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Tax administration and personal income tax compliance in Nigeria: A PLS-SEM approach

Odunayo Olamide Olaniyi[1]
Tajudeen John Ayoola[2*]
Olatunde Wright[3]
Olateju Dolapo Aregbesola[4]
Peace Ebunoluwa Kolawole[5]

[1,3,4,5]*Accounting and Finance Programme, Bowen University, Iwo, Nigeria.*
[1]*Email: olaniyi.odunayo@bowen.edu.ng*
[3]*Email: olatunde.wright@bowen.edu.ng*
[4]*Email: dolapo.aregbesola@bowen.edu.ng*
[5]*Email: peace.kolawole@bowen.edu.ng*
[2]*Department of Management and Accounting, Obafemi Awolowo University, Ile-Ife, Nigeria.*
[2]*Email: alabiayoolaaca@oauife.edu.ng*

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(Corresponding Author)*

Abstract

Increasing tax revenue required to support basic state functions is a crucial challenge for relevant tax authorities, especially in developing countries where economic developments are inadequate. This challenge is amplified by peculiar issues such as poor tax orientation and informal sector dominance, among others, which the tax administration continuously seeks to resolve. This paper examines the effect of tax administration (represented by tax education, tax support service, tax penalty, and tax administrative efficiency) on personal income tax compliance in Nigeria. Using a survey design, data were obtained through a structured questionnaire administered to randomly selected individual taxpayers from three States of Nigeria, resulting in a usable data set of 365 responses. Partial Least Square Structural Equation Modelling (PLS-SEM) was applied to test the study's hypotheses. The statistical results show that tax education, tax penalty, and tax administrative efficiency significantly and positively influence personal income tax compliance, while tax support services have a negative and insignificant influence on personal income tax compliance. Tax administration effectiveness is crucial in enhancing personal income tax compliance and increasing tax revenue. Given the need to optimise tax compliance and revenue, tax administration needs to constantly evolve systems (policies, strategies, and principles) using effective and efficient education models, enforcement models, and bureaucratic models.

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1. Introduction

Mobilising tax revenue required to support basic state functions is a crucial challenge for relevant tax authorities in developing countries. This challenge is amplified by peculiar issues such as poor tax orientation, trust deficit, and low-capacity utilisation, which the tax administration continuously seeks to resolve. A school of thought deriving from the authoritarian paradigm upholds that governments have the power to impose taxes on the incomes, profits, properties, and consumptions of individuals and entities in order to raise domestic revenue to provide public goods, reduce poverty, and stimulate economic growth (Abomaye-Nimenibo, Michael, & Friday, 2018). Another school of thought considers the payment of taxes as a citizen's civil responsibility to be fulfilled as their contribution towards good governance and providing the funds for governments to function effectively. Both paradigms agree on the legitimacy of governments to receive taxes, but they differ on the taxpayers' inclination, with the former considering enforced compliance instituted by a sovereign and the latter upholding voluntary and cheerful contributions to state finances. Due to the peculiar situation in many developing economies, the enforced approach holds sway.

Junquera-Varela and Bernard (2018) argued that in order to provide a source of financing for public goods such as quality healthcare delivery and education, and in achieving other sustainable development goals, countries must generate above a 15 percent of their Gross Domestic Product (GDP) from taxes. To attain 15 percent tax-to-GDP target, governments, through revenue authorities, must effectively generate tax revenue from economic activities undertaken in the country. Studies (e.g., (Bird, 2015; Oppel, McNabb, & Chachu, 2022)) posit that poor tax revenue mobilisation has been a persistent challenge confronting governments in developing economies, despite the large taxable population. According to OECD (2021a), the tax-to-GDP ratio in developed countries is significantly higher than that of developing countries, with some countries generating less than the minimum threshold of15 percent. Oronde (2016) noted that the revenue challenge in developing countries stems from the low level of tax compliance, characterised by citizens' failure to register as taxpayers, underreporting of tax liabilities, failure to file, late filing, and non-payment of taxes.

