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Determinants of SME tax compliance: The intervening role of tax awareness in Jakarta

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Abstract
Purpose: This study examines the determinants of tax compliance among Small and Medium Enterprises (SMEs) in DKI Jakarta by testing tax awareness as an intervening variable.
Research Methodology: This research was conducted in DKI Jakarta, Indonesia, using a quantitative approach. Primary data were collected using a structured questionnaire administered to SME taxpayers. The conceptual model is grounded in Attribution Theory, the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM), and Institutional Theory. This study evaluates the effects of tax knowledge, e-filing tax systems, tax authority service quality, and tax law enforcement on tax awareness and compliance. Data were analyzed using Partial Least Squares structural equation modeling (PLS-SEM) with dedicated PLS-SEM software (brand/version not specified).
Results: The findings indicate that tax knowledge, the e-filing tax system, tax authority service quality, and tax law enforcement have positive and significant direct effects on tax awareness and compliance. Tax awareness also has a positive and significant effect on tax compliance and mediates the relationship between the four antecedent factors and tax compliance.
Conclusions: Strengthening SME tax compliance requires improvements in knowledge, digital tax processes, service quality, and enforcement, while tax awareness functions as a key mechanism linking these factors to compliance
Limitations: This study uses cross-sectional, self-reported survey data from SMEs in one province, which may limit generalizability and causal inference.
Contribution: This study integrates behavioral, technological, and institutional perspectives and provides practical input for the Directorate General of Taxes to enhance voluntary awareness-based compliance among SMEs.

Keywords: *E-Filing, SMEs, Tax Compliance, Tax Awareness, Tax Law Enforcement*

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1. Introduction

Tax compliance is integral to fiscal capacity, public service delivery, and the legitimacy of state institutions in the Philippines. In developing economies, the challenge of revenue mobilization is exacerbated by the prevalence of informal transactions, uneven administrative capabilities, and limited tax morale. Cross-country evidence highlights that enhancing compliance is not merely a technical issue of rates and rules, but a behavioral and institutional challenge shaped by taxpayers' experiences with the tax system (Adem, Desta, & Girma, 2024; Yabré, Loaba, & Semedo, 2025). Small and medium-sized enterprises (SMEs) are particularly significant in this context. They contribute substantially to employment and output but often encounter higher relative compliance costs, less formal recordkeeping, and greater sensitivity to administrative friction. When SMEs face complex procedures or lack confidence in compliance tasks, they may delay filing, underreport, or disengage from the system.

Indonesia has implemented tax administration reforms that integrate digitalization, service improvement, and supervision. The expansion of digital tax services aims to reduce compliance burdens, enhance accuracy, and improve taxpayer experience. However, digital transformation alone does not ensure compliance with the law. Digital tools may fail to effect behavioral change when users have limited literacy, distrust the platform, or perceive the system as unreliable. Evidence from e-government research indicates that trust and digital capability determine whether citizens utilize government platforms and whether these platforms improve compliance-relevant outcomes (AbdulKareem & Oladimeji, 2024).

Similarly, studies on e-filing adoption emphasize that trust can moderate technology effects and that convenience benefits arise only when systems are perceived as useful and easy to use (Abu-Silake, Alshurafat, Alaqrabawi, & Shehadeh, 2024; Mas' ud, Manaf, Saad, & Pantamee, 2024). Institutional interactions significantly influence compliance. For numerous SMEs, tax authorities serve as vital sources of information and practical assistance. When the service provided is responsive, clear, and equitable, it can mitigate uncertainty and foster cooperation. Conversely, substandard services can exacerbate perceptions of complexity and unfairness, thereby discouraging compliance. Recent research has developed and validated measures of service quality in tax administration, demonstrating its correlation with trust and compliance behavior (Au et al., 2023).

Evidence from Indonesia similarly indicates that service quality enhances compliance, particularly within the SME sector, where taxpayers often require guidance (Jarwa, Ratnawati, & Nugroho, 2021; Kurniawan & Daito, 2021). Enforcement is a fundamental component of compliance policy. Audits and sanctions can increase the anticipated cost of noncompliance; however, the behavioral response is contingent on perceived fairness and legitimacy. The concept of responsive regulation posits that enforcement, when applied credibly and fairly, can sustain compliance through a graduated strategy (Sanusi et al., 2021). Experimental findings suggest that perceived unfair audits can diminish compliance, indicating that enforcement perceived as arbitrary may undermine voluntary compliance (Lancee, Rossel, & Kasper, 2023). For SMEs, sanctions and audit signals may be particularly significant, as cash flow constraints and administrative limitations are prevalent.

