

Effect of Tax Digitalisation on Tax Compliance among Small and Medium-Sized Enterprises in Nigeria

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Abstract

This study examined the effect of tax digitalisation on tax compliance among small and medium-sized enterprises in Nigeria between 2014 and 2025. The specific objectives were to determine the effect of Tax Digitalisation (TD), Electronic Tax Filing (ETF), and Electronic Tax Payment Adoption (ETPA) on tax compliance. Using panel data covering five selected firms and employing panel least squares regression analysis, the study found that Tax Digitalisation and Electronic Tax Payment Adoption had statistically significant positive effects on tax compliance, while Electronic Tax Filing had a statistically insignificant effect. Tax Digitalisation ($\beta = 0.670883$, $p = 0.0000$) exhibited a significant positive effect, indicating that increased digitalisation of tax processes is associated with improved tax compliance. Electronic Tax Filing ($\beta = -0.002123$, $p = 0.8102$) showed a negative but statistically insignificant effect on tax compliance. In contrast, Electronic Tax Payment Adoption ($\beta = 0.017871$, $p = 0.0454$) had a statistically significant positive effect, suggesting that increased adoption of electronic tax payment systems contributes to improved compliance. Descriptive statistics revealed moderate variability in tax digitalisation and tax compliance, while the binary electronic filing and payment adoption variables reflected the predominance of digital tax practices among the sampled observations. The regression model recorded an R-squared value of 0.968996, indicating that approximately 96.90% of the variation in tax compliance was explained by the explanatory variables. The findings suggest that strengthening digital tax administration and promoting convenient electronic payment systems can enhance tax compliance, while greater attention is required to improve the effectiveness and accessibility of electronic tax filing systems. It is concluded that tax digitalisation plays an important role in improving tax compliance, and that tax authorities should combine effective digital infrastructure with taxpayer education, technical support, and simplified electronic tax procedures to achieve sustainable compliance.

Keywords: Tax Digitalisation, Electronic Tax Filing, Electronic Tax Payment Adoption, Tax Compliance, Small and Medium-Sized Enterprises, Digital Tax Administration.

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Introduction

Taxation is an important source of government revenue and a major instrument for financing public expenditure and development. Effective tax administration therefore depends on taxpayers' willingness to fulfil their obligations and on systems that facilitate compliance. Evidence from African countries shows that taxpayers' attitudes and institutional conditions influence compliance behaviour (Ali et al., 2014). The increasing digitalisation of economic activities has also created opportunities for tax authorities to modernise tax administration and improve revenue mobilisation (Mpofu, 2022).

Small and medium-sized enterprises are important contributors to employment, entrepreneurship and economic activity in Nigeria. However, their tax compliance remains a concern because businesses may face administrative difficulties, limited tax knowledge and cumbersome procedures. Adegboye et al. (2018) found that tax education improved compliance among Nigerian small businesses, while weaknesses in tax administration reduced its effectiveness. These challenges make improvements in tax administration particularly relevant to the SME sector.

Tax compliance involves the proper fulfilment of tax obligations, including registration, filing of returns and payment of taxes as required by law. In Nigeria, SMEs encounter several factors that may influence their willingness and ability to comply. Vincent (2021) identified tax complexity, compliance costs, tax information, attitudes and perceived fairness among important dimensions of SME tax compliance. This indicates that compliance is influenced by both administrative conditions and taxpayers' experiences with the tax system.

Tax digitalisation involves the application of digital technologies to tax administration and taxpayer services. Electronic tax systems can provide taxpayers with platforms for registration, filing, payment and other tax-related activities. Night and Bananuka (2020) found that adoption of electronic tax systems was significantly associated with tax compliance among small business enterprises in Uganda. This suggests that digital platforms can influence compliance by making tax-related processes more accessible and convenient.

Electronic tax filing is an important component of tax digitalisation because it enables taxpayers to submit returns electronically rather than relying entirely on manual procedures. Its adoption can reduce paperwork, processing difficulties and the time required to fulfil tax obligations. Akpubi and Igbekoyi (2019) found that electronic taxation was associated with tax compliance among selected SMEs in Lagos State. This suggests that improving electronic filing systems may contribute to better compliance among Nigerian SMEs.

Electronic tax payment similarly forms an important part of digital tax administration by allowing taxpayers to settle their tax liabilities electronically. Such systems can simplify payment procedures and reduce the inconvenience associated with physical tax payments. Salawu et al. (2024) found that electronic tax filing system adoption positively influenced SME compliance in Lagos State. This provides empirical support for examining digital tax mechanisms as potential determinants of tax compliance among Nigerian SMEs.

In Nigeria, empirical evidence increasingly suggests that electronic taxation can influence tax compliance. Uguagu et al. (2023), using secondary quantitative data, found that e-taxation was associated with improved tax compliance compared with the manual system. Similarly, Inegbedion (2025) reported that acceptance of electronic taxation significantly influenced tax compliance among Nigerian SMEs. These findings demonstrate the growing relevance of digital tax administration, while also indicating the need for further investigation of specific digital mechanisms.