Tax compliance is a universal phenomenon; however, developing countries exhibit a higher prevalence of non-compliance or low levels of compliance. This limits governments' ability to collect sufficient tax income to cover basic expenses and stimulate the desired economic growth (Beale & Wyatt, 2017). Attempts at identifying factors that influence tax compliance have been going on in both developed and developing countries, and existing literature (either through conceptualisation, field surveys, or laboratory experiments) has identified various factors (Kostritsa & Sittler, 2017). For example, the income tax evasion model Allingham and Sandmo (1972), based on Becker's economics of crime, identified four economic parameters: income level, tax rate, penalty rate, and audit probability, which influence tax compliance decisions. Their economic model gave rise to the enforcement paradigm and served as the foundation for many tax administration reforms, suggesting that tax compliance can be improved through stricter enforcement measures, such as tax audits and stricter tax penalties (Williams & Horodnic, 2015). Alm and Torgler (2011) complemented the enforcement paradigm by emphasizing the role of tax administration as a provider and facilitator of "service". They argued that taxpayers are more likely to comply when they are provided with information that reduces uncertainty and simplifies complexities associated with tax compliance. Therefore, to enhance tax compliance, tax administration must embark on reforms aimed at improving service delivery and deterring tax evasion. Two gaps can be identified in the empirical literature. First, there is limited empirical evidence on the relationship between tax administration and personal income tax compliance. Although Enyi, Akintoye, and Adekoya (2019) examined the influence of quality tax administration on tax compliance, their study did not examine the specific effect of tax administration paradigms as identified by Alm and Torgler (2011) and Okello (2014) on tax compliance. Second, prior studies have generally considered tax compliance without specifying a particular taxpayer group.

This study aims to address the gaps identified by investigating the effect of tax administration, based on four paradigms: tax education, tax support service, tax penalty, and administrative efficiency, on personal income tax compliance in Nigeria. The findings of this study are crucial for policymakers in tackling the prevailing low level of tax compliance. The study is structured as follows: Section 2 provides a comprehensive literature review, while Section 3 details the methodology employed. Data analysis is presented in Section 4, followed by the discussion of findings in Section 5. Finally, the study concludes in Section 6.

2. Literature Review

2.1. Institutional Background

Nigeria's low level of tax compliance is a cause of concern, despite various measures taken to address it (Oladele, Abdullahi, Ogunwale, & Adeniran, 2020). The low level of tax compliance is revealed by the country's tax-to-GDP ratio, which over the years has been below the 15 percent threshold stipulated by the World Bank, highlighting the extent of the problem. For instance, according to the OECD revenue statistics, Nigeria's tax-to-GDP ratio was 9.6% in 2011, 5.3% in 2016, 5.7% in 2017, 6.3% in 2018, and 6.0% in 2019. In contrast, other African countries such as Morocco, South Africa, Tunisia, and Seychelles had ratios above 25% (OECD, 2021a). Mayega, Ssuuna, Mubajje, Nalucwago, and Muwonge (2019) noted that in developing countries, including Nigeria, the personal income tax revenue to GDP ratio is around 3%, significantly lower than the 8% observed in developed countries. The prevalence of tax non-compliance in Nigeria has been attributed to factors such as inefficient tax administration, inadequate taxpayer education and public enlightenment, low taxpayers' morale, lack of institutional capacity for taxing the informal sector, mismanagement of tax revenue, and a lack of technological infrastructures (Oyedele, 2016). Personal income tax has been regarded as underperforming and unsatisfactory (Adegbite, Taiwo, & Araoye, 2019) due to its poor contribution to GDP. One of the challenges faced by personal income tax is the low number of registered and active personal income taxpayers, which can be attributed to a lack of information on the population of taxable individuals. Additionally, evidence suggests non-registration and under-taxation among high-income earners (Kangave, Bryne, & Karangwa, 2020). Furthermore, a major proportion of the personal income tax revenue is generated from the Pay-As-You-Earn scheme, despite the relatively small size of the formal market (Asiedu, Chuiqiao, Pavelesku, Sato, & Tanaka, 2017). On the other hand, the informal economy, which constitutes a large sector comprising self-employed individuals such as traders, artisans, wealthy individuals, and professionals, is under taxed. This ineffective taxation leads to significant revenue loss for the tax administration (Prichard, Custers, Dom, Davenport, & Roscitt, 2019). The Nigerian government has undertaken various efforts to enhance tax compliance, which include automating tax administrative processes for tax registration, filing and payment, tax audit and investigation, and taxpayers' file management system (Ofurum, Amaefule, Okonya, & Amaefule, 2018). Furthermore, a tax amnesty programme called the Voluntary Assets and Income Disclosure Scheme (VAIDS) was launched from July 2017 to June 2018. This programme aimed to encourage taxpayers to voluntarily disclose previously undisclosed assets and income for the preceding six (6) years, from 2011 to 2016, and settle all outstanding tax liabilities without incurring interest and penalties. The programme also provided assurance that tax defaulters, both individuals, and companies, would not face prosecution.

