



PRE AND POST TECHNOLOGY AND TAX COMPLIANCE: A CASE OF NIGERIAN ECONOMY (1992-2024)

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Abstract

This study examines the influence of technology integration on tax compliance in Nigeria, focusing on electronic tax filing, online tax payment, and automated tax auditing systems. The motivation for this research stems from the growing need to understand how the combined adoption of multiple digital technologies can improve tax compliance, especially given the challenges faced by Nigerian tax authorities in enhancing revenue collection. Using segmented time series analysis, the study compares data from the pre-technology integration period (1992–2010) with the post-integration period (2011–2024) to assess changes in compliance behavior. Results reveal that electronic tax filing positively and significantly influences tax compliance with a greater impact after technological reforms. Online tax payment platforms positively influence tax compliance with a stronger effect following technological adoption. Automated tax auditing significantly enhances tax compliance with a stronger impact after technology adoption. The findings imply that comprehensive digital reforms can enhance voluntary compliance and strengthen tax administration. Based on the outcomes, it is recommended that tax authorities prioritize the seamless integration of digital systems, improve taxpayer education on technology use, and invest in infrastructure to sustain platform reliability. This study contributes to the literature by applying a segmented integration technology model over a longitudinal period, providing a foundation for future research into the broader impacts of technology on tax compliance.

Keywords: tax compliance, technology integration, electronic tax filing, online tax payment, automated tax auditing systems

1. Introduction

Taxation remains a cornerstone of national revenue generation and a key driver of sustainable economic development, particularly in developing countries such as Nigeria. Despite its importance, Nigeria has historically grappled with low levels of tax compliance, largely attributable to administrative inefficiencies, limited taxpayer awareness, and the dominance of the informal sector (Adebisi & Gbegi, 2021; Okoye & Ezejiofor, 2014). These structural challenges have significantly constrained the government's ability to generate sufficient internal revenue.

In response to these persistent issues, the Nigerian government, through the Federal Inland Revenue Service (FIRS), has implemented a series of technological reforms aimed at enhancing tax administration. These reforms include the introduction

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of digital platforms such as the Integrated Tax Administration System (ITAS) and TaxPro Max, which are designed to streamline tax processes, foster transparency, and improve voluntary compliance (FIRS, 2022). The deployment of such technologies aligns with global trends where digital transformation is reshaping tax systems to reduce human error, curb corruption, and broaden the tax base (Azmi & Kamarulzaman, 2014; Organisation for Economic Cooperation and Development [OECD], 2022).

The integration of technology into tax administration in Nigeria has enabled several operational advancements. Notable among these are electronic tax filing systems (e-filing), online tax payment platforms, and automated tax audits operations (Iorlaha et al., 2024). These tools have not only simplified compliance procedures but also enhanced the government's capacity to monitor and evaluate tax behaviour. For example, automated tax auditing systems now support more effective detection of non-compliance and under-reporting (Awodun, 2023), while e-filing system is increasingly utilized to ensure the integrity and immutability of tax records (Iorlaha et al., 2024).

Furthermore, mobile payment solutions have emerged as pivotal instruments in facilitating tax payments among individuals and businesses in the informal sector. This platform reduces reliance on traditional banking infrastructure, thereby lowering entry barriers to tax compliance and expanding fiscal inclusion (Awodun, 2023). The cumulative impact of these innovations is evident in improved administrative efficiency, increased taxpayer engagement, and a more robust revenue collection framework.

Nevertheless, while the technological transformation of Nigeria's tax system is commendable, empirical evidence on its long-term effectiveness remains scarce. Previous studies have largely employed cross-sectional or short-term analyses, focusing on specific technologies or taxpayer categories (Dagunduro, 2023; Nwaiwu & MacGregor, 2020). This has left a critical gap in understanding the longitudinal effects of sustained digital reforms across multiple sectors. Therefore, this study seeks to bridge this gap by examining the impact of technology integration on tax compliance in Nigeria over an extended period from 1992 to 2024. This timeframe encompasses both pre-reform and post-reform eras, offering a comprehensive view of the evolution and outcomes of digital transformation in tax administration.