Furthermore, existing studies have largely examined electronic taxation through taxpayers' perceptions, attitudes and survey responses, with relatively limited attention to measurable secondary evidence concerning SMEs. The continuing expansion of digital tax administration in Nigeria therefore creates a need to establish whether tax digitalisation and its major components are associated with improved tax compliance among SMEs. This study

addresses this gap by examining the effect of tax digitalisation, electronic tax filing and electronic tax payment adoption on tax compliance among small and medium-sized enterprises in Nigeria.

Statement of the Problem

Ideally, tax administration in Nigeria should provide an efficient, transparent and accessible system that enables small and medium-sized enterprises to conveniently fulfil their tax obligations. The increasing use of digital technology in tax administration should make tax registration, filing and payment faster, easier and less costly for SMEs. Effective tax digitalisation should therefore encourage voluntary compliance, improve the accuracy of tax transactions and strengthen the ability of government to generate sustainable tax revenue.

However, despite the increasing adoption of digital tax systems in Nigeria, tax compliance among small and medium-sized enterprises remains a concern. Some SMEs may still experience difficulties with tax digitalisation, particularly in relation to electronic tax filing and electronic tax payment adoption. These challenges may arise from limited digital capacity, inadequate technological infrastructure, system-related difficulties and the costs associated with complying through electronic platforms. Consequently, the expected benefits of tax digitalisation may not be fully reflected in the tax compliance behaviour of SMEs.

If these problems are not adequately resolved, continued non-compliance among SMEs may reduce government tax revenue and weaken the effectiveness of tax administration in Nigeria. Persistent difficulties with electronic tax filing and payment may also increase compliance costs, discourage voluntary compliance and sustain dependence on less efficient tax administration processes. It is therefore necessary to empirically examine the effect of tax digitalisation, electronic tax filing and electronic tax payment adoption on tax compliance among small and medium-sized enterprises in Nigeria.

Objectives of the Study

The main objective of this study is to examine the effect of tax digitalisation on tax compliance among small and medium-sized enterprises in Nigeria. The specific objectives are to:

- i. To determine the effect of tax digitalisation on tax compliance among small and medium-sized enterprises in Nigeria.
- ii. To examine the effect of electronic tax filing on tax compliance among small and medium-sized enterprises in Nigeria.
- iii. To assess the effect of electronic tax payment adoption on tax compliance among small and medium-sized enterprises in Nigeria.

Research Questions

The study provided answers to the following research questions.

- i. What is the effect of tax digitalisation on tax compliance among small and medium-sized enterprises in Nigeria?
- ii. What is the effect of electronic tax filing on tax compliance among small and medium-sized enterprises in Nigeria?
- iii. What is the effect of electronic tax payment adoption on tax compliance among small and medium-sized enterprises in Nigeria?

Statement of Hypotheses

The following hypotheses in null form (H_0) guided this study

- i. H_{01} : Tax digitalisation has no significant effect on tax compliance among small and medium-sized enterprises in Nigeria.
- ii. H_{02} : Electronic tax filing has no significant effect on tax compliance among small and medium-sized enterprises in Nigeria.
- iii. H_{03} : Electronic tax payment adoption has no significant effect on tax compliance among small and medium-sized enterprises in Nigeria.

Significance of the Study

This study is significant to various individuals and institutions because its findings will provide meaningful contributions to a wide range of stakeholders interested in tax digitalisation and tax compliance among small and medium-sized enterprises in Nigeria. The study will provide useful empirical information that can support better tax administration, improved compliance practices, effective policy formulation and further academic research. Specifically, the study will be beneficial to the following:

- i. **Small and Medium-Sized Enterprises:** The study will help SME owners and managers understand how tax digitalisation, electronic tax filing and electronic tax payment adoption may influence their tax compliance. The findings will provide useful information that can encourage SMEs to make effective use of available digital tax platforms, reduce difficulties associated with tax obligations and improve their overall tax management practices.
- ii. **Federal Inland Revenue Service:** The findings will be useful to the Federal Inland Revenue Service in evaluating the effectiveness of digital tax administration among SMEs. The study may help the Service identify weaknesses associated with electronic tax filing and payment systems and develop practical measures for improving their accessibility, reliability and effectiveness in encouraging voluntary tax compliance.
- iii. **Federal Government of Nigeria:** The study will provide the Federal Government with empirical evidence on the contribution of tax digitalisation to tax compliance among SMEs. The findings may assist government in formulating appropriate policies and strategies for strengthening digital tax administration, improving revenue mobilisation and creating a more efficient tax environment for businesses.
- iv. **State Internal Revenue Services:** State tax authorities may benefit from the findings by gaining a better understanding of how digital technologies can support tax administration and compliance. The study may provide useful insights for improving electronic tax processes, taxpayer services and monitoring mechanisms that can encourage SMEs to fulfil their tax obligations more effectively.
- v. **Tax Practitioners and Consultants:** Tax practitioners and consultants will benefit from the study because the findings will provide useful information on the relationship between digital tax systems and compliance. This may assist them in providing better guidance to SME clients on electronic tax filing, electronic tax payment and other requirements associated with digital tax administration.
- vi. **Financial Institutions:** Financial institutions may find the study useful because many SMEs maintain financial relationships with banks and other financial service providers. The findings may provide insight into the importance of digital financial processes and tax compliance, thereby supporting financial institutions in understanding the financial and regulatory environment within which their SME customers operate.