Tax awareness is a pivotal concept linking cognitive, technological, institutional, and deterrence factors to behavior. Tax awareness refers to a taxpayer’s internal recognition of their obligations, comprehension of the role of taxes, and willingness to comply as a responsible economic actor. Behavioral theories, such as the theory of planned behavior, assert that beliefs and perceptions shape intentions and behaviors through attitudes, norms, and perceived control (Ajzen, 1991). In the context of taxation, awareness can be interpreted as a proximal mechanism that encapsulates internalized obligations and readiness to act. Empirical studies have found that awareness predicts compliance across various settings, including SMEs and individual taxpayers (H. T. D. Le, Bui, & Nguyen, 2021; Ndlovu & Schutte, 2024).

Despite this growing body of literature, three gaps remain salient in Indonesia’s current policy environment. First, many studies focus on a single driver, such as only e-filing, only penalties, or only socialization, without integrating the combined experience of taxpayers who simultaneously face technology, service, and enforcement conditions (Purba, 2020; Rokhman et al., 2023). Second, while awareness and tax morale are frequently discussed, fewer studies have tested tax awareness as an explicit intervening variable that transmits the effects of knowledge, digital systems, service quality, and enforcement on compliance (Mbilla, 2023; Nurlis & Ariani, 2020). Third, evidence from Indonesia is still uneven across regions and segments, and the Jakarta context, where digital access is relatively high and compliance enforcement is comparatively intense, provides a useful setting to examine how modernization and deterrence interact with awareness and compliance.

This study addresses these gaps by evaluating an integrated model of SME tax compliance in DKI Jakarta. It investigates the direct effects of tax knowledge, quality of the e-filing system, quality of tax authority services, and tax law enforcement on tax compliance, while also assessing the mediating role of tax awareness. The findings offer policy-relevant insights into the most effective levers for enhancing voluntary compliance among SMEs within the digital administrative framework. Furthermore, Indonesia's ongoing modernization agenda underscores the necessity of understanding the interaction between digital reforms and traditional compliance mechanisms.

Digital transformation has the potential to reshape taxpayer expectations, leading to reduced tolerance for procedural friction, a demand for faster responses, and an evaluation of system legitimacy based on digital experiences. Recent research indicates that broader digital transformation is linked to improved governance outcomes and can influence tax-related behaviors by altering the transparency and accountability environments (Cai et al., 2025). This underscores the importance of examining compliance determinants in a context such as Jakarta, where digital access is relatively high, and administrative reforms are evident.

2. Literature Review

Tax compliance behavior is often explained from behavioral and institutional perspectives. The theory of planned behavior (TPB) argues that behavior is driven by intention, which is shaped by attitudes, subjective norms, and perceived behavioral control (Ajzen, 1991). In tax settings, these components are influenced by cognitive resources (knowledge), system conditions (administrative ease and usability), and institutional interactions (service quality and legitimacy of enforcement). As tax reporting and payment increasingly rely on digital interfaces, technology acceptance perspectives are also relevant. The technology acceptance model emphasizes that perceived usefulness and ease of use affect the adoption and continued use of technology (Davis, 1989). In the tax domain, higher system quality and trust can increase e-filing usage and reduce administrative friction, which can translate into better compliance outcomes.

Tax knowledge and awareness. Tax knowledge refers to taxpayers' understanding of tax rules, filing requirements, calculation procedures, and practical steps needed to comply. Knowledge is especially important for SMEs because owners often make tax decisions without dedicated accounting staff. When knowledge is low, taxpayers may misunderstand their obligations, experience anxiety about mistakes, and perceive compliance as risky or costly. Evidence shows that tax knowledge improves compliance and is closely related to awareness, tax morale, and informed decision-making (Bhalla, Sharma, & Kaur, 2022; Kushwah, Nathani, & Vigg, 2021). Studies in different countries have found that knowledge reduces noncompliance by improving capability and shaping awareness of the value and consequences of taxation. Indonesian SME compliance research framed in behavioral theory also highlights knowledge and understanding as important determinants of compliance intentions and behavior (Arham & Firmansyah, 2021; Nurlela, Kurniawan, & Umiyati, 2021). Thus, stronger knowledge should increase tax awareness and support for compliance.
H1: Tax knowledge positively affects tax awareness.
H5: Tax knowledge positively affects tax compliance.

E-filing system quality and tax awareness. E-filing is intended to lower compliance costs by allowing taxpayers to submit returns electronically, thereby reducing physical visits and administrative processing time. However, the benefits of compliance depend on actual usage and the perceived quality of the platform. If the system is unreliable, difficult to navigate, or perceived as unsafe, taxpayers may avoid it or make mistakes. Technology adoption studies in taxation highlight that trust, perceived usefulness, and ease of use are critical for sustained usage (Abu-Silake et al., 2024; Mas' ud et al., 2024). Evidence from Indonesia likewise finds that e-filing usage depends on perceived convenience and system capability (Wibowo & Mauritsius, 2022), and that socialization and system understanding influence the effectiveness of e-filing implementation (Hamilah & Aliza, 2021).

