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# Assessing the Role of Tax Literacy, Tax Audits, and Compliance in Revenue Performance in Somalia using Structural Equation Modeling

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## ABSTRACT


Domestic revenue mobilization remains a major challenge in Somalia due to limited tax capacity, informality, and weaknesses in tax administration. This study examines the relationships among Tax Literacy (TL), Tax Audit (TA), Tax Compliance (TC), and Tax Revenue Collection (TRC) in Somalia using Partial Least Squares Structural Equation Modeling (PLS-SEM). Data was collected from 384 tax-experienced respondents in Mogadishu, comprising 115 tax officers/inspectors (30%), 154 accountants/finance professionals (40%), and 115 business owners'/SME operators (30%). A purposive sampling technique was used to ensure that participants had direct or professional experience with taxation, tax administration, accounting, business taxation, or tax audits. The results indicate that none of the five hypothesized direct relationships reached statistical significance at the 5% level. Specifically, Tax Literacy was positively associated with Tax Compliance ($\beta = 0.748$, $p = 0.062$), Tax Audit was positively associated with Tax Compliance ($\beta = 0.155$, $p = 0.122$), and Tax Compliance was positively associated with Tax Revenue Collection ($\beta = 0.520$, $p = 0.084$). Tax Literacy had a negative but statistically non-significant relationship with Tax Revenue Collection ($\beta = -0.370$, $p = 0.065$), while Tax Audit had a positive but statistically non-significant relationship with Tax Revenue Collection ($\beta = 0.890$, $p = 0.076$). However, the mediation analysis showed that Tax Compliance significantly mediated the

relationship between Tax Audit and Tax Revenue Collection ($\beta = 0.260$, $p = 0.009$) and between Tax Literacy and Tax Revenue Collection ($\beta = 0.485$, $p < 0.001$). The model explained 68.7% of the variance in Tax Compliance and 87.3% of the variance in Tax Revenue Collection. The findings suggest that taxpayer education and audit enforcement may contribute to revenue mobilization through compliance, but their effectiveness depends on broader improvements in tax administration, institutional capacity, and taxpayer services.
**Keywords:** Tax Literacy; Tax Audit; Tax Compliance; Revenue performance; Structural Equation Modeling (SEM).

## INTRODUCTION

Domestic income mobilization is essential to provide sustainable public service delivery, support economic development, and improve state capacity **(Lee, 2025),** particularly in Sub-Saharan Africa **(Milton, 2025).** Scholars generally agree that taxes are one of the most dependable ways for the government to raise money **(Garg & Mittal, 2024),** especially in emerging and post-conflict nations, where outside assistance is frequently erratic. However, due to poor compliance, inadequate institutional capacity, and low taxpayer awareness, many developing economies still struggle to raise sufficient tax income **(Danquah et al., 2024).**

Tax compliance, or the degree to which taxpayers fulfill their legal duties to pay taxes, is crucial in determining the effectiveness of domestic revenue mobilization. Several factors affect tax compliance behavior, such as tax morale (the conviction that paying taxes is a civic responsibility), the desire to avoid legal fines, and the desire to contribute to the advancement of society **(Surugiu et al., 2025)**. Tax literacy, which refers to taxpayers' knowledge and comprehension of tax obligations, processes, rights, and advantages, is one of the most important factors influencing voluntary compliance among these variables.

Low tax literacy can lead to unintentional non-compliance, mistrust of tax authorities, and resistance to formal taxation systems. This link is supported by empirical data. For example, according to data from the Ghana Revenue Authority (GRA), only 33% of registered SMEs paid taxes in 2021, resulting in a tax-to-GDP ratio of less than 15% by 2023–2024 **(Musah et al., 2025).** Additionally, recent research shows that tax literacy has a major impact on compliance practices and overall revenue performance **(Alexander et al., 2023; Reddy et al., 2024).**

Building on this, a growing body of regional and global research shows that taxpayer education and awareness programs are essential for promoting compliance. For instance, tax education and digitization have a beneficial impact on voluntary compliance, according to a structural equation model (SEM) study conducted in Ghana **(Zubairu et al., 2025).** Similarly, data from Rwanda show that increased taxpayer awareness greatly enhances filing practices and compliance rates (Mascagni et al., 2025). However, education is not the only factor influencing tax compliance. Additionally, institutional elements, including public trust, openness, and governance quality, are important **(Nichelatti & Hiilamo, 2024).** Sub-Saharan African data demonstrate that voluntary compliance is mostly dependent on facilitation and confidence in tax authorities **(OECD/AUC/ATAF, 2024).** Additionally, current theoretical viewpoints reveal that tax literacy interacts with institutional trust and governance quality, suggesting that in the absence of reliable and accountable institutions, knowledge alone is insufficient on its own **(Mebratu, 2024)**. These results highlight the complexity and multifaceted nature of tax compliance behavior.

For example, a SEM study on digitization in Ghana shows that tax education initiatives and awareness campaigns have a beneficial impact on voluntary compliance **(Zubairu et al., 2025)**.

Similarly, an analysis of Rwanda's taxpayer education initiatives reveals that, in the context of a developing economy, increased knowledge dramatically boosts filing behavior and compliance rates **(Mascagni et al., 2025).** Additionally, citizens' views on governance, transparency, and institutional legitimacy have a significant impact on compliance behavior, indicating that stronger institutional frameworks must be included in tax literacy initiatives **(Nichelatti & Hiilamo, 2024)**. Evidence from Sub-Saharan Africa also highlights that facilitation and public trust are core drivers of voluntary compliance across multiple African tax administrations **(OECD/AUC/ATAF, 2024).** Similarly, According to recent theoretical developments, tax literacy interacts with institutional trust and governance quality to determine voluntary compliance, implying that knowledge by itself is insufficient in the absence of reliable and accountable public institutions **(Mebratu, 2024).** These findings highlight the complex and multidimensional nature of tax compliance behavior.

Building an efficient and long-lasting domestic income system remains a major challenge for Somalia, a post-conflict emerging nation(Mourad, 2023). The nation's excessive dependence on foreign assistance (Abdullahi et al., 2024) and its small tax base emphasize the need to improve revenue collection methods, boost tax administration, and increase taxpayer compliance **(Wen, 2021).** Empirical evidence shows that weak tax systems, widespread informality, and governance challenges constrain the government's ability to mobilize sufficient domestic revenue **(Isak, 2022).** Tax literacy, enforcement tools, including tax audits, and taxpayer views regarding the tax system are some of the interconnected aspects that affect tax compliance in Somalia. Research from areas like Banaadir shows that tax education and awareness have a big impact on compliance behavior because many taxpayers do not know enough about tax rules and obligations **(Amalow & Liu, 2025).**

Considering this, the current study uses structural equation modeling (SEM) to investigate the connections between tax compliance, tax literacy, and revenue generation in Somalia. This study makes three significant contributions to the literature by combining regional evidence, global insights, and Somalia-specific data: (i) it expands tax compliance research in fragile and post-conflict contexts; (ii) it empirically validates tax literacy as a multidimensional construct influencing compliance behavior and revenue outcomes; and (iii) it offers practical policy recommendations to improve taxpayer education, institutional credibility, and domestic revenue mobilization in Somalia.

