







“Taxpayer compliance among MSMEs in Indonesia: Moderating role of e-filing on tax authority services, awareness, and tax sanctions”

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TAXPAYER COMPLIANCE AMONG MSMES IN INDONESIA: MODERATING ROLE OF E-FILING ON TAX AUTHORITY SERVICES, AWARENESS, AND TAX SANCTIONS

Abstract

This study investigates the impact of tax authority services, awareness, and tax sanctions on MSMEs' tax compliance, with e-filing as a moderating variable. The study is inspired by the low level of tax compliance among MSMEs in emerging economies. A quantitative analysis was conducted using the PLS-SEM approach. Data were collected between January and March 2025 through a questionnaire administered to 100 MSME taxpayers, who were either firm owners or financial managers registered with local tax offices in Indonesia. The results indicate that taxpayer awareness has a positive effect on taxpayer compliance ($\beta = 0.169$; $p < 0.05$), while tax authority services show a negative effect ($\beta = -0.189$; $p < 0.05$). Tax sanctions had no effect on compliance ($\beta = -0.081$; $p > 0.05$). Furthermore, e-filing moderates the relationship between taxpayer awareness and compliance ($\beta = 0.214$; $p < 0.05$), but it does not moderate the effects of tax authority services and tax sanctions. The model explains 13.3% of the variance in taxpayer compliance ($R^2 = 0.133$), indicating that additional factors may influence compliance behavior. These findings highlight the importance of integrating taxpayer education with digital tax systems to enhance voluntary compliance. The study suggests that improving awareness, supported by accessible technology, is more effective than relying solely on service quality or sanctions in regional MSME contexts.

Keywords

taxpayer compliance, services, awareness, sanctions,
e-filing

JEL Classification

H26, H83, O33, M38

INTRODUCTION

Tax revenue remains a key pillar of national income, supporting public spending and macroeconomic growth. Improving taxpayer compliance is crucial to address policy and compliance gaps that undermine fiscal capacity. According to the OECD (2024), Indonesia faces critical fiscal constraints, particularly low tax compliance rates among micro, small, and medium enterprises (MSMEs). Previous economic theory and recent studies (Tambunan, 2019; Resnick, 2021; Khan & Tjaraka, 2024; Allam et al., 2024) indicate that MSME taxpayers often exhibit varying motivations for paying taxes. Despite various policy reforms and administrative improvements, compliance among MSME taxpayers remains inconsistent. Factors such as limited taxpayer awareness, the effectiveness of tax sanctions, and varying perceptions of tax authority services contribute to this issue. Furthermore, the extent to which digital tax systems, particularly e-filing, influence taxpayer compliance behavior remains unclear. The government must be more responsive to low tax compliance motivation to increase potential tax revenue. Therefore, tax authorities need to focus on providing a positive tax climate, easing tax reporting through a digital tax system, and improving services for taxpayers.

1. LITERATURE REVIEW AND HYPOTHESES

Understanding taxpayer compliance requires a comprehensive perspective. According to Resnick (2021), the drivers of tax compliance can vary depending on taxpayer awareness and tax authority services. This involves integrating both external and internal determinants rather than a single-dimensional approach. The theory of planned behavior (TPB) provides an appropriate framework to explain how external factors, such as tax authority services and sanctions, interact with internal factors like awareness to shape compliance intentions (Nurwanah et al., 2018; Ajzen, 2020). Yet, digital platforms such as e-filing have emerged as critical enablers, particularly in contexts where taxpayer awareness and the quality of tax authority services are still evolving (Belahouaoui & Attak, 2024). Recent studies suggest that the adoption of a digital tax system can strengthen the relationship between administrative factors and compliance behavior by reducing procedural complexity, enhancing perceived fairness, and improving accessibility (Okunogbe & Pouliquen, 2022; Belahouaoui & Attak, 2024). In addition, digital tax reform enhances tax compliance by improving third-party reporting and strengthening tax enforcement, particularly among high-tax firms (Li et al., 2020). However, these empirical findings remain fragmented, indicating the need for a more integrated analytical framework among MSMEs in emerging economies. This holistic approach contributes to bridging the gap between behavioral theory and the digital transformation of tax systems.