2.2. Tax Administration and Personal Income Tax Compliance

Tax administration encompasses various activities, including implementing and enforcing tax laws, registration of taxpayers, processing of tax returns, verifying the correctness of tax returns, collection of taxes, provision of quality services to taxpayers, and imposing sanctions on offenders (Flavianus, 2016; Onoja & Odoma, 2020). It plays a crucial role in domestic revenue generation, as it enables the government to generate sufficient tax revenue for financing public goods and services. Therefore, it is essential for tax administration to provide taxpayers with adequate information and support them in fulfilling their tax compliance obligation by providing quality services that simplify tax compliance procedures. Savić, Dragojlović, Vujošević, Arsić, and Martić (2015) suggested that an efficient tax administration that focuses on rendering quality tax service to taxpayers and effectively detecting and penalising tax evasion can enhance tax compliance and reduce tax evasion. However, this study adopts the features of tax administration provided by Okello (2014) in measuring tax administration. It emphasises a service-oriented approach that includes tax education to educate and assists taxpayers in meeting their tax reporting obligations, filing, and tax support service to facilitate filling and payment compliance, the use of penalties to promote tax compliance while serving as a deterrent for non-compliance, and a fair and honest administration of tax laws to ensure tax administrative efficiency.

Tax compliance refers to the willingness of taxpayers to fulfil their tax obligations by rendering timely and accurate tax returns in accordance with tax laws and regulations (Badara, 2012; Kirchler, 2007). While there are various definitions of tax compliance, this study adopts the tax compliance model proposed by Brown and Mazur (2003), which identifies three forms of tax compliance: reporting, filing, and payment compliance. Filing compliance measures the proportion of returns submitted by taxpayers; reporting compliance measures the accuracy of reported financial information, and payment compliance measures the share of taxes paid on the reported financial gain. A taxpayer is responsible for registering with the tax authority, accurately reporting income and expenses, and promptly filing the required returns in compliance with applicable tax provisions. However, non-compliance among taxable individuals can occur through failure to register, underreporting of tax liabilities, or failure to pay taxes (Oronde, 2016; Surugiu, Mazilescu, & Surugiu, 2023). Non-compliance can be intentional, stemming from a deliberate refusal to comply with tax regulations or underreporting tax liabilities. Alternatively, it can be unintentional, resulting from a lack of knowledge about tax laws and compliance requirements. The literature has identified several factors that influence tax compliance, including economic factors such as tax audits, tax penalties, income, and tax rates (Modugu & Anyaduba, 2014; Okpeyo, Musah, & Gakpetor, 2019), as well as behavioural factors such as tax morale, perception of fairness, motivational factors, trust in tax authorities, and power of the tax authorities (Bornman, 2015).