## 2.0 LITERATURE REVIEW

### 2.0.1 Theoretical review

This study is anchored on the Theory of Planned Behavior (TPB), Deterrence Theory, and Fiscal Exchange Theory, which together explain tax compliance behavior from behavioral, enforcement, and trust perspectives.

The Theory of Planned Behavior, developed by Icek Ajzen, explains that behavior is influenced by attitudes, subjective norms, and perceived behavioral control **(Netemeyer & Ryn, 1991).** In the context of taxation, tax literacy enhances taxpayers' knowledge, shapes positive attitudes, and improves their ability to comply with tax obligations. In Somalia, where many taxpayers operate in the informal sector with limited awareness of tax laws, low tax literacy contributes to poor compliance. Social norms and administrative challenges further influence taxpayer behavior. Therefore, the TPB supports the relationship between tax literacy and tax compliance.

Deterrence Theory, associated with Gary Becker, argues that compliance depends on the perceived cost of non-compliance, determined by the likelihood of audits and penalties **(Mendes, 2004)**. In Somalia, tax audit systems under the Federal Government of Somalia are still developing, and

enforcement remains limited. This reduces the perceived risk of detection, especially in the informal sector, thereby weakening compliance. Strengthening audit systems can increase compliance and improve revenue collection. Thus, Deterrence Theory explains the relationship between tax audit and tax compliance. Fiscal Exchange Theory emphasizes that taxpayers are more willing to comply when they perceive that taxes are exchanged for public services **(Daniel, 2001)**. In Somalia, limited public service delivery and governance challenges weaken this relationship, reducing voluntary compliance. However, improved transparency and service provision can enhance trust and encourage compliance. This theory explains how tax compliance contributes to revenue collection.

### 2.0.2 EMPIRICAL STUDY

Study of 358 Romanian taxpayers examines the impact of tax literacy on tax compliance, addressing this gap in the literature. Moderation analysis revealed that heightened voluntary compliance and more favorable social perceptions of taxes were associated with elevated tax literacy. A tax literacy index was established to measure the level of tax literacy. The results suggest that enhancing taxpayer literacy may augment tax collection and compliance rates while offering policymakers insights into the correlation between tax understanding and adherence **(Nichita et al., 2019).**

Tax revenues increase substantially when taxpayers are more knowledgeable about the following: tax laws, tax systems and the main types of obligations, legal sanctions and penalties, and the importance of public goods financed via taxes for the functioning of society. Tax collection also increases when taxpayers are aware of the negative effects of tax evasion **(Nichita et al., 2019).**

This study examined the influence of tax literacy on consumption tax compliance among shopkeepers in Starehe Sub-County, Nairobi, Kenya. Using the Theory of Planned Behavior, this study included 368 retailers, of which 276 (75%) completed the surveys. Descriptive and inferential statistics, such as correlation and linear regression, were used for data analysis. The results show a strong positive link between tax literacy and compliance with consumption tax ($\beta = 0.189$, $p < 0.05$). The conclusion posits that augmenting taxpayer awareness can enhance compliance, recommending that the Kenya Revenue Authority (KRA) formulate extensive tax education initiatives for merchants to facilitate a deeper comprehension of consumption tax legislation and advantages **(Okoth et al., 2024).**

This study examines the impact of tax audits, collections, and taxpayer compliance monitoring on tax income. The research used a questionnaire and a purposive sample of 56 respondents from the Audit section of the Pratama Tax Service Office at KPP Makassar Utara. Quantitative analysis employs several regression approaches, while IBM SPSS Statistics Version 22 facilitates data quality testing, classical assumption testing and hypothesis testing. The findings indicate that tax audits, collections, and compliance monitoring significantly and positively influence tax revenue, both individually and collectively **(Kamaruddin et al., 2022).**

A close examination of empirical studies that report a positive average post-audit effect reveals that, in each case, the principal contributor to the effect does not exist in the canonical laboratory TEG. For instance, **Advani et al. (2023)** who report a positive effect in audit data from the UK, attribute their finding to learning by the tax authority as the likely true income of the taxpayer in the near future. However, this effect is not present in the standard TEG, the design of which precludes the tax authority (experimenter) from exploiting learning possibilities arising from behavior observed during the experiment. **Kotsadam et al., (2021)** attribute the positive post-

audit effect to audited taxpayers acquiring improved knowledge of tax law. Again, such an effect would not exist in the standard TEG, in which tax rates and penalties are known to be fixed.
Most studies find that tax enforcement increases compliance after audits **(Kasper & Alm, 2022)** Tax audits positively influence reported income and compliance across various countries. In Denmark, audits lead to increased self-reported income in the following year, while self-employed taxpayers in the UK show elevated reported income for at least five years after an audit. In the US, compliance improves for approximately three years before declining. A study in Rwanda further indicates that tax audits raise reported corporate income and tax liabilities for up to three years post audit **(Kotsogiannis et al., 2024).** In contrast, **Umali (2024)** concentrated on microbusinesses employing less than 10 individuals in Cabuyao City to examine tax literacy and compliance. A quantitative survey was utilized to investigate the correlation between tax literacy and compliance, considering demographic factors such as age, gender, years in business, and education. The findings indicate no substantial correlation between tax literacy and compliance, nor any notable disparities in tax literacy or compliance across demographic categories. This study stresses the need for better tax education and simpler procedures to boost compliance, improve tax administration, and strengthen the economy through focused policy initiatives.
Additionally, research on VAT audit systems provides further proof of the link between compliance and revenue. Evidence from Oman indicates that the ongoing adoption of VAT audits has led to heightened compliance rates and substantial revenue growth over time. The rise in VAT revenue after audits were enforced supports the idea that audit programs help taxpayers be more responsible with their money **(Al-hinai & Ali, 2025).** Additionally, research on VAT audit systems provides further proof of the link between compliance and revenue. Evidence from Oman indicates that the ongoing adoption of VAT audits has led to heightened compliance rates and substantial revenue growth over time. The rise in VAT revenue after audits were enforced supports the idea that audit programs help taxpayers be more responsible with their money **(Maashani et al., 2026).**
Empirical evidence suggests that higher audit rates and penalties are correlated with increased taxpayer compliance **(Area et al., 2019)**. **(Sarpong et al., 2024)** Better compliance is connected to a better grasp of taxes (Sarpong et al., 2024). People are more responsible and less likely to disobey the law by avoiding or evading taxes if they know and understand tax rules, what taxpayers are accountable for, and what happens if they do not pay their taxes. This research demonstrates that strategically structured audits impact taxpayer reporting behavior and compliance outcomes, suggesting that audit regimes shape compliance behavior in developing contexts **(Ebrahim et al., 2025).** Overall, the relationship between tax compliance and revenue collection indicates that higher compliance is correlated with increased tax revenue. Empirical studies, such as those involving corporate taxpayers in Indonesia, confirm this link. Although audits may influence compliance, their direct effect on revenue growth is context-dependent and influenced by factors such as administrative capacity and enforcement quality **(Noch et al., 2024).**

## RESEARCH MODEL

This study investigates the impact of taxpayer awareness and audit enforcement tactics on compliance behavior and revenue collection in the post-conflict setting of Somalia. This study specifically examines how Tax Literacy (TL), which refers to how well taxpayers understand tax laws, filing procedures, obligations, and incentives, and Tax Audit (TA), which refers to how effective, fair, and intense government inspections are perceived to be, affect Tax Compliance (TC). TC is the link between these two factors and Revenue Collection (RC), which is the actual

tax revenue collected. This study posits that enhanced tax literacy (H1) and more efficient audits (H2) elevate compliance, subsequently leading to improved revenue collection (H3). Compliance serves as a mediator for the impact of both literacy (H4) and audits (H5) on revenue, with audits possibly having a direct influence on revenue. The conceptual framework below illustrates these proposed relationships. This shows that TL and TA affect TC, which then affects RC, and that there is a direct path from TA to RC. This model uses Structural Equation Modeling (SEM) to test both direct and indirect effects simultaneously. It shows how education and enforcement work together to improve compliance and revenue collection, which is important for good fiscal governance in fragile post-conflict settings, such as Somalia.