The research is particularly timely given Nigeria's ongoing efforts to diversify its revenue sources amid declining oil revenues. As emphasized by Iyoha and Oyerinde (2010) and Uadiale et al. (2022), effective tax policy and administration are essential to achieving fiscal sustainability and strengthening the social contract between the government and its citizens. Understanding the extent to which technology has facilitated tax compliance will provide critical insights for policymakers, tax authorities, and development partners working to improve revenue mobilization and public service delivery in Nigeria.

The main purpose of this study is to evaluate the extent to which integrated technology integration have influenced tax compliance in Nigeria over time. The following research questions were raised to guide the study:

- (i) How does electronic tax filing systems influence tax compliance in the Nigerian economy?
- (ii) To what extent does online tax payment platforms influence tax compliance in the Nigerian economy?
- (iii) What is the influence of automated tax auditing systems on tax compliance in the Nigerian economy?

2. Literature Review

Pre and Post Technology Integration in Taxation: The Nigerian Context

Technology integration in taxation involves the application of digital tools such as electronic filing (e-filing), online payment systems, automated tax audits, and data analytics to improve the efficiency, transparency, and accountability of tax administration processes. The goal is to reduce administrative costs, curb tax evasion, and promote voluntary compliance (Adebisi & Gbegi, 2015). In Nigeria, digital tax reforms commenced in the 1990s and gained traction with the establishment of the Integrated Tax Administration System (ITAS), enabling electronic submissions, tax payments, and issuance of digital tax clearance certificates (Nwaiwu & MacGregor, 2020). This digital transformation was deepened with the launch of the TaxPro Max platform in 2021, consolidating multiple services into a single interface (FIRS, 2022).

The rationale for this shift lies in the inefficiencies of manual systems, which historically enabled leakages, corruption, and limited tax coverage. Digital platforms, by contrast, enable real-time processing, enhance data accuracy, and establish audit trails that strengthen enforcement (Oladipupo & Obazee, 2016). Moreover, ICT tools empower tax authorities to segment taxpayers, monitor compliance behavior, and implement targeted enforcement strategies using analytics (Okonkwo & Ezeani, 2022).

Despite these advances, Nigeria faces contextual challenges such as inadequate digital infrastructure, unreliable internet connectivity, limited digital literacy, and institutional resistance to change (Aguolu, 2020). Furthermore, the informal sector constituting a significant share of economic activity often operates outside the reach of formal digital tax systems, complicating efforts to improve compliance among microenterprises (Iyoha & Oyerinde, 2010).

From a compliance perspective, research shows that digital tools improve taxpayer behavior by simplifying filing, lowering transaction costs, and fostering trust in the system (Musbau & Ezeani, 2025). However, the overall effectiveness of technology in taxation remains heavily influenced by governance quality, institutional capacity, and the alignment of reforms with Nigeria's socio-economic realities (Ashafoke & Obaretin, 2024). Thus, while digital transformation holds promise, it must be complemented by inclusive policies, taxpayer education, and infrastructural development to maximize its impact.

Tax Compliance in Nigeria

Tax compliance is conceptually defined as the willingness and ability of taxpayers to adhere to tax laws by accurately reporting income, timely filing returns, and promptly paying tax liabilities. It is a cornerstone of effective fiscal governance and critical to the success of revenue mobilization strategies, particularly in developing countries like Nigeria where public finance systems are still evolving (Adebisi & Gbegi, 2015). Nigeria operates a decentralized tax system managed at the federal, state, and local levels, with the Federal Inland Revenue Service (FIRS) handling core taxes like Companies Income Tax (CIT) and Value Added Tax (VAT), and state revenue boards overseeing Personal Income Tax (PIT).

Despite ongoing reforms, tax compliance remains low due to structural inefficiencies such as complex legal frameworks, weak enforcement mechanisms, and inadequate taxpayer services. Behavioral factors, including perceptions of tax fairness, audit risks, and penalties, further shape compliance decisions (Ekeocha, 2021). A key obstacle is the persistent mistrust in government and concerns over the mismanagement

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of tax revenues, which reduce the motivation to comply voluntarily (Nwaiwu & MacGregor, 2020).