More broadly, e-government reforms that integrate e-billing and e-filing are linked to improved compliance outcomes when they reduce friction and strengthen the transparency (Rokhman et al., 2023). Studies in other settings also confirm that digital filing platforms can affect compliance through user experience and perceived integrity (AbdulKareem & Oladimeji, 2024; Lamidi, Olowookere, Saad, & Ahmi, 2023; Purba, 2020). These arguments suggest that a higher e-filing system quality increases tax awareness and compliance.
H2: The quality of the e-filing system positively affects tax awareness.
H6: E-filing system quality positively affects tax compliance.

Tax authority service quality and tax awareness. Service quality reflects how taxpayers experience assistance from tax authorities, including the clarity of information, responsiveness, accessibility, and fairness. For SMEs, high-quality service reduces confusion, supports correct reporting, and builds trust. Measurement development work emphasizes that service quality must be rigorously assessed and that it captures multiple dimensions relevant to taxpayer satisfaction and compliance (Au et al., 2023). Empirical studies also indicate that service quality strengthens compliance, particularly for SMEs that require guidance and support (Jarwa et al., 2021; Kurniawan and Daito, 2021). Therefore, better service quality should strengthen awareness and compliance.
H3: Tax authority service quality positively affects tax awareness.
H7: Tax authority service quality positively affects tax compliance.

Tax law enforcement and awareness. Enforcement includes audits, sanctions, and perceived certainty of detection. Deterrence mechanisms are expected to increase compliance by raising the expected costs of evasion; however, modern compliance perspectives stress legitimacy and procedural fairness. Responsive regulation suggests that enforcement must be applied proportionately and consistently to sustain voluntary compliance and avoid a backlash (Sanusi et al., 2021). Experimental evidence shows that unfair audits reduce compliance intentions (Lancee et al., 2023). Studies on SME compliance also show that enforcement and audit perceptions influence behavior, and that enforcement can complement service-based strategies (Ojo & Shittu, 2023). Hence, stronger enforcement should increase awareness and compliance rates.
H4: Tax law enforcement positively affects tax awareness.
H8: Tax law enforcement positively influences tax compliance.

Tax awareness and compliance. Tax awareness is the internalized recognition of tax obligations and willingness to comply voluntarily. In TPB terms, awareness relates to attitudes and perceived obligation, and it can strengthen the intention to comply (Ajzen, 1991). Empirical studies have found that awareness is a significant predictor of compliance, including in contexts where digital tools and institutional reforms are present (H. T. D. Le et al., 2021; Ndlovu & Schutte, 2024). Indonesian studies similarly emphasize the role of awareness and moral reasoning in motivating compliance among individual and SME taxpayers (Nurlela et al., 2021). Accordingly, a higher awareness should translate into higher compliance.
H9: Tax awareness positively affects tax compliance.

The mediating role of tax awareness was significant. Awareness serves as a behavioral conduit through which structural and administrative factors influence compliance. In the context of small and medium-sized enterprises (SMEs), modernization efforts such as electronic filing (e-filing) and institutional factors like service quality may initially enhance awareness and trust, subsequently leading to consistent compliance behavior. Empirical research substantiates these mediation pathways, wherein awareness and related psychological constructs convey the effects of modernization and knowledge on compliance (Mbilla, 2023; Nurlis and Ariani, 2020). Digital transformation and transparency reforms may also shape compliance norms and awareness at the institutional level, reinforcing compliance incentives (Cai et al., 2025). Thus, tax awareness is expected to mediate the effects of knowledge, e-filing, service quality and enforcement.
H10: Tax awareness mediates the effect of tax knowledge on tax compliance.
H11: Tax awareness mediates the effect of the e-filing system on tax compliance.
H12: Tax awareness mediates the effect of service quality on tax compliance.

H13: Tax awareness mediates the effect of enforcement on tax compliance.