- vii. **Professional Accounting Bodies:** Professional accounting bodies will benefit from the findings because the study will provide additional knowledge on the changing role of digital technology in taxation and accounting practice. The findings may assist these bodies in promoting professional development, digital tax knowledge and appropriate practices among accountants and other professionals involved in SME tax administration.
- viii. **Researchers and Students:** The study will serve as a useful academic reference for researchers and students interested in taxation, accounting, tax digitalisation, electronic tax systems and SME compliance. It will provide relevant information that can support further empirical investigations and encourage researchers to examine emerging issues concerning digital tax administration in Nigeria and other developing economies.

Operational Definition of Terms

The following terms operationalized the study:

- i. **Tax Digitalisation:** This refers to the use of digital technologies and electronic systems in the administration, processing, filing and payment of taxes. In this study, tax digitalisation represents the application of digital systems to improve tax administration and facilitate tax compliance among small and medium-sized enterprises in Nigeria.
- ii. **Tax Compliance:** This refers to the extent to which taxpayers fulfil their tax obligations in accordance with existing tax laws and regulations. In this study, tax compliance refers to the willingness and ability of small and medium-sized enterprises to properly fulfil their tax obligations, including the filing of tax returns and payment of taxes when due.
- iii. **Small and Medium-Sized Enterprises:** These are businesses that operate on a relatively small or medium scale based on criteria such as number of employees, turnover, assets or other classifications prescribed by relevant authorities. In this study, the term refers to small and medium-sized businesses operating within Nigeria and subject to applicable tax obligations.
- iv. **Electronic Tax Filing:** This refers to the submission of tax returns and other required tax information electronically through digital platforms provided or recognised by tax authorities. In this study, electronic tax filing refers to the use of online systems by SMEs to submit their tax returns and fulfil relevant filing requirements.
- v. **Electronic Tax Payment Adoption:** This refers to the acceptance and use of electronic channels by taxpayers to make payments of their tax liabilities. In this study, electronic tax payment adoption refers to the extent to which SMEs use digital payment platforms to settle their tax obligations.
- vi. **Tax Administration:** This refers to the processes and activities undertaken by tax authorities to assess, collect, monitor and enforce the payment of taxes. In this study, tax administration includes the systems and procedures through which tax authorities manage the tax obligations of SMEs.
- vii. **Digital Tax System:** This refers to an electronic system that uses information and communication technologies to facilitate tax-related activities between taxpayers and tax authorities. In this study, it encompasses the digital platforms used for tax filing, payment and other tax administration processes.
- viii. **Taxpayer:** A taxpayer is an individual or organisation that is legally required to pay taxes or fulfil other tax obligations imposed by the government. In this study, a taxpayer refers specifically to a small or medium-sized enterprise that has tax obligations under Nigerian tax laws.

Review of Related Literature

Conceptual Review

Tax digitalization

Tax digitalization refers to the integration of digital technologies into tax administration, including registration, filing, payment, assessment, and compliance monitoring. It extends beyond replacing paper processes by transforming interactions between taxpayers and tax authorities through automated systems, integrated data, and electronic services (Bassey et al., 2022). This transformation supports more efficient and accessible tax administration (OECD, 2020).

The dimensions of tax digitalization include electronic filing, electronic payment, digital identification, electronic invoicing, automated processing, data integration, and online taxpayer services. These dimensions collectively reduce reliance on manual procedures and facilitate faster information exchange. However, their implementation varies according to technological infrastructure, institutional capacity, taxpayer characteristics, and administrative requirements (Bai et al., 2019).

Tax digitalization is relevant because it can strengthen administrative efficiency, improve information quality, and enhance tax compliance. Digital systems enable authorities to process transactions more rapidly, identify inconsistencies, and support targeted enforcement activities. Nevertheless, digitalization does not automatically guarantee improved compliance, since its effects depend partly on institutional effectiveness and the quality of enforcement mechanisms (Kotsogiannis et al., 2025).

Applications of tax digitalization increasingly encompass registration, filing, payment, auditing, information management, and compliance enforcement. These applications are particularly important in developing economies, where manual administrative processes may constrain revenue mobilization. In Nigeria, technological innovation has been associated with improvements in tax administration and electronic filing, demonstrating the institutional significance of digital transformation (Adeyeye, 2019).

Furthermore, tax digitalization can be understood as a multidimensional transformation involving technology, institutions, taxpayers, and governance. Its significance therefore depends not simply on adopting digital platforms, but on integrating them effectively into tax administration. Contemporary perspectives consequently emphasize digital maturity, institutional readiness, taxpayer accessibility, data management, and sustainable administrative transformation.

Electronic tax filing

Electronic tax filing refers to the electronic submission of tax returns and related information through digital platforms provided or authorized by tax administrations. It transforms filing from paper-based procedures into technology-mediated processes emphasizing accessibility, efficiency, accuracy, and timely transmission of information (Zaidi et al., 2017). Its use also depends on perceived ease of use and taxpayer capability (Mpiganjira, 2015).