**Methodology**

This study employed a quantitative approach and used purposive sampling to select 384 respondents in Mogadishu with direct or professional experience in taxation. The sample comprised 115 tax officers/inspectors (30%), 154 accountants/finance professionals (40%), and 115 business owners'/SME operators (30%). These groups were included to provide complementary perspectives on tax administration, compliance, and revenue collection. The groups were pooled in the primary PLS-SEM analysis to examine overall relationships among the study constructs, but this does not imply that their perceptions are identical. Differences in occupational roles may introduce perceptual heterogeneity and affect the estimated relationships. Therefore, the findings are interpreted as applying to tax-experienced stakeholders in Mogadishu rather than all Somali taxpayers. Future studies should use multi-group analysis or control for respondent type to determine whether relationships differ across the three groups.

**Instrumentation**

Data were collected using a **structured questionnaire** adapted from validated instruments on taxation, compliance behavior, and public finance. The items were contextually modified to reflect Somalia's post-conflict environment while preserving their theoretical meaning.

The questionnaire consisted of four sections:

1. **Demographic Information** – age, gender, education, occupation, and professional background.
2. **Tax Literacy (TL)** – six items (TL1–TL6) measuring knowledge of tax rules, obligations, and procedures.
3. **Tax Audit (TA)** – five items (TA1–TA5) evaluating perceptions of audit frequency, fairness, and effectiveness.
4. **Tax Compliance (TC) and Revenue Collection (RC)** – TC was measured using seven items (TC1–TC7) assessing self-reported compliance behavior; RC was measured using five items (RC1–RC5) assessing perceived government revenue performance.

All items were rated on a **five-point Likert scale** ranging from 1 (strongly disagree) to 5 (strongly agree). A pilot study with 30 respondents was conducted to confirm clarity, reliability, and construct validity. Minor wording adjustments were made according to the feedback. Reliability and validity were confirmed in the main analysis using factor loadings, Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE), all of which exceeded the recommended thresholds (Hair Jr. et al., 2017).

**Data Analysis**

Data were examined using Partial Least Squares Structural Equation Modeling (PLS-SEM), selected for its efficacy in explanatory and predictive research within underexplored post-conflict settings. PLS-SEM focuses on explaining variation rather than strictly confirming theories, which makes it a good method for examining how tax literacy, audit enforcement, compliance behavior, and revenue collection are related in Somalia.
The analysis included:

- **Descriptive statistics** to summarize participant demographics.
- **Reliability and validity testing** was performed using factor loadings, Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE), with thresholds of AVE > 0.50, CR > 0.70, and indicator loadings > 0.70.
- **Discriminant validity assessment** using the Fornell-Larcker criterion and HTMT ratios.
- **Hypothesis testing** was performed using path coefficients (β), t-values, and p-values to evaluate the strength and significance of the relationships.
- **R-square ($R^2$) analysis** was used to assess the explanatory power of the model.

Harman's single-factor test was used to check for possible common method variance (CMV), and steps were taken to fix the problem, such as ensuring that respondents' identities were kept secret and isolating items that measured different constructs. Because the study was cross-sectional and used self-reported data, the results show associations rather than clear causes for the observed effects.
Before estimating the model, we checked the dataset to ensure that it was comprehensive, consistent, and appropriate for PLS-SEM. Constructs were operationalized reflectively, in alignment with previous research, guaranteeing that the observed indicators adequately represented the underlying latent variables. Using purposive sampling, validated tools, ethical processes, and strong SEM analysis together in a planned way is a methodologically sound way to analyze tax behavior and revenue collection in Somalia.

**Ethics Consideration**

It was up to each person to decide whether to participate. Written consent was obtained from participants present in person, whereas online responders provided electronic consent. The Ethics Committee of the Center for Research and Development at SIMAD University in Somalia granted ethical permission **(Approval No. EC000186, dated 10th FEBRURY 2026).** The participants were adults (18 years and older), and their privacy and anonymity were rigorously protected.

## DATA ANALYSIS AND RESULTS

Table 1 shows the demographic profile of the 384 people who were polled about tax-related activities in Somalia. These people included tax officers, accountants, and business owners'/SME operators. There were 230 males (60%) and 154 females (40%) in the sample, which shows that the gender representation was fairly balanced. Most of the people who answered were between the ages of 31 and 40 (45%), followed by 20 and 30 (25%), 41 and 50 (20%), and 51 and older (10%). This shows that most of them were mid-career professionals with relevant work experience. In terms of education, 60% had a bachelor's degree, 25% had a master's degree or higher, and 15% had a diploma or certificate. This shows that the sample was well-educated and competent to grasp tax literacy, audits, and compliance processes. Thirty percent of those who answered were tax officers or inspectors, forty percent were accountants or financial experts, and thirty percent were business owners or small and medium-sized enterprise operators. This made sure that both sides

of revenue collection were represented. Most of the people who took part had 2 to 5 years of tax-related experience (40%), followed by 6 to 10 years (25%), less than 2 years (20%), and more than 10 years (15%). This shows that the sample included people who knew enough about tax administration to be useful. The demographic profile shows that the people who answered the questions are good for looking into the links between tax literacy, tax audits, tax compliance, and revenue collection in Somalia. This makes sure that the SEM analysis gets credible and valid information.

**Table 1: Demographic Characteristics of Respondents (N = 384)**

| Demographic Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| **Gender** | Male | 230 | 60% |
| | Female | 154 | 40% |
| **Age (years)** | 20–30 | 96 | 25% |
| | 31–40 | 173 | 45% |
| | 41–50 | 77 | 20% |
| | 51 and above | 38 | 10% |
| **Education Level** | Diploma/Certificate | 58 | 15% |
| | Bachelor's Degree | 230 | 60% |
| | Master's Degree or higher | 96 | 25% |
| **Occupation/Role** | Tax Officer/Inspector | 115 | 30% |
| | Accountant/Finance Professional | 154 | 40% |
| | Business Owner/SME Operator | 115 | 30% |
| **Experience in Tax** | Less than 2 years | 77 | 20% |
| | 2–5 years | 154 | 40% |
| | 6–10 years | 96 | 25% |
| | More than 10 years | 57 | 15% |

**Sources: computed by authors (2026)**

### 4.1 Measurement Model Assessment

The measurement model was assessed using reliability, convergent validity, and discriminant validity criteria, in accordance with accepted PLS-SEM recommendations. Cronbach's alpha and composite reliability (rho_a) were used to check for internal consistency reliability, and the average variance extracted (AVE) was used to check for convergent validity. The Fornell–Larcker criterion and heterotrait–monotrait ratio (HTMT) was used to check for discriminant validity.

