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Compliance of Tax Reforms on Infrastructural Development in Nigeria: The SEM Approach

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Abstract

Nigeria's current tax-reform agenda is intended to simplify the legal framework, modernise administration, broaden the tax base and improve domestic revenue mobilisation. Whether these reforms acquire developmental legitimacy, however, depends on two connected outcomes: taxpayers must comply with the reformed system, and the resulting revenue must be converted transparently into visible infrastructure. This article developed a structural equation model in which reform quality and clarity, digital tax administration, taxpayer support and education, and fair enforcement predict tax compliance; compliance predicts revenue mobilisation; and revenue mobilisation predicts infrastructural development, with transparency and accountability moderating the final relationship. Fiscal exchange reasoning was integrated with the slippery-slope perspective to provide the theoretical basis. The proposed survey instrument contains 32 reflective indicators designed for businesses, tax practitioners, revenue officials and public-finance stakeholders. A dataset of 438 cases was used solely to demonstrate the analytical procedure. Partial least squares structural equation modelling yielded satisfactory measurement properties, with composite reliability values of .913–.929 and average variance extracted values of .723–.766. Each hypothesised compliance driver had a positive coefficient. Tax compliance strongly predicted revenue mobilisation ($\beta = .526$, $p < .001$), revenue mobilisation predicted infrastructural development ($\beta = .453$, $p < .001$), and transparency strengthened that relationship ($\beta = .152$, $p < .001$). The model accounted for 42.6% of the variance in infrastructural development. Taken together, the results illustrate why legal reform cannot operate in isolation: clear rules, dependable digital systems, credible and fair enforcement, practical taxpayer assistance and transparent public spending must function as parts of the same fiscal-governance chain. The policy implications therefore centre on clearer reform communication, stronger tax technology, fair enforcement, transparent reporting of infrastructure expenditure and independent scrutiny of public spending.

Keywords: tax reform; tax compliance; infrastructural development; revenue mobilisation; transparency; PLS-SEM; Nigeria

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1.0 Introduction

Taxation contributes to development only when revenue collection is connected to a credible system of public obligation and public benefit. Beyond imposing statutory liabilities, an effective tax system must make obligations enforceable, support voluntary cooperation, provide a reasonably predictable stream of public revenue and sustain citizens' confidence that contributions are used for collective purposes. That connection is particularly consequential in Nigeria, where persistent infrastructure deficits exist alongside a historically narrow non-oil revenue base, widespread informality, administrative fragmentation and recurrent distrust of public institutions. When revenue remains weak, federal, state and local governments face greater difficulty financing roads, electricity networks, health facilities, water systems, schools and digital infrastructure without increasing reliance on borrowing.

Against this background, tax reform has become an important part of Nigeria's fiscal strategy. The Finance Act 2020 sustained the annual reform process by amending tax provisions in response to changing economic conditions and administrative priorities (Federal Republic of Nigeria, 2020). A much broader restructuring followed in 2025 with the Nigeria Tax Act, the Nigeria Tax Administration Act, the Nigeria Revenue Service (Establishment) Act and the Joint Revenue Board of Nigeria (Establishment) Act (Federal Republic of Nigeria, 2025a, 2025b, 2025c, 2025d). Taken together, the four statutes consolidate substantive rules, reorganise revenue administration, establish common procedural principles and create institutions for coordination, adjudication and taxpayer protection. The underlying policy direction is therefore not limited to changing rates or bases; it is an attempt to replace overlapping provisions and fragmented administrative practices with a more coherent national tax architecture.

Passing legislation, however, does not by itself change taxpayer behaviour. Compliance is shaped by what people and firms experience when they register, receive assessments, file returns, make payments, undergo audits, challenge decisions or interact with government services. A technically sound reform can still perform poorly if taxpayers face unclear language, unreliable digital portals, inconsistent official interpretations, high compliance costs or little evidence that public revenue produces valued services. The practical issue is therefore wider than the content of revised rates and tax bases. It is whether the reform reduces uncertainty, makes lawful compliance feasible, applies consequences for non-compliance fairly and strengthens the reciprocal fiscal relationship between citizens and the state (Olaniyi et al.,2023).

Evidence from Nigeria has begun to clarify several parts of this behavioural problem, although the studies generally examine them separately. Vincent (2021), approaching the issue from a measurement perspective, developed a multidimensional scale for small-business tax compliance and showed why demographic, institutional, economic and behavioural influences should not be reduced to a single enforcement construct. Collectively, these studies deepen understanding of compliance antecedents, but none traces the full sequence from reform implementation to compliance, from compliance to revenue mobilisation, and ultimately from mobilisation to infrastructure outcomes.

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A related literature examines the developmental consequences of tax revenue. Using electricity production as a proxy for infrastructure, Oziegbe and Itua (2024) found positive short- and long-run relationships between value-added tax, customs duties, company income tax and infrastructural development. That macroeconomic evidence supports the importance of revenue, yet aggregate coefficients cannot show how taxpayers' perceptions of reform quality shape compliance or whether transparency affects the conversion of collected revenue into public assets. Nor does a positive revenue coefficient imply that every additional naira generated by reform yields an equivalent developmental return. Weak project selection, procurement failures, leakages, maintenance deficiencies and limited disclosure can interrupt the path between fiscal capacity and completed infrastructure.

These relationships are difficult to represent with single observed measures because the central concepts are latent and multidimensional. Reform clarity, digital administration, taxpayer support, enforcement fairness, compliance, transparency and perceived infrastructure improvement each contain several related attributes. Structural equation modelling is therefore appropriate because it assesses measurement quality and structural relationships together, accounts explicitly for measurement error, and accommodates mediation and moderation within the same analytical framework (Hair et al., 2021, 2022; Kline, 2023). In the present context, SEM makes it possible to test whether reform dimensions influence compliance, whether revenue mobilisation transmits compliance into development, and whether transparency changes the strength of the final revenue–infrastructure relationship.

The main objective of this study, therefore, is to specify an integrated SEM framework for examining tax reform compliance and infrastructural development in Nigeria. Five specific objectives guide the analysis and they are to:

1. determine the effects of reform quality, digital administration, taxpayer support and fair enforcement on tax compliance;
2. evaluate the effect of tax compliance on revenue mobilisation;
3. examine the effect of revenue mobilisation on infrastructure development;
4. test the indirect compliance–revenue–infrastructure pathway; and
5. assess whether transparency moderates the relationship between revenue mobilisation and infrastructure development.

By placing behavioural tax compliance and public-finance outcomes in one model, the article connects literatures that are often treated separately. It also provides a detailed measurement instrument and analytical template that can be applied to authentic multi-state field data.

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2.0 Literature Review

2.1 Conceptual Review

2.1.1 Tax Reform and Reform Quality

Tax reform encompasses deliberate changes to the legal rules, administrative procedures and institutional arrangements through which taxes are defined, assessed, collected, enforced and disputed (Mardan, 2023; Afolabi, 2026). Changes to rates, thresholds, exemptions and tax bases are part of reforms, but they do not fully describe its practical quality as opined by Benzarti and Wallossek (2024). From the taxpayer's standpoint, Olumoh (2024) noted that reform also involves the clarity of obligations, consistency across agencies, simplicity of procedures, quality of transition arrangements and accessibility of official guidance. Reform quality is therefore treated here as a taxpayer-facing construct rather than as the number of statutes enacted. The construct captures whether new rules are understandable, internally coherent, predictable in application and easier to use than the arrangements they replace.