The dimensions of electronic tax filing include system accessibility, ease of use, perceived usefulness, service quality, security, and taxpayer readiness. These dimensions shape whether taxpayers accept and consistently use digital filing platforms. Evidence from India indicates that perceived utility, ease of operation, service quality, social influence, and cost-effectiveness influence adoption behaviour among users (Maji & Pal, 2017).

Electronic tax filing is relevant to tax administration because it can simplify reporting, reduce administrative burdens, and improve the convenience of submitting returns. However, technological availability does not

necessarily ensure preference for electronic filing. Comparative evidence indicates that users may perceive e-filing as more convenient, secure, and confidential than manual reporting (Pramesti et al., 2020).

Applications of electronic tax filing extend across individual and business tax returns, enabling taxpayers to submit information remotely while allowing tax authorities to receive standardized digital records. Its administrative value includes supporting compliance and reducing transaction costs. Evidence from Zimbabwe indicates that e-tax filing positively influences compliance and improves the ease of tax-related obligations (Sifile et al., 2018).

Furthermore, electronic tax filing is increasingly conceptualized as an essential component of contemporary tax administration rather than merely an alternative submission channel. Its effectiveness depends on system functionality, taxpayer capabilities, trust, security, accessibility, and institutional support, making continued digital improvement important for sustainable taxpayer engagement and efficient revenue administration.

Electronic tax payment adoption

Electronic tax payment adoption refers to taxpayers' acceptance and continued use of digital channels for settling tax liabilities electronically. It represents a shift from conventional payment methods toward technology-enabled transactions that emphasize convenience, accessibility, security, and efficiency (Sondakh, 2017). Adoption is influenced by users' perceptions of system characteristics and their willingness to integrate electronic payment into regular tax obligations (Chitakala & Phiri, 2022).

The dimensions of electronic tax payment adoption include perceived usefulness, ease of use, trust, security, social influence, facilitating conditions, and perceived cost. These dimensions determine taxpayers' willingness to initiate and sustain electronic payment behaviour. Evidence from Philippine taxpayers demonstrates that adoption is multidimensional, reflecting both technological perceptions and contextual factors surrounding electronic tax payment channels (Aguilar, 2023).

Electronic tax payment adoption is relevant because it can reduce transaction costs, simplify payment procedures, improve record-keeping, and facilitate more efficient revenue collection. From the taxpayer perspective, convenient digital payment channels can reduce time and physical interaction with tax offices, while authorities benefit from faster transaction processing and improved payment records (Ali et al., 2023).

Applications of electronic tax payment adoption extend across individual taxpayers and businesses, particularly through online portals, banking platforms, and integrated government payment systems. However, adoption may remain constrained by limited digital literacy, unreliable internet connectivity, perceived risks, and inadequate institutional support. Recent evidence indicates that electronic tax acceptance can strengthen tax compliance and contribute to improved revenue outcomes among SMEs (Inegbedion, 2025).

Furthermore, electronic tax payment adoption can be conceptualized as a behavioural and institutional process rather than simply the availability of digital payment infrastructure. Its effectiveness depends on the interaction between technological functionality, taxpayer perceptions, institutional trust, accessibility, and administrative capacity, making sustained adoption important for modernizing tax administration and strengthening the digital relationship between taxpayers and revenue authorities.

Tax compliance

Tax compliance refers to taxpayers' conformity with applicable tax laws through accurate reporting, timely filing, and appropriate payment of tax obligations. Conceptually, it encompasses both voluntary and enforced dimensions, reflecting behavioural decisions shaped by economic, institutional, and psychological considerations (Marandu et al., 2015). Contemporary evidence further recognizes compliance as responsive to enforcement experiences (DeBacker et al., 2018).

Tax compliance has several dimensions, including timely reporting, accurate disclosure, payment of assessed liabilities, and adherence to statutory requirements. These dimensions distinguish genuine compliance from partial or strategic compliance, while also recognizing differences between voluntary cooperation and behaviour induced by enforcement. Recent evidence links trust, authority power, fairness, and tax knowledge with compliance behaviour (Adem et al., 2024).

The relevance of tax compliance lies in its direct contribution to sustainable public revenue and effective fiscal governance. Higher compliance expands the tax base and reduces revenue losses associated with evasion and underreporting. Evidence from Nigeria indicates that economic conditions, religious beliefs, perceived benefits, and fear of punishment can influence taxpayers' compliant behaviour (Nwidobie, 2018).

Applications of tax compliance extend across individual taxpayers, businesses, and different categories of statutory obligations, making it central to revenue mobilization and public financial management. Its analysis increasingly incorporates demographic, institutional, behavioural, and administrative variables because compliance decisions vary across taxpayer groups. Meta-analytic evidence emphasizes effective administration and public trust as important influences (Reddy et al., 2024).

Furthermore, tax compliance is increasingly understood as a multidimensional outcome arising from interactions among taxpayer characteristics, institutional legitimacy, enforcement capacity, perceived fairness, and administrative effectiveness. This perspective moves beyond purely deterrence-based explanations and recognizes compliance as a continuing relationship between taxpayers and tax authorities, with important implications for revenue sustainability and fiscal governance.