2.3. Hypotheses Development

The theoretical underpinning for the study is the economic deterrence theory. Allingham and Sandmo (1972) employed the economic deterrence theory by Becker (1968) to explain the factors that influence tax compliance, which focuses on crime and punishment. Tax compliance decision is influenced by a taxpayer's evaluation of the cost and benefits of tax evasion. They weigh the chances of being discovered through an audit and the potential consequences of being penalised against the option of paying taxes. If a taxpayer perceives a high likelihood of being audited and serving penalties, they may refrain from engaging in tax evasion. Conversely, if penalties are lenient and the likelihood of an audit is low, a taxpayer may attempt to evade taxes. Therefore, tax compliance is induced by severe penalties and a higher probability of detection, strengthening the enforcement paradigm (Alm, Cherry, Jones, & McKee, 2010).

Another school of thought highlights the role of tax administration as a facilitator and provider of service to taxpayers, in addition to enforcement, in promoting tax compliance. Prichard et al. (2019) noted that facilitating compliance measures include providing support and advice to taxpayers, ensuring easy access to tax liability information, and establishing a simple payment method.

The empirical literature on the subject matter is inconclusive, with conflicting findings. Some studies, such as those by Oladele, Aribaba, Ahmodu, Yusuff, and Alade (2019) and Slemrod (2019), examined the influence of economic factors, particularly, tax audits and tax penalties, on tax compliance. They found a positive association between tax audits, tax penalties, and tax compliance. However, another strand of literature, Olaoye and

Ekundayo (2019), documented a negative association between tax penalties and tax compliance. Santoro and Waiswa (2022) also provided inconclusive findings on the relationship between tax enforcement tools and compliance among a specific group of taxpayers in Uganda. However, using laboratory experiments, Kasper and Alm (2022) showed that the effectiveness of an audit can have varying implications for tax compliance. Additionally, De Neve, Imbert, Spinnewijn, Tsankova, and Luts (2019) investigated the impact of the tax administration's information simplicity, deterrent strategies, and tax morale on personal income taxpayers' compliance with filing, reporting, and payment requirements.

The study examined the simplicity of information at the various stages of communication between the tax authorities and taxpayers, which include the demand for submission of tax returns, payment of taxes, and follow-up communications in the event of late filing or payment. The study found that the tax administration can reduce costs associated with enforcement by simplifying the information it provides to taxpayers, thereby increasing tax compliance. OECD (2021b) underscores the importance of educating citizens by noting that understanding taxes may be complicated for citizens without prior knowledge about the tax system. However, efforts at educating them will make them appreciate the significance of taxes and commit to fulfilling their tax obligations. Mascagni and Santoro (2018), in their review of tax education in selected African countries, discovered various initiatives aimed at improving tax education, including the introduction of tax clubs in countries like Kenya, Rwanda, and Tanzania; tax edutainment through television and radio programs; National Taxpayer Days; and tax training and seminars, amongst others. However, they noted that one challenge of tax education is that it may not have a strong influence on actual compliance but on tax knowledge.

The gap in the literature identified by this study is that previous studies that examined the effect of tax administration on tax compliance have independently focused on the influence of specific enforcement services. This study bridges the gap by examining the influence of tax administration, measured by tax education, tax support service, tax penalty, and tax administrative efficiency, on personal income tax compliance.

Given the inconsistent findings in the literature as well as the significant contribution of using four proxies for tax administration, the general objective of the study is delimited to four hypotheses stated in their alternative form as shown below:

H_{A1}: Tax education has a statistically significant positive influence on personal income tax compliance.

H_{A2}: Tax support service has a statistically significant positive influence on personal income tax compliance.

H_{A3}: Tax penalty has a statistically significant positive influence on personal income tax compliance.

H_{A4}: Tax administrative efficiency has a statistically significant positive influence on personal income tax compliance.

3. Methodology

3.1. Research Design and Data

This study adopts a cross-sectional survey design to obtain primary data for assessing the influence of tax administration on personal income tax compliance in Nigeria. The study population comprises personal income taxpayers from different sectors in Nigeria. A sample size of 550 was adopted as the minimum sample size for an infinite population (Hair, Wolfinbarger, & Ortinall, 2008). A non-probability sampling technique was used to select the respondents for the study, and the sample was drawn from individual taxpayers from different sectors, ages, genders, educational qualifications, and years of experience.