Nigeria's 2025 package demonstrates why that broader interpretation is necessary. The Nigeria Tax Act consolidates substantive tax provisions, the Nigeria Tax Administration Act establishes common administrative procedures, the Nigeria Revenue Service (Establishment) Act reorganises federal revenue administration, and the Joint Revenue Board legislation provides institutions for coordination, adjudication and taxpayer protection (Federal Republic of Nigeria, 2025a, 2025b, 2025c, 2025d). Whether these legal changes improve compliance will depend largely on implementation. Consolidated statutes must be accompanied by consistent interpretation, functional administrative systems, adequately trained officers and guidance that taxpayers can use in practice. The expected compliance effect of reform quality therefore rests on reducing ambiguity and limiting perceptions of arbitrary administration.

2.1.2 Digital Tax Administration

Digital tax administration refers to the use of electronic systems for registration, taxpayer identification, return filing, payment, invoicing, data matching, audit selection, communication and case management (Ogbeta & Ayeni, 2024). Properly designed systems can reduce travel and waiting time, limit informal contact, lower clerical error and improve the information available to revenue authorities (Okunogbe & Santoro, 2022). Their benefits are nevertheless conditional. In lower-income settings, Okunogbe and Santoro (2022) noted that technology produces meaningful administrative gains only when systems are reliable, interoperable, inclusive and integrated with wider institutional reform.

Accessible and traceable digital services reduce transaction costs, but failed portals, weak connectivity, separate credentials across agencies and slow correction of automated assessments can have the opposite effect. The digital-administration construct therefore focuses on perceived accessibility, reliability, interoperability and cost reduction rather than the mere presence of online services. A positive association with compliance is expected when digital systems make lawful behaviour easier while also improving the authority's ability to detect non-compliance through integrated information.

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2.1.3 Taxpayer Support and Education

According to OECD (2021), taxpayer support includes guidance, education, help desks, reminders, pre-filing assistance, complaint mechanisms and timely responses to technical questions. Education develops the taxpayer's substantive and procedural knowledge; support services help convert that knowledge into correctly completed compliance tasks. The OECD (2021) places taxpayer education within the broader development of tax culture and fiscal citizenship, an issue that is particularly relevant where first-time taxpayers and participants in the informal sector need continuing orientation rather than occasional awareness campaigns.

The influence of support depends less on whether a channel exists than on whether it resolves the taxpayer's problem. Effective assistance can reduce uncertainty, unintentional mistakes and the anxiety associated with complex obligations. Evidence from Olaniyi et al. (2023) is instructive: tax education had a positive effect, while support services were insignificant. That contrast suggests that nominal service provision is insufficient when access, accuracy or responsiveness is weak. The present article consequently combines education and support within one latent construct, while retaining indicators that distinguish the quality of information from the responsiveness of service delivery.

2.1.4 Fair and Credible Enforcement

Enforcement covers audit, verification, penalties, collection action and prosecution, yet its behavioural effect depends on how taxpayers judge both its credibility and its fairness. Credibility requires a realistic probability that non-compliance will be identified and appropriately sanctioned (Nwokoye et al.,2023). Fairness requires comparable treatment of similar cases, due process, proportionate penalties and workable channels for dispute resolution (Kogler et al.,2023).
Siglé et al. (2022) likewise found that cooperative engagement can improve interactions between corporate taxpayers and revenue authorities, although effects vary across taxes and forms of non-compliance. On that basis, enforcement in the present framework is defined as credible but procedurally fair, rather than simply punitive.

2.1.5 Tax Compliance

Tax compliance describes the extent to which taxpayers register when required, file accurate returns, declare the correct tax base, pay liabilities within the prescribed period and cooperate with lawful verification. Compliance is therefore both formal and substantive (Mascagni & Nell, 2022). Timely filing can coexist with understated income, just as correct reporting can coexist with late payment caused by liquidity constraints (Mascagni & Nell, 2022; D'Agostino et al., 2024). The multidimensional approach advanced by Vincent (2021) is useful for this reason: it recognises that economic, demographic, institutional and behavioural influences affect different aspects of compliance rather than a single undifferentiated act.

In this article, self-reported compliance is represented by timely registration and filing, accurate declaration, timely payment and willingness to cooperate with legitimate audits. The indicators deliberately capture both voluntary and enforced dimensions of behaviour without assuming that one mechanism operates independently of the other. Within the structural model, compliance is the immediate behavioural outcome of reform implementation and the main antecedent of revenue mobilisation.

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2.1.6 Revenue Mobilisation

Revenue mobilisation should not be equated with a rise in nominal tax receipts (Mascagni & Nell, 2022). It refers to the state's capacity to secure adequate, stable and sustainable revenue from legally defined tax bases while controlling leakage and avoiding excessive compliance costs (OECD, 2024; World Bank, 2024). Better compliance can broaden the effective base, reduce arrears and improve the predictability of collections (Okunogbe & Santoro, 2022). Nominal revenue may still rise for other reasons, including inflation, exchange-rate movements, rate adjustments or one-off settlements (OECD, 2024). For that reason, the perception-based SEM construct asks whether reform is associated with wider participation, lower leakage, greater collection efficiency and more stable revenue rather than with headline receipts alone (World Bank, 2024).

The Nigerian fiscal setting gives this transmission particular importance. The World Bank (2022) estimated a substantial difference between actual tax collection and the country's revenue potential. Similarly, the African Union Commission, African Tax Administration Forum, and OECD (2024) reported a tax-to-GDP ratio for Nigeria below the African average. Revenue mobilisation is therefore relevant not only as an accounting outcome but as the fiscal space through which improved compliance can finance public investment. The World Bank (2025) makes the complementary argument that stronger fiscal performance must ultimately be reflected in better public services and more inclusive development.

2.1.7 Infrastructural Development

Infrastructural development concerns the expansion, quality, reliability and maintenance of the physical and social systems on which economic and human activity depend (Saadaoui Mallek et al., 2024; El-Bouayady et al., 2024). Transport networks, electricity, water and sanitation, schools, health facilities and digital connectivity all fall within this domain (Saadaoui Mallek et al., 2024). A useful measure must go beyond announced capital expenditure because spending commitments can coexist with delayed projects, abandonment, poor maintenance or uneven geographical access (Selcuk et al., 2024; Gertler et al., 2024). The indicators used in this study therefore focus on perceived changes in access, service reliability, project completion and maintenance across several major infrastructure categories (Oziegbe and Itua ,2024).

As stated by Benitez et al. (2023), tax revenue can finance infrastructure directly through budgetary allocation and counterpart funding, indirectly through maintenance expenditure, and more broadly by strengthening the fiscal credibility needed for long-term investment. The result does not, however, remove the institutional problem between collection and delivery. Adequate revenue is necessary but not sufficient; project appraisal, procurement, implementation, monitoring and disclosure determine whether available fiscal resources are eventually transformed into functioning public assets (Bah, 2024).

2.1.8 Transparency and Accountability

Transparency concerns whether information on revenue collection, budget allocation, procurement, project implementation and final outcomes is available, understandable and timely (Hsu, 2024). Accountability goes further by requiring public institutions to explain decisions, permit scrutiny and face consequences when resources are misused (Omoniyi & Akintoye, 2024).

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Both concepts operate on the two sides of the fiscal relationship (de la Cuesta et al., 2023). Before taxes are paid, credible evidence of public spending can affect tax morale (Capasso et al., 2021). After revenue has been collected, openness and oversight can reduce losses in the process through which fiscal resources are converted into infrastructure (McDonough et al., 2024).

Recent studies underline the relevance of this governance dimension. Across 32 sub-Saharan African countries, Nichelatti and Hiilamo (2024) associated citizens' governance perceptions with tax compliance. Amani (2024) similarly showed that public trust mediated the relationship between corporate legitimacy and SME compliance intentions. Such findings suggest that taxpayers do not evaluate the revenue authority in isolation; their judgement extends to the wider conduct of the state. The model therefore assigns transparency both a direct relationship with infrastructure perceptions and a moderating role in the revenue–infrastructure path, on the expectation that mobilisation should translate more effectively into development when allocation and project delivery are open to scrutiny.