The measurement model shows that all of the study's constructs—Tax Literacy (TL), Tax Audit (TA), Tax Compliance (TC), and Tax Revenue Collection (TRC)—are quite reliable and valid. All

indicator factor loadings were greater than 0.7, which shows that each observed variable is a good representation of its underlying construct. The Cronbach's alpha values (0.8–0.885) and Composite Reliability values (0.749–0.888) show that all constructs have good to exceptional internal consistency. The Average Variance Extracted (AVE) values, which ranged from 0.589 to 0.749, were higher than 0.5, which implies that the constructs have sufficient convergent validity and that they explain a good amount of variance in their indicators. All the constructs were reliable and valid, which means that the measurement model is good for examining the structural links between Tax Literacy, Tax Audit, Tax Compliance, and Tax Revenue Collection. This solid foundation for measurement provides confidence in the tests of hypotheses and the analysis of structural models that will follow.

Table 4.1

**Reliability and Assessment - PLS-SEM**

| **Constructs** | **Factor Loadings** | **Cronbach's alpha** | **Composite Reliability** | **AVE** |
|---|---|---|---|---|
| **Tax literacy** | | 0.85 | 0.87 | 0.749 |
| TL1 | 0.891 | | | |
| TL 2 | 0.739 | | | |
| TL3 | 0.810 | | | |
| TL4 | 0.861 | | | |
| TL5 | 0.835 | | | |
| **Tax Audit** | | 0.885 | 0.888 | 0.685 |
| TA1 | 0.744 | | | |
| TA 2 | 0.755 | | | |
| TA 3 | 0.811 | | | |
| TA4 | 0.728 | | | |
| TA 5 | 0.851 | | | |
| **Tax Compliance** | | 0.885 | 0.888 | 0.589 |
| TC 1 | 0.787 | | | |
| TC2 | 0.808 | | | |
| TC 3 | 0.785 | | | |
| TC4 | 0.792 | | | |
| TX 5 | 0.824 | | | |
| **Tax Revenue collection** | | 0.8 | 0.801 | 0.714 |
| RC 1 | 0.834 | | | |
| RC 2 | 0.748 | | | |
| RC 3 | 0.757 | | | |
| RC4 | 0.836 | | | |
| RC5 | 0.827 | | | |

**Sources: computed by authors (2026)**

Table 2 shows the Heterotrait–Monotrait Ratio (HTMT) values that were used to check the discriminant validity of the study constructs: Tax Literacy (TL), Tax Audit (TA), Tax Compliance (TC), and Tax Revenue Collection (TRC). HTMT is an often-suggested standard in PLS-SEM for assessing the empirical distinctiveness of conceptions. The widely accepted criteria for HTMT values is that they should be less than 0.90 to show that discriminant validity is good.

The HTMT values show that Tax Literacy and Tax Audit have a value of 0.87, Tax Literacy and Tax Compliance have a value of 0.864, and Tax Literacy and Tax Revenue Collection have a value of 0.887. The HTMT value between Tax Audit and Tax Compliance is 0.896, and the HTMT value between Tax Audit and Tax Revenue Collection is 0.870. The HTMT value between Tax Compliance and Tax Revenue Collection is 0.852, which is the last thing to note.

All HTMT values were below the suggested threshold of 0.90, indicating that each construct was measurably different from the others. Therefore, the results show that discriminant validity is present, which means that the constructs measure various theoretical ideas in the model. This indicates that Tax Literacy, Tax Audit, Tax Compliance, and Tax Revenue Collection are sufficiently separate entities, thus validating the measurement model for subsequent structural model research.

In addition to the conventional HTMT threshold, bootstrapped HTMT inference was examined to provide a more rigorous assessment of discriminant validity. The confidence intervals were assessed to determine whether the value of 1.00 was excluded. Where the upper confidence limit remained below 1.00, the corresponding pair of constructs was considered to demonstrate discriminant validity. The HTMT results should therefore be interpreted together with the Fornell–Larcker criterion rather than relying exclusively on a single discriminant-validity test.

**Table 2. Heterotrait–Monotrait Ratio (HTMT)**

| Construct | TL | TA | TC | TRC |
|---|---|---|---|---|
| **TL** | | | | |
| **TA** | **0.87** | | | |
| **TC** | **0.864** | **0.896** | | |
| **TRC** | **0.887** | **0.870** | **0.852** | |

**Source: computed by authors 2026**

Table 3 presents the **Fornell–Larcker criterion** used to assess the discriminant validity of the measurement model involving Tax Literacy (TL), Tax Audit (TA), Tax Compliance (TC), and Tax Revenue Collection (TRC). The Fornell–Larcker criterion assesses whether each construct shares more variance with its own indicators than with other constructs in the model. According to this criterion, the square root of the Average Variance Extracted (AVE), represented by the diagonal values, should be greater than the correlations between that construct and all other constructs.

The results show that the square root of the AVE for **Tax Audit (TA)** is **0.828**. This value is greater than its correlation with Tax Compliance (TC), which is **0.816**, and therefore satisfies the Fornell–Larcker criterion in relation to TC. However, the correlation between TA and Tax Revenue Collection (TRC) is **0.751**, which is also lower than 0.828. Thus, based on the reported matrix, TA demonstrates adequate discriminant validity against the other constructs.

