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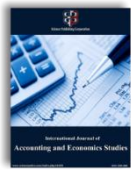

Digital Tax Policies and The Tax Gap in The Informal Sector in Southwest, Nigeria

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Abstract

Globally, the tax gap remains a pressing challenge for many economies, particularly within the informal sector, where compliance levels are traditionally low and monitoring is difficult. Considering this, this study examined the effect of digital tax policies on the tax gap within the informal sector of Southwest Nigeria, focusing on three key constructs: digital tax reporting, electronic tax systems, and Tax ProMax. The study adopted a survey research design targeting 3,145 Federal Inland Revenue Service (FIRS) tax officers across the South-West states of Nigeria and 200 micro and small business operators in Lagos, given their central role in tax administration and informal sector compliance. A sample of 342 tax officers was proportionately selected across states using the Krejcie and Morgan formula, while 200 questionnaires were purposively distributed to informal operators, yielding 146 valid responses and bringing the total sample to 488. Data were collected through a structured questionnaire. Using partial least squares structural equation modelling, the findings revealed that both digital tax reporting and Tax ProMax had significant positive effects on reducing the tax gap, while the electronic tax system had a positive but insignificant impact. The results showed that technologies that enhance monitoring, enforcement, and transparency are more effective in addressing compliance issues within the informal sector. The study concluded that digital tax policies are critical instruments for addressing the persistent tax gap in Nigeria's informal sector. Based on these findings, this study recommends that policymakers should strengthen the adoption of digital tax reporting platforms by enhancing accessibility, reliability, and security.

Keywords: *Digital Tax Policies; Tax Promax; Electronic Tax System; Digital Tax Reporting; Tax Gap.*

1. Introduction

Over the years, tax compliance challenges have emerged as a worldwide issue affecting both developed and developing nations. The Organisation for Economic Co-operation and Development (OECD, 2019) report on tax gap measurement for 2017 stated that enhancing tax compliance and narrowing the tax gap represents a fundamental goal for all revenue authorities. The tax gap concept is complex, incorporating elements including non-filing, underreporting, and underpayment. Conventional tax systems have frequently failed to adequately address these elements, resulting in substantial revenue shortfalls (Mbise & Tembuku, 2022). The international organisation noted that globalisation has heightened the requirement for revenue authorities worldwide to assist nations in managing their revenue systems to eliminate tax gaps. The United Kingdom's tax gap estimates reveal a general declining pattern, with the percentage falling from 6.5% in 2014-2015 to 4.8% in 2022, predominantly within the informal sector (HMRC 2023). In the United States, the tax gap reached $688 billion in 2021, with 11% attributed to non-filing, 79% to incorrect tax returns, and 10% to non-payment of taxes owed (IRS 2023). Australia's tax gap stood at 7% in 2021 (ATO 2023). PricewaterhouseCoopers (PwC) (2024) indicates that Nigeria's tax compliance rate falls considerably below that of other countries, chiefly owing to inadequate revenue administration and limited data availability, particularly regarding the informal sector.

The informal sector, which constitutes a substantial element of developing economies and possesses considerable revenue-generating potential given its extensive scale, frequently evades taxation as its income remains unrecorded officially (Awa, 2021; Dakhil et al., 2024). The OECD's 2023 Revenue Statistics in Africa indicate that Nigeria's tax-to-GDP ratio in 2021 was 6.7%, markedly below the 15.6% average across 33 African nations (Awotomilusi et al., 2023; Lawal et al., 2024). Tax non-compliance adversely affects the tax-to-GDP ratio. World Bank specialists maintain that tax revenues surpassing 15% of a nation's GDP are essential for economic development and poverty reduction (Adewara et al., 2023; Falana et al., 2024). Nations seek to accomplish this not through tax increases but by improving tax collection and reducing the tax gap (Gaverdovskiy, 2023). Nigeria's informal sector represents a substantial proportion of the economy, contributing significantly to GDP and employment whilst remaining largely outside the formal tax system, thereby creating a considerable revenue shortfall for government (Aina, 2025; Monye & Abang, 2020). Research demonstrates that informal businesses often lack

appropriate registration and record-keeping, rendering identification and assessment problematic; socio-cultural factors such as poor tax morale, distrust in government, and perceptions of tax revenue misuse further undermine compliance (Adekoya et al., 2020; Dagunduro et al., 2025; Garuba & Oladipupo, 2021). Administrative difficulties, inadequate enforcement, numerous tax and levy agents, elevated compliance costs, and insufficient integration of tax identification systems compound the problem (Aina, 2025; Ogunleye et al., 2020). As Nigeria endeavours to expand its tax base amid economic pressures and declining oil revenues, these challenges within the informal sector represent both barriers and prospects for policy reforms aimed at simplifying tax regimes, increasing voluntary compliance, and enhancing public awareness to capture this "missing" tax potential (Aina, 2025; Aluko et al., 2022; Jack-Osimiri et al., 2023).

In recent years, digital technologies have fundamentally transformed the global economic landscape. This transformation has extended to taxation, prompting governments to reconsider and redesign their tax policies to address the complexities introduced by the digital economy (Manabu & Andualem, 2023). One of the most critical issues is the tax gap, representing the difference between taxes owed to the government and those actually collected (Amaglobeli et al., 2022). The emergence of digital tax policies seeks to close this gap by utilising technology to enhance tax compliance, improve tax administration efficiency, and ultimately increase revenue collection (Adekoya et al., 2019). Digital tax policies, encompassing measures such as TaxProMax, electronic tax systems, electronic invoicing, digital reporting, and real-time tax collection, offer a promising solution to these challenges. Through automating and streamlining tax processes, these policies not only diminish opportunities for tax evasion but also increase transparency and accountability within the tax system.

Numerous countries have already implemented various forms of digital tax policies, achieving varying levels of success. For example, the introduction of mandatory electronic invoicing in countries such as Italy and Brazil has led to substantial reductions in their tax gaps (Dagunduro et al., 2025; Kang'oro et al., 2024). Similarly, the United Kingdom's Making Tax Digital (MTD) initiative aims to render tax administration more effective, efficient, and simpler for taxpayers to submit accurate returns (Mbise & Baseka, 2022). Despite the encouraging outcomes observed in certain jurisdictions, implementing digital tax policies presents challenges. Issues including data privacy, cybersecurity, and the digital divide constitute significant obstacles to widespread adoption of these policies (Derrick et al., 2023). Furthermore, transitioning from traditional to digital tax systems requires substantial investment in technology and capacity building, which may prove challenging for developing countries with limited resources (Bellon et al., 2022).

This study seeks to address several research gaps identified in existing literature. Whilst previous studies emphasise that the informal sector significantly contributes to tax evasion and low compliance, with factors such as inadequate tax knowledge, poor record-keeping, and high tax rates being major obstacles (Iredele, 2018; Adekoya et al., 2019), there is limited research specifically examining the impact of digital tax policies on this sector. Although recent studies, such as those by Manabu and Andualem (2023) and Mbise and Baseka (2022), demonstrate the potential of digital technologies to enhance tax compliance and revenue mobilisation amongst SMEs and the formal sectors, they do not adequately address the unique challenges and dynamics of the informal economy. Additionally, whilst Bellon et al. (2022) and others have explored the positive spillover effects of digital tax tools like e-invoicing, there remains a significant gap in understanding how such tools can be effectively implemented to improve compliance within the unregulated and often elusive informal sector in Nigeria. This study aims to address these gaps by providing empirical evidence on the effectiveness of digital tax policies in reducing the tax gap and enhancing compliance, specifically within Nigeria's informal sector.

This aims to provide a comprehensive analysis of how these policies can effectively reduce the tax gap, identify the key factors contributing to their success or failure, and offer recommendations for policymakers seeking to implement similar measures. By examining the intersection of digital technology and tax policy, this study contributes to the broader discourse on enhancing tax compliance and optimising tax administration in the digital age. It underscores the importance of adopting innovative solutions to address traditional challenges in tax collection, particularly within the informal sector. This study will also highlight the potential of digitalisation to transform tax systems, rendering them more transparent, efficient, and inclusive. Through its findings, the study aims to inform and influence policy decisions, ultimately leading to more effective tax administration and improved fiscal sustainability in Nigeria and beyond.