2.2 Theoretical Framework

2.2.1 Fiscal Exchange and Social Contract Reasoning

Fiscal exchange reasoning interprets taxation as part of a reciprocal relationship between citizens and the state. Citizens surrender resources through taxes, while government is expected to provide public goods, protection and accountable administration (Hassan et al.,2021). The expected exchange is collective rather than a direct purchase of services by each taxpayer.

In the Nigerian setting, fiscal exchange reasoning therefore helps explain why administrative reform alone may not be enough. Reform becomes more legitimate when taxpayers can connect improved administration and additional revenue to visible public infrastructure, which also provides the theoretical justification for treating transparency as a condition affecting the conversion of revenue into development.

2.2.2 Slippery-Slope Framework

Darmayasa and Hardika (2024) noted that the slippery-slope framework approaches compliance through two interacting dimensions: trust in authorities and the power of authorities. Trust supports voluntary compliance because taxpayers view the authority as competent, legitimate and broadly benevolent. Power underpins enforced compliance because the authority can detect evasion and impose sanctions.

Cross-cultural evidence reported by Kogler et al. (2023) associates perceptions of trust and authority power with indicators of tax compliance. The framework maps closely onto the constructs used here: reform clarity, digital administration and taxpayer support can strengthen trust, whereas fair enforcement expresses legitimate authority power. The four reform-implementation dimensions are therefore expected to influence compliance through complementary routes. For Nigeria, the theoretical implication is practical: service and enforcement should not be designed as competing approaches. Predictable assistance and credible sanctions are more likely to reinforce one another within a mature tax administration.

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2.2.3 Integrated Theoretical Position and Hypotheses

The integrated position uses the slippery-slope framework to explain the behavioural entry into compliance and fiscal exchange reasoning to explain the developmental consequences that follow (Darmayasa & Hardika, 2024). Reform quality, digital administration and taxpayer support can reduce uncertainty and build institutional trust, while fair enforcement supplies legitimate authority power (Gobena, 2024). These mechanisms shape compliance behaviour. Compliance, in turn, expands the state's capacity to mobilise revenue, creating fiscal space for infrastructure. Transparency and accountability strengthen the final link by making the use of revenue more visible and by reducing the likelihood that taxpayer contributions are dissipated before they become public assets (Bah, 2024).

Drawing from the foregoing theoretical arguments, conceptual relationships and empirical evidence, the study is consistent with recent evidence showing that tax administration reforms can generate sustained improvements in revenue performance, and that digital technologies can strengthen tax capacity and compliance. Also, institutional quality and perceptions of governance are associated with tax revenue mobilisation and tax compliance respectively (Okunogbe & Tourek, 2024; Bah, 2024; Nichelatti & Hiilamo, 2024). Accordingly, and in line with the study's theoretical framework and conceptual model, the following hypotheses are proposed:

H_1: reform quality and clarity positively affect tax compliance;

H_2: digital tax administration positively affects tax compliance;

H_3: taxpayer support and education positively affect tax compliance;

H_4: fair and credible enforcement positively affects tax compliance;

H_5: tax compliance positively affects revenue mobilisation;

H_6: revenue mobilisation positively affects infrastructural development;

H_7: tax compliance has a positive direct effect on infrastructural development;

H_8: revenue mobilisation mediates the relationship between tax compliance and infrastructural development; and

H_9: transparency and accountability positively moderate the relationship between revenue mobilisation and infrastructural development.

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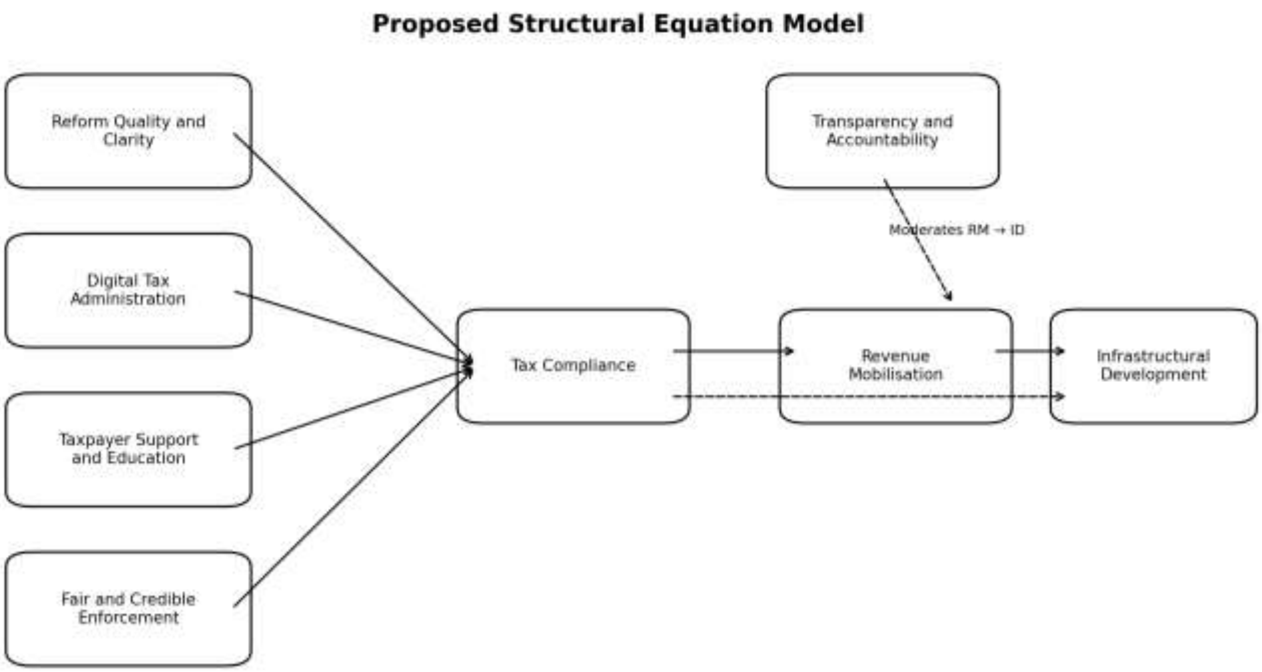

Figure 2.1. Proposed structural equation model for tax reform compliance and infrastructural development.

2.3 Empirical Review

Table 2.1. Selected empirical studies on tax administration, compliance, governance and infrastructure

Author(s)/ context	Focus	Method/sample	Principal finding	Limitation relevant to this study
Vincent (2021), Nigeria	Developed an SME tax-compliance scale from Fischer's model.	Survey; principal component analysis.	Produced a reliable multidimensional scale and identified demographic and institutional influences.	Focused on measurement; did not connect reform compliance to revenue or infrastructure.
Hassan et al. (2021), Pakistan	Examined economic, social, behavioural and institutional determinants of voluntary compliance.	Survey; SEM.	Simplicity, tax morale, spending perceptions and fairness shaped voluntary compliance; fairness mediated relationships.	Non-Nigerian setting and no public-investment outcome.