The quality of tax authority services plays a crucial role in shaping taxpayer perceptions and compliance behavior. High-quality tax authority services characterized by transparency, accessibility, responsiveness, and professionalism are generally associated with increased trust and reduced compliance costs, thereby fostering voluntary compliance (Luttmer & Singhal, 2014; Ernest et al., 2022; Gobena, 2023). Empirical evidence supports this view, showing that positive service experiences encourage cooperative behavior and strengthen the legitimacy of tax authorities (Gangl et al., 2015; Belahouaoui & Attak, 2024). The relationship between service quality and compliance is not al-

ways consistent. Some studies report insignificant or even negative effects in contexts where taxpayers perceive services as bureaucratic, inefficient, or lacking credibility (Molero & Pujol, 2012). These inconsistencies imply that the effectiveness of tax authority services depends not only on their technical quality but also on broader institutional trust and taxpayer perceptions.

Taxpayer awareness represents a key internal determinant of compliance behavior, influencing individuals' understanding of tax obligations, reporting procedures, and the broader role of taxation in supporting public goods. Higher levels of awareness are generally associated with stronger voluntary compliance, as informed taxpayers are more likely to recognize the societal benefits of taxation and perceive the system as legitimate (Mas'ud et al., 2019; Gobena, 2023). Recent studies further indicate that awareness enhances perceptions of fairness and strengthens compliance intentions (Jimenez & Iyer, 2016). However, awareness alone does not necessarily translate into compliant behavior. Empirical evidence suggests that its effect may be constrained by factors such as procedural complexity, limited digital literacy, and insufficient institutional support. This highlights the need to consider awareness in conjunction with facilitating mechanisms such as digital tax systems.

Tax sanctions function as external regulatory instruments intended to deter non-compliance by increasing the perceived costs of rule violations. Traditional economic theory posits that stricter sanctions should lead to higher compliance by discouraging tax evasion. While some empirical studies support this deterrence effect (Gangl et al., 2015; Lancee et al., 2023), others find limited or negligible impacts, particularly in environments characterized by weak enforcement, inconsistent application, or low perceived fairness (Kogler et al., 2013). However, other studies suggest that compliance can be significantly influenced by alternative mechanisms beyond deterrence, such as behavioral interventions that may outperform traditional sanction-based approaches (Aziz & Idris, 2014; Zaidi et al., 2017; Agbetunde et al., 2022; Cheng et al., 2024). These mixed findings indicate that the effectiveness of sanctions is highly context-dependent and may depend on their interaction with

other factors, such as awareness, trust in authorities, and tax authorities' service quality. Therefore, sanctions should be understood as part of a broader compliance framework rather than as a stand-alone mechanism.

A digital tax system represents a significant technological innovation in tax administration, enhancing the efficiency and accessibility of reporting processes (Li et al., 2020). Simplifying procedures and reducing administrative burdens enables taxpayers to exercise greater control over their compliance behavior. Empirical studies demonstrate that digital tax systems improve voluntary compliance by increasing convenience, accuracy, and transparency (Okunogbe & Pouliquen, 2022; Allam et al., 2024). More importantly, a digital tax system may act as a moderating mechanism that strengthens the relationship between behavioral and institutional determinants and compliance outcomes, as the technology mitigates procedural obstacles and lowers compliance costs (Ernest et al., 2022). For instance, digital platforms can enhance the effectiveness of tax authority services by improving responsiveness and accessibility, facilitating the translation of taxpayer awareness into actual compliance behavior, and reducing unintentional non-compliance associated with procedural errors. However, the moderating role of the digital tax system remains insufficiently explored, particularly in regional MSME contexts where digital adoption and institutional capacity vary significantly.