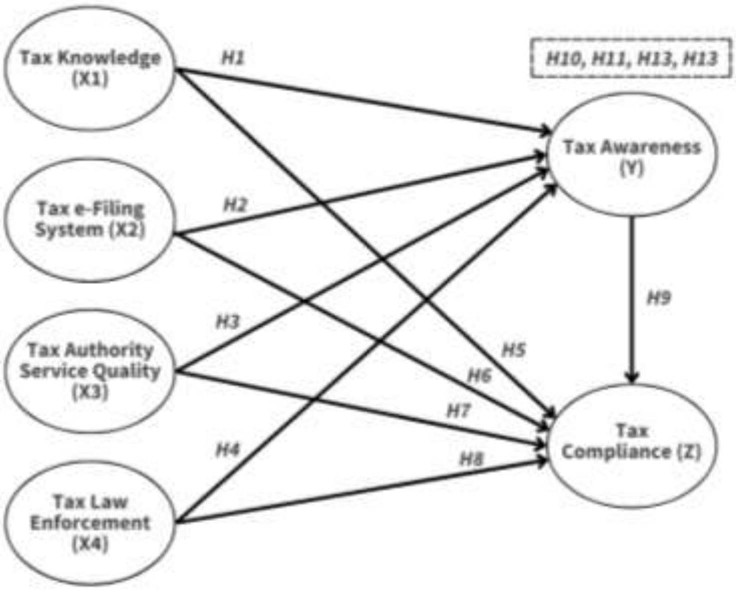

Figure.1 Conceptual Framework
Source: Processed by the authors (2025)

3. Research Methodology

This study applies a quantitative, cross-sectional survey design to test the proposed model of SME tax compliance in Jakarta, Indonesia. The design is appropriate for examining the relationships among perceptions and self-reported behaviors and for testing mediation effects. The target population comprised SME taxpayers located in DKI Jakarta who were subject to self-assessment obligations. Because a complete sampling frame was not accessible, purposive sampling was used to recruit respondents who (1) own or manage an SME operating in DKI Jakarta and (2) have experience with tax payment and reporting obligations. Data will be collected in 2025. After screening for completeness and consistency, 156 responses were retained for the analysis.

The questionnaire measured six latent constructs: tax knowledge, e-filing system quality, tax authority service quality, tax law enforcement, tax awareness, and tax compliance. Each construct was measured using multiple indicators adapted from the compliance and e-tax literature. Responses were captured on a six-point Likert scale (1=strongly disagree to 6=strongly agree). The use of an even-numbered scale aims to reduce neutral responses and obtain clearer directional judgments. Measurement quality was evaluated using reliability and validity tests. Structural equation modeling-partial least squares (SEM-PLS) was used to estimate the measurement and structural models and to test the direct and indirect effects. SEM-PLS is suitable for predictive models with multiple constructs and indicators and is widely used in e-tax and SME compliance research (H. T. D. Le et al., 2021).

The measurement model was evaluated using Cronbach's alpha and composite reliability for internal consistency, average variance extracted (AVE) for convergent validity, and the heterotrait-monotrait ratio (HTMT) for discriminant validity. The structural model was assessed using coefficients, significance ($p<0.05$), and the coefficient of determination (R^2). Participation was voluntary, and respondents were informed that the survey was for research purposes only. No personally identifiable information was used in the analysis, and the responses were treated anonymously. To improve data quality, the questionnaire was designed to be concise and use clear wording aligned with SME tax practices. The completed questionnaires were screened for missing values and inconsistent patterns before analysis. Because the data are self-reported, the results should be interpreted as reflecting taxpayer perceptions and reported behaviors, which are important for understanding compliance decisions but may differ from the administrative records.

The structural model specifies tax awareness as an endogenous construct predicted by tax knowledge, e-filing system quality, service quality, and enforcement. Tax compliance was modeled as an endogenous construct predicted by the four antecedents and tax awareness. This specification allows the model to estimate both direct (e.g., e-filing → compliance) and indirect effects through awareness (e.g., e-filing → awareness → compliance). Indirect effects were evaluated using the product of the path coefficients and the corresponding bootstrapped significance tests. Because mediation can occur even when direct effects remain significant, the analysis interprets the mediation pattern in terms of partial mediation when both the direct and indirect paths are significant and in terms of full mediation when the indirect effect is statistically significant, whereas the direct effect is not.

This study adheres to the established SEM-PLS evaluation practices for reflective measurement models. Internal consistency reliability was assessed using Cronbach's alpha and composite reliability (CR). Convergent validity was evaluated using the Average Variance Extracted (AVE), with values exceeding 0.50 indicating that constructs account for more than half of the variance of their indicators. Discriminant validity was assessed using the heterotrait-monotrait ratio (HTMT). The quality of the structural model was evaluated using the R^2 values for endogenous constructs and the sign and significance of the path coefficients. Collectively, these criteria provide a coherent framework for assessing the adequacy of the measurement and structural models for hypothesis testing and their interpretation.

4. Results and Discussions

4.1 Respondent Characteristics

Table 1 summarizes the respondent characteristics. The sample comprised 156 SME taxpayers in DKI Jakarta. Male respondents constituted 63% of the sample. The most common age group was 30–40 years (42%), followed by 40–50 years (27%), indicating that many respondents were in a mature working-age segment. Regarding business duration, 37% have operated for 5–10 years and 24% for 10–15 years, suggesting that a substantial share of respondents manage established SMEs. The education profile indicates that 35% hold a bachelor's degree, 23% completed high school, and 21% completed a master's degree.