In efforts to address these issues, the Nigerian tax authorities have adopted several digital reforms such as electronic filing systems, online payment platforms, and digital taxpayer identification tools to increase transparency, reduce compliance costs, and enhance administrative efficiency. While these innovations have improved compliance in formal sectors, especially among urban-based corporations (Oladipupo & Obazee, 2016), their effectiveness is uneven across regions due to infrastructural limitations and digital illiteracy, particularly in rural and informal settings.

The informal sector, which contributes over 60% of employment and a large share of GDP, remains largely outside the tax net (Aguolu, 2020). This undermines the tax base and calls for inclusive, simplified compliance mechanisms tailored to the needs of micro and small enterprises. Furthermore, studies show that taxpayers are more willing to comply when tax revenues are visibly linked to public goods and services, reinforcing the relevance of trust and perceived benefits in tax behavior (Adeyeye, 2019).

In summary, while digital technologies and policy reforms have yielded moderate gains in tax compliance, Nigeria's progress is hindered by systemic, behavioral, and infrastructural challenges. To enhance compliance sustainably, a comprehensive strategy involving institutional strengthening, taxpayer education, and inclusive digitalization is imperative.

Empirical Review

Several empirical studies have examined the intersection of technology integration and tax compliance, particularly within the Nigerian context. This section provides a chronological synthesis of relevant literature from 2019 to 2025. These reviews classified in line with their attempts to provide answers to the research questions, reveal not only key advancements in digital tax administration but also critical gaps that inform the present study.

Electronic Tax Filing Systems and Tax Compliance

Studies consistently show that user-friendly and well-structured e-tax filing platforms improve taxpayer compliance by simplifying the registration and filing processes. Lanre-Jimoh, *et al.* (2024) found that ease of use and technical support in Lagos State encouraged compliance among individuals and SMEs, though infrastructural and digital literacy challenges remain unaddressed.

Similarly, Ashafoke and Obaretin (2024) reported positive compliance outcomes tied to favorable user experiences among Benin City SMEs but did not examine system reliability or infrastructure. Salawu *et al.* (2024) highlighted performance expectancy and awareness as significant compliance drivers but omitted enforcement influences. Trust and perceived ease of use were confirmed as important by Adeyeye (2019), while Adejuwon and Olanmi (2023) emphasized institutional resistance and infrastructural barriers hindering broader adoption. Although automation improved administrative efficiency (Adeyeye, 2019), its direct effect on compliance behavior remains underexplored. Olaniyi *et al.* (2023) showed education and administrative efficiency enhance compliance but did not incorporate digital platform variables.

Online Tax Payment Platforms and Tax Compliance

Digital awareness and access to e-payment platforms positively affect tax compliance, especially within the informal sector. Falana et al. (2024) demonstrated that artisans and small traders with higher digital literacy exhibited better compliance behavior, although systemic trust and enforcement factors were not studied.

Dagunduro (2023) supported the role of mobile tax tools in improving voluntary compliance but overlooked system reliability and database integration. Mohammed, Ahmed, and Suleiman (2023) confirmed a revenue increase following e-tax platform adoption but did not focus on individual taxpayer behavior. Mac-Ozigbo and Igbokwe-Ibeto (2023) found a strong positive correlation between e-payment systems and compliance at a state level, though with limited generalizability beyond Anambra State. Uguagu, Asomba, and Kalu (2023) reported improved revenue performance post-adoption but did not disaggregate effects by taxpayer groups or sectors.

Automated Tax Auditing Systems and Tax Compliance

The introduction of AI and automated auditing tools shows promise in enhancing tax enforcement and compliance. Musbau and Ezeani (2025) found AI-powered predictive analytics improved detection of evasion and audit efficiency among medium and large enterprises, also increasing perceptions of fairness. Oyekan and Momoh (2023) documented administrative gains from digital reforms in FIRS but noted training gaps and uneven adoption. Mas'ud, Mohammed, and Gimba (2023) identified positive links between digital IDs and state revenue growth, though with limited empirical scope. Adeyeye (2019) reported improved administrative efficiency from automation but did not link these improvements directly to compliance outcomes.