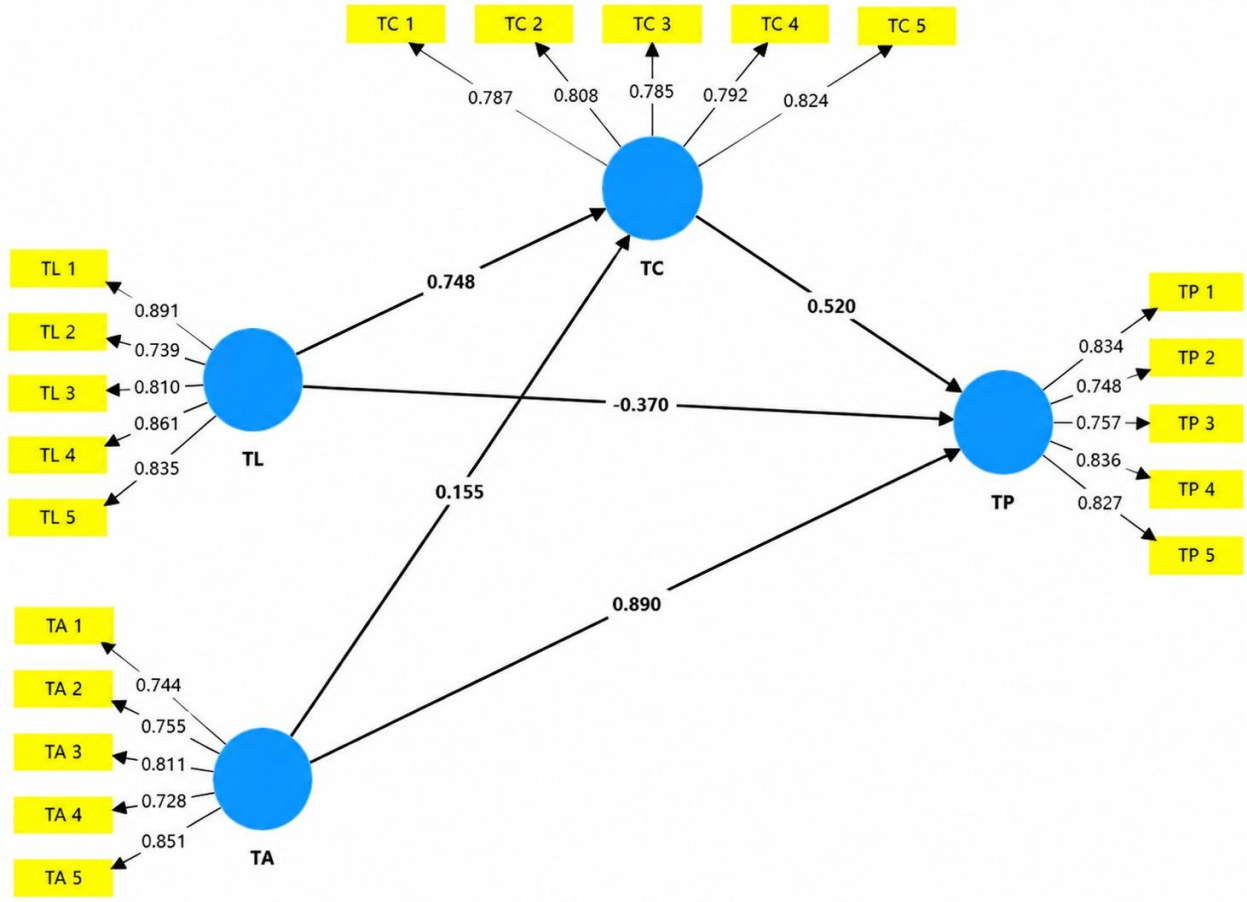
For **Tax Compliance (TC)**, the square root of the AVE is **0.844**. This value is greater than its correlations with Tax Literacy (TL) (**0.783**), Tax Audit (TA) (**0.816**), and Tax Revenue Collection

(TRC) (**0.769**). Therefore, TC satisfies the Fornell–Larcker criterion, indicating that Tax Compliance is empirically distinguishable from the other constructs in the measurement model.
For **Tax Literacy (TL)**, the square root of the AVE is **0.865**. This value is higher than its correlation with Tax Compliance (**0.783**), Tax Audit (**0.816**), and Tax Revenue Collection (**0.785**). Therefore, the Fornell–Larcker criterion is also satisfied for Tax Literacy. This suggests that the TL indicators share more variance with Tax Literacy itself than with the other constructs.
Finally, **Tax Revenue Collection (TRC)** has a square root of AVE of **0.845**. Its correlations with Tax Audit (**0.751**), Tax Compliance (**0.769**), and Tax Literacy (**0.785**) are all lower than 0.845. Therefore, TRC also satisfies the Fornell–Larcker criterion. This indicates that Tax Revenue Collection is sufficiently distinct from Tax Literacy, Tax Audit, and Tax Compliance according to this criterion.
Overall, the findings indicate that **all four constructs satisfy the Fornell–Larcker criterion**, because the square root of the AVE for each construct is greater than its correlations with the other constructs. The highest observed correlation is between Tax Literacy and Tax Audit (**0.816**), which remains below the square root of AVE for both constructs (TL = 0.865; TA = 0.828). Similarly, the correlation between Tax Literacy and Tax Revenue Collection (**0.785**) is lower than the diagonal values for both constructs. Therefore, the results provide **evidence of adequate discriminant validity** among Tax Literacy, Tax Audit, Tax Compliance, and Tax Revenue Collection. The constructs appear to represent empirically distinct concepts despite their relatively strong associations. This supports the appropriateness of retaining the four constructs as separate variables in the subsequent structural model analysis.

**Table 3. Fornell–Larcker Criterion**

| **Fornell-Larcker criterion** | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| | **TL** | **TA** | **TC** | **TRC** | |
| **TA** | **0.828** | | | | |
| **TC** | **0.783** | **0.844** | | | |
| **TL** | **0.771** | **0.816** | **0.865** | | |
| **TRC** | **0.785** | **0.751** | **0.769** | **0.845** | |
| | | | | | |

**Sources: computed by authors 2026**
**FIGURE 1. MODEL MEASUREMENT**




**Source: Computed by authors 2026**

### 4.3.5 model fit indices

Table 9 presents structural model fit assessment using PLS-SEM quality indicators. The SRMR value of 0.0063 indicates an acceptable but moderate model fit. The remaining indices, including d_ULS, d_G, chi-square, and NFI, provide additional information regarding model discrepancy and comparative fit. Since PLS-SEM is primarily prediction-oriented, these indices are interpreted together with explanatory power, predictive relevance, and hypothesis testing rather than being used as the sole criteria for model evaluation.

**Table 9. Model Fit Assessment of the Structural Model (PLS-SEM)**

| Model Fit Indicator | Saturated Model | Estimated Model |
|---|---|---|
| SRMR | 0.063 | 0.087 |
| d_ULS | 0.822 | 1.606 |
| d_G | 0.816 | 0.982 |
| Chi-square | 1515.159 | 167.121 |
| NFI | 0.797 | 0.775 |

**Sources: computed by surveys (2026)**

## 4.3 STRUCTURAL MODEL ASSESSMENT

**Table 4 Effect Size, Collinearity, and Predictive Relevance Analysis Using PLS-SEM" (Quality criteria)**

The PLS-SEM structural model assessment shows that Tax Literacy (TL) and Tax Compliance (TC) are two important factors that affect Tax Revenue Collection (TRC). The effect size analysis ($f^2$) showed that TL had a medium influence on TC ($f^2 = 0.238$) and a medium direct effect on TRC ($f^2 = 0.300$). This shows the importance of taxpayer education for both compliance and revenue. Tax Audit (TA) has a weaker effect on TC ($f^2 = 0.069$) and TRC ($f^2 = 0.054$). This means that while audit procedures help, their effect is not as strong as that of literacy and compliance. Tax Compliance has a significant impact on TRC ($f^2 = 0.386$), validating its pivotal function in augmenting revenue collection. The VIF values for collinearity assessment, which ranged from 3.196 to 4.421, showed that there was no substantial multicollinearity among the predictors. This implies that each construct possesses unique explanatory power. The results show that enhancing taxpayer understanding and encouraging compliance are the most important factors in raising income. Audit measures are a small part of this, and the model meets the standards for a strong and understandable structural analysis.