Table 1. Respondent Characteristics

Characteristic	Category	n	%
Gender	Male	99	63
	Female	57	37
Age	< 30	17	11
	30–40	65	42
	40–50	42	27
	> 50	32	21
Business duration	3–5 years	32	21
	5–10 years	57	37
	10–15 years	37	24
	> 15 years	30	19
Education	High school	36	23
	Diploma	34	22
	Bachelor	54	35
	Master	32	21

Source: Processed by the authors (2025)

4.2 Reliability and Convergent Validity

Table 2 shows the strong internal consistency and convergent validity of all constructs. Cronbach's alpha values ranged from 0.947 to 0.964, exceeding the common reliability threshold of 0.70, indicating that the items within each construct were highly consistent. Composite reliability values were also high, ranging from 0.956 to 0.969, confirming robust construct reliability and supporting the stability of the measurement model.

Table 2. Reliability and Convergent Validity

Construct	Cronbach's α	Composite reliability (rho_c)	AVE
Tax E-Filing System	0.947	0.956	0.758
Tax Compliance	0.964	0.969	0.797
Tax Awareness	0.957	0.964	0.795
Tax Authority Service Quality	0.962	0.968	0.789
Tax Law Enforcement	0.951	0.960	0.774
Tax Knowledge	0.955	0.962	0.762

Source: Processed by PLS (2025)

Convergent validity is supported by the Average Variance Extracted (AVE) values, which range from 0.758 to 0.797, well above the recommended minimum of 0.50. This indicates that each construct explains a substantial proportion of the variance in its indicators. Among the constructs, Tax Compliance demonstrates the strongest measurement quality (α = 0.964, CR = 0.969, AVE = 0.797), while the Tax E-Filing System shows the lowest AVE but still remains comfortably above the threshold (AVE = 0.758). Overall, the results confirm that the measurement model meets the reliability and convergent validity requirements and is suitable for subsequent structural model testing.

4.3 Discriminant Validity (HTMT)

Table 3 presents the Heterotrait–Monotrait (HTMT) ratios as evidence of discriminant validity across latent constructs. The HTMT coefficients ranged from 0.657 to 0.894, indicating moderate to strong associations but not to a degree that would suggest problematic construct redundancy. Applying the widely used HTMT criterion (< 0.90), all inter-construct values fell below the threshold, thereby supporting the conclusion that the measurement model demonstrated adequate discriminant validity.

Table 3. HTMT

Construct	Tax E-Filing System	Tax Compliance	Tax Awareness	Tax Authority Service quality	Tax Law Enforcement	Tax Knowledge
Tax E-Filing System	—	—	—	—	—	—
Tax Compliance	0.790	—	—	—	—	—
Tax Awareness	0.774	0.894	—	—	—	—
Tax Authority Service quality	0.662	0.788	0.769	—	—	—
Tax Law Enforcement	0.678	0.764	0.779	0.676	—	—
Tax Knowledge	0.721	0.787	0.778	0.720	0.657	—

Source: Processed by PLS (2025)

The strongest association was observed between Tax Awareness and Tax Compliance (HTMT = 0.894), which approached but did not exceed the recommended cutoff. Substantively, this pattern is theoretically plausible because awareness is conceptually proximal to compliance behavior; nevertheless, the HTMT evidence suggests that the two constructs remain empirically distinguishable. In contrast, relatively lower HTMT values, such as between Tax Knowledge and Tax Law Enforcement (0.657) and between Tax Authority Service Quality and Tax E-Filing System (0.662), indicate a clearer separation among these domains. Overall, the HTMT results confirmed that the constructs exhibited sufficient discriminant validity, supporting the subsequent interpretation of the structural model relationships.

4.4 Structural Model and Hypotesis Testing

The model exhibits a strong explanatory power (Table 4). Tax knowledge, e-filing system quality, service quality, and enforcement explained 74.4% of the variance in tax awareness (R^2=0.744). Together with tax awareness, these predictors explain 80.8% of the variance in tax compliance (R^2=0.808), indicating that the integrated model captures a large share of compliance behavior among SMEs in Jakarta.

Figure.2 β/path coefficients + loading
Source: Processed by the authors (2025)

Table 4. Coefficient of determination (R^2)

Endogenous construct	R^2	Adjusted R^2
Tax awareness	0.744	0.738
Tax compliance	0.808	0.802

Source: Processed by PLS (2025)

Table 5 reports the direct effects of the variables. Tax knowledge has positive and significant effects on tax awareness (β=0.233, p=0.001) and tax compliance (β=0.136, p=0.039), supporting H1 and H5. This result indicates that capability matters: SME taxpayers with a stronger understanding of rules and procedures are more aware of their obligations and more able to comply. This finding aligns with evidence that tax knowledge reduces compliance friction and strengthens adherence (Bhalla et al. (2022); Kushwah et al. (2021) and with Indonesian behavioral research emphasizing the importance of knowledge and moral reasoning in SME compliance (Arham & Firmansyah, 2021; Nurlela et al., 2021).