The remainder of the paper is structured as follows: Section two will provide a review of relevant literature, whilst section three will detail the methodology employed in the study. Section four will present the data analysis and discuss the findings. The final section will conclude the study, offering recommendations and outlining the study's contributions.

2. Literature Review

This section summarizes important studies concerning the variables addressed in this research. It assesses earlier findings to offer context and background, demonstrating how these studies relate to and support the present investigation.

2.1. Conceptual review

This section provides clear and concise definitions for the key concepts and variables used in this study. Establishing these definitions is essential to ensure a common understanding and to facilitate the interpretation of the study’s findings.

2.1.1. Tax gap

In the United States, the IRS (2021) characterised the tax gap as the disparity between the actual tax obligation for a specific year and the sum remitted punctually. This notion, as outlined by Bagdad, underscores the shortfall between taxes due to the government and amounts actually received. The OECD states that the tax gap signifies the difference between the estimated tax obligation under tax legislation and the tax amount that is actually paid (OECD, 2020). This interpretation, supported by international bodies such as the OECD, offers a more comprehensive view by examining the statutory tax liability and actual payments made. It draws attention to discrepancies that may emerge due to legislative loopholes or tax evasion tactics. Smith (2019) described the tax gap as the variance between anticipated tax revenue assuming complete taxpayer compliance and the actual tax revenue collected. This interpretation concentrates on theoretical projections versus practical results, offering insight into the efficacy of tax policies and compliance initiatives. It emphasises the consequences of non-compliance on government revenue and fiscal strategy. According to HMRC (2023), it encompasses the theoretical tax liability in comparison to actual payments.

In this study, the tax gap is characterised as the difference between the tax amount that taxpayers ought to pay and the sum that is actually remitted on time. This interpretation, frequently employed by tax authorities such as the IRS, highlights the revenue shortfall resulting from non-compliance or late payments. It stresses the significance of timely and accurate tax reporting. The tax gap represents the discrepancy between the theoretical sum of taxes that should ideally be paid and the actual amount received by tax authorities. The tax gap functions as a vital indicator for tax authorities to assess non-compliance, incorporating factors such as underreporting, underpayment, and non-filing

amongst eligible taxpayers, whether within or outside the formal tax system. It assists in comprehending the causes of non-compliance and guides strategies to increase tax revenue through improved compliance. Furthermore, it fosters transparency within the tax system by demonstrating the effectiveness of enforcement measures over time and distinguishing between inadvertent errors and intentional evasion or avoidance strategies.

2.1.2. Digital tax policies

Derrick et al. (2023) characterised digital tax policies as a collection of regulatory measures and technological initiatives designed to utilise digital technologies to streamline tax administration, strengthen compliance, and improve revenue collection processes. This characterisation emphasises the dual emphasis of digital tax policies on regulatory frameworks and technological implementation. It highlights the function of digital tools in transforming conventional tax systems to render them more efficient and responsive to contemporary challenges. Digital tax policies refer to governmental strategies that incorporate advanced digital tools such as artificial intelligence, blockchain, and real-time data analytics into tax compliance processes to tackle tax evasion and increase transparency (Dagunduro et al., 2025; Mbise & Baseka, 2022). This characterisation underscores the technological innovations embedded within digital tax policies, emphasising their role in enhancing the precision and effectiveness of tax compliance efforts through innovative technologies.

Digital tax policies encompass initiatives that enable online tax filing, electronic invoicing, and digital reporting systems, designed to simplify tax compliance for both taxpayers and tax authorities (Kang'oro et al., 2024). This characterisation focuses on the practical implementations of digital tax policies, highlighting their role in reducing administrative burdens and enhancing the ease of compliance for taxpayers, whilst also facilitating more efficient data management for tax authorities. Digital tax policies involve the deployment of electronic systems for tax registration, payment, and auditing, aimed at modernising tax administration to align with the digital economy's dynamics (Bellon et al., 2022). This characterisation emphasises the modernisation element of digital tax policies, illustrating how they adapt tax administration practices to keep pace with technological advancements and evolving business landscapes. Digital tax policies encompass legislative measures and technological solutions designed to combat tax base erosion and profit shifting (BEPS) in a digitalised global economy, ensuring equitable taxation across borders (Manabu & Andualem, 2023). This characterisation addresses the international dimension of digital tax policies, focusing on their role in addressing challenges presented by cross-border transactions and digital business models, thereby promoting global tax fairness and equity.

Within the context of this study, digital tax policies are regarded as a comprehensive framework comprising both regulatory measures and technological innovations. These policies aim to utilise digital technologies effectively to enhance the efficiency and effectiveness of tax administration processes. Examples of such measures include TaxProMax, which enables automated tax processing and compliance monitoring, electronic tax filing systems that permit taxpayers to submit returns online, and digital tax reporting platforms that allow real-time reporting and analysis of tax data. Collectively, these initiatives are designed to simplify tax compliance, reduce administrative burdens, improve transparency, and ultimately enhance revenue collection capabilities for tax authorities.

2.1.2.1. Taxpromax

TaxProMax is a comprehensive tax administration solution launched by the Federal Inland Revenue Service (FIRS) in Nigeria (Peter, 2023). It is designed to facilitate and strengthen tax compliance amongst taxpayers by providing various digital services. TaxProMax enables streamlined processes such as tax registration, filing, payment, and the automatic allocation of withholding tax and other credits to taxpayers' accounts (Desi & Bingilar, 2023). It also provides a unified interface that permits taxpayers to manage all their interactions with the tax authority efficiently (David, 2021). Furthermore, TaxProMax supports transactions in both Nigerian Naira and other international currencies, thereby accommodating diverse taxpayer requirements and enhancing transparency and efficiency in tax administration (Dein & Rufus, 2022).

In this study, TaxProMax is characterised as an integrated digital platform developed by the Federal Inland Revenue Service (FIRS) in Nigeria, aimed at modernising and simplifying tax administration. It encompasses a suite of electronic services that permits taxpayers to register, file taxes, make payments, and manage their tax obligations online. TaxProMax facilitates real-time access to tax information, enhances compliance through automated processes, and provides a centralised view of taxpayer transactions with FIRS. This digital tool supports transparency, efficiency, and convenience in tax management, contributing to improved revenue collection and administration effectiveness.

2.1.2.2. Electronic tax system

The electronic tax system is described as the digital platforms and technologies utilized by tax authorities to streamline tax administration processes, including tax filing, payment, and compliance monitoring (Adejuwon & Olasunkanmi, 2023). The electronic tax system has been shown to significantly enhance efficiency in tax collection and reduce administrative burdens on taxpayers by providing convenient online access to tax services. An electronic tax system is a digital infrastructure employed by tax authorities to automate and integrate tax-related operations, facilitating seamless taxpayer interactions and improving compliance through technological advancements (Abdulkadir & Alabede, 2022). Edori (2023) indicates that electronic tax system implementation leads to higher taxpayer satisfaction and compliance rates due to its user-friendly interfaces and real-time transaction capabilities. Electronic tax systems encompass software applications and digital tools deployed by tax administrations to modernize tax processes, promote transparency, and optimize revenue collection through automated workflows (Falana et al., 2024; Otekunrin et al., 2022). The findings of David (2021) demonstrate that electronic tax system adoption enhances tax compliance by reducing errors in tax reporting, minimizing tax evasion opportunities, and increasing government revenue through efficient tax management.

In this study, the electronic tax system is defined as a technological framework employed by tax authorities to facilitate the electronic submission of tax returns, online payment of taxes, and electronic communication with taxpayers. The primary objective is to enhance the effectiveness and efficiency of tax administration. The electronic tax system is recognized for its capability to combat tax fraud by enabling secure transactions and reducing opportunities for evasion. Additionally, they streamline audit processes by providing real-time access to comprehensive taxpayer data, which enhances accuracy and transparency in compliance monitoring. Ultimately, the electronic tax system contributes to creating a favorable environment for sustainable revenue generation by modernizing tax operations and improving overall administrative efficacy.

