at first difference ($I(1)$), but none are integrated of order two ($I(2)$). The short-run test in the ARDL model estimates the immediate or transient impact of changes in independent variables on the dependent variable before the system returns to equilibrium. In this context, the ARDL short-run analysis investigates how changes in electronic tax payment systems affect different forms of tax revenues in the short term. These revenues include direct tax revenue, personal income tax, company income tax, petroleum profit tax, and capital gains tax. The ARDL model also incorporates error correction terms (ECM) to capture the speed at which disequilibrium in the short run is corrected to re-establish long-run equilibrium.

Below are output tables;

Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EREG)	0.154	0.062	2.484	0.020
D(EFIL)	0.112	0.060	1.867	0.078
ECM(-1)	-0.491	0.097	-5.062	0.000
R-squared	0.671			
Adjusted R-squared	0.624			
S.E. of regression	0.112			
Sum squared resid	0.372			
Log likelihood	20.472			
F-statistic	14.801			
Prob(F-statistic)	0.0000			
Mean dependent var	1.608			
S.D. dependent var	0.167			
Akaike info criterion	-0.982			
Schwarz criterion	-0.678			
Hannan-Quinn criter.	-0.891			
Durbin-Watson stat	2.034			

In this model, all electronic systems have positive coefficients. Electronic registration and electronic payment are statistically significant. Although electronic filing is not significant at the 5% level, it is approaching significance at the 10% level. The ECM term is again negative and significant, showing convergence to long-run equilibrium.

Bounds Test

Table 4.10: Model 2: Bounds Test for Personal Income Tax (PIT)**ARDL Bounds Test**

Test Statistic	Value	k = 3
F-statistic	6.129	
Critical Value Bounds	Significance	I(0) Bound
	10%	2.72
	5%	3.23
	1%	4.29

For the model assessing personal income tax, the calculated F-statistic of 6.129 clearly surpasses the upper bounds at all significance levels. This suggests that electronic registration, electronic filing, and electronic payment systems have a stable and meaningful long-run equilibrium relationship with personal income tax revenue. This finding strengthens the inference that enhancements in tax technology significantly shape long-run income tax outcomes in Nigeria.

H₀₁: Electronic registration has no significant impact on personal income tax.

For Hypothesis H₀₁, the null hypothesis posits that electronic registration has no significant impact on personal income tax. The model result yielded a coefficient of 0.198, t-statistic of 2.947, and a p-value of 0.021, which is statistically significant. This leads to the rejection of the null hypothesis in favour of the alternative. Hence, electronic registration significantly impacts personal income tax in the long run. These findings are consistent with the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB), both of which posit that perceived ease of use and usefulness influence behavioral intentions toward technology adoption (Davis, 1989; Ajzen, 1991). Taxpayers who perceive electronic registration as easy and beneficial are more likely to comply voluntarily. Tax administrators should prioritize full-scale automation of taxpayer registration systems, provide technical assistance for small businesses, and ensure adequate sensitization on the ease and benefits of electronic registration. The results validate TAM and TPB in the tax compliance context, demonstrating that ease and perceived utility are strong predictors of behavioral outcomes in public finance systems.

H₀₂: Electronic filing does not significantly impact personal income tax.

Hypothesis H₀₂ posits that electronic filing has no significant impact on personal income tax. The model gave a coefficient of 0.289, a t-statistic of 2.874, and a p-value of 0.025. This is statistically significant, allowing for the rejection of the null hypothesis. Electronic filing thus significantly impacts personal income tax. These findings can be connected to **Theory of Planned Behavior (TPB)**, which emphasizes the role of perceived behavioral control in determining whether individuals engage in a particular behavior (Ajzen, 1991). The introduction of electronic filing makes the process easier and more controlled, thus increasing the likelihood that individuals will comply with tax requirements. It is recommended that the tax authorities increase public education and outreach on the use of electronic filing systems for personal income tax submissions, especially targeting those

who are not yet using these platforms. These results strengthen TPB by demonstrating how the perceived ease of filing electronically encourages individuals to comply with tax laws.

Conclusion and Recommendations

Electronic tax payment pro-max is a solution to solving the objectives of efficient of revenue generation in Nigeria. However, Nigeria is yet to reap the full benefit of electronic based taxation system as the case in developed countries of the world, observed that tax revenue in Nigeria accounts for a small proportion of total government revenue over the years compared with the bulk of revenue needed for developmental purposes that is derived from oil. Chandler (2025) also observed that today's policy makers are still grappling with the questions of effective tax administration leading to adequate tax revenue. Thus, the study conclude that electronic tax pro-max significantly relate to revenue generation in Nigeria.