Digital reporting tools such as e-filing reduce procedural barriers and improve the ease of tax submission, thereby facilitating taxpayer compliance (Lymer et al., 2012). The implementation of digital systems also minimizes unintentional non-compliance caused by technical errors and procedural complexity. However, some studies report inconsistent results, suggesting that the effectiveness of digital tax systems may be limited when digital literacy is low or when taxpayers perceive the system as complex, thereby reducing its ability to translate awareness into actual compliance (Night & Bananuka, 2020). On the other hand, tax sanctions serve as an external enforcement mechanism that encourages compliance (Hakelberg, 2016; Ariyanto et al., 2024). In a digital environment, the effectiveness of sanctions may be further strength-

ened through structured systems, automated processes, and improved monitoring. While sanctions create external pressure to comply, the availability of e-filing may reduce unintentional non-compliance caused by procedural errors or technical barriers. In a digital environment, taxpayers can access reminders, standardized forms, and automated calculations, which may amplify the deterrent effect of sanctions.

Overall, prior studies highlight that taxpayer compliance is influenced by a combination of external factors such as tax authority services and sanctions, as well as internal factors such as taxpayer awareness (Resnick, 2021; Blesse, 2023; Allam et al., 2024). Taxpayer compliance is shaped by a complex interaction between internal factors, such as awareness, and external factors, including tax authority services and tax sanctions, with digital tax systems playing an increasingly important role (Frecknall-Hughes et al., 2023). However, existing findings remain inconsistent, particularly regarding the effectiveness of sanctions and the quality of tax authority services across different institutional contexts (Cingl et al., 2023; Santoro & Mascagni, 2023; Ariyanto et al., 2024). In addition, the moderating role of digital tax systems, such as e-filing, has not been sufficiently explored, particularly in regional MSME settings in developing countries.

Therefore, this study aims to examine the influence of tax authority services, taxpayer awareness, and tax sanctions on MSME taxpayer compliance, and to investigate the moderating role of e-filing in these relationships. Based on the theoretical framework and the empirical evidence discussed above, the following hypotheses are proposed:

- H1: Tax authority services affect MSME taxpayer compliance.*
- H2: Taxpayer awareness affects MSME taxpayer compliance.*
- H3: Tax sanctions affect MSME taxpayer compliance.*
- H4: The use of e-filing moderates the effect of tax authority services on MSME taxpayer compliance.*

H5: *The use of e-filing moderates the effect of taxpayer awareness on MSME taxpayer compliance.*

H6: *The use of e-filing moderates the effect of tax sanctions on MSME taxpayer compliance.*

2. METHOD

This study employs a quantitative research design to examine the influence of tax authority services, taxpayer awareness, and tax sanctions on MSME taxpayer compliance, with e-filing as a moderating variable in Jambi Province. The analysis uses partial least squares structural equation modeling (PLS-SEM), which is appropriate for assessing complex relationships and moderating effects in predictive research models (Henseler et al., 2016; Ringle et al., 2020). Data were collected between January and March 2025 through a self-administered questionnaire distributed to 100 MSME taxpayers in Jambi Province, Indonesia. The respondents were business owners or financial managers registered with local tax offices who are directly responsible for tax reporting and payment decisions. A convenience sampling method was applied due to accessibility considerations. The use of convenience sampling was considered appropriate due to limited access to MSME taxpayers and the exploratory nature of this study. Although this approach may limit generalizability, it is considered appropriate for behavioral compliance research where access to respondents is inherently restricted. The findings are thus interpreted within the scope of the sampled population while still providing relevant insight into MSME tax behavior in regional Indonesia. In the MSME context, tax compliance is typically not delegated to large accounting departments but handled directly by the business owner or a small internal team.