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Siglé et al. (2022), Netherlands	Assessed cooperative corporate tax compliance.	Empirical corporate-tax assessment.	Cooperative engagement improved authority–taxpayer interaction, with varied compliance effects.	Large-corporate context; infrastructure and reform transmission were outside scope.
Olaniyi et al. (2023), Nigeria	Tested tax education, support, penalties and administrative efficiency.	365 individual taxpayers; PLS-SEM.	Education, penalties and administrative efficiency were positive; support services were insignificant.	Explained personal income tax compliance only; no revenue-development chain.
Nwokoye et al. (2023), South-East Nigeria	Assessed fiscal incentives and determinants of firm compliance in industrial clusters.	Cluster survey; descriptive statistics and logistic regression.	Audits, simplified communication, deterrence, owner education, legitimacy and incentives influenced compliance.	Regional and firm-cluster focus; latent mediation and infrastructure were not modelled.
Kogler et al. (2023), cross-cultural	Related trust and authority power to shadow-economy and corruption indicators.	14,509 participants across countries/regions; multilevel analysis.	Trust and power were associated with compliance-related national outcomes.	Country-level associations did not trace reform-specific Nigerian outcomes.
Oziegbe & Itua (2024), Nigeria	Linked non-oil taxes to infrastructural development proxied by electricity production.	Time series; ARDL.	VAT, customs duties and company income tax had positive short- and long-run effects.	Used aggregate revenue and one infrastructure proxy; behavioural compliance was absent.
Nichelatti & Hiilamo (2024), 32 SSA countries	Tested governance perceptions and individual tax compliance.	Afrobarometer Round 7; logistic and mediation analysis.	Governance perceptions significantly explained compliance differences.	Cross-country design could not model Nigeria's 2025 reform architecture or infrastructure delivery.
Amani (2024), SMEs	Modelled corporate legitimacy, public trust and tax-compliance intention.	Survey; mediation analysis with 5,000 bootstrap samples.	Corporate legitimacy increased public trust, which strengthened compliance intention.	Focused on intention rather than realised revenue and development outcomes.
Okunogbe & Tourek (2024),	Synthesised evidence on	Review of field and	Technology raises capacity when paired	A synthesis rather than an integrated latent-

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lower-income countries	technology, tax agents and political incentives.	administrative evidence.	with administrative incentives and political commitment.	variable test for Nigeria.

2.4 Gap in Literature

The available literature clarifies important parts of the tax–development relationship, but it rarely estimates the entire behavioural and fiscal sequence within one model. Vincent (2021) improved the measurement of compliance but did not connect taxpayer behaviour to public outcomes. At the macro level, Oziegbe and Itua (2024) related non-oil tax revenue to electricity production, although their time-series design could not identify taxpayers' perceptions of reform implementation or the institutional mechanisms linking revenue to infrastructure. Cross-country evidence further shows that governance, trust and authority power matter (Kogler et al., 2023; Nichelatti & Hiilamo, 2024), yet Nigeria's restructured tax institutions and the full infrastructure pathway remain insufficiently tested. The unresolved gap is therefore an integrated latent-variable framework in which reform clarity, digital administration, support and fair enforcement shape compliance, compliance supports revenue mobilisation, and transparency conditions the conversion of that mobilisation into multidimensional infrastructure. This study addresses that gap through a mediation-moderation SEM framework.

3.0 Methodology

3.1 Research Design and Analytical Strategy

The substantive field study is designed as a cross-sectional explanatory survey. Its unit of analysis is the informed stakeholder with practical knowledge of tax obligations, tax administration or public infrastructure. Respondents are intended to include owners and senior managers of registered businesses, accountants and tax practitioners, officers of federal and state revenue institutions, and professionals working in public finance or infrastructure. Bringing these groups together reflects the structure of the model, which combines taxpayer experience with perceptions of revenue generation and expenditure outcomes. During field implementation, the sample should be stratified by geopolitical zone, taxpayer category and institutional role so that a single tax type, profession or region does not dominate the evidence.

Partial least squares structural equation modelling is used because the proposed model is prediction-oriented, contains several latent constructs, includes mediation and moderation, and does not require multivariate normality for estimation. It is also appropriate where theory is being extended by combining relationships that have usually been analysed separately in behavioural taxation and public finance (Hair et al., 2021, 2022; Sarstedt et al., 2022). The measurement specification is reflective, meaning that the observed items are treated as manifestations of their underlying perceptions. If future fieldwork considers formative alternatives, construct specification should be reassessed through a theory-based review or confirmatory tetrad assessment rather than changed solely on statistical grounds.

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3.2 Demonstration Dataset and Research Integrity

Because no questionnaire responses or administrative microdata were supplied for this study, the numerical analysis uses a reproducible synthetic dataset of 438 cases generated with a fixed random seed. Its purpose is to demonstrate how the proposed SEM can be estimated and reported. The observations were constructed to resemble five-point Likert responses while retaining plausible positive relationships among reform implementation, compliance, revenue mobilisation, transparency and infrastructure. They do not represent actual taxpayers, officials, states or organisations in Nigeria. Accordingly, the reported p-values and effect sizes illustrate analytical mechanics only; they cannot be interpreted as population estimates or evidence of the actual performance of the tax reforms.

A field version suitable for publication should add the safeguards that a demonstration dataset cannot provide. Where required, ethical approval should be obtained, informed consent administered, respondent identities protected, and a de-identified dataset and analysis script archived. Statistical power analysis should be used to justify sample adequacy rather than relying on the ten-times rule alone. With four predictors of tax compliance and a small-to-medium expected effect, a sample above 200 would ordinarily provide reasonable power, whereas 400 or more observations would make subgroup and robustness analyses more defensible. Non-response bias should also be examined through early-versus-late response comparisons and, where the sampling frame permits, comparison with known population characteristics.

3.3 Instrument Development and Operationalisation

The instrument contains 32 items measured on a five-point agreement scale from 1 (strongly disagree) to 5 (strongly agree). The items were adapted conceptually from recent work on tax compliance, governance and PLS-SEM and then rewritten for the Nigerian reform setting. Before field administration, specialists in taxation, public finance and measurement should review the instrument for relevance, clarity and domain coverage. A pilot involving approximately 30–50 knowledgeable respondents can then identify ambiguous wording, excessive completion time and preliminary reliability problems. Procedural controls for common-method bias should include separation of predictor and criterion sections, respondent anonymity and carefully varied item wording, supplemented by a marker variable or full-collinearity assessment at the analytical stage. Table 3.1 summarises the constructs and their indicative content. Reform quality is represented through clarity, consistency, predictability and simplification; digital administration through accessibility, reliability, integration and cost reduction; and taxpayer support through the usefulness of guidance and the responsiveness of assistance. Fair enforcement captures consistency, proportionality, detection credibility and due process. Compliance covers registration, filing, accurate declaration and payment behaviour. Revenue mobilisation reflects base expansion, reduced leakage, efficiency and stability, while transparency concerns disclosure, traceability, oversight and corrective feedback. Infrastructure development is assessed in terms of access, reliability, completion and maintenance.

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Table 3.1. Measurement constructs and proposed indicators

Construct	Code	Indicative content
Reform quality and clarity (RQ)	RQ1–RQ4	Rules are understandable; provisions are consistent; transition guidance is adequate; reform reduces complexity.
Digital tax administration (DA)	DA1–DA4	Online services are accessible; platforms are reliable; systems are interoperable; digital processes reduce compliance cost.
Taxpayer support and education (TS)	TS1–TS4	Guidance is understandable; education reaches taxpayers; help channels respond; rulings/FAQs resolve uncertainty.
Fair and credible enforcement (FE)	FE1–FE4	Audits are risk-based; penalties are proportionate; similar cases are treated consistently; appeals follow due process.
Tax compliance (TC)	TC1–TC4	Registration and filing are timely; declarations are accurate; liabilities are paid; lawful verification is supported.
Revenue mobilisation (RM)	RM1–RM4	Tax base broadens; leakages decline; collection becomes efficient; revenue becomes predictable.
Transparency and accountability (TR)	TR1–TR4	Collections and allocations are disclosed; projects are traceable; oversight is credible; feedback produces corrective action.
Infrastructural development (ID)	ID1–ID4	Access improves; services become reliable; projects are completed; maintenance is sustained.