2.1.2.3. Digital tax reporting

Digital tax reporting refers to the use of electronic systems and technologies for taxpayers to fulfill their tax obligations, such as filing tax returns and making payments electronically. It aims to streamline tax processes, reduce errors, and enhance compliance through automation (Dagunduro et al., 2025; Ike & Bright, 2023). Digital tax reporting involves the implementation of digital platforms and tools that enable taxpayers to report their tax information online, facilitating real-time data submission and analysis. Studies show that digital reporting systems improve efficiency in tax administration and increase taxpayer compliance rates (Adegbi et al., 2022). Digital tax reporting encompasses the adoption of advanced technologies like cloud computing, AI, and blockchain to transform traditional tax reporting methods. These innovations enable governments to collect and analyze tax data more effectively, leading to improved revenue collection and reduced tax evasion (Mohammed et al., 2023).

In this study, digital tax reporting refers to the shift away from traditional paper-based methods of tax reporting towards electronic systems. These systems facilitate smooth communication and transactions between taxpayers and tax authorities. Digital reporting is characterized by its ability to enhance transparency in tax processes, lower administrative expenses associated with manual handling of tax data, and bolster tax compliance. By offering taxpayers convenient, secure, and user-friendly platforms, digital tax reporting aims to streamline interactions, improve accuracy in reporting, and ultimately optimize the efficiency of tax administration.

2.2. Theoretical review

This study examined the Diffusion of Innovation Theory and the Technology Acceptance Model (TAM) as theoretical foundations. This study is grounded in these theories to explore how digital tax policies impact the tax gap in the informal sector.

2.2.1. Diffusion of innovation theory

The Diffusion of Innovation (DOI) Theory, established by E.M. Rogers in 1962, examines how and at what pace innovations spread through populations. It describes the gradual process by which an idea or product gains traction and disseminates among people. The theory identifies four key components influencing this dissemination: the innovation itself, communication channels, the time required for adoption, and the social systems involved. Innovations typically progress through five stages: knowledge, persuasion, decision, implementation, and confirmation (Call & Herber, 2022). The theory also classifies users into five categories based on their adoption behavior: innovators (the first users, about 2.5%), early adopters (easily persuaded, 13.5%), early majority (adopting after seeing prior use, 34%), late majority (adopting later, 34%), and laggards (resisting until the benefits are clear, 16%) (Mbise & Baseka, 2022).

This theory has been extensively applied to fields like e-commerce, finance, and taxation. For example, Ofurum (2019) used diffusion of innovation theory to explore the impact of electronic taxation on tax revenue. Similarly, Eke and Alohan (2022) and Ike and Bright (2023) applied the diffusion of innovation theory in their studies on the effects of electronic taxation on tax administration in Nigeria. The diffusion of innovation theory is directly relevant to this study on the impact of digital tax policies on the tax gap in the informal sector. This theory, which explores how new ideas or technologies gain acceptance and spread through a population, is particularly pertinent in understanding the adoption of digital tax policies. These policies represent technological innovations in the field of taxation that need to be gradually adopted by taxpayers. According to the DOI Theory, the process of adoption involves several stages: knowledge, persuasion, decision, implementation, and confirmation. In the context of digital tax policies, this means that the successful implementation of electronic tax systems requires time and effort for taxpayers to become aware of, understand, and integrate these innovations into their tax practices.

The diffusion of innovation theory has been criticized for its lack of attention to external factors, such as political, economic, and social conditions, which can significantly impact the adoption of innovations. Sani et al. (2021) argue that the theory often overlooks these broader environmental and organizational contexts, which play a crucial role in the diffusion process. Additionally, Adams and Baseka (2023) contend that the DOI Theory focuses too heavily on attributes like perceived advantage and ease of use, neglecting other important factors such as cost, compatibility, and complexity. Mohammed et al. (2023) further criticize the theory for not adequately incorporating the influence of social networks and peer groups, which are vital in understanding how innovations are adopted or resisted. However, the theory helps to explain how these digital tax tools will gradually influence taxpayer behaviour, potentially reducing the tax gap as adoption increases and more taxpayers comply with electronic reporting requirements.

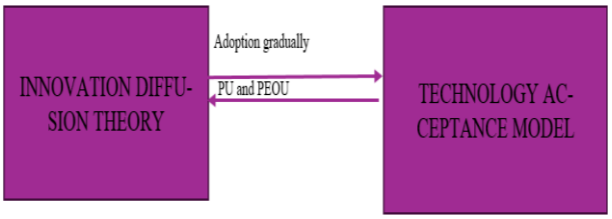
2.2.2. Technology acceptance model theory

The Technology Acceptance Model (TAM), proposed by Fred D. Davis in 1986, aims to explain and predict how users accept and implement new technology. It suggests that the perceived usefulness and perceived ease of use of a system are critical factors influencing users' decisions on when and how to utilize it (Ibrahim et al., 2017; Marikyan & Papagiannidis, 2023). TAM outlines a three-stage process where external factors, such as system design, trigger cognitive responses, leading to an attitude toward using the technology, which ultimately affects user behavior. The theory has been extensively applied in various fields, including taxation, disruptive technologies, and finance. For instance, Adams and Baseka (2023) examined the influence of digital technologies on tax compliance, basing their study on the technology acceptance model. Similarly, Desi and Bingilar (2023) and Mbise and Tembulu investigated the effects of TaxPro-Max and digitalization on tax compliance, with their research also grounded in the technology acceptance model.

The technology acceptance model is directly applicable to the study of digital tax policies and their impact on the tax gap in the informal sector. By focusing on perceived usefulness and ease of use, TAM helps to understand how taxpayers in the informal sector might adopt digital tax policies. If taxpayers find digital tax systems easy to use and believe they enhance efficiency and compliance, they are more likely to adopt these technologies (Edori, 2023). This increased adoption can lead to better tax compliance, thereby reducing the tax gap in the informal sector. The model has been effective in explaining the acceptance of e-commerce and website usage, although it has faced criticism for its simplicity and lack of attention to the antecedents of technology acceptance. Oyewobi and Ozovehe (2023) argue that it oversimplifies the relationship between technology usage and performance by implying that more technology use invariably leads to better outcomes, which is not always the case. Abdulkadir and Alabede (2022) highlight that TAM does not adequately consider the crucial role of system design and how well the technology fits the user's specific tasks. Without addressing these factors, merely increasing technology usage may not result in improved performance or efficiency. Therefore, a comprehensive evaluation of technology adoption should include an assessment of how well the system is designed and how effectively it meets users' needs.

2.2.3. Innovation diffusion theory (IDT) and technology acceptance model (TAM)

Innovation Diffusion Theory assumes that five categories of individuals adopt the use of information technology, while the Technology Acceptance Model mentions that the adoption is dependent on Perceived Usefulness (PU) and Perceived Ease of Use (PEOU).



2.3. Empirical review

This section presents a comprehensive review of related existing literature on digital tax policies and the tax gap. It aims to contextualize the current research within the broader academic discourse and highlight the key findings, methodologies, and gaps in the literature.

2.3.1. TaxProMax and tax gap

Desi and Bingilar (2023) examined the impact of implementing TaxPro-Max on tax remittance to the Federal Inland Revenue Service (FIRS) in Nigeria. By using proxies such as online tax services and electronic filing, they conducted a survey among FIRS staff in Yenagoa, collecting 70 usable responses from 76 distributed questionnaires. The analysis was conducted using descriptive statistics, demonstrated a positive and statistically significant relationship between the adoption of TaxPro-Max and improvements in tax remittance, indicating that the system's implementation has effectively enhanced tax collection processes. Peter (2023) analyzed the effect of the TaxPro-Max system on tax revenue and collection efficiency in Nigeria, focusing on the tax achievement rate as a measure of efficiency. By employing paired sample t-tests on FIRS tax remittance data from 2019 to 2023, the study found significant improvements in tax revenues post-TaxPro-Max implementation, with Petroleum Profit Tax (PPT) revenues increasing by 131% and Value Added Tax (VAT) revenues by 62%. Although the increase in PPT collection achievement rate was not statistically significant, significant growth was observed in the collection achievement rates for Company Income Tax (CIT) and VAT, highlighting TaxPro-Max's effectiveness in boosting tax revenue generation.