The main research instrument used for the study was a questionnaire. Personal income tax compliance was measured by items covering reporting, filing, and payment practices on a five-point Likert scale using a range from Never (1) to Always (5). Tax administration was measured by items covering tax education and enlightenment, tax support service, tax penalty, and tax administrative efficiency on a five-point Likert scale ranging from Strongly agree (4), Agree (3), Disagree (2), Strongly Disagree (1) and Undecided (0). The questionnaire was administered using both online surveys (Bonnel, Bayart, & Smith, 2015) and paper surveys for three (3) months from March to May 2022. Table 1 provides the details of the questionnaire.

Sixty-seven (67) responses were obtained from the online survey, while three hundred and seventy-three (373) responses were obtained from the paper survey, totalling 440 responses. Out of 440 responses, 365 (83%) were deemed fit for analysis, and the remaining 75 (17%) were discarded due to anomalies such as incomplete filing of the questionnaire. Descriptive statistics were analysed using SPSS version 21, while hypotheses were tested using Partial Least Square Structural Equation Modelling (PLS-SEM). PLS-SEM uses a two-step approach by assessing the measurement and structural models (Hair, Risher, Sarstedft, & Ringle, 2019). The measurement model was assessed first by examining the constructs' outer or indicator loadings, reliability, and validity (Hair et al., 2019).

Hulland (1999) noted that loadings of above 0.5 are acceptable. The internal consistency reliability measured through composite reliability has an acceptable threshold of 0.7 and above, while the acceptable threshold for convergent validity measured through average variance extracted (AVE) is 0.5 and above (Hair et al., 2019). The structural model assessment followed the criteria recommended by Hair et al. (2019) in assessing the path coefficient, coefficient of determination through the bootstrapping procedure, and effect size.

Table 1. Questionnaire distribution statistics.

Questionnaire statistics	Frequency	Percentage (%)
Distributed questionnaire	550	100
Unreturned questionnaire	(110)	20
Retrieved questionnaire	440	80
Rejected questionnaire	(75)	14
Retained copies of the questionnaire	365	66

3.2. Model Specification and Measurement of Variables

The econometric model for achieving the study's objective is presented in Equation 1. The *a priori* expectation is that tax administration (TA) will positively and significantly influence personal income tax compliance (PITC).

$$PITC_i = \beta_0 + \beta_1 TA \qquad (1)$$

Tax administration (TA) is decomposed into four elements, namely tax education (TEE), tax support service (TSS), tax penalty (TEP), and tax administration efficiency (TAE).
Therefore, Equation 1 is decomposed as follows:

$$PITC_i = \beta_0 + \beta_1 TEE_i + \beta_2 TSS_i + \beta_3 TEP_i + \beta_4 TAE_i + \varepsilon_i \qquad (2)$$

Where PITC represents personal income tax compliance and tax administration covering: (i) TEE represents tax education and enlightenment, (ii) TSS represents tax support service, (iii) TEP represents Tax penalty, and (iv) TAE represents tax administration efficiency.

4. Data Analysis

4.1. Demographic Analyses

The demographic profile of respondents is presented in Table 2. The results showed that 195 (53.4%) respondents were male, while 170 (46.6%) were female. Furthermore, 59 (16.1%) respondents were aged between 18-28 years, 105 (28.8%) were aged between 29-39, 139 (38.1%) were within the age bracket 40-50 years, and the remaining 62 (17%) respondents were aged from 51 and above. This indicates that the respondents were distributed across different age brackets, with the highest number coming from the age bracket of 40-50 years.

The frequency distribution of respondents' academic qualifications in Table 2 shows that 15 (4.1%) had a Secondary School Certificate Examination (SSCE) qualification, 43 (11.8%) had an Ordinary National Diploma (OND) or Nigerian Certificate in Education (NCE), and 227 (62.2%) of the respondents had Higher National Diploma (HND) or B.Sc. Qualification, 57 (15.6%) had an M.Sc. qualification, 16 (4.4%) had a PhD, and 7 (1.9%) had other qualifications. This shows that a larger percentage of the respondents were literate and assumed to be knowledgeable about tax. Furthermore, 182 (49.9%) respondents had between 1-10 years of experience in business or work, 117 (32%) respondents had between 11-20years, 47 (12.9%) respondents had between 21-30years, while only 19 (5.2%) respondents had 31 and above years of experience.