The measurement instrument was developed based on established constructs from prior studies and adapted to the MSME context. Each variable was operationalized using multiple indicators measured on a five-point Likert scale (Appendix A). The questionnaire items were adapted from validated instruments used in prior studies, ensuring content validity and reliability. The data used in this study have not been previously pub-

lished or used in another research. This study ensures that all research procedures involving human participants adhere to ethical standards. Participation was voluntary, and informed consent was obtained from all respondents prior to data collection. The anonymity and confidentiality of respondents were strictly maintained, and no personally identifiable information was collected. The data were used solely for academic purposes.

The selection of MSMEs in Jambi Province is also substantively relevant. Jambi represents a developing regional economy in Indonesia with a growing MSME base and increasing digital tax adoption. Unlike large metropolitan areas that have been extensively studied, regional provinces provide valuable insight into how tax policy, awareness, and digital systems function in less-centralized contexts. Given the government's ongoing efforts to expand digital tax administration across Indonesia, examining MSME compliance behavior in such regions offers meaningful empirical contributions.

The population consists of all registered MSME taxpayers in Jambi Province, a total of 176,051 entities. Using the convenience sampling method and the Slovin formula with a 10% margin of error ($e = 0.10$), the minimum sample size was calculated to be 100 respondents who are owners or financial managers of MSMEs registered at KPP Pratama in Jambi Province and are directly involved in tax reporting and payment decisions. A convenience sampling method was applied, selecting respondents based on accessibility and willingness to participate (Ringle et al., 2020). This group was deliberately selected because they are the primary decision-makers responsible for fulfilling tax obligations within their businesses. Using the Slovin formula with a 10% margin of error is considered acceptable for exploratory research, particularly when the objective is to examine structural relationships rather than estimate population parameters with high precision.

The measurement instrument comprised five primary constructs: tax authority services (PF), taxpayer awareness (SWP), tax sanctions (SP), taxpayer compliance (KWP), and e-filing (EF). Drawing on the theory of planned behavior and prior empirical studies, each construct was operationalized

into multiple indicators (see Table 1). For example, tax authority services were measured via indicators reflecting payment convenience, duty fulfillment, and procedural efficiency; taxpayer awareness included indicators of perceived development contributions and moral obligation; and e-filing was measured via ease, speed, and accessibility of the online reporting system. Prior to model testing, the measurement instrument underwent validity and reliability assessments.

Table 1. Variable indicator

Variable	Indicators
Fiscal service (PF)	Fiscal service provides tax services in an efficient manner Paying and settling taxes is easy and efficient
Taxpayer awareness (SWP)	Awareness in participating in the development of the country by paying taxes, delaying, and reducing tax payments
Tax sanctions (SP)	Tax sanctions, administrative sanctions (can be in the form of fines and interest), and criminal sanctions
Taxpayer compliance (KWP)	Compliance in registering with the tax office, submitting tax returns on time, and collecting and paying taxes correctly
e-filing (EF)	The speed of reporting tax returns, the ease of filling out tax returns, faster and more precise calculations, more efficient and hassle-free, and broad and flexible access

3. RESULTS

This study investigates the effect of tax authority services, taxpayer awareness, and tax sanctions on MSMEs taxpayer compliance, with e-filing included as a moderating variable. The hypothesis testing results indicate that not all proposed relationships are supported, highlighting the complexity of taxpayer compliance behavior in MSME contexts. To test these relationships, the analysis applied the PLS-SEM approach. In PLS-SEM, model evaluation consists of two major stages: assessment of the measurement model (outer model) and assessment of the structural model (inner model) (Dijkstra & Henseler, 2015; Sarstedt et al., 2022). The results of the factor loading calculations for each indicator demonstrated that all items satisfied the criteria for convergent validity, with loading values exceeding 0.70 and statistically significant *p*-values below 0.05. The detailed loading values, as calculated using WarpPLS software, are presented in Table 2.