3.4 Model Specification

The structural model is specified as follows:

$$TC = \beta_0 + \beta_1 RQ + \beta_2 DA + \beta_3 TS + \beta_4 FE + \zeta_1 \quad (1)$$

$$RM = \alpha_0 + \alpha_1 TC + \alpha_2 DA + \zeta_2 \quad (2)$$

$$ID = \gamma_0 + \gamma_1 RM + \gamma_2 TR + \gamma_3 TC + \gamma_4 (RM \times TR) + \zeta_3 \quad (3)$$

In these equations, TC represents tax compliance; RQ, reform quality; DA, digital administration; TS, taxpayer support and education; FE, fair enforcement; RM, revenue mobilisation; TR, transparency and accountability; ID, infrastructural development; and ζ, the disturbance terms. The indirect effect of tax compliance on infrastructure is $\alpha_1\gamma_1$. The conditional effect of revenue mobilisation on infrastructure is $\gamma_1 + \gamma_4 TR$. A positive γ_4 therefore means that the relationship between mobilisation and infrastructure becomes stronger as transparency increases.

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For each reflective construct, the measurement model is expressed as $x_i = \lambda_i \eta + \varepsilon_i$, where x_i denotes an observed indicator, λ_i its loading, η the latent construct and ε_i measurement error. Indicator loadings are preferably above .708, although values between .40 and .70 may be retained when the item remains substantively important and the overall measures of reliability are satisfactory. Cronbach's alpha and composite reliability are used for internal consistency, average variance extracted for convergent validity, and the heterotrait–monotrait ratio together with the Fornell–Larcker criterion for discriminant validity (Hair et al., 2022).

3.5 Data Analysis Procedure

Analysis proceeds in two linked stages. The first evaluates the measurement model through indicator reliability, internal consistency, convergent validity and discriminant validity, with variance inflation factors used to inspect collinearity. The second evaluates the structural model using standardised path coefficients, bootstrap confidence intervals, coefficients of determination, predictive relevance and effect sizes. For the demonstration, inference is based on 2,000 bootstrap resamples and two-tailed tests. A substantive field analysis should increase this to at least 5,000 resamples and report the resulting confidence intervals explicitly.

Mediation is supported when the bootstrapped indirect-effect interval does not include zero. Moderation is assessed by mean-centring revenue mobilisation and transparency, creating the interaction term and estimating its contribution to infrastructure. Where the interaction is significant, simple slopes are examined at one standard deviation below and above the mean of transparency. Cross-validated Q^2 values provide evidence on predictive relevance, while a field application should also assess out-of-sample performance by comparing PLS prediction errors with a linear benchmark. Multi-group analysis can then be used to determine whether structural paths differ by firm size, region, tax type or respondent role.

4.0 Illustrative Results and Discussion

Every numerical result reported in this section comes from the synthetic demonstration dataset described in Section 3.2. The purpose is to illustrate the form of a complete SEM report using the proposed model. None of the coefficients, probabilities or descriptive statistics should be interpreted as empirical estimates for Nigerian taxpayers, revenue institutions or states.

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4.1 Respondent Profile

Table 4.1. Illustrative profile of synthetic cases (n = 438)

Characteristic	Category	Frequency	Percent
Primary role	Business owner/manager	213	48.6
	Accountant/tax practitioner	96	21.9
	Revenue/public-sector officer	63	14.4
	Public-finance/infrastructure professional	66	15.1
Organisation sector	Trade and general services	128	29.2
	Manufacturing	94	21.5
	Professional services	71	16.2
	Construction/real estate	62	14.2
	Transport/logistics	48	11.0
	Other	35	8.0
Tax-System Experience	Below 5 years	104	23.7
	5–10 years	157	35.8
	11–15 years	103	23.5
	Above 15 years	74	16.9

The synthetic profile was constructed to include several stakeholder perspectives rather than a single respondent type. Business owners and managers account for almost half of the cases, with the remainder drawn from tax practitioners, public officers and public-finance or infrastructure professionals. This composition is not intended to reproduce Nigeria's taxpayer population. In an actual field survey, formal businesses and professionals may be easier to reach than micro-enterprises or informal operators, so weighting may be required where the sampling frame permits. The final report should disclose the sampling frame, state distribution and response rate clearly enough for readers to assess the limits of external validity.

4.2 Descriptive Statistics

Table 4.2. Illustrative construct-level descriptive statistics

Construct	Mean	Std. deviation	Skewness	Kurtosis
Reform quality and clarity	3.433	.590	−.18	−.21
Digital tax administration	3.431	.630	−.11	−.17
Taxpayer support and education	3.457	.619	−.07	−.26
Fair and credible enforcement	3.443	.610	−.15	−.19
Transparency and accountability	3.441	.591	−.12	−.18
Tax compliance	3.459	.615	−.09	−.24
Revenue mobilisation	3.447	.600	−.10	−.20
Infrastructural development	3.460	.624	−.14	−.22

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Construct means fall between 3.431 and 3.460, a moderately favourable pattern created by the design of the demonstration data. Standard deviations are close to .60, providing adequate variation for illustrating the estimation procedure, while the reported skewness and kurtosis do not suggest severe univariate non-normality. Although PLS-SEM does not require multivariate normality, a real survey should still be screened for extreme cases, straight-lining, careless responding and unusual distributional patterns. These descriptive statistics are not evidence that the reforms have succeeded; they describe the synthetic respondents' central tendencies and would need to be interpreted alongside objective fiscal and infrastructure indicators in field research.

4.3 Measurement Model Assessment

Table 4.3. Reliability and convergent-validity results

Construct	Loading range	Cronbach's α	Composite reliability	AVE
RQ	.821–.877	.874	.914	.726
DA	.856–.900	.896	.928	.763
TS	.835–.875	.872	.913	.723
FE	.838–.875	.880	.918	.736
TR	.829–.872	.873	.914	.725
TC	.834–.890	.889	.924	.752
RM	.840–.880	.873	.913	.724
ID	.851–.893	.897	.929	.766

All illustrative indicator loadings are above .80. Cronbach's alpha ranges from .872 to .897 and composite reliability from .913 to .929, comfortably above the conventional .70 benchmark without reaching levels that would automatically signal item redundancy. Average variance extracted ranges from .723 to .766, so every construct explains substantially more than half of the variance in its indicators. On these criteria, the demonstration satisfies accepted requirements for internal consistency and convergent validity (Hair et al., 2022).

The Fornell–Larcker assessment also supports discriminant validity in the demonstration. For every construct, the square root of AVE is greater than its correlations with the remaining constructs. Tax compliance and revenue mobilisation show the largest association (.611), followed by revenue mobilisation and infrastructural development (.587). Both relationships are theoretically plausible and remain below the relevant diagonal values. A substantive field analysis should supplement this check with the heterotrait–monotrait ratio, using .85 as a conservative threshold and .90 where conceptually similar constructs justify the less restrictive criterion.

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Table 4.4. Illustrative Fornell–Larcker matrix

Construct	RQ	DA	TS	FE	TR	TC	RM	ID
RQ	.852							
DA	.263	.874						
TS	.323	.324	.850					
FE	.232	.249	.324	.858				
TR	.239	.271	.345	.249	.852			
TC	.397	.450	.433	.374	.348	.867		
RM	.304	.427	.328	.249	.211	.611	.851	
ID	.244	.313	.269	.231	.340	.486	.587	.875

Note: Diagonal values are square roots of AVE; off-diagonal values are inter-construct correlations.