Table 2. Demographic profile of respondents.

Variables	Categories	Frequency	Percentage (%)
Gender	Male	195	53.4
	Female	170	46.5
Age	18-28	59	16.1
	29-39	105	28.8
	40-50	139	38.1
	51 and above	62	17
Educational qualification	SSCE	15	4.1
	OND/NCE	43	11.8
	HND/B.Sc.	227	62.2
	M.Sc.	57	15.6
	PhD.	16	4.4
	Others	7	1.9
Length of years in business	1-10	182	49.9
	11-20	117	32.0
	21-30	47	12.9
	31 and above	19	5.2

Note: SSCE=Secondary school certificate examination; OND= Ordinary national diploma; NCE=Nigerian certificate examination; M.Sc. = Masters of science; PhD= Doctor of philosophy.

4.2. Descriptive Statistics

The mean and standard deviation of the study's construct, as shown in Table 3, reveal that personal income tax compliance had a mean score of 3.25 (SD=0.81), which is mildly above a low compliance level. Tax education, tax support service, tax enforcement, and tax administrative efficiency had mean scores of 2.40, 2.19, 2.54, and

2.15, respectively. This indicates that the responses tend slightly towards agreement. It suggests that the respondents have a slightly positive perception of the tax administration.

Table 3. Variable mean and standard deviation.

Items	Description	Mean	SD
1.	Personal income tax compliance	3.25	0.81
2.	Tax education	2.40	0.87
3.	Tax support service	2.19	0.88
4.	Tax enforcement	2.54	0.92
5.	Tax administrative efficiency	2.15	0.81

4.3. Results

The research model was analysed using PLS-SEM on SmartPLS 4 software (Ringle, Wende, & Becker, 2022). Hair et al. (2019) suggested assessing the measurement model through reliability and validity tests, as well as the structural model. The measurement model, presented in Table 4 reveals that indicator loadings of 0.5 and above were retained, while those below 0.5 were removed. Additionally, the internal consistency reliability, measured through composite reliability, shows that the composite reliability values for all constructs exceeded the recommended 0.7. This reveals that the indicators are reliable in measuring the constructs.

Convergent validity, measured through AVE, also shows that the AVE of all constructs exceeded the threshold of 0.5. This shows that all items measuring each construct converge to represent the underlying construct and that the constructs converge in explaining the variance of their indicators.

Table 4. Measurement model assessment for reliability and convergent validity.

Constructs	Indicators	Loadings	CR	AVE
TEE	C23	0.818	0.77	0.54
	C24	0.839		
	C26	0.509		
TSS	C29	0.812	0.82	0.54
	C31	0.681		
	C32	0.555		
	C33	0.846		
TEP	C35	0.917	0.76	0.52
	C36	0.532		
	C37	0.649		
TAE	C45	0.559	0.77	0.50
	C46	0.672		
	C47	0.710		
	C48	0.752		
PITC	B7	0.743	0.88	0.51
	B8	0.796		
	B10	0.786		
	B13	0.645		
	B14	0.762		
	B16	0.701		
	B17	0.531		

Note: Tax education, TSS = Tax support service; TEP = Tax penalty; TAE = Tax administrative efficiency; CR = Composite reliability; PITC = Personal income tac compliance; AVE = Average variance extracted.
TEE = Tax education, TSS = Tax support service; TEP = Tax penalty; TAE = Tax administrative efficiency.

Table 5. Discriminant validity-Fornell and Larcker criterion.

CONSTRUCTS	TEE	TSS	TEP	TAE	PITC
TEE	0.737				
TSS	0.445	0.732			
TEP	0.218	0.102	0.717		
TAE	0.326	0.382	0.175	0.677	
PITC	0.209	0.124	0.163	0.256	0.714

Note: TEE = Tax education, TSS = Tax support service; TEP = Tax penalty; TAE = Tax administrative efficiency.
Source: Values on the diagonal (Bolded) are the square root of the AVE, while the off-diagonal are correlations.