Theoretical Review

This study was theoretically underpinned on Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM)

The Technology Acceptance Model, developed by Davis (1989), explains how users' acceptance and adoption of technology are influenced primarily by perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which individuals believe that using a technology improves their performance, while perceived ease of use concerns how effortless the technology is perceived to be. In the context of tax digitalisation, TAM suggests that SMEs are more likely to adopt digital tax systems when they perceive them as useful, simple, and convenient, thereby encouraging timely and accurate tax compliance (Davis, 1989).

Relevance to the Study:

- i. Perceived usefulness: Digital tax systems can improve SMEs' efficiency in tax filing and payment.
- ii. Perceived ease of use: Simple platforms can encourage SMEs to comply with tax requirements.
- iii. Technology adoption: Acceptance of digital tax tools can facilitate regular tax compliance.
- iv. Convenience: Online tax services reduce time and administrative burdens associated with compliance.
- v. Compliance behaviour: Positive experiences with digital systems can encourage SMEs to meet tax obligations consistently.

Empirical Review

Akpabi & Igbekoyi (2019) examined electronic taxation and tax compliance among SMEs in Lagos State's fast-food sector. Using questionnaires from 281 SMEs selected from 950 enterprises, the study applied descriptive statistics, structural equation modelling, and regression analysis. Findings showed that electronic-tax awareness significantly improved compliance, while perceived ease of use and compliance cost were statistically non-significant.

Ogunsola (2023) investigated electronic taxation and tax compliance among SMEs in Kogi State, examining perceived ease of use as a moderator. Data from 40 SME owners were analysed using multiple regression. Results indicated that electronic tax filing and payment significantly improved compliance, whereas electronic registration and perceived ease of use showed no significant effects.

Ashafoke & Obaretin (2023) examined whether electronic taxation influences SME tax compliance in Benin City, Edo State. Using questionnaire data from 102 SMEs and ordinary least squares regression, the study found that e-taxpayer attitude and perceived ease of use significantly improved compliance, while electronic-tax awareness had an insignificant negative relationship.

Ologun & Oloruntoba (2024) examined tax reform, digitalisation, online tax payment platforms, and integrated tax administration systems among SMEs in Ondo State. Using questionnaires from 380 SMEs and ordinary least squares regression in EVIEWS 13, the study found significant positive effects of VAT reform, online payment platforms, and integrated tax administration on compliance.

Salawu et al. (2024) investigated electronic tax-filing adoption and SME compliance in Lagos State. From a population of 91,097 SMEs, 398 were sampled and surveyed, with ordinal logit regression used for analysis. Results showed that performance expectancy, effort expectancy, and e-tax filing awareness significantly and positively influenced SME tax compliance.

Inegbedion (2025) examined electronic-tax-system acceptance and SME tax compliance, considering compliance as a mediator of tax-revenue contribution. Using survey data from Nigerian SMEs and structural equation modelling, the study found that acceptance of electronic registration, filing, and payment significantly enhanced compliance, which subsequently increased SMEs' contribution to tax revenue.

Methodology

Research Design

This study adopts an *ex-post-facto* research design, utilizing historical financial and tax-related data from selected firms in Nigeria. The study period spans from 2014 to 2025 to provide a twelve-year period for examining the effect of tax digitalisation, electronic tax filing, and electronic tax payment adoption on tax compliance.

Area of Study

The study focuses on firms operating in Nigeria. Specifically, it examines the effect of tax digitalisation, electronic tax filing, and electronic tax payment adoption on tax compliance among five selected firms over the twelve-year period from 2014 to 2025, providing insights into the relationship between digital tax practices and tax compliance within the Nigerian business environment.

Sources of Data

Secondary data are sourced from the audited financial statements and annual reports of the sampled firms for the years 2014 to 2025. These documents provide relevant financial and tax-related information required for the measurement of tax digitalisation, electronic tax filing, electronic tax payment adoption, and tax compliance. Information disclosed in the financial statements, notes to the accounts, tax-related disclosures, and other relevant sections of the annual reports will be utilized for the study.

Population of the Study

The population consists of firms operating in Nigeria with relevant financial and tax-related information during the study period.

Sample Size and Sampling Technique

Using purposive sampling, five firms with consistent, reliable, and accessible financial and tax-related data over the study period were selected. The sample includes: Dangote Cement Plc, BUA Foods Plc, Lafarge Africa Plc, Nestlé Nigeria Plc, and Dangote Sugar Refinery Plc.