4.4 Structural Model and Hypothesis Tests

Table 4.5. Illustrative structural paths and hypothesis decisions

Hyp.	Path	β	Boot SE	t	p	95% CI	Decision
H1	RQ → TC	.211	.039	5.42	< .001	.135, .290	Supported
H2	DA → TC	.279	.040	6.97	< .001	.202, .358	Supported
H3	TS → TC	.214	.043	4.98	< .001	.131, .299	Supported
H4	FE → TC	.187	.043	4.34	< .001	.109, .273	Supported
H5	TC → RM	.526	.042	12.52	< .001	.442, .604	Supported
—	DA → RM	.190	.037	5.14	< .001	.117, .261	Control path
H6	RM → ID	.453	.046	9.85	< .001	.362, .539	Supported
—	TR → ID	.196	.037	5.30	< .001	.124, .268	Direct effect
H7	TC → ID	.142	.048	2.95	.003	.049, .236	Supported
H9	RM × TR → ID	.152	.032	4.75	< .001	.085, .212	Supported

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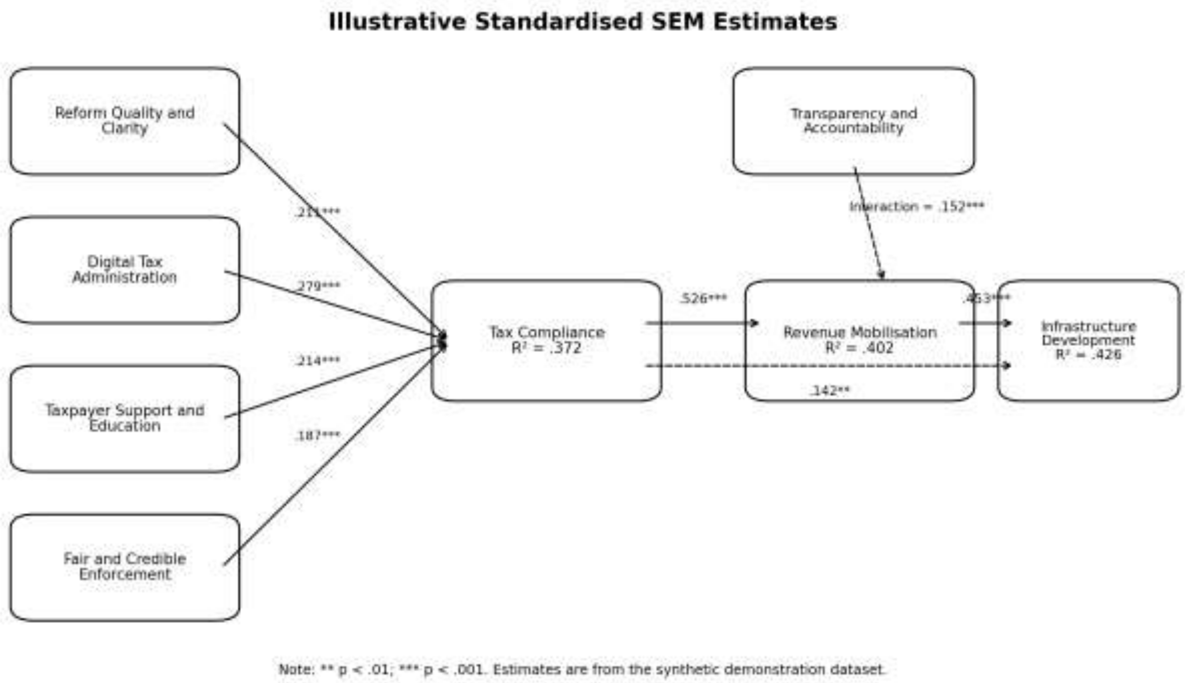

Figure 4.1. Illustrative structural model with standardised coefficients.

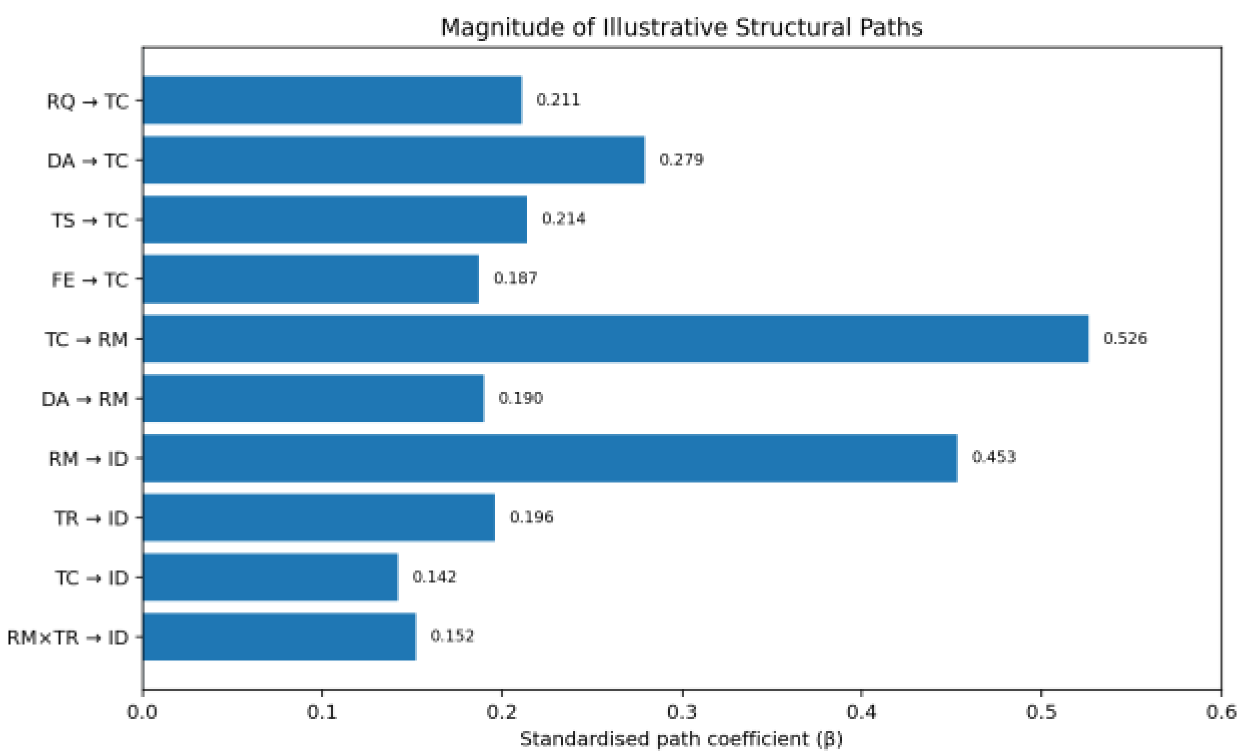

Figure 4.2. Comparative magnitude of the illustrative structural-path coefficients.

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The structural model accounts for 37.2% of the variance in tax compliance, 40.2% in revenue mobilisation and 42.6% in infrastructural development. Its cross-validated Q^2 values are .436 for compliance, .505 for revenue mobilisation and .391 for infrastructure, indicating positive predictive relevance within the synthetic dataset. Predictor variance inflation factors are below 2.0, so collinearity is not problematic in the demonstration. These statistics describe the performance of the constructed model only; they are not national estimates.

Among the four reform-related predictors of compliance, digital tax administration has the largest direct coefficient (β = .279). It is followed by taxpayer support and education (β = .214), reform quality (β = .211) and fair enforcement (β = .187). The ordering illustrates a practical point: the usability of the tax system may matter at least as much as the formal content of legal reform. Clear statutes implemented through unstable portals or fragmented payment procedures can leave the effective compliance burden largely unchanged, while digitalisation built on unclear rules can simply automate uncertainty. The coefficients therefore favour an integrated reform strategy rather than a sequence in which law, technology, support and enforcement are treated independently.