Discriminant validity was assessed using the Fornell and Larcker (1981) criterion, which compares the square root of the AVE to the correlation coefficient. Table 5 shows that the square of AVE values for each construct was higher than the correlation coefficient between constructs. This indicates that discriminant validity was achieved, as the constructs exhibit more variance within themselves than they share with other constructs.

4.4. Structural Model

The assessment of the structural model followed the criteria recommended by Hair et al. (2019), which included evaluating the path coefficients, coefficient of determination through bootstrapping, and effect size. In the structural model, the significance of the hypothesised relationship was examined to determine whether they should be accepted or rejected. The criteria for assessment include examining the p-value and the t-statistics. A significant relationship exists where the p-value is less than 0.05, and the t-value is above 1.96.

The results presented in Table 6 and Figure 1 show that on the one hand, three of the hypothesised relationships (H_{A1}, H_{A3}, and H_{A4}) are statistically significant, with a p-value less than (<) 0.05 and a t-value greater than (>) 1.96, while on the other hand, H_{A2} is not statistically significant, as its p-value does not meet the threshold. Therefore, hypotheses H_{A1}, H_{A3}, and H_{A4} are not rejected. This paper establishes that tax education ($\beta = 0.13, p = 0.012, \text{and } t - \text{value} = 2.511$) has a statistically significant positive influence on personal income tax compliance. The results also show that the tax penalty ($\beta = 0.099$, p= 0.04, and t-value=2.05) has a statistically significant positive influence on personal income tax compliance. Furthermore, the results establish that tax administrative efficiency ($\beta = 0.204, p = 0.000 \text{ and}, t - \text{value} = 3.652$) has a statistically significant positive influence on personal income tax compliance. However, the paper establishes that tax support service does not have a statistically significant positive influence on personal income tax compliance. The coefficient of determination (R^2) of 0.093, as shown in Table 6, indicates that tax administration (measured by tax education (TEE), tax penalty (TEP), and tax administrative efficiency (TAE)) explains 9.3% of the variance in personal income tax compliance. The effect sizes (f^2) were evaluated using Cohen (1988) recommended threshold of 0.02, 0.15, and 0.35 for small, medium, and large effect sizes, respectively. Table 6 shows that all hypothesised relationships have small effect sizes.

Table 6. Structural estimates (Hypotheses testing).

Hypotheses	Beta (β)	T-value	P-value	f^2	R^2	Decision
TEE -> PITC	0.130	2.511	0.012	0.014	0.093	Supported
TSS -> PITC	-0.019	0.296	0.767	0		Not supported
TEP -> PITC	0.099	2.05	0.04	0.01		Supported
TAE -> PITC	0.204	3.652	0.000	0.037		Supported

Note: TEE=Tax education, TSS=Tax support service; TEP= Tax penalty; TAE=Tax administrative efficiency; Critical t-values, 1.96 (P<0.05).

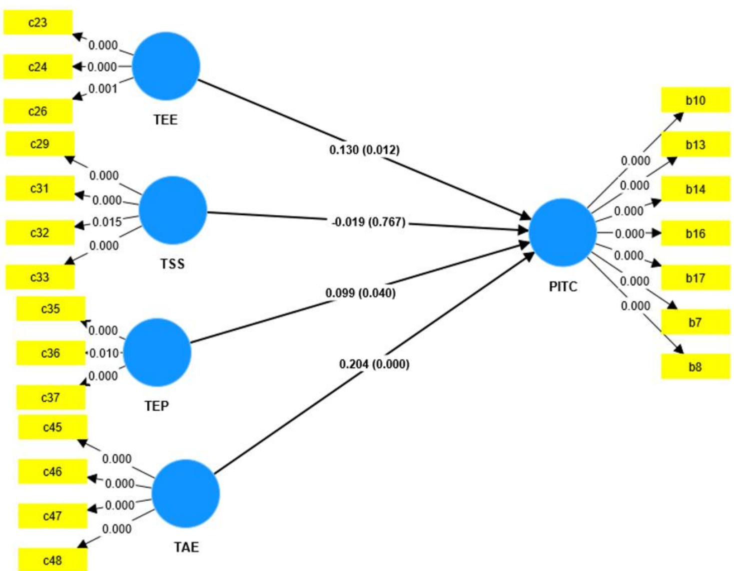

Figure 1. PLS bootstrapping result of the effect of tax administration on personal income tax compliance.