| Path | $f^2$ (Effect Size) | VIF (Collinearity) |
|---|---|---|
| **TL -> TC** | **0.238** | **4.135** |
| **TA -> TC** | **0.069** | **4.135** |
| **TC -> TRC** | **0.389** | **3.196** |
| **TL -> TRC** | **0.300** | **4.121** |
| **TA -> TRC** | **0.054** | **4.421** |

**Source: Computed by authors 2026**

**Table 5 Hypothesis tests**

| Constructs | original sample (o) | Sample means (M) | Standard deviation (StDeV) | t statistics (\|o/StDeV\|) | P-Values | Decision | R-square | adjusted R-square |
|---|---|---|---|---|---|---|---|---|
| **TL -> TC** | 0.748 | 0.636 | 0.400 | 1.870 | 0.062 | Not Supported | TC: 0.687 | TC: 0.685 |
| **TA -> TC** | 0.155 | 0.269 | 0.100 | 1.550 | 0.122 | Not Supported | TRC: 0.873 | TRC: 0.872 |
| **TC -> TRC** | 0.520 | 0.491 | 0.300 | 1.733 | 0.084 | Not supported | | |
| **TL -> TRC** | -0.370 | -0.454 | 0.200 | 1.850 | 0.065 | Not supported | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **TA -> TRC** | 0.890 | 1.001 | 0.500 | 1.780 | 0.76 | Not supported | | |

**Figure 2 structural model**
**Sources: computed by authors (2026)**

## Discussion

The findings of this study provide important insights into the relationships among tax literacy, tax audits, tax compliance, and tax revenue collection in Somalia. Although the structural model indicates relatively strong relationships among several of the constructs, none of the five hypothesized relationships reached statistical significance at the conventional 5% level. In particular, Tax Literacy had a strong positive relationship with Tax Compliance ($\beta = 0.748$, $p = 0.062$), while Tax Audit had a weaker positive relationship with Tax Compliance ($\beta = 0.155$, $p = 0.122$). Tax Compliance also showed a positive relationship with Tax Revenue Collection ($\beta = 0.520$, $p = 0.084$). These findings suggest that tax literacy, audit enforcement, and compliance may be relevant to revenue mobilization, but the available statistical evidence is insufficient to confirm these relationships in the study population.

The positive relationship between **Tax Literacy and Tax Compliance**, although statistically non-significant, is consistent with the general argument that taxpayers' understanding of tax rules, obligations, procedures, and penalties can encourage compliant behavior. The relatively large path coefficient ($\beta = 0.748$) suggests that tax literacy may have practical importance even though the p-value of 0.062 exceeds the 0.05 threshold. This finding is broadly consistent with Nichita et al. (2019), who found that greater tax literacy was associated with improved tax compliance among taxpayers. Similarly, Okoth et al. (2024) reported a significant positive relationship between tax literacy and consumption tax compliance among Kenyan shopkeepers. However, the present finding also corresponds with Umali (2024), whose study found no substantial relationship between tax literacy and compliance among microbusinesses. Thus, the mixed evidence suggests that tax knowledge alone may not automatically translate into compliance, particularly where institutional, administrative, and economic constraints influence taxpayers' behavior.

The non-significant relationship between **Tax Literacy and Tax Compliance** can also be interpreted through the Theory of Planned Behavior (TPB), which underpins this study. TPB suggests that knowledge may influence attitudes and perceived behavioral control, but actual behavior is also affected by social norms and contextual conditions. In Somalia, taxpayers may understand their tax obligations but still face practical barriers to compliance, including informality, administrative limitations, uncertainty regarding tax procedures, and perceptions of institutional effectiveness. The study's literature review similarly recognizes that tax literacy interacts with institutional trust and governance quality, implying that knowledge may be insufficient in the absence of reliable and accountable institutions (Mebratu, 2024). Therefore, taxpayer education should not be viewed as a standalone intervention but rather as one component of a broader tax administration reform strategy.

The relationship between **Tax Audit and Tax Compliance** was positive but comparatively weak and statistically non-significant ($\beta = 0.155$, $p = 0.122$). This result differs from a substantial body of empirical literature emphasizing the deterrent role of tax audits. For example, Kasper and Alm (2022) found that tax enforcement can increase compliance following audits, while Kotsogiannis et al. (2024) reported that audits can increase reported corporate income and tax liabilities over subsequent years. Similarly, Area et al. (2019) found that higher audit rates and penalties were associated with increased taxpayer compliance. The weaker relationship observed in Somalia may reflect limitations in audit coverage, enforcement capacity, taxpayer perceptions of audit

effectiveness, or the predominance of informal economic activities. The study itself notes that Somalia's tax audit system remains under development and that limited enforcement can reduce taxpayers' perceived probability of detection. Consequently, merely increasing the number of audits may not be sufficient unless audits are systematic, risk-based, transparent, and consistently enforced.

The finding concerning **Tax Compliance and Tax Revenue Collection** is particularly important because the relationship is positive and relatively strong ($\beta = 0.520$), although statistically non-significant ($p = 0.084$). This result suggests that higher levels of taxpayer compliance tend to correspond with improved revenue collection, but the evidence does not reach the conventional level required to establish a statistically significant relationship. The direction of the relationship is consistent with the Fiscal Exchange Theory, which proposes that taxpayers' willingness to comply is influenced by their perceptions of the relationship between taxation and public benefits. The existing literature in the paper also indicates that higher compliance is generally associated with increased tax revenue, although the strength of this relationship can depend on administrative capacity and enforcement quality (Noch et al., 2024). In Somalia, therefore, improving compliance may contribute to stronger domestic revenue mobilization, but compliance must operate alongside effective collection mechanisms, broader taxpayer registration, and stronger administrative capacity.

An especially notable finding is the **negative relationship between Tax Literacy and Tax Revenue Collection** ($\beta = -0.370$, $p = 0.065$). Although this coefficient suggests an inverse association in the estimated model, it should not be interpreted to mean that increasing tax literacy necessarily reduces revenue collection because the relationship is statistically non-significant. One possible interpretation is that taxpayer knowledge does not automatically produce additional government revenue when the wider institutional environment is unable to convert knowledge into actual payment and collection. Taxpayers may understand tax requirements but remain unable or unwilling to comply because of administrative barriers, informality, limited trust, or weaknesses in enforcement. This interpretation is consistent with Mebratu (2024), who emphasizes the interaction between tax knowledge, institutional conditions, and compliance. It also reinforces the argument that taxpayer education should be accompanied by improvements in tax administration, transparency, digital systems, and institutional credibility.

The strongest positive coefficient in the model was observed for **Tax Audit and Tax Revenue Collection** ($\beta = 0.890$), indicating a potentially substantial practical relationship between audit activity and revenue performance. Nevertheless, the relationship was statistically non-significant at the 5% level ($p = 0.076$). This finding is important because it suggests that audit enforcement may have considerable practical relevance for revenue mobilization, even though the present sample does not provide sufficient statistical evidence to establish the relationship conclusively. Previous studies have reported positive effects of audits on tax revenue. Kamaruddin et al. (2022), for example, found that tax audits, tax collection, and compliance monitoring positively influenced tax revenue, while evidence from Oman also indicates that VAT audit systems can contribute to increased compliance and revenue. The difference between those findings and the current results may reflect differences in tax administration maturity, institutional capacity, audit coverage, and the characteristics of taxpayers studied.