Pascale and Paymaster (2023) and David (2021) similarly investigated the relationship between TaxPro-Max adoption and FIRS tax remittance using online tax services and electronic filing as proxies. Both studies utilized survey designs, collecting data through questionnaires from FIRS staff, and found positive and statistically significant correlations between TaxPro-Max adoption and improved tax remittance. Dein and Rufus (2022) corroborated these findings in their study focusing on South-West Nigeria, while Adejuwon and Olasunkanmi (2023) extended the analysis to tax digitalization's broader impact on revenue collection challenges in Nigeria, concluding that digitalization significantly enhances tax revenue and reduces tax evasion. Extending beyond Nigeria, Xu et al. (2025) found that digital tax administration promoted enterprise innovation by easing financing constraints and lowering management costs, with stronger effects in non-state-owned firms. Zhao and Wang (2025) further showed that digitization curbs corporate earnings management by reducing information opacity and tax avoidance, with varying effects across firm types.

Although prior studies such as Desi and Bingilar (2023), Peter (2023), Pascale and Paymaster (2023), David (2021), Dein and Rufus (2022), and Adejuwon and Olasunkanmi (2023) have provided valuable insights into the effect of TaxPro-Max on tax remittance, revenue generation, and collection efficiency, they largely focused on revenue performance metrics and administrative efficiency while neglecting its direct impact on the tax gap. Most of these studies relied on survey data from FIRS staff or revenue achievement rates, which, while informative, do not capture the broader gap between potential and actual tax revenues, particularly in relation to tax evasion, underreporting, and informal sector compliance. Furthermore, existing works emphasize remittance improvements without sufficiently analyzing whether TaxPro-Max effectively addresses structural challenges in narrowing Nigeria's persistent tax gap across different tax types and taxpayer categories. This study, therefore, seeks to fill these gaps by examining the effect of TaxPro-Max specifically on the tax gap, thereby moving the discourse beyond revenue growth and efficiency to assessing how digital tax reforms can close leakages in Nigeria's tax system. Based on these identified research gaps, this study formulates and tests the following hypothesis:

$H_0 1$: The adoption of TaxPro-Max does not significantly reduce the tax gap in the informal sector in the Southwest of Nigeria.

2.3.2. Electronic tax system and tax gap

Ike and Bright (2023) explored the impact of e-taxation on the effectiveness of tax administration at the Federal Inland Revenue Service branches in Benin and Auchi. Their research, which used stratified random sampling and involved 390 respondents, found that while e-taxation had a statistically insignificant negative effect on the ease of paying taxes, it significantly enhanced the efficiency of processing tax returns and assessments. This suggests that e-taxation has a marginally positive impact on the overall efficiency of tax administration but has not notably simplified the tax payment process. In contrast, Edori (2023) focused on the ease of tax compliance with electronic tax services, such as e-registration, e-tax payment, and e-filing. Using data from 106 participants analyzed through Pearson Product-Moment Correlation, Edori's study demonstrated that these e-tax services significantly improved the ease of tax compliance. Strong correlations were observed between e-registration, e-filing, and ease of compliance, indicating that these services have made it easier for taxpayers to manage their tax obligations.

Oyewobi and Ozovehe (2023) examined the relationship between tax automation and economic growth, utilizing VAT and stamp duty data with a Vector Error Correction Model. Their analysis revealed a significant short-term impact of tax automation on GDP, suggesting that the use of ICT in tax assessment and collection positively influences economic growth in the short run. The study advocates for continued investment in technological advancements to maintain and potentially enhance these benefits over the long term. Abdulkadir and Alabede (2022) investigated the influence of electronic tax administration on taxpayers' compliance attitudes in Taraba State. Their study, based on data from 312 individual taxpayers and analyzed with multiple regression, found that electronic tax awareness and perceived ease of use positively affected compliance attitudes, while the quality of electronic tax services had a negative impact. This highlights the need for improvements in service quality to enhance taxpayer compliance. This finding aligns with earlier research by Sani et al. (2021) and Eke and Alohan (2022), which also pointed to the challenges in tax compliance and the limitations of e-taxation in improving tax revenue and

administrative efficiency. This outcome aligns with the findings of Ofurum (2019), which also reported that e-taxation had not led to improvements in tax revenue, federally collected revenue, or the tax-to-GDP ratio in Nigeria.

Beyond Nigeria, international studies point to broader trends in tax digitalization. Belahouaoui and Attak (2024), through a systematic review of 62 studies, underscored the potential of advanced digital tools AI, machine learning, and blockchain, in strengthening compliance and curbing evasion, but stressed the importance of regulatory support, global cooperation, and targeted strategies for SMEs and developing economies. Similarly, Ofosu-Ampong (2024) examined Ghana's e-levy on mobile money, finding that factors like innovativeness, tax structure, and social compliance norms shaped attitudes toward compliance, though attitudes did not necessarily translate into actual payment behavior. Together, these studies reveal that while digital tax reforms enhance efficiency, compliance, and even economic growth, challenges persist in service quality, taxpayer behavior, and the effective translation of attitudes into compliance, particularly in developing contexts. It is, therefore, hypothesized as follows:

H_02: The Electronic tax system has no significant effect on the tax gap in the informal sector of Southwest Nigeria.

2.3.3. Digital tax reporting and tax gap

Studies on digital tax reporting and administration consistently highlight its potential to improve compliance and revenue mobilization, though challenges remain. Amaglobeli et al. (2023) found that digital tax reporting positively influenced revenue mobilization by enhancing administrative efficiency, while Mbise and Baseka (2022) emphasized its role in boosting compliance among SMEs through improved accuracy and reduced errors. Similarly, Bellon et al. (2022) reported efficiency gains in VAT remittance, and Kang'oro et al. (2024) highlighted broader compliance and collection improvements, albeit with implementation challenges. Derrick et al. (2023) further showed that digital tax policies generated sustained revenue increases in Cameroon, even under infrastructure constraints. In Nigeria, Adejuwon and Olasunkanmi (2023) reinforced these findings by demonstrating that digitalization curbed tax evasion and improved revenue collection, though Abdulkadir and Alabede (2022) cautioned that poor service quality could weaken compliance attitudes despite the positive effects of awareness and ease of use. Collectively, these studies underscore digital reporting's role in strengthening tax systems while pointing to persistent service delivery and infrastructure gaps.

At the micro level, recent research has investigated how digital tax tools affect individual taxpayers. Indrawan (2024) showed that while e-filing and e-billing simplified taxpayer obligations in West Java, the efficiency of the reporting system did not significantly moderate their relationship with compliance. Rasyida and Badjuri (2025) extended this analysis in Central Java and Yogyakarta, revealing that e-filing, tax knowledge, and income significantly influenced compliance, though tax socialization only moderates income's effect rather than strengthening links with e-filing and knowledge. These findings suggest that while digital tax platforms generally enhance compliance, contextual factors such as system efficiency, taxpayer awareness, and socioeconomic conditions influence outcomes. This highlights the need for continuous system improvements, targeted socialization programs, and infrastructure investments to maximize the effectiveness of digital tax reporting across different settings. Based on the above facts, this study's hypothesis:

H_03: Digital tax reporting has no significant positive effect on reducing the tax gap in the informal sector in Southwest Nigeria.

2.4. Conceptual framework

Figure 1 visually illustrates the conceptual framework of the study by mapping the relationship between independent and dependent variables. The independent variable, Digital Tax Policies, is represented through three key proxies: Tax ProMax, Electronic Tax System, and Digital Tax Reporting. These proxies capture the extent of digitalization in tax administration. The dependent variable, Tax Gap, reflects the difference between expected tax revenue and actual collections. The diagram demonstrates how the adoption and effective implementation of digital tax policies may contribute to reducing the tax gap, particularly within the informal sector in Southwest Nigeria. By providing this visual, the figure simplifies complex interactions and highlights the potential role of digital innovations in enhancing tax compliance and revenue mobilization.