Table 5. Structural model results (direct effects)

H	Path	β	t	p
H1	Tax Knowledge -> Tax Awareness	0.233	3.388	0.001
H2	Tax E-Filing System -> Tax Awareness	0.241	3.512	0.000
H3	Tax Authority Service Quality -> Tax Awareness	0.239	3.053	0.002
H4	Tax Law Enforcement -> Tax Awareness	0.289	4.145	0.000
H5	Tax Knowledge -> Tax Compliance	0.136	2.066	0.039
H6	Tam E-Filing System -> Tax Compliance	0.167	2.228	0.026
H7	Tax Authority Service Quality -> Tax Compliance	0.177	2.508	0.0012
H8	Tax Law Enforcement -> Tax Compliance	0.110	2.284	0.022
H9	Tax Awareness -> Tax Compliance	0.422	3.300	0.001

Source: Processed by PLS (2025)

Table 5 reports the direct effects of the variables. Tax knowledge has positive and significant effects on tax awareness (β=0.233, p=0.001) and tax compliance (β=0.136, p=0.039), supporting H1 and H5. This result indicates that capability matters: SME taxpayers with a stronger understanding of rules and procedures are more aware of their obligations and more able to comply. This finding aligns with evidence that tax knowledge reduces compliance friction and strengthens adherence (Bhalla et al. (2022); Kushwah et al. (2021) and with Indonesian behavioral research emphasizing the importance of knowledge and moral reasoning in SME compliance (Arham & Firmansyah, 2021; Nurlela et al., 2021).

E-filing system quality positively affected tax awareness (β=0.241, p<0.001) and tax compliance (β=0.167, p=0.026), supporting H2 and H6. This suggests that when the system is perceived as functional and helpful, taxpayers become more attentive to their filing obligations and are more likely to comply. This result is consistent with the technology acceptance theory (Davis, 1989) and the findings that trust and usability determine the benefits of e-government systems (Abu-Silake et al., 2024; Mas' ud et al., 2024). It also complements evidence from Indonesia showing that perceived convenience and system quality affect e-filing usage and outcomes (Wibowo & Mauritsius (2022); Hamilah & Aliza (2021) and broader evidence that digital tax platforms support compliance when they reduce friction and build trust (AbdulKareem & Oladimeji, 2024; Lamidi et al., 2023; Purba, 2020; Rokhman et al., 2023).

Tax authority service quality has positive and significant effects on tax awareness (β=0.239, p=0.002) and tax compliance (β=0.177, p=0.012), supporting H3 and H7. This indicates that high-quality interactions with tax authorities remain important, even in digital settings. Clear guidance, responsiveness, and fair treatment reduce perceived complexity and support cooperative compliance. This is consistent with tax service quality measurement research and its links to compliance outcomes (Au et al., 2023) and with Indonesian SME evidence highlighting the importance of service and support (Jarwa et al., 2021; Kurniawan & Daito, 2021).

Tax law enforcement positively affects tax awareness (β=0.289, p<0.001) and tax compliance (β=0.110, p=0.022), thus supporting H4 and H8. Enforcement has the largest effect on tax awareness, implying that credible deterrence elevates taxpayer attention to obligations. Simultaneously, the magnitude of the compliance effect suggests that enforcement works most effectively when paired with supportive mechanisms, such as service quality and system usability. This interpretation aligns with the responsive regulation views of calibrated enforcement Sanusi et al. (2021) and with evidence that perceived unfair audits can undermine compliance (Lancee et al., 2023). This aligns with SME compliance research, which shows that enforcement and audit conditions shape compliance, including in VAT-related contexts (Ojo & Shittu, 2023).

Tax awareness significantly increased tax compliance (β=0.422, p=0.001), supporting H9. This confirms that awareness is a proximal driver of compliance behavior, as implied by the TPB (Ajzen, 1991). Recent evidence also documents strong links between awareness and compliance among SMEs and individual taxpayers (H. T. D. Le et al., 2021; Ndlovu & Schutte, 2024). The large coefficient suggests that policies that raise awareness through education, targeted communication, and clear services can generate substantial compliance gains.

Figure.3 Bootstraping
Source: Processed by the authors (2025)

4.5 Mediation Effects

Table 6 reports the indirect effects of tax awareness. All four mediation hypotheses are supported: Tax knowledge → Tax awareness → Tax compliance (β=0.099, p=0.034), Tax e-filing system → Tax awareness → Tax compliance (β=0.102, p=0.043), Tax authority service quality → Tax awareness → Tax compliance (β=0.101, p=0.045), and Tax law enforcement → Tax awareness → Tax compliance (β=0.122, p=0.002). These results indicate partial mediation because the direct effects remained significant after accounting for tax awareness.