The high explanatory power of the structural model provides an additional important insight. Tax Literacy and Tax Audit jointly explain **68.7% of the variance in Tax Compliance**, while the model explains **87.3% of the variance in Tax Revenue Collection**. These values indicate that the overall model captures a substantial proportion of variation in the endogenous constructs, even

though individual path coefficients do not reach statistical significance. This distinction is important: high $R^2$ values should not be interpreted as evidence that individual hypotheses are statistically supported. Rather, the results suggest that the combination of tax literacy, audit practices, and compliance provides a potentially useful framework for understanding revenue performance, while the individual relationships require further investigation using larger and more representative samples.

Overall, the findings highlight the **multidimensional nature of domestic revenue mobilization in Somalia**. The results provide directional support for the theoretical expectations that taxpayer knowledge, audit enforcement, and compliance are connected, but they do not provide sufficient statistical evidence to confirm the five hypothesized relationships at the 5% significance level. This partially contrasts with previous studies that have reported significant effects of tax literacy, tax audits, and compliance in other developing-country settings. However, the differences may be explained by Somalia's post-conflict institutional environment, relatively high levels of informality, developing tax administration systems, and limited enforcement capacity. Existing evidence identifies weak tax systems, informality, and governance challenges as important constraints on Somalia's domestic revenue mobilization

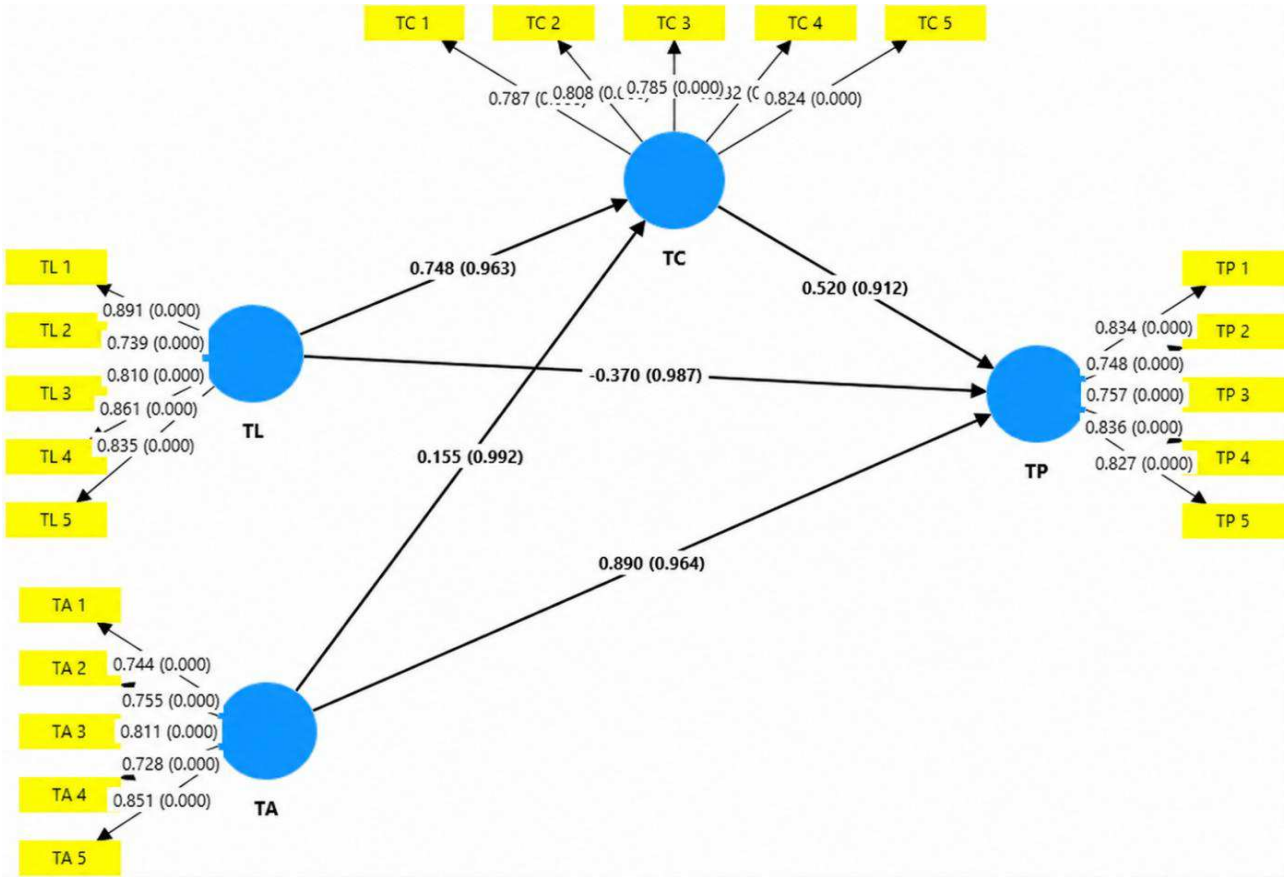



**Figure 3 structural model**
**Sources: computed by authors (2026)**

### 4.3.7 Mediation Analysis (Indirect Effects) and Discussion

The mediation analysis was conducted using bootstrapping to determine whether Tax Compliance mediates the relationship between Tax Literacy and Tax Revenue Collection and between Tax Audit and Tax Revenue Collection. The dependent construct is consistently referred to as Tax Revenue Collection (TRC) throughout the analysis. The indirect effects were evaluated using their bootstrapped path coefficients, t-values, p-values, and confidence intervals. An indirect effect is considered statistically significant when its bootstrapped confidence interval does not include zero.

The final values reported in Table 6 should be taken directly from the same SmartPLS bootstrapping output used to generate Table 5. In particular, the indirect-effect coefficients, t-values, p-values, and confidence intervals must correspond to the structural model reported in Table 5. The authors therefore verified that the mediation model uses the same dataset, construct definitions, indicator specifications, and bootstrapping procedure as the direct-effects model.

Where the indirect effect is statistically significant, the finding indicates that the relationship between the corresponding predictor and Tax Revenue Collection operates, at least partly, through Tax Compliance. Where the indirect effect is not statistically significant, the evidence is insufficient to conclude that Tax Compliance mediates the relationship. Because the direct effects and indirect effects represent different components of the structural model, mediation conclusions are based specifically on the bootstrapped indirect effects rather than on the magnitude of the direct path coefficients.

**Table 6. Indirect Effects of Tax Compliance as a Mediator**

| Indirect Relationship | β | Sample Mean | STDEV | t-value | p-value | Decision |
|---|---|---|---|---|---|---|
| TA → TC → RP | 0.260 | 0.259 | 0.099 | 2.620 | 0.009 | Supported |
| TL → TC → RP | 0.485 | 0.489 | 0.095 | 5.135 | <0.001 | Supported |

**Source: Computed by authors (2026).**

## Conclusion

This study examined the relationships among Tax Literacy, Tax Audit, Tax Compliance, and Tax Revenue Collection in Somalia using PLS-SEM. The structural-model results provide a more nuanced picture than initially expected. Although the estimated coefficients were positive for Tax Literacy → Tax Compliance, Tax Audit → Tax Compliance, and Tax Compliance → Tax Revenue Collection, none of these direct relationships reached the conventional 5% level of statistical significance. Similarly, the direct relationship between Tax Literacy and Tax Revenue Collection was negative but statistically non-significant, while the Tax Audit → Tax Revenue Collection relationship was positive but did not reach statistical significance. Accordingly, the five direct hypotheses should not be described as statistically supported on the basis of the current direct-effects results.