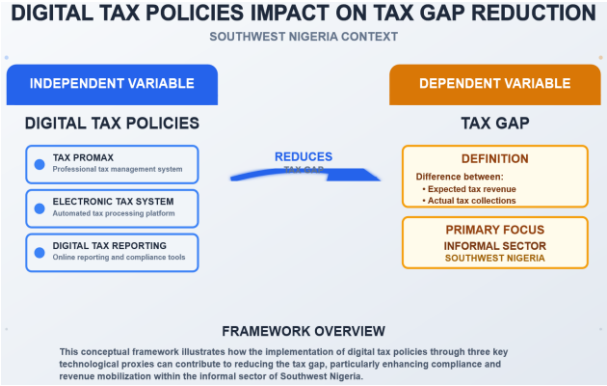


Fig. 1: Conceptual Framework.

Source: Authors' Concepts (2024).

3. Methodology

The study employed a survey research design to enable the collection of first-hand, quantifiable data directly from respondents, a method considered appropriate for examining attitudes, perceptions, and behaviors on tax-related issues. The target population comprised 3,145 tax officers of the Federal Inland Revenue Service (FIRS) across the South-West states of Nigeria, alongside 200 micro and small business operators in Lagos State. The inclusion of tax officers was justified as they are directly responsible for tax administration and compliance enforcement, while micro and small business operators were included, given their dominance in the informal sector and their critical role in shaping tax compliance outcomes. According to FIRS records as of December 31, 2023, the distribution of tax officers was as follows: 69 in Ondo State, 66 in Osun State, 41 in Ekiti State, 315 in Oyo State, 290 in Ogun State, and 2,364 in Lagos State. The South-West

region was purposively selected as it represents the commercial hub of Nigeria and contributes the highest proportion of tax revenue among the six geopolitical zones, thereby providing a robust context for the study.

A sample size of 342 tax officers was determined using the Krejcie and Morgan formula, which ensures a statistically valid representation of the population. Proportionate sampling was further applied to distribute the sample across states based on population size, thereby enhancing representativeness and reducing sampling bias. This resulted in 26 respondents from Ekiti State, 8 from Osun State, 7 from Ondo State, 34 from Oyo State, 32 from Ogun State, and 235 from Lagos State. Similarly, 200 questionnaires were administered purposively to micro and small business operators in Lagos, comprising market traders, roadside vendors, hawkers, artisans, transport operators, and unregistered private tutors or trainers, since they possess relevant knowledge of digital technologies and are directly affected by tax policies. Out of these, 146 valid responses were retrieved, reflecting a strong response rate. In total, the study sample comprised 488 respondents. Data collection was conducted using a well-structured questionnaire, while the reliability and validity of the instrument were confirmed through the Cronbach Alpha test, ensuring internal consistency and measurement accuracy.

3.1. Reliability and validity of the research instrument

The reliability and validity of the research instrument will be evaluated using statistical methods (Cronbach's Alpha) and non-statistical methods (pilot study of the questionnaire with a focus group of taxpayers). Table 1 explains the quality of the measurements and items to be employed in the analysis. It was indicated that all of the questionnaire items met the criteria of the 0.6 threshold for the outer loadings, which implies that they were a perfect reflective measurement of the constructs of the study, and they all included the measurements considered for analysis. The measuring items were further tested for internal consistency, even though the Cronbach Alpha is mostly used in social sciences, composite reliability is most preferred for partial least squares. All the variables have composite reliability that is above the 0.7 required threshold. The convergent validity is measured using the average variance extracted (AVE), and it shows that convergent validity for the variables is valid as none is less than 0.50, as suggested by Bagozzi and Yi (1998).

Table 1: A) Constructs Reliability and Validity for Digital Reporting

Variables	Indicators	Factor loading	Composite reliability	Average Variance Extracted	No of Items
Digital Tax Reporting	DGRPG1	0.914	0.896	0.709	6
	DGRPG2	0.883			
	DGRPG3	0.650			
	DGRPG4	0.847			
	DGRPG5	0.344			
	DGRPG6	0.329			

Source: Researchers' Computation (2025)

The table shows the results analysis for the reliability of the investigated variables.

Table 1: B) Constructs Reliability and Validity for Electronic Tax System

Variables	Indicators	Factor loading	Composite reliability	Average Variance Extracted	No of Items
Electronic Tax System	ELTSY1	0.683	0.842	0.548	6
	ELTSY2	0.659			
	ELTSY3	0.862			
	ELTSY4	0.719			
	ELTSY5	0.687			
	ELTSY6	0.807			

Source: Researchers' Computation (2025).

The table shows the results analysis for the reliability of the investigated variables.

Table 1: C) Constructs Reliability and Validity for Tax Promax

Variables	Indicators	Factor loading	Composite reliability	Average Variance Extracted	No of Items
Tax Promax	TXPMAX1	0.677	0.835	0.555	6
	TXPMAX2	0.780			
	TXPMAX3	0.796			
	TXPMAX4	-0.337			
	TXPMAX5	-0.467			
	TXPMAX6	0.631			

Source: Researchers' Computation (2025).

Table 1: D) Constructs Reliability and Validity for Tax Gap

Variables	Indicators	Factor loading	Composite reliability	Average Variance Extracted	No of Items
Tax Gap	TAXGAP1	0.856	0.794	0.825	7
	TAXGAP2	0.462			
	TAXGAP3	-0.836			
	TAXGAP4	-0.256			
	TAXGAP5	0.851			
	TAXGAP6	0.912			
	TAXGAP7	-0.572			

Source: Researchers' Computation (2025).

The table shows the results analysis for the reliability of the investigated variables.

Table 2 presents the results for the discriminant validity, which is obtained using the Fornell-Larcker Criterion, and it is calculated using the square root of AVE in each latent variable. This test is important to validate the degree to which measures of different traits are unrelated in order to prevent multicollinearity issues. The values are expected to be higher than the correlation values among the latent variables. As presented in Table 2 that the results showed that for all the latent variables, we have correlations that are of perfect fit.

Table 2: Discriminant Validity

Study Variables	Digital Tax Reporting	Electronic Tax System	TAX GAP	Tax ProMax
Digital Tax Reporting	0.842			
Electronic Tax System	0.751	0.740		
TAX GAP	0.797	0.752	0.908	
Tax ProMax	0.780	0.759	0.844	0.745

Source: Researchers' Computation (2025).

The table shows the results analysis for the validity of the investigated variables.

3.2. Model specification

This study modified the econometric model created by Derrick et al. (2023), which explored the effects of digital tax policies on tax revenue in Cameroon. In this study, however, tax revenue was substituted with the tax gap. The revised model is specified as follows:

$$TAG = \alpha 0 + \beta_1 TPM + \beta_2 ETS + \beta_3 DTR + \varepsilon$$

Where:
TAG = Tax Gap
TPM = Tax Pro-Max
ETS = Electronic Tax System
DTR = Digital Tax Reporting
$\alpha 0$ = Constant
Σ = Stochastic Error Term
β_0 = Intercept
β_1, β_2, β_3 = The Coefficients of the independent variable
The a priori expectation = β_1, β_2, $\beta_3 > 0$, which suggests that a positive correlation is anticipated between the explanatory variables and the dependent variable.

3.3. Data analysis techniques

The data were analyzed using both descriptive and inferential statistical techniques to ensure a comprehensive evaluation of the research objectives. Descriptive statistics such as mean, variance, skewness, and kurtosis were employed to summarize the basic characteristics of the data, identify patterns, and assess the distributional properties of the responses. This was considered appropriate as it provides a clear overview of the dataset and establishes the foundation for further analysis. Inferential statistics, including correlation and regression analysis, were applied to examine the relationships between variables and to test the study's hypotheses. The choice of these techniques was justified because they allow for broader generalizations about the population from the sample data and provide evidence of the strength and direction of associations among variables. Thus, the combination of descriptive and inferential approaches ensured both a detailed description of the dataset and robust inferences necessary for drawing valid and reliable conclusions.