Table 2. Loading value of each indicator

Variable	Item	Factor Loading	P value	Convergent Validity
Fiscal service (PF)	PF.1	0.601	< 0.001	Valid
	PF.2	0.809	< 0.001	Valid
	PF.3	0.663	< 0.001	Valid
	PF.4	0.644	< 0.001	Valid
	PF.5	0.632	< 0.001	Valid
Taxpayer awareness (SWP)	SWP.3	0.679	< 0.001	Valid
	SWP.4	0.703	< 0.001	Valid
	SWP.5	0.821	< 0.001	Valid
	SWP.6	0.662	< 0.001	Valid
Tax sanctions (SP)	SP.1	0.946	< 0.001	Valid
	SP.2	0.858	< 0.001	Valid
	SP.3	0.955	< 0.001	Valid
	SP.4	0.821	< 0.001	Valid
	SP.5	0.744	< 0.001	Valid
	SP.6	0.952	< 0.001	Valid
e-filing (EF)	EF.1	0.790	< 0.001	Valid
	EF.2	0.732	< 0.001	Valid
	EF.3	0.757	< 0.001	Valid
	EF.4	0.708	< 0.001	Valid
	EF.5	0.756	< 0.001	Valid
Taxpayers compliance (KWP)	KWP.1	0.846	< 0.001	Valid
	KWP.2	0.862	< 0.001	Valid
	KWP.3	0.844	< 0.001	Valid
	KWP.4	0.919	< 0.001	Valid
	KWP.5	0.910	< 0.001	Valid
	KWP.6	0.900	< 0.001	Valid
	KWP.7	0.900	< 0.001	Valid
	KWP.8	0.924	< 0.001	Valid
	KWP.9	0.900	< 0.001	Valid

Discriminant validity was further assessed to ensure that each construct was distinct from the others within the research model. This was evaluated using the average variance extracted (AVE) criterion, where values greater than 0.50 indicate that the construct explains more than half of the variance of its indicators, thereby confirming sufficient discriminant validity (Hair et al., 2021). The AVE results for all latent variables are presented in Table 3, demonstrating that the measurement model met the minimum thresholds for reliability and validity. Besides, the results of this study demonstrate that all constructs possess strong internal consistency reliability and are appropriate for inclusion in the structural model.

The evaluation of the structural model (inner model) in the partial least squares structural equation modeling (PLS-SEM) framework focuses on the model fit, R^2 values, and path coefficients (Table 4). The results of the R^2 estimation for the taxpayer

Table 3. AVE, Cronbach's alpha, composite reliability

Measurement Model Evaluation	PF	SWP	SP	EF	KWP
Cronbach's alpha	0.694	0.684	0.942	0.802	0.967
Composite reliability	0.804	0.809	0.955	0.863	0.972
Average variance extracted (AVE)	0.554	0.517	0.780	0.558	0.792

Table 4. Model fit and quality indices

Model Fit and Quality Indices	Index	P-Value	Criteria	Results
Average Path Coefficient (APC)	0.144	0.034	P < 0.05	Accepted
Average R-squared (ARS)	0.133	0.043	P < 0.05	Accepted
Average Adjusted R-squared (AARS)	0.077	0.109	P < 0.05	Accepted
Average Block VIF (AVIF)	1.086 Good if < 5	–	AVIF < 5	Accepted

compliance construct yielded a value of 0.133. This level of explanatory power may be categorized as weak in statistical terms; tax compliance behavior is shaped by multiple dimensions beyond those included in this model, and they represent only part of a broader behavioral framework. Future studies may incorporate additional socio-psychological and institutional variables to enhance predictive capacity.

Overall, the structural model assessment highlights that while the measurement model demonstrates satisfactory validity and reliability, the explanatory power of the inner model remains limited. This implies that future research should integrate additional theoretical constructs to enhance predictive capability and provide a more comprehensive understanding of taxpayer compliance behavior in the digital taxation environment.