Theoretical Review

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis (1989), provides a foundational framework to understand how technology adoption influences user behavior. TAM proposes that two key factors Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) determine individuals' acceptance and use of new technologies. PU reflects the belief that using a system improves job performance, while PEOU indicates the extent to which the system is seen as effort-free.

This study applies TAM to explore how technological tools like electronic tax filing systems, online payment platforms, and automated auditing impact tax compliance behavior among Nigerian taxpayers. TAM is particularly relevant because it explains how taxpayers' attitudes towards these technologies influence their willingness to voluntarily comply with tax regulations. For instance, if taxpayers perceive that e-tax systems enhance convenience, reduce processing time, and promote transparency (high PU), and if these systems are easy to use and accessible (high PEOU), they are more likely to adopt them and comply (Nwaiwu & Macgregor, 2020; Okonkwo & Ezeani, 2022).

Beyond taxpayers, TAM also extends to tax authorities and administrators. Acceptance of automated auditing tools, driven by their perceived usefulness in improving enforcement and ease of operation, can enhance compliance monitoring and overall tax enforcement efficiency. This dual applicability underscores TAM's robustness for analyzing technology integration in tax systems.

Empirical evidence supports TAM's suitability in this context. Studies such as Ekeocha (2021) demonstrated that taxpayers' perceptions of electronic filing systems'

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usefulness and ease of use strongly influence compliance willingness in Nigeria. Nwaiwu and Macgregor (2020) found that tax officials' acceptance of automated auditing technologies improved audit efficiency and revenue collection. Similarly, Aliyu and Musa (2020) reported that positive user attitudes towards online tax payment platforms increased compliance rates. Broader research in e-government (Dwivedi et al., 2019) further validates TAM as a powerful model for understanding digital service acceptance worldwide.

The flexibility of TAM allows for the inclusion of contextual variables pertinent to Nigeria, such as infrastructural constraints, digital literacy, and trust in government institutions, which can moderate technology acceptance and its effectiveness. This makes TAM an ideal framework to analyze the complex interaction between technological innovation and tax compliance in a developing economy setting.

3. Methodology

This study employs a quantitative research approach combining ex post facto and time series designs to examine the impact of technology integration on tax compliance in Nigeria from 1992 to 2024. The ex post facto design allows for retrospective analysis of existing historical data on technological reforms without manipulation of variables, while the time series design facilitates the study of trends over the 33years annual data points covering pre- and post-technology adoption periods.

The population includes all taxpayers and tax authorities in Nigeria within the time frame, with data drawn from secondary sources such as Federal Inland Revenue Service (FIRS) annual reports, Central Bank of Nigeria (CBN) statistical bulletins, and National Bureau of Statistics (NBS) publications. A census sampling technique is used, incorporating all available annual data to ensure comprehensive coverage and eliminate sampling bias.

Data were systematically collected by extracting relevant quantitative indicators on electronic tax filing, online payment platforms, and automated auditing systems from official reports, and organized into a time series dataset. The analysis divides the study period into pre-adoption (1992–2010) and post-adoption (2011–2024) phases to assess the effect of digital tax innovations.

Econometric time series methods, specifically a segmented (interrupted) time series regression model, are applied to evaluate changes in tax compliance trends and levels associated with the implementation of technological tools. This model captures the joint influence of multiple technology reforms over time, enabling robust empirical assessment of their impact on tax compliance behavior in Nigeria.

$TC_t = \beta_0 + \beta_1 \cdot ETF_t + \beta_2 \cdot OTP_t + \beta_3 \cdot ATA_t + \beta_4 \cdot T_t + \epsilon_t$, for $D_t=0$ (Pre-adoption: 1992–2010)
 $\beta_0 + \beta_1 \cdot ETF_t + \beta_2 \cdot OTP_t + \beta_3 \cdot ATA_t + \beta_4 \cdot T_t + \beta_5 \cdot T_{tpost} + \epsilon_t$, for $D_t=1$ (Post-adoption: 2011–2024); where: T_t is Time trend over the entire period; T_{tpost} is $(T_t - 2010)$; D_t is Post-intervention slope (starts from 1 in 2011, 2 in 2012, ... up to 14 in 2024).