4. Data Analysis and Discussion of Findings

4.1. Data presentation

As reported in Table 3, the distribution of respondents across states shows that the majority were from Lagos State (78.07%), while smaller proportions were drawn from Oyo (6.97%), Ogun (6.55%), Ekiti (5.33%), Osun (1.6%), and Ondo (1.43%), indicating Lagos as the dominant hub of operations. This dominance reflects the concentration of FIRS officers in Lagos (2,364 out of 3,145) and the purposive inclusion of 200 micro and small business operators from the state, underscoring its role as Nigeria's commercial hub and the highest tax revenue contributor in the South-West. The smaller shares from the other states mirror the lower staff strength of FIRS within those jurisdictions, ensuring proportional representation in the study. In terms of tax compliance, over half of the respondents (54.71%) reported high compliance, while 42.83% indicated low compliance and only 2.66% reported moderate compliance, reflecting a polarized outlook. Digital tax proficiency revealed a similar trend, with 52.66% rating themselves high, 43.44% low, and 4.1% moderate, suggesting that although many respondents were digitally capable, a sizable minority still lacked adequate proficiency.
Regarding experience in tax matters, the largest group (43.85%) had between 11–15 years, followed by 26.02% with 6–10 years, 11.68% with 16–20 years, and smaller groups with less than 5 years (9.01%) or more than 21 years (9.63%), showing a predominance of mid-level expertise. For years of doing business, most operators (73.28%) had been active for 6–10 years, with fewer reporting 11–15 years (9.59%), 16–20 years (10.96%), or more than 21 years (6.16%), indicating that most businesses surveyed were still in their growth and consolidation stage. Overall, the background information illustrates that the sample successfully captured both the institutional strength of Lagos in tax administration and the dynamics of micro and small businesses in the informal sector, while also highlighting critical gaps in compliance and digital proficiency that carry important policy implications.

Table 3: Background Information of Respondents

Items	Components	Frequency	Percentages
State of Operation	Lagos State	381	78.07
	Oyo State	34	6.97
	Ogun State	32	6.55
	Osun State	8	1.6
	Ondo State	7	1.43
	Ekiti State	26	5.33
	Total	488	100.00
Views on Tax Compliance	High	267	54.71

	Middle	13	2.66
	Low	209	42.83
	Total	488	100.00
Level of Digital Tax Proficiency	High	257	52.66
	Middle	20	4.1
	Low	212	43.44
	Total	488	100.00
	1-5 years	44	9.01
Experience in tax Matters	6-10 years	127	26.02
	11 -15 years	214	43.85
	16 – 20 years	57	11.68
	21 years and above	47	9.63
	Total	488	100.00
Years of Doing Business	6-10 years	107	73.28
	11 -15 years	14	9.59
	16 – 20 years	16	10.96
	21 years and above	09	6.16
	Total	146	100.00

Source: Researchers' Computation 2025.

The table shows the results analysis of the demographic information of the respondents.

4.1.1. Descriptive statistics

The results in Table 4 indicate that the mean values of all the study variables were quite high, ranging from 4.834 for the tax gap to 4.939 for the electronic tax system. This shows that respondents generally agreed on the importance and effectiveness of the digital tax initiatives under study. The slightly higher means for the electronic tax system and digital tax reporting suggest that participants viewed these tools as particularly significant in addressing tax challenges and improving compliance. The standard deviation values, which ranged from 0.240 to 0.495, and the coefficients of variation, which were all below 0.11, point to low variability in responses. This means that most respondents shared similar opinions, with little divergence across the sample. The minimum and maximum scores also confirm this trend, as the majority of responses clustered between 4 and 5, with tax gaps being the only variable to record a much lower minimum score of 1, possibly reflecting mixed views on how effectively the tax gap can be closed.

The skewness values were negative across all variables, ranging between -2.482 and -3.975, indicating that responses were skewed to the left. In practice, this means that most participants rated their agreement at the higher end of the scale, creating a concentration of positive perceptions. The high kurtosis values, ranging from 7.161 to 23.103, further suggest that the distributions were sharply peaked, implying that responses were tightly clustered around the mean with few outliers. Taken together, these statistics reveal a strong consensus among respondents that digital tax tools such as electronic tax systems and digital reporting are effective in improving tax administration and reducing compliance challenges. The consistency in responses provides robust support for the study's findings and suggests that there is a broad perception among both tax officers and business operators that digitalization has a central role to play in addressing tax-related issues in the region.

Table 4: Descriptive Statistics of Study Variables

Stats	Tax Gap	Tax ProMax	Electronic Tax System	Digital Tax Reporting
Mean	4.834	4.889	4.939	4.906
Sd	0.495	0.314	0.240	0.306
C.V	0.102	0.064	0.049	0.062
Min	1	4	4	3
Max	5	5	5	5
Skewness	-3.975	-2.482	-3.651	-3.198
Kurtosis	23.103	7.161	14.332	12.797

Source: Author's Computation (2025).

The table shows the results analysis of mean, number of observations, minimum and maximum statistics, standard deviation, skewness, and kurtosis.

4.2. Pre-estimation test of hypotheses

4.2.1. Correlation analysis of study variables

Before testing the hypotheses of the study, the relationship between the study variables needs to be examined. Spearman correlation, which is a non-parametric test suitable for hypothesis testing in survey research, was employed. Doing this will help establish the contribution of digital tax policies to tax gaps in Nigeria and help validate the PLS results. The correlation result is presented in Table 5. The correlation results indicate strong and statistically significant relationships among the study variables. Tax ProMax showed the highest positive correlation with the tax gap ($r = 0.8195$, $p = 0.0002$), suggesting that improvements in proactive tax measures are strongly associated with reductions in the tax gap within the informal sector. Similarly, digital tax reporting also had a strong correlation with the tax gap ($r = 0.7677$, $p = 0.0000$), implying that the adoption of digital reporting tools plays a major role in narrowing the gap between potential and actual tax revenue.

The electronic tax system demonstrated a moderate but significant positive relationship with the tax gap ($r = 0.6534$, $p = 0.0000$), showing that while electronic platforms contribute meaningfully to closing the gap, their impact is slightly less pronounced compared to proactive tax measures and digital reporting. In addition, the intercorrelations among the independent variables were all positive and significant, with tax ProMax correlating highly with both the electronic tax system ($r = 0.7256$, $p = 0.0000$) and digital tax reporting ($r = 0.7560$, $p = 0.0000$), reflecting that these policies often work in tandem rather than in isolation. Overall, the table suggests that strengthening digital tax policies, particularly proactive tax measures, and digital reporting has the potential to significantly minimize the tax gap in the informal sector. The

strong and consistent correlations underscore the complementary nature of these digital initiatives, pointing to the need for integrated implementation strategies to maximize their effectiveness.

Table 5: Correlation between Digital Tax Policies and Tax Gap Within the Informal Sector

Study Variables	Tax Gap	Tax ProMax	Electronic Tax System	Digital Tax Reporting
Tax Gap	1.0000 -			
Tax Pro-max	0.8195* (0.0002)	1.000 ---		
Electronic Tax System	0.6534* (0.0000)	0.7256* (0.0000)	1.0000 ---	
Digital Tax Reporting	0.7677* (0.0000)	0.7560* (0.0000)	0.6366* (0.0000)	1.0000 ---

Source: Researchers' Computation (2025).

The table shows the results correlation analysis for the investigated variables.

4.2.2. Common method bias

Before estimating the model, the data were checked for common method bias (CMB). Common method bias may exist in research where variables are latent and measured through an instrument on similar types of scales. It also occurs when the instruction at the beginning of the instrument influences different people to give responses in a similar direction, reflecting social desirability, thus leading to a common variance along the various items (Kock, 2025). The results were presented in Table 6. The collinearity statistics show that the variance inflation factor (VIF) values for all the study variables were below the commonly accepted threshold of 10, with digital tax reporting at 3.174, tax ProMax at 2.910, and electronic tax system at 2.694. These results indicate that multicollinearity was not a serious concern in the model, as the predictors were not excessively correlated with one another.