Table 5. Hypothesis testing result

Hypothesis	Path Coefficient	P Values	Conclusion
H1	-0.189	0.025	Significant Effect
H2	0.169	0.040	Significant Effect
H3	-0.081	0.204	No Effect
H4	-0.130	0.091	No Effect
H5	0.214	0.013	Significant Effect
H6	0.082	0.201	No Effect

4. DISCUSSION

Based on statistical testing, tax authority services had a significant negative effect on taxpayer compliance (Table 5). This finding contradicts Gobena (2023) and Belahouaoui and Attak (2024), who emphasize the positive role of tax authority service quality in enhancing voluntary compliance. However, similar inconsistencies have been reported in contexts where

institutional trust is low or where service improvements are perceived as bureaucratic rather than facilitative (Molero & Pujol, 2012; Kogler et al., 2013). In this study, the negative effect may indicate that improvements in formal service delivery have not been matched by improvements in perceived usefulness or accessibility among MSMEs. Thus, this finding supports the results of Kogler et al. (2013), showing that higher levels of trust and authority power lead to increased tax compliance.

According to Kogler et al. (2013), this finding can be interpreted through the lens of the slippery slope framework, which suggests that compliance depends not only on service quality but also on trust and perceived legitimacy. When services are perceived as procedural rather than supportive, they may fail to generate trust and can even reinforce negative perceptions of the tax system. Moreover, recent studies in developing economies highlight that digital and informal support channels often substitute formal tax authority services among small businesses (Okunogbe & Pouliquen, 2022). Thus, the negative relationship may reflect a misalignment between tax designation and MSMEs' actual needs (Cingl et al., 2023). However, this finding is consistent with recent studies indicating that tax authority service quality does not always have a direct effect on taxpayer compliance, as behavioral outcomes are often mediated by system usage and user satisfaction (Cingl et al., 2023; Ariyanto et al., 2024).

Taxpayer awareness is found to have a significant positive effect on compliance, which is consistent with prior empirical and meta-analytical evidence (Kogler et al., 2013; Antinyan & Asatryan, 2020; Santoso et al., 2024). This supports the argument that awareness functions as a key internal driver of

voluntary compliance by shaping attitudes, moral norms, and perceived legitimacy. This finding is consistent with Allam et al. (2024) and Santoso et al. (2024), indicating that taxpayers in OECD countries tend to engage in higher tax compliance than those in non-OECD or emerging countries due to weaker access to financial services. From the perspective of the theory of planned behavior (TPB), awareness enhances behavioral intentions by strengthening attitudes toward compliance and internalized norms (Nurwanah et al., 2018).

The findings also align with recent studies in emerging economies showing that taxpayer awareness significantly improves compliance when taxpayers understand both procedural obligations and the societal benefits of taxation (Le et al., 2024). Therefore, this study reinforces the argument that awareness is not merely informational but also normative, influencing both cognition and motivation. In this sense, awareness helps shape a more positive attitude toward taxation and strengthens the willingness to comply voluntarily. This finding is consistent with prior studies, which emphasize the critical role of taxpayer awareness in fostering voluntary compliance (Gobena, 2023).

Statistical testing indicates that tax sanctions do not exert a significant influence on MSMEs taxpayer compliance. This finding contradicts Frecky and Waluyo (2025), who emphasize the positive role of tax sanctions in enhancing taxpayer awareness. While economic theory frames sanctions as external motivators to discourage violations, our findings show that their effectiveness may be limited under certain institutional conditions. One possible explanation lies in the marginal severity and delayed application of sanctions in practice. When administrative penalties are minor or enforcement involves protracted procedures, the taxpayer may perceive the risk and cost of sanctions as negligible. In such environments, sanctions fail to exert the psychological pressure required for deterrence, and many taxpayers may remain indifferent or dismiss the threat altogether.