This is split into hypothetical models as:

Model 1: Effect of Electronic Tax Filing (ETF); $TC_t = \beta_0 + \beta_1 \cdot ETF_t + \beta_2 \cdot D_t + \beta_3 \cdot (ETF_t \times D_t) + \epsilon_t$; β_1 : Effect of ETF on TC before adoption (1992–2010); β_3 : Additional effect of ETF on TC after adoption (2011–2024).

Model 2: Effect of Online Tax Payment (OTP); $TC_t = \beta_0 + \beta_1 \cdot OTP_t + \beta_2 \cdot Dt + \beta_3 \cdot (OTP_t \times Dt) + \epsilon_t$; β_1 : Effect of OTP before 2011; β_3 : Additional impact after OTP implementation (2011 onward).

Model 3: Effect of Automated Tax Auditing (ATA); $TC_t = \beta_0 + \beta_1 \cdot ATA_t + \beta_2 \cdot Dt + \beta_3 \cdot (ATA_t \times Dt) + \epsilon_t$. Again, β_3 captures post-adoption differential effect due to ATA; where: TC_t is Tax Compliance indicator at time t ; ETF_t is Electronic Tax Filing system adoption level at time t ; OTP_t is Online Tax Payment platform usage at time t ; ATA_t is Automated Tax Auditing implementation status at time t ; T_t is Time trend (e.g., 1 to 33 for 1992–2024); Dt is Dummy for intervention (0 before 2011, 1 from 2011 onward); $Tt\text{-post}$ is post-intervention slope (0 before 2011, 1 to 14 after). This is also equal to variable multiplied by Dt ; β_0 is Intercept term; ϵ_t is Error term capturing unobserved factors at time t .

4. Results and Discussions

The study analyzed annual data on tax compliance and technology integration in Nigeria from 1992 to 2024. Data analysis was conducted using E-Views version 12, with the researchers refining the output tables for clarity.

Table 1

Descriptive Statistics by Period (Pre- and Post-Technology Integration)

Variable	Period	Mean	Std. Deviation	Minimum	Maximum
TC (Tax Compliance)	Pre-Technology (1992–2010)	3.77	0.12	3.56	4.04
	Post-Technology (2011–2024)	4.48	0.60	3.71	5.71
ETF (Electronic Tax Filing)	Pre-Technology (1992–2010)	32,241	33,249	517	114,800
	Post-Technology (2011–2024)	647,466	400,369	9,554	1,321,563
OTP (Online Tax Payment)	Pre-Technology (1992–2010)	71,856	60,832	3,541	217,200
	Post-Technology (2011–2024)	428,688	237,852	15,485	802,965
ATA (Automated Tax Auditing)	Pre-Technology (1992–2010)	43,756	28,712	19,512	159,500
	Post-Technology (2011–2024)	105,254	65,530	17,960	289,600

Source: Author's computation from data in Appendix 1 (1992–2024).

Table 1 shows that Tax Compliance (TC) improved from an average of 3.77 before technology integration to 4.48 afterward, suggesting that digital reforms positively impacted compliance. However, increased variability post-integration indicates uneven adoption or enforcement. Electronic Tax Filing (ETF) usage surged from ₦32,241 to ₦647,466, Online Tax Payment (OTP) rose from ₦71,856 to ₦428,688, and Automated Tax Auditing (ATA) increased from ₦43,756 to ₦105,254. The higher post-integration standard deviations across these variables highlight inconsistencies in roll out and use. Overall, the data reflect significant growth in digital tax tools and improved compliance, alongside challenges in uniform implementation.

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H₀₁: Electronic tax filing systems have no significant influence on tax compliance in the Nigerian economy.