The moderate VIF values suggest that while the digital tax policies are related, each variable still provides unique explanatory power in predicting the tax gap within the informal sector. In other words, the independent variables are sufficiently distinct to justify their inclusion in the same regression model, ensuring the robustness and reliability of the regression estimates. Overall, the results confirm that the model is statistically sound, with limited risk of distortion due to multicollinearity, thereby strengthening confidence in the study's regression analysis.

Table 6: Collinearity Statistics of Study

Study Variables	VIF
Digital Tax Reporting	3.174
Electronic Tax System	2.694
Tax ProMax	2.910

Source: Researchers' Computation (2025).

4.3. Assessment of digital tax policies and tax gap within the informal sector of the southwest states, Nigeria

4.3.1. Structural model of the assessment of digital tax policies and tax gap within the informal sector of southwest states, Nigeria

The specific objective of the study is to investigate whether Tax ProMax, Electronic Tax System, and Digital Tax Reporting as measures for digital tax policy can influence the tax gap in the informal sector of southwestern Nigeria, and to achieve this objective, Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed. The path coefficient, t-statistic value, probability value, and R-Square determination, effect size (f^2), the predictive relevance of the model, and the predictive relevance of the model index were the core standards for evaluating the structural model, as shown in Figure 2, and the other statistical reports are presented in subsequent tables. The Partial Least Squares Structural Equation Modelling (PLS-SEM) in Figure 2 illustrates the directional relationships between digital tax policies and the tax gap in the informal sector of Southwest Nigeria. The diagram demonstrates how constructs such as digital tax reporting, electronic tax systems, and tax ProMax interact with the tax gap, highlighting the strength of these relationships through path coefficients. Visually, the model shows that tax ProMax exerts the strongest influence on the tax gap compared to the other constructs, followed by digital reporting, while electronic tax systems contribute less significantly. This graphical representation underscores that while digital tax policies collectively reduce the tax gap, their effectiveness varies in magnitude.

Table 7 presents the relationship between digital tax policies and the tax gap within the informal sector of Southwest Nigeria. The results show that digital reporting has a significant effect on the tax gap, with a path coefficient of 0.291, a t-statistic of 2.557, and a p-value of 0.011. This means that the adoption of digital tax reporting systems, such as online filing and electronic records, helps reduce the tax gap by improving accountability and limiting opportunities for under-reporting among informal sector operators. Although the effect is moderate, it is still meaningful in driving compliance. The effect of the electronic tax system on the tax gap, however, was weaker and not statistically significant, with a coefficient of 0.153, a t-statistic of 1.670, and a p-value of 0.095. This suggests that while the availability of electronic tax platforms such as e-payment portals and tax identification systems creates a supportive environment for compliance, these systems on their own do not strongly influence the reduction of the tax gap. This may be because informal sector operators face challenges such as limited access to technology, a lack of awareness, or the complexity of the systems, which reduces their effectiveness. In contrast, Tax ProMax, which reflects proactive compliance measures, enforcement mechanisms, and monitoring systems, had the strongest effect on reducing the tax gap. With a path coefficient of 0.500, a t-statistic of 5.146, and a p-value of 0.000, it clearly shows that enforcement-driven approaches play a critical role in closing the tax gap in the informal sector. This indicates that strategies such as real-time monitoring, targeted audits, and effective compliance campaigns are essential in addressing tax evasion and ensuring better revenue collection.

The model further shows strong explanatory power, with R^2 and adjusted R^2 values of 0.769 and 0.768, respectively, meaning that the three constructs together explained nearly 77 percent of the variation in the tax gap. The Q^2 value of 0.742 confirms that the model has high predictive relevance, indicating that digital tax policies are reliable in forecasting tax gap outcomes. The F-square values also highlight the relative importance of the variables, with Tax ProMax (0.350) exerting the largest effect, digital reporting (0.112) showing a moderate effect, and the electronic tax system (0.037) having only a small effect. Model fit statistics support the reliability of the findings. The SRMR value of 0.081 is below the recommended threshold of 0.10, suggesting an acceptable fit. The NFI of 0.767, while below the stricter

benchmark of 0.90, remains adequate for exploratory studies. The RMSE of 0.516 further indicates that the model provides a reasonable approximation of the observed data.

In practical terms, these results suggest that tax authorities should place greater emphasis on proactive compliance measures and enforcement strategies, as they offer the strongest impact on reducing the tax gap. At the same time, strengthening digital reporting systems can further improve compliance by enhancing transparency and reducing under-reporting. However, simply investing in electronic tax systems without complementary awareness, training, and enforcement may not deliver significant improvements. Overall, the findings point toward a blended approach that combines technology with strong compliance enforcement as the most effective strategy for reducing the tax gap in the informal sector. Two of the constructs turned out to have a p-value lower than 5 percent; the null hypothesis that digital tax policies have no significant effect on the tax gap within the informal sector in Southwest Nigeria is hereby rejected.

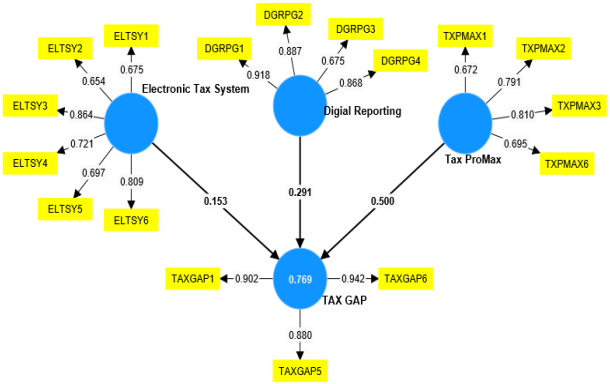


Fig. 2: Partial Least Squares Structural Equation Modelling Showing the Effect of Digital Tax Policies on Tax Gap within the Informal Sector of Southwest States, Nigeria.

Source: Researcher's Computation (2025) SMART-PLS4.

Table 7: Digital Tax Policies and Tax Gap Within the Informal Sector of Southwest States, Nigeria

Constructs		Path Co-efficient	T- Statistics	P- Values
Digital Tax Reporting -> TAX GAP		0.291	2.557	0.011
Electronic Tax System -> TAX GAP		0.153	1.670	0.095
Tax ProMax -> TAX GAP		0.500	5.146	0.000
	R Square	R Square Adjusted	Q^2	
TAX GAP	0.769	0.768	0.742	
	F-Square (Key Performance Indicator)	Model Fit Summary		
Digital Tax Reporting	0.112	SRMR - 0.081		
Electronic Tax System	0037	NFI - 0.767		
Tax ProMax	0.350	RMSE – 0.516		

Source: Researcher's Computation (2025).

4.4. Discussion of findings

The tax gap remains a pressing challenge for many economies, particularly within the informal sector, where compliance levels are traditionally low and monitoring is difficult. This study examined how digital tax policies can contribute to reducing the tax gap in southwestern Nigeria, focusing on three main constructs: tax promax, electronic tax systems, and digital tax reporting. The results provided valuable insights into the role each of these factors plays in shaping tax compliance within the informal sector. The findings of this study revealed that digital tax reporting had a significant positive effect on reducing the tax gap. With a coefficient of 2.557 and a p-value of 0.011, the results suggest that the use of digital reporting tools, such as online filing and electronic records, strengthens transparency and accountability. By enabling easier submission of tax information and reducing opportunities for manipulation or under-reporting, digital tax reporting contributes to narrowing the compliance gap in the informal economy. This highlights the importance of continuous investment in user-friendly reporting systems and training initiatives for informal sector operators. The findings are strongly supported by prior research. Amaglobeli et al. (2023) demonstrated that digital tax reporting enhanced revenue mobilization through improved administrative efficiency, while Mbise and Baseka (2022) found it boosted compliance among SMEs by improving reporting accuracy and reducing filing errors. Bellon et al. (2022) reported similar efficiency gains in VAT remittances, and Kang'oro et al. (2024) highlighted broader compliance improvements despite some implementation challenges. Derrick et al. (2023) further showed that digital tax policies generated sustained revenue increases in Cameroon, even in the presence of infrastructural constraints. In Nigeria, Adejuwon and Olasunkanmi (2023) confirmed that digitalization curbed tax evasion and improved collection processes, reinforcing the positive role of digital reporting. At the micro level, Indrawan (2024) and Rasyida and Badjuri (2025) showed that e-filing and e-billing simplified taxpayer obligations and enhanced compliance, though the moderating influence of system efficiency and socialization was limited. Collectively, these studies corroborate the finding that digital reporting tools, when effectively deployed, foster transparency and accountability, thereby narrowing the tax gap.