The insignificant effect of tax sanctions suggests that penalties alone may not be sufficient to influence compliance behavior among MSMEs. According to Savitri and Musfaldy (2016), sanctions are perceived as distant or unlikely to be enforced consistently, thereby reducing their deterrent effect. This find-

ing is also explained by the passive delivery of sanction information, which often leads to knowledge rather than actual compliance behavior (Santoro & Mascagni, 2023). According to Blesse (2023), when taxpayers perceive that others are uncertain about tax rules and filing procedures, they tend to show lower support for tax compliance. Moreover, MSME taxpayers often face practical constraints such as limited financial capacity or administrative challenges, which may take precedence over concerns about penalties. This may explain why sanctions do not play a dominant role in shaping compliance in this context. This finding is not consistent with prior studies, which suggest that tax sanctions and penalties serve as effective deterrents in improving taxpayer compliance (Gangl et al., 2015).

The moderating role of e-filing provides nuanced insights into taxpayer behavior among MSMEs. Statistical results indicate that e-filing does not significantly strengthen the relationship between tax authority services and taxpayer compliance, suggesting that digital systems may not be sufficient to enhance the impact of service quality. This finding implies that e-filing primarily functions as a technological facilitation tool rather than a mechanism that reinforces taxpayers' perceptions of tax authority services. This is in line with Tahar et al. (2020), which shows that e-filing in Indonesia still has limitations, as its adoption still indicates a need for improvements in system quality, especially in technology readiness. When service quality is perceived as inadequate, the presence of digital platforms alone cannot compensate for these deficiencies. Empirical evidence shows that e-filing can directly improve taxpayer compliance by simplifying administrative procedures and reducing compliance costs (Veeramootoo et al., 2018; Ernest et al., 2022). However, this effect tends to operate independently and does not necessarily amplify the influence of tax authority services. In line with this, the adoption of electronic tax systems contributes to compliance mainly through improved usability and taxpayer attitudes rather than by strengthening external service factors (Night & Bananuka, 2020).

Furthermore, the effectiveness of e-filing is highly dependent on contextual factors, particularly digital literacy and technological readiness. In developing countries, digital tax systems are more effective when they complement rather than substitute trustworthy institutional interactions (Okunogbe

& Pouliquen, 2022; Belahouaoui & Attak, 2024). In contexts where digital literacy is uneven, the implementation of e-filing may introduce new barriers, thereby limiting its ability to enhance the role of tax authority services (Tahar et al., 2020). This finding is inconsistent with prior studies reporting a significant direct effect of e-filing on taxpayer compliance, as those studies primarily focus on direct relationships rather than moderating effects. However, this finding is consistent with previous research suggesting that electronic tax system adoption influences compliance through internal behavioral mechanisms rather than strengthening external service relationships (Night & Bananuka, 2020).

Digital tax system through e-filing significantly moderates the relationship between taxpayer awareness and compliance. This finding is strongly supported by the technology acceptance model (TAM), which posits that perceived usefulness and ease of use enhance the translation of intention into actual behavior. In this study, e-filing serves as an enabling mechanism that translates taxpayer awareness into actual compliance by reducing procedural complexity, minimizing transaction costs, and improving reporting efficiency. In other words, while awareness provides the cognitive and motivational foundation for compliance, the presence of an accessible digital system such as e-filing facilitates the execution of that intention into actual behavior. This result is consistent with prior studies indicating that digital tax systems enhance compliance primarily by facilitating informed taxpayers rather than coercing uninformed ones (Okunogbe & Pouliquen, 2022; Belahouaoui & Attak, 2024).