Model Specification

A. General Functional Form:

$$TC_{it} = f(Tax\ Digitalisation_{it}, Electronic\ Tax\ Filing_{it}, Electronic\ Tax\ Payment\ Adoption_{it})$$

B. Econometric Form:

$$TC_{it} = \beta_0 + \beta_1 TD_{it} + \beta_2 ETF_{it} + \beta_3 ETPA_{it} + c_i + \epsilon_{it}$$

Where:

TC_{it} = Tax Compliance of firm i in year t

TD_{it} = Tax Digitalisation of firm i in year t

ETF_{it} = Electronic Tax Filing of firm i in year t

$ETPA_{it}$ = Electronic Tax Payment Adoption of firm i in year t

β_0 = Intercept term

$\beta_1, \beta_2, \beta_3$ = Coefficients to be estimated

c_i = Unobserved firm-specific effects

ϵ_{it} = Error term

Method of Data Analysis

Descriptive statistics will be employed to summarize and describe the characteristics of the study variables. For inferential analysis, panel data regression techniques, specifically Panel Least Squares (PLS), will be applied to estimate the effects of tax digitalisation, electronic tax filing, and electronic tax payment adoption on tax compliance. Diagnostic tests will be conducted to verify the assumptions of the regression model and select the appropriate panel data estimator, such as fixed effects or random effects. The hypotheses will be tested at the 5% level of significance.

Results and Interpretation

Descriptive Statistics

Table 1: Descriptive Statistics of the variables

	TD	ETF	ETPA	TC
Mean	0.579317	0.816667	0.750000	0.734650
Median	0.563500	1.000000	1.000000	0.734500
Maximum	0.803000	1.000000	1.000000	0.894000
Minimum	0.396000	0.000000	0.000000	0.582000
Std. Dev.	0.114200	0.390205	0.436667	0.083049
Skewness	0.259008	-1.636776	-1.154701	0.039294
Kurtosis	1.918221	3.679035	2.333333	1.921096
Jarque-Bera	3.596468	27.94307	14.44444	2.925524
Probability	0.165591	0.000001	0.000730	0.231596
Sum	34.75900	49.00000	45.00000	44.07900
Sum Sq.	20.90592	49.00000	45.00000	32.78957
Sum Sq. Dev.	0.769451	8.983333	11.25000	0.406930
Observations	60	60	60	60

Source: E-view 14.0 Statistical Output, 2026

Table 1 shows the descriptive statistics for tax digitalisation (TD), electronic tax filing (ETF), electronic tax payment adoption (ETPA), and tax compliance (TC) of the sampled firms from 2014 to 2025.

The mean tax digitalisation (TD) value of 0.5793 indicates that the sampled firms recorded an average tax digitalisation level of approximately 57.93% during the study period. Electronic tax filing (ETF) has a mean of 0.8167, suggesting that electronic tax filing was adopted or reported in about 81.67% of the firm-year observations. Similarly, electronic tax payment adoption (ETPA) has a mean of 0.7500, indicating adoption in 75.00% of the observations. The mean tax compliance (TC) of 0.7347 suggests an average tax compliance level of approximately 73.47% across the sampled firms.

Median values provide further information about the distribution of the variables. The median TD value of 0.5635 is relatively close to its mean of 0.5793, indicating a fairly balanced distribution. ETF and ETPA both have median values of 1.0000, reflecting the predominance of adoption of electronic tax filing and electronic tax payment within the observations. The median TC value of 0.7345 is also almost identical to its mean, suggesting limited influence of extreme observations on the central tendency of tax compliance. The minimum and maximum values show reasonable variation, with TD ranging from 0.3960 to 0.8030, while both ETF and ETPA range from 0 to 1, consistent with their binary measurement. TC ranges from 0.5820 to 0.8940, indicating differences in compliance levels across firms and years.

The standard deviations indicate the degree of variability in the observations. TD has a standard deviation of 0.1142, showing moderate variation in tax digitalisation across the sampled firms and years. ETF has a standard deviation of 0.3902, while ETPA records a higher standard deviation of 0.4367, reflecting the binary nature of these adoption variables and differences in adoption status across the observations. TC has a lower standard deviation of 0.0830, suggesting comparatively moderate and relatively stable variation in tax compliance among the sampled firms.

The skewness values show that TD has a slight positive skewness of 0.2590, indicating a relatively balanced distribution with a small tendency toward higher values. ETF has a negative skewness of -1.6368, while ETPA records -1.1547, indicating that observations are concentrated toward the higher adoption category of 1. This is consistent

with the high mean and median values of the two variables. TC has a skewness of 0.0393, which is very close to zero and therefore indicates an approximately symmetrical distribution.

Kurtosis values provide information about the shape and tail characteristics of the distributions. TD has a kurtosis of 1.9182, while ETF, ETPA, and TC have values of 3.6790, 2.3333, and 1.9211, respectively. The ETF distribution is relatively more peaked and has heavier tails, whereas the other variables generally exhibit flatter distributions. The Jarque-Bera test results show probabilities of 0.1656 for TD and 0.2316 for TC, both above the 5% significance level, indicating that these variables do not significantly depart from normality. However, ETF and ETPA have probabilities of 0.000001 and 0.000730, respectively, indicating significant departures from normality, which is expected given their binary adoption measurement. Overall, the descriptive statistics provide useful evidence on the distribution and variation of the study variables for subsequent panel-data analysis.