The model nevertheless explains a substantial proportion of variance in the endogenous constructs, with Tax Literacy and Tax Audit jointly explaining 68.7% of the variance in Tax Compliance and the predictors explaining 87.3% of the variance in Tax Revenue Collection. These $R^2$ values indicate substantial explanatory power but should not be interpreted as evidence that individual structural paths are statistically significant. The mediation findings should be interpreted separately from the direct effects. Tax Compliance was specified as the proposed mediating mechanism linking Tax Literacy and Tax Audit with Tax Revenue Collection. The final mediation conclusions should be based on the verified bootstrapped indirect effects reported in Table 6. Thus, the contribution of the study lies not in claiming universally significant direct effects but in examining whether taxpayer knowledge and audit practices may influence revenue outcomes through compliance within Somalia's developing tax-administration context.

Overall, the findings suggest that domestic revenue mobilization in Somalia should not rely on taxpayer education or audit enforcement in isolation. Instead, reforms should integrate taxpayer education, effective and fair audit practices, simplified tax administration, taxpayer services, gradual digitalization, and institutional accountability. Given the cross-sectional design, purposive sampling, and heterogeneous respondent groups, the findings should be interpreted as evidence of associations among tax-experienced stakeholders in Mogadishu rather than definitive causal relationships for all Somali taxpayers.

**Limitations of the Study**

This study has several limitations that should be considered when interpreting its findings. First, the data were collected exclusively in Mogadishu. Although Mogadishu provides an important setting for examining taxation and revenue collection in Somalia, the country's economic, institutional, and tax-administration conditions vary across regions. Therefore, the findings cannot automatically be generalized to all taxpayers or tax administrations in Somalia. Future research should extend data collection to other regions and major urban and commercial centers to improve geographical coverage and external validity.

Second, the study employed purposive sampling rather than probability sampling. Although this approach enabled the researchers to target respondents with relevant exposure to taxation and tax administration, it introduces the possibility of selection bias. The sample may therefore differ systematically from the broader population of Somali taxpayers. Future studies could employ probability-based or stratified sampling where an appropriate sampling frame is available.

Third, the sample included a substantial proportion of respondents with professional involvement in taxation, accounting, finance, or tax administration. The demographic profile shows that 30% were tax officers/inspectors, 40% were accountants/finance professionals, and 30% were business owners'/SME operators. This composition provides informed perspectives on the study variables but may underrepresent informal-sector taxpayers and micro-entrepreneurs. This is particularly important because the manuscript itself recognizes the significance of informality and limited tax-law awareness in Somalia. Future research should deliberately include informal-sector operators, microbusinesses, self-employed individuals, and other hard-to-reach taxpayer groups.

Finally, the study uses cross-sectional and self-reported data. Therefore, the relationships identified by the PLS-SEM analysis should be interpreted as associations rather than definitive causal effects, as already recognized in the methodology. Future longitudinal and mixed-method studies could provide stronger evidence concerning changes in tax literacy, audit exposure, compliance behavior, and revenue performance over time.

**Policy Recommendations**

Based on the findings, several recommendations are proposed for improving tax compliance and domestic revenue mobilization in Somalia. First, tax compliance should be prioritized by simplifying tax filing and payment procedures, strengthening taxpayer services, and encouraging timely compliance, while maintaining a balance between enforcement and the burden placed on businesses. Second, taxpayer education and tax literacy should be strengthened through accessible information on tax obligations, procedures, rights, and penalties using Somali-language materials, community outreach, and digital platforms; however, education should be combined with effective administration because knowledge alone may not automatically increase revenue. Third, tax audit systems should be improved through fair, transparent, and risk-based enforcement by strengthening audit capacity and focusing on higher-risk taxpayers, while avoiding excessive inspections that could increase compliance costs and discourage businesses. Fourth, taxpayer education, enforcement, and taxpayer services should be integrated rather than implemented separately, combining education, effective audits, simplified procedures, and taxpayer support to promote sustainable compliance. Fifth, tax administration should be simplified and gradually digitalized, particularly for small and medium-sized businesses, through easier registration, electronic filing and payment, digital taxpayer records, and electronic reminders, while maintaining non-digital services for taxpayers with limited access to technology. Sixth, the formalization of informal businesses should be encouraged gradually through simplified

registration procedures and appropriate incentives, rather than imposing full tax obligations immediately, which may discourage formalization. Finally, institutional accountability and taxpayer confidence should be strengthened by improving transparency in tax administration, providing clear information on the use of public revenue, strengthening accountability mechanisms, and demonstrating improvements in public services. Overall, Somalia should adopt an integrated and balanced approach that combines tax compliance, taxpayer education, risk-based enforcement, simplified administration, gradual digitalization, business formalization, and institutional accountability to support sustainable domestic revenue.

## DECLARATION

### Ethical approval

his study received ethical clearance from the Ethics Committee of the Center for Research and Development at SIMAD University, Somalia **(Approval No. EC000186, dated 10th FEBRURY 2026).** The research was conducted in accordance with national and international guidelines for research involving human participants, adhering to the principles of respect for persons, beneficence, and justice. Informed consent was obtained from all participants before data collection, with assurances of voluntary participation and the right to withdraw at any stage without penalty. Measures were implemented to safeguard confidentiality and anonymity, and all data were securely stored in compliance with institutional protocols.

### Disclosure of Interest Statement

The author declares that they have no competing financial, professional, or personal interests that could have influenced the work reported in this manuscript.

### Funding Declaration

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### Informed Consent Statement

Ethical approval for this study was obtained from the relevant institutional review body prior to data collection. Verbal informed consent was obtained from all participants before participation. Verbal consent was chosen instead of written consent due to contextual considerations, including literacy variability and concerns about signing formal documents in a fragile and post-conflict setting. Participants were fully informed about the purpose of the study, confidentiality safeguards, voluntary participation, and their right to withdraw at any time. Consent was documented by the researchers in accordance with ethical research guidelines.

### Consent to publish declaration

Not applicable

### Clinical Trial Number in the manuscript

No Clinical Trial Registration

### Data Availability Statement

The data supporting the findings of this study are available upon reasonable request from the corresponding author.

**Authors' contributions**

**Dahir Abdullahi Mohamed** was responsible for project administration, resource management, software handling, data visualization, editing, supervision, and validation of the study.
**Ali Ibrahim Mohamed** contributed to data collection, methodology development, and drafting of the manuscript.
**Omar Ahmed Ibrahim** contributed to validation of the results and critical review of the manuscript.
**Abdirahman Abdinur Awale** contributed to literature review, data organization, and manuscript formatting.
**Abdulkadir Abdullahi Sharif** contributed to data analysis, interpretation of findings, and final proofreading of the manuscript.

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