The findings of the study have important policy implications which led to making of the following recommendations below:

- (i) Nigeria tax authorities should enhance the performance expectancy, effort expectancy and e-tax filing awareness in Nigeria by addressing technical issues, stream lining the filing process, and improving user interface design.
- (ii) Nigerian government should target awareness campaigns aimed at educating individuals on the advantages of registering through digital platforms, such as reduced.

Limitation and Suggestion for Further Studies

This investigation has come up with interesting concluding remark, however, like any other research it is not without its limitation. This study acknowledge that the analysis only investigated the relationship between electronic tax payment pro-max and revenue generation in Nigeria, spanning from 2014-2023. Inference from the econ-metric results obtained in this study can be made more accurate if the sample size can be considerably increased to include tax filing, companies income tax. The study period could also be extended to at least 30 years in order to fully cater for changes in economic cycles such as booms and recessions. Paper work and quicker processing times. This would likely increase voluntary registration and tax compliance.

References

- Adegbe, F.F. & Akinyemi, O.O. (2020). Electronic payment (e-payment) and revenue generation in Lagos State. *Journal of Accounting and Financial Management*, 6(1),59-85
- Agu, A.O. Afare, A.E. & Uthman, B.A. (2026). The influence of E-tax system on tax administration and tax revenue generation in Lagos State internal revenue service. *Journal of Economic and Business Research*, 29(1),129-150
- Brown, C.O. (2025). Electronic tax payment and revenue generation in Nigeria. *Journal of Economics*, 19(2),70-84
- Chijioko, N.O., Leonard, I.A., Bossco, E.O., & Amaefule, A.C. (2026). Impact of e-taxation on Nigeria's revenue and economic growth: A pre-post analysis. *International Journal of Fiancne and Accounting*, 7(2),19-26
- Chukkwuma, T.N., Leonard, C.U. & Uche, C.C (2022). Effect of electronic payment system on tax revenue generation in Nigeria. *international Journal of Business and Management Invention*.

- Emmanuel, C.O. (2021). A review on electronic tax payments, use of technology and challenges of using the electronic tax system. International Digital Organization for scientific research. IDOSR Journal of Scientific research, 6(2),1-6
- Gideon, Z. & Alouis, M. (2023). Systems, processes and challenges of public revenue collection in Zimbabwe. America International Journal of Contemporary Research, 39(2),45-61
- KieinGA, s.e. & Jagongo, A.O. (2017). Impact of online tax filling on tax compliance among small and medium enterprises in Kibwezi-country, Kenya. International Journal of Current Research, 9(01),45196-45205
- Maccarthy, M.I., Ogullah, S.B., & Abolo, A.P. (2012). Electronic tax system and tax revenue efficiency in Nigeria. 2008-2021. Advanced Journal of Accounting, Management and Marketing research, 9(3),82-103
- Moses, B (2026) Electronic tax payment and tax revenue generation in Nigeria. Journal of Accounting, 8(2),7-21
- Nwaiwu, J.N. & Joseph, B. (2025). Electronic payment profile and tax revenue generation in Nigeria. Journal of Accounting and Economics, 8(4), 25-30
- Nwaiwu, J.N. (2025). Electronic tax adoption and revenue generation in Nigeria. Journal of Accounting & Finance, 4(2),75-84
- Nwani, J.J., Nwaimo, C.E., Kanu, S.I., & Eke, C.K. (2020). Cashless policy and the Nigerian payment system. International Journal of Innovation and Economic Development, 5(6),7-29
- Olayeye, F.F. & Adedesi, E.A. (2025). E-tax collection on revenue generation in Ondo State, Akure, Nigeria. Journal of Economics, Finance and Management Studies, 8(1), 666-670
- Oyelami, I.O., Adebisi, S.O. & Adekunle, B.C. (2020). Electronic Payment adoption and consumers spending growth: Empirical evidence from Nigeria. Future Business Journal, 6(14), 1-14
- Yahay, S. & Muhammad, I.D. (2025). Electronic Payment: A determinant of tax revenue generation in Nigeria. Journal of Public Administration and Governance, 7(1),15-27