Tax compliance is the strongest structural predictor of revenue mobilisation in the model (β = .526). The relationship represents the fiscal consequence of broader registration, accurate declarations, timely filing and actual payment: each makes collections more adequate and predictable. Digital administration retains an additional direct path to mobilisation (β = .190), suggesting that technology can reduce leakage or improve collection efficiency apart from its influence on voluntary behaviour. When field data become available, that direct mechanism could be examined against administrative indicators such as the electronic-payment share, return-processing time and audit yield.

Revenue mobilisation has a positive relationship with infrastructural development (β = .453), while tax compliance retains a smaller direct coefficient (β = .142). The latter may capture legitimacy or earmarking perceptions that are not fully expressed through general revenue adequacy. Transparency also has a positive direct effect on infrastructure (β = .196). More importantly for the proposed theory, the positive interaction coefficient indicates that the revenue–infrastructure relationship becomes stronger at higher levels of transparency.

4.5 Mediation and Moderation Results

Table 4.6. Illustrative bootstrapped indirect effects

Indirect pathway	Effect	Boot SE	95% CI	Interpretation
TC → RM → ID	.237	.030	.181, .297	Significant partial mediation
RQ → TC → RM → ID	.050	.012	.029, .075	Significant serial indirect effect
DA → TC → RM → ID	.066	.013	.043, .093	Significant serial indirect effect
TS → TC → RM → ID	.051	.012	.029, .076	Significant serial indirect effect
FE → TC → RM → ID	.045	.012	.024, .070	Significant serial indirect effect

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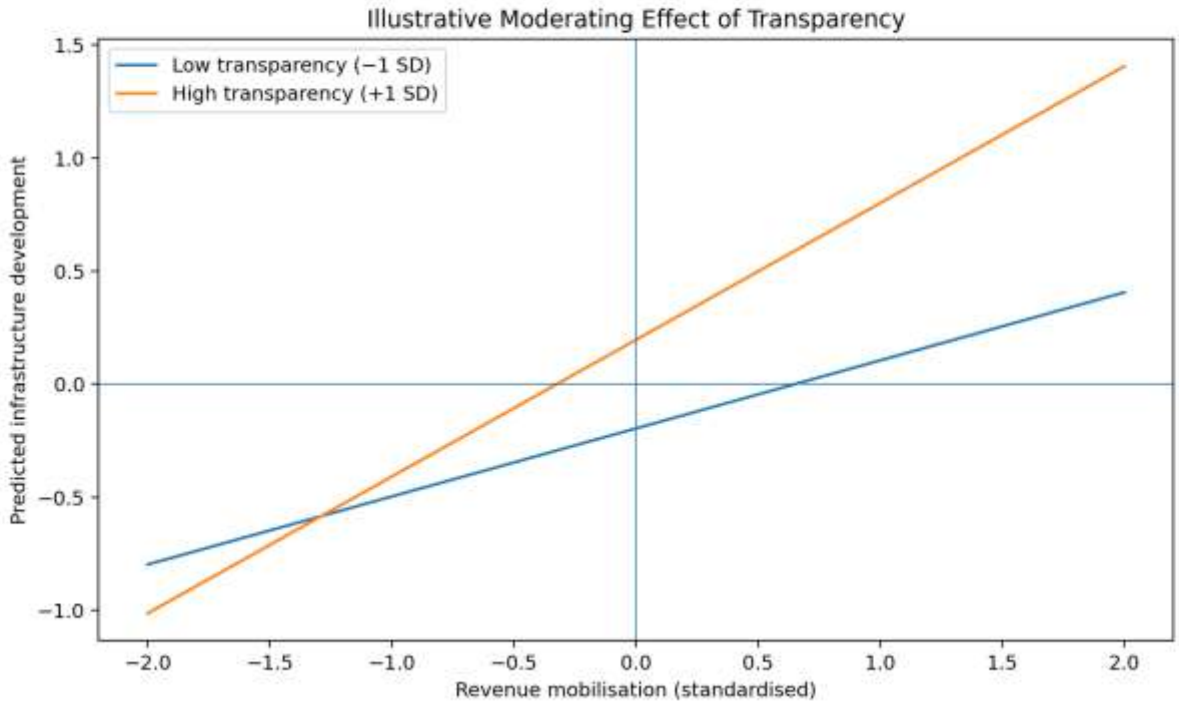

Figure 4.3. Illustrative simple slopes for the moderating role of transparency and accountability.

The indirect effect from compliance to infrastructure through revenue mobilisation is .237, with a bootstrap interval that excludes zero. Because the direct compliance–infrastructure relationship remains significant, the demonstration exhibits partial rather than full mediation. Each reform driver also produces a positive serial indirect effect through compliance and revenue mobilisation. This pattern changes the way reform performance should be interpreted. Legal or administrative quality cannot be judged only by immediate collection figures or isolated satisfaction measures; the developmental effect depends on whether reform first changes behaviour and then strengthens the fiscal capacity available for public investment.

The simple-slope pattern is similarly conditional. Predicted infrastructure increases more quickly with revenue mobilisation when transparency is one standard deviation above its mean, whereas the positive slope is weaker under low transparency. This should not be read as though disclosure directly constructs roads or power systems. The institutional argument is that open allocation, procurement and monitoring can reduce the losses that occur between increased fiscal capacity and completed public assets. A substantive field study should therefore combine perception measures with objective project-level evidence so that actual delivery can be distinguished from communication effects.

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4.6 Discussion of Findings

The positive illustrative path from reform quality to compliance is consistent with the proposition that understandable and predictable obligations reduce accidental non-compliance. Hassan et al. (2021) identified simplicity as an important influence on voluntary behaviour and showed that fairness mediated several institutional relationships. Nigeria's consolidation of tax provisions under the 2025 legislation could therefore reduce interpretive fragmentation, but only where administrative guidance is timely and consistent. In practice, reform quality will be judged by whether taxpayers and advisers can establish their liabilities without confronting conflicting circulars, duplicate registrations or uncertain transition rules.

Digital administration has the largest reform-related coefficient in the illustrative model. The implication is that digital reform should be evaluated through user outcomes rather than the number of services moved online. Registration success, filing completion, payment confirmation, correction of errors and platform uptime provide more informative measures of modernisation than a catalogue of digital modules.

Support and education also have a positive path in the demonstration, which is consistent with the OECD's (2021) treatment of sustained taxpayer learning as part of tax-culture development. The result differs from the insignificant support-service effect reported by Olaniyi et al. (2023), but the contrast is plausible because support varies greatly in quality. General seminars may do little to change behaviour, whereas sector-specific guidance, pre-filled information, multilingual assistance, enforceable service standards and rapid case resolution can reduce real compliance mistakes. Future field analysis should therefore distinguish the reach of taxpayer education from the quality of support services rather than assuming that both operate identically.

Fair enforcement makes a further positive contribution, in line with Nwokoye et al. (2023), whose study of industrial clusters identified audits and deterrent communication as compliance influences. The result is also compatible with the slippery-slope interpretation supported by Kogler et al. (2023), under which legitimate power and trust work together. For Nigeria, this means strengthening risk-based audit capacity without normalising discretionary harassment. Penalties need to be predictable, proportionate and reviewable. The Office of the Tax Ombud and the Tax Appeal Tribunal may improve perceptions of procedural fairness when they are accessible, independent and capable of providing timely remedies.