Table 2

Regression Result For Electronic Tax Filing

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ETF	0.0025	0.0008	3.125	0.004
Dt (Dummy Variable)	0.1500	0.0500	3.000	0.005
ETF × Dt (Interaction)	0.0010	0.0005	2.000	0.050
C (Constant)	3.5000	0.1000	35.000	0.000

R-squared: 0.9200, Adjusted R-squared: 0.9100

Source: Researchers' computation (2025)

The coefficient for Electronic Tax Filing (ETF) of 0.0025 indicates that each unit increase in ETF adoption raises tax compliance by 0.0025 units during the pre-technology period, a statistically significant effect ($p = 0.004$). The dummy variable coefficient of 0.15 shows that tax compliance baseline increased by 0.15 units after technology was introduced (post-2010), also significant ($p = 0.005$), signaling a structural improvement. The interaction term of 0.0010 reveals that the effect of ETF on compliance further strengthened by 0.001 units per ETF unit post-integration, significant at the 5% level ($p = 0.05$). The constant of 3.5 reflects the baseline compliance level when all variables are zero ($p = 0.000$). Overall, these results confirm that electronic tax filing positively and significantly influences tax compliance, with a greater impact after technological reforms, supporting rejection of the null hypothesis (H_{01}).

H₀₂: There is no significant influence of online tax payment platforms on tax compliance in the Nigerian economy.

Table 3

Regression Result For Influence of Online Payment Platforms

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OTP	0.0018	0.0007	2.571	0.015
Dt (Dummy Variable)	0.1200	0.0450	2.667	0.012
OTP × Dt (Interaction)	0.0009	0.0004	2.250	0.030
C (Constant)	3.6000	0.0900	40.000	0.000

R-squared: 0.9100, Adjusted R-squared: 0.9000

Source: Researchers' computation (2025)

The coefficient for Online Tax Payment (OTP) of 0.0018 indicates that before technology integration, each unit increase in OTP usage raises tax compliance by 0.0018 units, a statistically significant effect ($p = 0.015$). The dummy variable coefficient of 0.12 shows that tax compliance improved by 0.12 units after technology adoption, significant at $p = 0.012$. The interaction term of 0.0009 means that post-technology, the impact of OTP on compliance further increased by 0.0009 units per unit increase in OTP, also significant ($p = 0.030$). The constant of 3.6 represents the baseline compliance level before accounting for other variables. Overall, online tax payment

platforms positively influence tax compliance, with a stronger effect following technological adoption, leading to the rejection of the null hypothesis (H_{02}).

H_{03} : Automated tax auditing systems do not significantly influence tax compliance in the Nigerian economy.

Corresponding segmented regression model:

Table 4

Regression Result For Influence of Automated Tax Auditing

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ATA	0.0022	0.0009	2.444	0.020
Dt (Dummy Variable)	0.1300	0.0480	2.708	0.011
ATA × Dt (Interaction)	0.0011	0.0005	2.200	0.035
C (Constant)	3.5500	0.0950	37.368	0.000

R-squared: 0.9150, Adjusted R-squared: 0.9050

Source: Researchers' computation (2025)

The coefficient for Automated Tax Auditing (ATA) of 0.0022 indicates that before technology integration, each unit increase in ATA is associated with a 0.0022 unit rise in tax compliance, significant at $p = 0.02$. The dummy variable coefficient of 0.13 shows tax compliance increased by 0.13 units after technology adoption, significant at $p = 0.011$. The interaction term of 0.0011 means the effect of ATA on compliance grows by 0.0011 units post-integration, also statistically significant ($p = 0.035$). The constant of 3.55 represents the baseline compliance level. These findings suggest that automated tax auditing significantly enhances tax compliance, with a stronger impact after technology adoption, leading to rejection of the null hypothesis (H_{03}).

Discussion of Results

Electronic Tax Filing (ETF)

Electronic tax filing significantly improves tax compliance in Nigeria, with stronger effects post-technology adoption (Lanre-Jimoh, Igbekoyi, & Fasanmi, 2024). This aligns with findings that user-friendly e-tax platforms boost compliance (Ashafoke & Obaretin, 2024) and reduce errors (Ekeocha, 2021). However, challenges such as digital literacy and infrastructure may limit its impact (Falana et al., 2024; Adejuwon & Olasunkanmi, 2023). Unlike Musbau and Ezeani (2025), this study did not isolate advanced AI tools, suggesting future research directions. Overall, ETF's positive influence on compliance is well-supported but contingent on broader digital readiness.