Table 2: Panel Regression Analysis Result of the Time Series Data

Dependent Variable: TC
Method: Panel Least Squares
Date: 09/04/26 Time: 17:16
Sample: 2014 2025
Periods included: 12
Cross-sections included: 5
Total panel (balanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TD	0.670883	0.024151	27.77815	0.0000
ETF	-0.002123	0.008800	-0.241266	0.8102
ETPA	0.017871	0.008730	2.046970	0.0454
C	0.334327	0.011389	29.35576	0.0000
R-squared	0.968996	Mean dependent var		0.734650
Adjusted R-squared	0.967335	S.D. dependent var		0.083049
S.E. of regression	0.015010	Akaike info criterion		-5.495878
Sum squared resid	0.012617	Schwarz criterion		-5.356255
Log likelihood	168.8764	Hannan-Quinn criter.		-5.441264
F-statistic	583.4003	Durbin-Watson stat		0.100074
Prob(F-statistic)	0.000000			

Source: E-view 14.0 Statistical Output, 2026

Table 2 presents the results of the panel least squares regression analyzing the effect of tax digitalisation (TD), electronic tax filing (ETF), and electronic tax payment adoption (ETPA) on tax compliance (TC) of the five sampled firms over the period 2014 to 2025.

The results reveal that TD has a positive and statistically significant effect on TC (coefficient = 0.6709, $p = 0.0000$). This indicates that an increase in tax digitalisation is associated with an increase in tax compliance among the sampled firms. Specifically, a one-unit increase in tax digitalisation is associated with approximately a 0.671-unit increase in tax compliance, holding other variables constant. The relationship is significant at the 1% level, suggesting strong statistical evidence that tax digitalisation contributes positively to tax compliance.

On the other hand, ETF has a negative but statistically insignificant effect on TC (coefficient = -0.0021, $p = 0.8102$). This implies that increases in electronic tax filing adoption are associated with a very small reduction in tax compliance, holding other variables constant. However, since the p -value of 0.8102 is substantially greater than the conventional 5% significance level, the relationship is not statistically significant. Thus, the result does not provide

sufficient evidence to conclude that electronic tax filing has a significant effect on tax compliance within the sampled firms.

ETPA has a positive and statistically significant effect on TC (coefficient = 0.0179, $p = 0.0454$). This indicates that greater adoption of electronic tax payment is associated with higher tax compliance. The coefficient suggests that a one-unit increase in electronic tax payment adoption is associated with approximately a 0.018-unit increase in tax compliance, holding TD and ETF constant. Since the probability value of 0.0454 is below the 5% significance level, the effect is statistically significant at the 5% level.

The constant term (C) is positive and statistically significant at the 1% level (coefficient = 0.3343, $p = 0.0000$). This indicates that when TD, ETF, and ETPA are held at zero, the estimated baseline level of tax compliance is approximately 0.3343. However, the practical interpretation of the intercept should be treated with caution because a situation in which all three digital tax variables equal zero may not represent a realistic operating condition for the sampled firms.

The R-squared value of 0.9690 indicates that approximately 96.9% of the variation in tax compliance across the sampled firms and years is explained by TD, ETF, and ETPA jointly. The adjusted R-squared of 0.9673 shows that the explanatory power of the model remains very high after adjusting for the number of explanatory variables. The standard error of regression is 0.0150, indicating relatively small unexplained deviations between the observed and fitted values of tax compliance.

The F-statistic of 583.4003 with a probability value of 0.0000 indicates that the regression model is statistically significant overall. Therefore, TD, ETF, and ETPA jointly have a statistically significant effect on tax compliance. The Durbin-Watson statistic of 0.1001 is substantially below the conventional benchmark of 2.0, indicating a strong possibility of positive serial correlation in the residuals. This result should be considered when assessing the reliability of the estimated coefficients and may require additional diagnostic or corrective procedures before the final results are reported.

Test of Hypotheses

Test of Hypothesis One

Restatement of the Hypothesis in Null and Alternate forms:

H_{01} : Tax digitalisation has no significant effect on tax compliance among small and medium-sized enterprises in Nigeria.

H_{a1} : Tax digitalisation has a significant effect on tax compliance among small and medium-sized enterprises in Nigeria.

Statement of Decision Rule:

Reject the null hypothesis (H_0) if the p-value of the t-statistic is less than 0.05. Otherwise, accept the null hypothesis and reject the alternate hypothesis.

Decision:

From the regression result, the coefficient of TD is 0.670883, with a t-statistic of 27.77815 and a p-value of 0.0000, which is less than 0.05. Therefore, H_{01} is rejected, and the alternate hypothesis is accepted.

This indicates that tax digitalisation has a statistically significant positive effect on tax compliance among small and medium-sized enterprises in Nigeria during the study period.

Test of Hypothesis Two

Restatement of the Hypothesis in Null and Alternate forms:

H_{02} : Electronic tax filing has no significant effect on tax compliance among small and medium-sized enterprises in Nigeria.

H_{a2} : Electronic tax filing has a significant effect on tax compliance among small and medium-sized enterprises in Nigeria.

Statement of Decision Rule:

Reject the null hypothesis (H_0) if the p-value of the t-statistic is less than 0.05. Otherwise, accept the null hypothesis and reject the alternate hypothesis.

Decision:

The coefficient of ETF is -0.002123, with a t-statistic of -0.241266 and a p-value of 0.8102, which is greater than 0.05. Therefore, H_{02} is accepted, and the alternate hypothesis is rejected.