The strong compliance–mobilisation path gives the behavioural model a direct fiscal meaning. Tax bases produce usable fiscal space only after taxpayers are brought into the system, declarations are made accurately and liabilities are paid. This extends Vincent's (2021) multidimensional treatment of SME compliance by showing how the separate components contribute to aggregate revenue capacity: registration enlarges the known base, filing generates information, accurate declaration protects the assessment process, and payment converts liability into cash. A balanced compliance scorecard should therefore accompany gross collection figures. Relevant measures include active taxpayer growth, on-time filing, payment compliance, arrears recovery, audit yield, dispute age and the cost of collection.

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The positive revenue–infrastructure coefficient is broadly consistent with Oziegbe and Itua (2024), who found that VAT, customs duties and company income tax supported electricity production in both the short and long run. The present SEM framework extends that aggregate relationship by placing revenue within a behavioural sequence and by treating infrastructure as multidimensional rather than limiting it to electricity. Causal interpretation nevertheless remains difficult. Expanding infrastructure programmes can create pressure for higher taxes, better infrastructure can enlarge the tax base through productivity, and macroeconomic shocks can move both revenue and investment. For that reason, field evidence from stakeholder SEM should eventually be triangulated with time-series results and project-level indicators.

The moderating role of transparency is especially important because it shifts attention from revenue collection to revenue conversion. The positive interaction is consistent with the governance evidence of Nichelatti and Hiilamo (2024) and with the trust mechanism examined by Amani (2024). Higher revenue is an input, not a developmental outcome in itself. Tax reform acquires stronger developmental legitimacy when citizens can trace collections through approved budgets, procurement decisions, disbursements, physical implementation and final service outcomes. Transparent infrastructure reporting may also strengthen later compliance by making fiscal exchange visible, although that reciprocal relationship is not estimated in the present model.

The remaining direct path between compliance and infrastructure requires a cautious interpretation. It may indicate that taxpayers who view the fiscal system as legitimate also hold more favourable beliefs about collective development, rather than implying a separate physical channel from compliance to infrastructure. Such a common-attitude effect would create risks of common-method variance and reverse causality in field data. Objective indicators of road completion, electricity reliability, water access, school condition and health-facility functionality should therefore be matched to survey evidence at state or local-government level wherever feasible.

Viewed as a whole, the model argues against treating legal reform, technology, taxpayer service, enforcement and public expenditure as separate policy projects. Clear rules without usable services can still leave taxpayers uncertain; service without credible enforcement can reward strategic evasion; enforcement without fairness can weaken legitimacy; mobilisation without transparency can fail to produce development; and infrastructure spending that is poorly communicated may do little to strengthen fiscal trust. The relevant unit of policy is therefore the complete chain. That system-level interpretation is the principal contribution of the proposed SEM approach.

5.0 Conclusion and Policy Implications

5.1 Conclusion

This article develops an integrated structural equation model for examining how tax reforms may influence infrastructural development in Nigeria. The framework links four implementation dimensions (reform quality, digital administration, taxpayer support and fair enforcement) to tax compliance, connects compliance with revenue mobilisation, and then relates mobilisation to multidimensional infrastructure. Transparency and accountability are incorporated as a substantive moderating condition in the final relationship rather than treated as a peripheral governance consideration.

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The illustrative analysis shows how that architecture can be estimated and reported. In the synthetic dataset, all four reform drivers positively predict compliance; compliance strongly predicts mobilisation; mobilisation predicts infrastructure; and transparency strengthens the final relationship. These coefficients do not represent Nigerian taxpayers or institutions. Their purpose is methodological: they show the types of measurement, mediation and moderation evidence that a field study can test with authentic observations. Substantively, the model proposes that tax reform reaches development only when the chain remains intact, i.e. from understandable rules and workable administration, through credible compliance and efficient collection, to transparent allocation and competent delivery of public infrastructure.

5.2 Policy Recommendations

1. Translate legal reform into operational clarity. The Nigeria Revenue Service, state revenue services and the Joint Revenue Board should issue harmonised implementation manuals, sector guidance, transition calendars and searchable rulings. These materials should use clear language and follow a controlled updating process so that taxpayers are not forced to reconcile conflicting circulars.

2. Build one interoperable taxpayer journey. Registration, identification, filing, payment, withholding information, e-invoicing, correspondence and dispute tracking should exchange data securely across authorised institutions. Performance should be judged by uptime, completion rates, correction time and user cost rather than by the number of digital modules introduced.

3. Combine taxpayer service with risk-based enforcement. Revenue authorities should distinguish between taxpayers who are willing but confused and those presenting a high risk of deliberate non-compliance. Targeted assistance is appropriate for the former, while intensive enforcement should be concentrated on the latter. Audit selection, penalty calculation and collection action should remain documented, proportionate and open to effective review.

4. Publish an infrastructure-linked fiscal platforms. Government should disclose tax collections, statutory allocations, project budgets, procurement milestones, disbursements, geolocated physical progress, completion status and maintenance funding in reusable formats. The reporting system should allow citizens to follow the path from a revenue category to a service outcome without requiring specialist fiscal knowledge.

5. Protect taxpayer rights and make feedback consequential. Actions that identify constant administrative failures should serve as feed back into personnel training, guidance and system redesign.

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Appendix A. Questionnaire Items

Instruction: Please indicate your level of agreement with each statement using 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly agree.

Table A1. 32-item measurement instrument

Code	Statement	Response
RQ1	The reformed tax rules are understandable to taxpayers.	1 2 3 4 5
RQ2	Different provisions of the reform are internally consistent.	1 2 3 4 5
RQ3	Official transition guidance makes new obligations predictable.	1 2 3 4 5
RQ4	The reform reduces unnecessary complexity and duplication.	1 2 3 4 5
DA1	Online tax services are easy to access.	1 2 3 4 5
DA2	Digital tax platforms operate reliably when needed.	1 2 3 4 5
DA3	Tax registration, filing and payment systems exchange information effectively.	1 2 3 4 5
DA4	Digital processes reduce the time and cost of compliance.	1 2 3 4 5
TS1	Official tax guidance explains obligations clearly.	1 2 3 4 5
TS2	Taxpayer education reaches the groups that need it.	1 2 3 4 5
TS3	Help channels respond to questions within a reasonable time.	1 2 3 4 5
TS4	Published rulings and frequently asked questions resolve uncertainty.	1 2 3 4 5
FE1	Tax audits are based on credible risk indicators.	1 2 3 4 5
FE2	Penalties are proportionate to the nature of non-compliance.	1 2 3 4 5
FE3	Taxpayers in similar circumstances receive consistent treatment.	1 2 3 4 5
FE4	Appeals and complaints are handled through fair procedures.	1 2 3 4 5
TC1	Taxpayers register when legally required.	1 2 3 4 5
TC2	Tax returns are submitted by the due date.	1 2 3 4 5
TC3	Income and transactions are declared accurately.	1 2 3 4 5
TC4	Assessed liabilities are paid on time.	1 2 3 4 5
RM1	The reforms broaden the effective tax base.	1 2 3 4 5
RM2	Revenue leakages have reduced.	1 2 3 4 5
RM3	Tax collection has become more efficient.	1 2 3 4 5
RM4	Government tax revenue has become more stable and predictable.	1 2 3 4 5
TR1	Government discloses tax collections and their allocation clearly.	1 2 3 4 5
TR2	Citizens can trace infrastructure projects from budget to completion.	1 2 3 4 5
TR3	Independent oversight of tax-funded projects is credible.	1 2 3 4 5
TR4	Public feedback leads to corrective action when projects underperform.	1 2 3 4 5
ID1	Access to essential infrastructure is improving.	1 2 3 4 5
ID2	Infrastructure services are becoming more reliable.	1 2 3 4 5
ID3	Approved projects are completed within reasonable time and cost.	1 2 3 4 5
ID4	Existing infrastructure receives adequate maintenance.	1 2 3 4 5