5. Discussion

The paper used primary data gathered from individual taxpayers using paper and online surveys to examine the effect of tax administration measured by tax education, tax support service, tax penalty, and tax administrative efficiency, on personal income tax compliance. The results from the structural model assessment show that tax administration accounts for 9.3% of the variance in personal income tax compliance. This implies that a change in tax administration would result in a 9.3% increase in personal income tax compliance. This finding indicates that tax administration plays a significant role in influencing personal income tax compliance, adding to the existing body of literature on factors influencing tax compliance. This finding is consistent with the study conducted by Enyi et al. (2019) but contradicts the findings of Adegboye, Alao-Owunna, and Egharevba (2018).

Specifically, the four hypotheses tested through bootstrapping indicate that tax education has a positive and significant influence on personal income tax compliance, with a coefficient β=0.13, a *t-value*=2.511, and a *p-value*=0.012. This result is consistent with the findings of Kwok and Yip (2018) and Olaoye, Ayeni-Agbaje, and Alaran-Ajewole (2017) that highlights the influence of tax education on tax compliance. The findings of Gitaru (2017) and Amaning, Anim, Kyere, Kwakye, and Abina (2021) further support the notion that taxpayer education influences tax compliance. Therefore, this study's findings provide additional evidence that tax education serves as a predictor of personal income tax compliance.

The results of the study show that the tax penalty positively and significantly influences personal income tax compliance, with a coefficient $\beta = 0.099$, a t-value=2.05, and a p-value= 0.04. This result aligns with the findings of Anyaduba and Oboh (2020) and Yunus, Ramli, and Hassan (2017), which emphasizes that enforcement strategies, such as awareness of tax penalty tools, positively impact tax compliance. It is also consistent with the findings of Oghuma (2018) and Oladele et al. (2019) that highlight the influence of tax penalties on tax compliance. Additionally, the study demonstrates that tax administrative effectiveness has a positive and significant impact on personal income tax compliance with a coefficient β=0.204 and a p=0.000. However, tax support service does not positively or significantly influence personal income tax compliance, with a coefficient β= -0.019, and a p=0.76. This finding is inconsistent with the research of Alm et al. (2010), who found that taxpayers' service can influence taxpayers reporting compliance. The findings of Adekoya, Adegbie, and Agbetunde (2020) also showed that quality service positively influences tax compliance.

The results of this study provide evidence that tax administration is a predictor of personal income tax compliance. This study has significant implications for policy, research, and practice. Policymakers in Nigeria and other developing countries should prioritise taxpayers' education and the provision of quality services to stimulate voluntary compliance. Additionally, attention should be given to strengthening enforcement strategies. The study contributes to research by offering empirical evidence on the influence of the tax administration multi-dimension paradigm (tax education, tax support service, tax penalty, and administrative efficiency) on personal income tax compliance. It also contributes to policy by emphasising the need to implement effective and efficient education, enforcement, and bureaucratic models to enhance tax administration's effectiveness.

6. Conclusion

This paper examined the effect of a multifaceted tax administration paradigm, including tax education, tax support services, enforcement through tax penalties, and administrative efficiency, on individuals' willingness to report, file and pay personal income taxes in Nigeria. The findings of this study suggest that tax education, support services, and administrative efficiency are significant predictors of personal income tax compliance. These empirical results contribute to the existing literature by providing evidence of the effect of tax administration's multi-dimensional paradigm on personal income tax compliance. The study highlights that a combination of tax education, efficient administrative practices, and appropriate enforcement measures can foster personal income tax compliance.

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