Similarly, tax promax had the strongest influence on reducing the tax gap, with a coefficient of 5.146 and a highly significant pro-value of 0.000. This indicates that proactive compliance strategies such as enforcement mechanisms, monitoring frameworks, and targeted taxpayer education are highly effective in promoting compliance. The strong result suggests that enforcement, when combined with supportive digital initiatives, can create a powerful deterrent against tax evasion and enhance the efficiency of revenue collection in the informal sector. The results supported by empirical evidence by Desi and Bingilar (2023) found that TaxPro-Max adoption significantly improved tax remittance to FIRS in Yenagoa, while Peter (2023) reported substantial increases in CIT and VAT collection efficiency after its implementation. Similarly, Pascale and Paymaster (2023) and David (2021) showed positive and significant correlations between TaxPro-Max adoption and improved remittance, while Dein and Rufus (2022) confirmed these effects in Southwest Nigeria. These studies emphasize that proactive compliance mechanisms, including enforcement, monitoring, and education embedded in TaxPro-Max, are critical for

reducing evasion and boosting revenue. Xu et al. (2025) extended this argument by showing that digital tax administration even promoted enterprise innovation by reducing costs and easing financing constraints, suggesting wider benefits beyond compliance.

On the other hand, the electronic tax system showed a positive but statistically insignificant effect on the tax gap, with a coefficient of 1.670 and a p-value of 0.095. While electronic systems like e-payment platforms and tax identification portals provide a modern framework for compliance, their impact appears limited when used in isolation. This could be due to challenges such as limited digital literacy, poor internet access, or the reluctance of informal operators to adopt new technologies. The findings suggest that without complementary measures like training, awareness campaigns, and enforcement, electronic tax systems alone may not sufficiently drive compliance.

The findings corroborate the prior studies conducted by Edori (2023) demonstrated that e-tax services such as e-registration, e-filing, and e-payment significantly improved ease of compliance. Ike and Bright (2023) reported that e-taxation did not significantly simplify the ease of paying taxes, even though it improved processing efficiency. Abdulkadir and Alabede (2022) similarly found that although electronic tax awareness and ease of use positively influenced compliance attitudes, poor service quality weakened these benefits, leading to inconsistent outcomes. Earlier, Sani et al. (2021) and Eke and Alohan (2022) had also cautioned about the limitations of e-taxation in improving revenue and administrative efficiency. Ofurum (2019) further reported that e-taxation had not improved federally collected revenue or the tax-to-GDP ratio in Nigeria. These findings align with the current study's result that while electronic tax systems provide a modern framework, their standalone effect is weak without complementary interventions such as taxpayer education, system efficiency improvements, and infrastructure support. Beyond Nigeria, international evidence shows similar patterns. Belahouaoui and Attak (2024) highlighted the potential of advanced digital tools such as AI, machine learning, and blockchain to strengthen compliance and curb evasion but emphasized the importance of regulatory support and targeted strategies for SMEs in developing contexts. Ofosu-Ampong (2024) in Ghana showed that while innovativeness and compliance norms influenced attitudes toward digital tax, these did not always translate into actual payment behavior. This suggests that digital tools and systems may raise awareness and attitudes, but their real impact on compliance depends on contextual and behavioral factors.

Overall, the results underscore that digital tax policies hold promise in addressing the tax gap in Nigeria's informal sector, but their effectiveness depends on a combination of factors. While digital tax reporting and tax promax significantly reduce the gap, electronic systems require additional support mechanisms to achieve a meaningful impact. For policymakers, this implies that a blended strategy integrating digital innovation with strong compliance and enforcement measures offers the best pathway to closing the tax gap within the informal economy. The studies consistently support the positive role of digital reporting and tax ProMax in reducing the tax gap. Findings on electronic tax systems remain mixed, with some evidence highlighting their benefits in efficiency and compliance ease, while others show limited or insignificant effects. This divergence underscores the importance of integrating digital tax systems with taxpayer training, enforcement, and service quality improvements to achieve stronger outcomes.

The findings of this study can be explained through the lenses of the Innovation Diffusion Theory (IDT) and the Technology Acceptance Model (TAM). IDT posits that innovations are more readily adopted when they show clear relative advantages, compatibility with user needs, and observable outcomes (Rogers, 2003). This explains why tax ProMax and digital tax reporting significantly reduced the tax gap within the informal sector of Southwest Nigeria. Tax ProMax provides strong enforcement and monitoring benefits, making its impact easily observable, while digital reporting improves transparency and accountability, both of which enhance its adoption and effectiveness. These results aligned with recent evidence show that digital tax tools with tangible benefits and administrative value achieve stronger compliance outcomes.

On the other hand, TAM highlights perceived usefulness (PU) and perceived ease of use (PEOU) as key drivers of adoption (Davis, 1989). The electronic tax system showed a positive but insignificant effect, which may be due to limited perceived usefulness or difficulty of use among informal sector taxpayers. Challenges such as low digital literacy, poor service quality, and infrastructure barriers often reduce the ease of use and discourage consistent adoption, consistent with TAM predictions. Therefore, while digital tools can close tax gaps, their effectiveness depends on combining technological solutions with user-friendly design, taxpayer sensitization, and institutional support to boost PU and PEOU. This integrated approach ensures stronger adoption, greater compliance, and more sustainable reductions in the tax gap.

5. Conclusion and Recommendations

This study examined the effect of digital tax policies on the tax gap within the informal sector of Southwest Nigeria, focusing on three key constructs: digital tax reporting, electronic tax systems, and Tax ProMax. Using partial least squares structural equation modelling, the findings revealed that both digital tax reporting and Tax ProMax had significant positive effects on reducing the tax gap, while the electronic tax system had a positive but insignificant impact. The results highlight that technologies that enhance monitoring, enforcement, and transparency are more effective in addressing compliance issues within the informal sector. However, the limited effect of electronic tax systems suggests challenges related to usability, infrastructure, and taxpayer digital literacy. The study concluded that digital tax policies are critical instruments for addressing the persistent tax gap in Nigeria's informal sector. Tax ProMax and digital reporting stand out as effective strategies in curbing non-compliance by strengthening enforcement mechanisms and fostering accountability. On the other hand, the electronic tax system's limited influence implies that technology adoption alone may not yield significant outcomes unless complemented with ease of use, awareness campaigns, and adequate institutional support. Finally, digital tools hold transformative potential for tax administration but must be strategically tailored to the realities of the informal sector.

Based on these findings, the study recommends that policymakers strengthen the adoption of digital tax reporting platforms by enhancing accessibility, reliability, and security. Capacity-building initiatives should be introduced to improve digital literacy among informal sector taxpayers to ensure the effective use of electronic tax systems. Tax authorities should also expand and refine Tax ProMax, as it demonstrates strong effectiveness in compliance enforcement. Additionally, government agencies should invest in digital infrastructure, especially in underserved areas, to remove barriers to technology adoption. Collaborative stakeholder engagement, including training for tax officials and informal sector operators, will further improve trust and compliance.

This study contributes to the existing body of knowledge by providing empirical evidence on the role of digital tax policies in bridging the tax gap within the informal sector, a context often underexplored in African economies. By aligning the findings with theories such as the Technology Acceptance Model (TAM) and the Innovation Diffusion Theory (IDT), the research extends theoretical applications to digital tax administration, demonstrating how perceived usefulness, ease of use, and relative advantage influence adoption outcomes. Furthermore, it highlights the differentiated impacts of various digital tools, offering practical insights for policymakers on which interventions are most effective in reducing the tax gap in the informal economy.

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