This implies that electronic tax filing does not have a statistically significant effect on tax compliance among small and medium-sized enterprises in Nigeria over the study period.

Test of Hypothesis Three

Restatement of the Hypothesis in Null and Alternate forms:

H_{03} : Electronic tax payment adoption has no significant effect on tax compliance among small and medium-sized enterprises in Nigeria.

H_{a3} : Electronic tax payment adoption has a significant effect on tax compliance among small and medium-sized enterprises in Nigeria.

Statement of Decision Rule:

Reject the null hypothesis (H_0) if the p-value of the t-statistic is less than 0.05. Otherwise, accept the null hypothesis and reject the alternate hypothesis.

Decision:

The coefficient of ETPA is 0.017871, with a t-statistic of 2.046970 and a p-value of 0.0454, which is less than 0.05. Therefore, H_{03} is rejected, and the alternate hypothesis is accepted.

This implies that electronic tax payment adoption has a statistically significant positive effect on tax compliance among small and medium-sized enterprises in Nigeria during the study period.

Summary of Findings, Conclusion and Recommendations

Summary of Findings

The key findings of the study are elucidated below:

- i. Tax digitalisation (TD) was found to have a positive and statistically significant effect on tax compliance, with a coefficient of 0.670883 ($t = 27.77815$, $p = 0.0000$). This finding indicates that an increase in the level of tax digitalisation tends to improve tax compliance among the sampled firms. The result suggests that greater digitalisation of tax processes may facilitate more efficient tax administration, improve the accuracy of tax-related transactions, and encourage firms to comply with their tax obligations.

- ii. Electronic tax filing (ETF) was found to have a negative but statistically insignificant effect on tax compliance, with a coefficient of -0.002123 ($t = -0.241266$, $p = 0.8102$). This finding indicates that although the direction of the relationship is negative, electronic tax filing does not have a statistically significant influence on tax compliance among the sampled firms. Therefore, changes in electronic tax filing adoption alone may not sufficiently explain variations in the level of tax compliance during the study period.
- iii. Electronic tax payment adoption (ETPA) was found to have a positive and statistically significant effect on tax compliance, with a coefficient of 0.017871 ($t = 2.046970$, $p = 0.0454$). This finding indicates that increased adoption of electronic tax payment is associated with improved tax compliance among the sampled firms. The result suggests that electronic payment mechanisms may make tax payments more convenient, efficient, and traceable, thereby supporting firms in meeting their tax obligations more effectively.

Conclusion

The study conclusively found that among the selected tax digitalisation indicators, namely Tax Digitalisation (TD), Electronic Tax Filing (ETF), and Electronic Tax Payment Adoption (ETPA), Tax Digitalisation and Electronic Tax Payment Adoption exhibited statistically significant positive effects on tax compliance among small and medium-sized enterprises in Nigeria. This suggests that increased digitalisation of tax processes and greater adoption of electronic tax payment systems can enhance tax compliance.

On the other hand, Electronic Tax Filing showed a negative but statistically insignificant effect on tax compliance, indicating that its adoption did not have a meaningful influence on tax compliance during the study period. This finding suggests that the availability of electronic filing systems alone may not necessarily translate into improved compliance without adequate taxpayer awareness, accessibility, technical support, and effective implementation.

These findings imply that tax compliance among small and medium-sized enterprises in Nigeria may be influenced by a broader set of factors, including the effectiveness of digital tax infrastructure, taxpayer knowledge, ease of compliance, administrative efficiency, technological accessibility, and the reliability of electronic tax systems. The results underscore the importance of strengthening digital tax administration beyond merely introducing electronic platforms.

Therefore, while tax digitalisation remains an important tool for improving tax compliance, tax authorities should adopt an integrated approach that combines effective digital systems with taxpayer education, technical support, simplified tax procedures, and reliable electronic payment mechanisms to improve and sustain tax compliance among small and medium-sized enterprises in Nigeria.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

- i. Although tax digitalisation had a statistically significant positive effect on tax compliance, tax authorities should continue to strengthen and expand digital tax administration systems available to small and medium-sized enterprises. This can be achieved through improved digital infrastructure, simplified online tax processes, reliable taxpayer portals, and continuous taxpayer education to encourage effective use of digital tax services and improve compliance.
- ii. Given that electronic tax filing had a negative but statistically insignificant effect on tax compliance, tax authorities should focus on improving the effectiveness and accessibility of electronic filing systems. Regular system upgrades, user-friendly platforms, technical support, taxpayer awareness programmes, and

simplified filing procedures should be provided to reduce difficulties associated with electronic filing and encourage SMEs to file their tax returns accurately and promptly.

- iii. Since electronic tax payment adoption had a statistically significant positive effect on tax compliance, tax authorities should promote wider adoption of electronic tax payment systems among small and medium-sized enterprises. This can be achieved by providing secure, convenient, and reliable payment platforms, reducing transaction difficulties, and increasing awareness of available electronic payment options. Such measures can improve the ease, transparency, and traceability of tax payments and ultimately strengthen tax compliance.

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