Table 6. Mediation results (indirect effects via tax awareness)

H	Indirect path	β	t	p
H10	Tax Knowledge -> Tax Awareness -> Tax Compliance	0.099	2.122	0.034
H11	Tax E-Filing System -> Tax Awareness -> Tax Compliance	0.102	2.023	0.043

H12	Tax Authority Service quality -> Tax Awareness -> Tax Compliance	0.101	2.008	0.045
H13	Tax Law Enforcement -> Tax Awareness -> Tax Compliance	0.122	3.039	0.002

Source: Processed by PLS (2025)

The mediation results reinforce the view that strengthening compliance among SMEs is not only a matter of deterrence or system availability. Instead, capability, usability, and institutional interactions shape compliance partly by building awareness and internalized obligations. This aligns with prior evidence that awareness moderates or transmits the effects of knowledge and administrative factors (Mbilla 2023; Nurlis and Ariani 2020). In Indonesia's current policy environment, where relief policies and modernization efforts coexist, communication strategies that strengthen awareness and perceived legitimacy may enhance the effectiveness of both digital reforms and enforcement (Artanti, Saleh, & Prasetyo, 2025). Simultaneously, broader digital transformation can affect compliance norms and expectations, supporting the idea that institutional modernization can influence compliance through awareness and behavioral channels (Cai et al., 2025).

4.6 Implications for tax administration and SME support

The results have several practical implications for strengthening SME tax compliance in Jakarta and similar urban areas. First, the strong effect of tax awareness on compliance ($\beta=0.422$) suggests that voluntary compliance levers should be treated as core policy instruments rather than secondary "soft" measures. Awareness is not merely an information variable; it reflects an internalized obligation and readiness to act. Therefore, tax administrations should design interventions that translate technical information into understandable and actionable guidance. For SMEs, this implies emphasizing concrete compliance tasks, such as how to compute liabilities, what documents are needed, and how to submit returns, while communicating the rationale and benefits of compliance. Evidence across contexts shows that improving knowledge and awareness can produce meaningful compliance gains and complement enforcement (Bhalla et al., 2022; H. T. D. Le et al., 2021).

Second, the significance of tax knowledge paths indicates that capability building is still necessary, even when systems are digitized. SMEs often outsource accounting informally, operate with mixed personal and business finances, or rely on simple, cash-based records. Under these conditions, policy communication that assumes high literacy can be ineffective. Programs targeted at SMEs should be modular and industry-relevant, such as short sessions focused on VAT obligations, withholding rules, or simplified bookkeeping. Digital learning tools can help, but the content must remain practical and aligned with the SME workflows. Prior evidence suggests that knowledge reduces perceived complexity and strengthens compliance behavior, particularly among taxpayers facing procedural uncertainty (Arham & Firmansyah, 2021; Kushwah et al., 2021). A direct policy implication is that SME outreach should be measured not only by participation counts but also by improvements in task-level capabilities.

Third, both e-filing quality and awareness matter, which means that modernization must be treated as a user-experience program rather than a purely technical deployment. The positive e-filing effects in this study imply that when taxpayers perceive the platform as helpful and usable, they become more aware of deadlines and requirements and are more likely to comply with them. Indonesian evidence similarly highlights that perceived usefulness and ease of use shape e-filing behavior (Wibowo and Mauritsius, 2022) and that socialization influences implementation success (Hamilah and Aliza, 2021). From a management standpoint, this supports investments in (1) reliability (uptime and stability), (2) guidance embedded in the platform (contextual help, error explanations, and step-by-step prompts), and (3) trust features (security cues, clear confirmation receipts, and transparent error management). International evidence indicates that trust is particularly important in digital tax contexts and can shape whether taxpayers accept digital tools as legitimate and safe (AbdulKareem and Oladimeji, 2024; Mas' ud et al., 2024).

Fourth, service quality remains a significant determinant even in a digital environment, indicating that "digital first" should not imply "digital only." Many SMEs require human assistance for interpretation and problem solving. Service quality improvements can be operationalized through clearer communication, faster response channels, and consistent treatment protocols. Au et al. (2023) emphasize that tax service quality is multidimensional and that taxpayer perceptions are shaped by both the content and manner of interactions. At the local level, service quality can be strengthened by integrating digital and human support, for example, by enabling online chat support, appointment-based consultations, and consistent follow-up after queries. Because service quality also affects awareness, these improvements may amplify the effectiveness of other programs by increasing taxpayers' understanding and engagement with the program.