Online Tax Payment Platforms (OTP)

Online tax payment platforms positively influence tax compliance, with greater effects following technology integration (Falana et al., 2024). This supports findings that mobile payment access and digital awareness enhance voluntary compliance in Nigeria's informal sector (Dagunduro, 2023; Mac-Ozigbo & Igbokwe-Ibeto, 2023). Increased tax revenues linked to digital systems further validate this impact (Mohammed, Ahmed, & Suleiman, 2023). Nonetheless, issues like trust deficits and poor infrastructure may constrain OTP's effectiveness (Owolabi & Olayinka, 2022; Adejuwon & Olasunkanmi, 2023). Policymakers should address these barriers to maximize benefits.

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Automated Tax Auditing (ATA)

Automated tax auditing significantly improves compliance by enhancing audit efficiency and detection, with stronger effects post-adoption (Musbau & Ezeani, 2025). This complements findings that AI audit tools deter evasion and foster fairness perceptions (Oyekan & Momoh, 2023). Staff training gaps and infrastructural challenges may moderate full benefits (Salawu et al., 2024; Adejuwon & Olasunkanmi, 2023). The study confirms the critical role of digital auditing innovations in improving compliance outcomes. Behavioral and technological readiness remain key to realizing ATA's potential.

Overall Summary, this study's segmented time-series analysis shows that digital tax innovations electronic filing, online payment, and automated auditing significantly enhance tax compliance in Nigeria, especially after technology adoption. These findings align with a growing literature affirming digitalization's transformative effect on tax administration, while highlighting ongoing challenges in infrastructure and taxpayer readiness that must be addressed.

5. Conclusion and Recommendations

Conclusion

The study concludes that technology integration has a significant and positive influence on tax compliance in Nigeria. Specifically, the adoption of electronic tax filing, online tax payment platforms, and automated tax auditing systems has collectively enhanced voluntary compliance, improved tax administration efficiency, and reduced opportunities for tax evasion. These technological tools have streamlined processes, increased taxpayer convenience, and strengthened enforcement mechanisms, thereby fulfilling the study's primary objective. The implication is that policymakers should prioritize the expansion and maintenance of these technologies to ensure long-term compliance gains and strengthen domestic revenue mobilization.

Recommendations

Given the findings, the study recommends that:

- (i) Digital Infrastructure: Government should invest in building and maintaining secure, resilient digital tax infrastructure to support the consistent nationwide deployment of e-filing, online payments, and automated audits.
- (ii) Capacity Building: Tax authorities should implement sustained digital literacy campaigns targeting informal sector players and SMEs to improve engagement with digital tax platforms.
- (iii) Institutional Automation: The FIRS should formally adopt automated audit systems in routine operations to enhance accuracy, strengthen compliance enforcement, and build taxpayer confidence through transparency.

Contribution to Knowledge

This study advances the literature by jointly analyzing the effects of electronic tax filing, online tax payment, and automated auditing on tax compliance in Nigeria offering a comprehensive approach rather than isolated tool evaluations. It is also the first to employ a segmented Interrupted Time Series Model (ITSM) to assess pre- and post-technology effects, providing a dynamic temporal analysis of reform impacts. Moreover, it extends the application of the Technology Acceptance Model (TAM) to a macro-level context, capturing system-wide tax compliance behaviors rather than focusing on individual users or firms.

Implications for Further Studies

This study paves the way for future research in several directions. First, scholars are encouraged to explore the combined influence of multiple digital tax tools, including mobile apps and blockchain systems, rather than assessing single technologies in isolation. Second, the use of the segmented Interrupted Time Series Model (ITSM) demonstrates the value of longitudinal designs in evaluating policy and technological impacts, suggesting its application in other countries or sectors. Lastly, further research should investigate the behavioural and institutional dynamics affecting technology adoption, particularly among SMEs and informal sector taxpayers, using mixed or qualitative methods to capture deeper insights.

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