Fifth, enforcement has the largest effect on awareness and a positive direct effect on compliance; however, the mediation results show that enforcement also works by shaping attention and internalized obligation. This supports a balanced compliance strategy: credible enforcement signals should be maintained to deter evasion, while enforcement processes must remain procedurally fair to avoid undermining voluntary cooperation. Sanusi et al. (2021) argue that responsive regulation can be more effective than purely punitive strategies because it combines deterrence with legitimacy. Experimental evidence also warns that perceived unfair audits can reduce compliance (Lancee et al. 2023). For Jakarta, where enforcement intensity may be relatively high compared with other regions, the practical implication is to focus on transparency and consistency: clear criteria for audit selection, predictable sanction application, and communication that frames enforcement as rule-based rather than arbitrary. Ojo and Shittu (2023) similarly emphasized that enforcement mechanisms can shape SME compliance when integrated with supportive institutional measures.

Finally, the combined explanatory power of the model (R^2=0.808) indicates that policymakers should avoid single-instrument approaches to achieve the SDGs. Digitalization, service, knowledge building, and enforcement interact. For example, a highly usable e-filing system may reduce errors and costs, but without knowledge and awareness, it may not be used correctly; service quality can help SMEs overcome barriers, but service interventions are more effective when the system provides clear digital pathways; enforcement signals can raise attention, but over-reliance on sanctions without trust and service may produce resistance. These complementarities suggest a portfolio approach to compliance management, where interventions are coordinated and sequenced: capability building and platform improvement to lower barriers, service improvements to support adoption and understanding, and calibrated enforcement to sustain credibility.

4.7 Theoretical Implications

From a theoretical standpoint, the findings support the combination of behavioral and technological perspectives in compliance research. The strong role of awareness is consistent with TPB logic Ajzen (1991) and with evidence that awareness predicts compliance in SME settings (T. T. N. T. Le, Hai, Thi, & Hong, 2024; Ndlovu & Schutte, 2024). Simultaneously, the significant e-filing effects are consistent with technology acceptance ideas Davis (1989) and e-government evidence that trust and usability shape outcomes (Abu-Silake et al., 2024; Mas' ud et al., 2024). The partial mediation pattern implies that awareness is an important but not exclusive mechanism: administrative factors can change behavior directly by lowering costs and increasing perceived control while also shaping awareness and internalized obligation. This suggests that future compliance models may benefit from explicitly separating capability pathways (knowledge and perceived control), cost pathways (digital system usability), and legitimacy pathways (service quality and fairness of enforcement).

4.8 Summary of Key Findings

The empirical findings suggest that the compliance behavior of SMEs in Jakarta is influenced by both behavioral and institutional factors. While awareness serves as a fundamental channel, it is further enhanced by practical knowledge, accessible digital tools, supportive services and credible enforcement mechanisms. These findings provide a comprehensive foundation for developing effective compliance strategies within a digitally mediated tax administration framework.

5. Conclusion

5.1. Conclusion

This study provides evidence from 156 SME taxpayers in DKI Jakarta that tax compliance is shaped by a combined set of determinants: tax knowledge, e-filing system quality, tax authority service quality, and tax law enforcement, with tax awareness as a key behavioral channel. All four antecedents significantly increased tax awareness, and tax awareness had the strongest direct effect on compliance. Mediation tests confirmed that awareness partially transmits the effects of capability, technology, institutional services, and deterrence to compliance outcomes. Practically, the findings imply that strengthening SME compliance requires coordinated actions: improving taxpayer capability through education and assistance, improving e-filing usability and trust, strengthening service quality and responsiveness, and maintaining credible and fair enforcement of tax laws.

5.2. Limitation

This study used a cross-sectional design and relied on self-reported compliance, which may have been influenced by social desirability bias. Purposive sampling and the Jakarta-only focus limit the generalizability to other regions and SME segments.

5.3. Suggestion

Future research should employ longitudinal designs to capture temporal changes in awareness and compliance, incorporate objective indicators such as filing timeliness or administrative records, and conduct comparative analyses across multiple provinces to assess whether regional variations in digital readiness, service accessibility, and enforcement intensity influence the strength of the determinants and the mediation pathway. Furthermore, future studies could investigate heterogeneity across SME sectors (trade, manufacturing, services) and tax regimes to ascertain whether the determinants function differently for VAT-registered firms compared with non-VAT firms. Experimental or quasi-experimental designs that leverage policy changes (e.g., interface redesigns, enforcement campaigns, or service reforms) would facilitate the identification of causal mechanisms. Finally, qualitative follow-up interviews with SME taxpayers could elucidate the specific usability and trust barriers that shape e-filing experiences and identify the types of service interactions that most effectively enhance awareness and sustain compliance in the long term.

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