Consistently, empirical evidence supports the moderating role of e-filing in strengthening the relationship between behavioral factors and compliance (Bellon et al., 2022). The utilization of e-filing has been shown to reinforce the effect of internal determinants on taxpayer behavior, highlighting its role as a mechanism that amplifies the impact of awareness and attitudes on compliance. In addition, studies in the Indonesian context confirm that e-filing improves taxpayer compliance by simplifying reporting procedures and increasing administrative efficiency. Similarly, evidence from MSMEs suggests that the implementation of e-filing systems enhances compliance by improving taxpayers' understanding and ease in fulfilling tax obli-

gations (Rokhman et al., 2023). These findings are in line with prior research emphasizing that digital tax systems improve compliance through ease of use and accessibility (Aziz & Idris, 2014; Zaidi et al., 2017; Okunogbe & Pouliquen, 2022). Taken together, these findings indicate that awareness and digital technology function as complementary factors, where awareness drives the intention to comply, while e-filing enables and accelerates the realization of compliant behavior in practice.

However, e-filing does not moderate the relationship between tax sanctions and compliance. This indicates that digitalization does not strengthen the deterrence effect of sanctions. Consistent with deterrence theory, compliance depends not only on the presence of sanctions but also on their perceived certainty and severity (Santoso et al., 2024). Since e-filing primarily reduces procedural barriers rather than increasing enforcement intensity, its role in enhancing sanctions is limited. This finding aligns with prior studies suggesting that digital tax systems improve efficiency and simplify compliance processes but do not necessarily increase perceived enforcement pressure (Okunogbe & Pouliquen, 2022).

From a behavioral perspective, this result can be explained by the limited role of sanctions in shaping taxpayer compliance when other psychological and institutional factors are more dominant (Allam et al., 2024). The slippery slope framework emphasizes that compliance is influenced not only by coercive power but also by trust and legitimacy, indicating that sanctions alone may not be sufficient to drive compliance behavior (Kirchler et al., 2014). Empirical evidence also shows that behavioral interventions and non-coercive approaches can be more effective in improving compliance than relying solely on deterrence mechanisms (Frecky & Waluyo, 2025). These findings suggest that digital systems such as e-filing and tax sanctions operate through different mechanisms, where e-filing enhances convenience and accessibility, while sanctions rely on perceived enforcement. As a result, the interaction between the two remains weak. These findings are consistent with prior studies indicating that digital tax systems primarily enhance compliance through accessibility and efficiency rather than strengthening enforcement mechanisms (Okunogbe & Pouliquen, 2022; Night & Bananuka, 2020).

CONCLUSION

The objective of this study is to examine the influence of tax authority services, taxpayer awareness, and tax sanctions on taxpayer compliance among MSMEs in Indonesia, with e-filing as a moderating variable.

Based on the PLS-SEM approach, taxpayer awareness significantly enhances tax compliance among MSMEs. In contrast, tax authority services show a negative effect on compliance. Furthermore, tax sanctions are found to have no significant impact on MSME taxpayer compliance. The results also indicate that e-filing moderates the relationship between taxpayer awareness and compliance. These findings imply that enhancing taxpayer awareness and supporting it with digital systems can improve taxpayer compliance. Therefore, the government should prioritize providing a positive tax climate and optimizing digital platforms to encourage taxpayer compliance, while also ensuring that all taxpayers, particularly MSMEs, fulfill their tax obligations.

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APPENDIX A

Table A1. List of observed variables and statements

Variable	Statement
Tax authority services	
PF1	Tax officers always help taxpayers with difficulties.
PF2	Tax officers are quick to respond to complaints experienced by taxpayers.
PF3	Tax officers are friendly in serving taxpayers.
PF4	Tax authorities' services do not make things difficult for taxpayers.
PF5	The fiscal provides fast service to taxpayers.
Taxpayer awareness	
SWP1	I have to pay taxes because taxes are our obligation as citizens.
SWP2	Delaying tax payments can be detrimental to the state.
SWP3	Paying taxes that do not match the amount that should be paid will be very detrimental to the country.
SWP4	I am always happy to fulfill my tax obligations.
SWP5	I fulfill my tax obligations on time.
SWP6	I pay taxes of my own free will, not because of coercion from others.
Tax sanctions	
SP1	Taxpayers will be penalized if they are late in fulfilling their tax obligations.
SP2	Taxpayers are subject to sanctions if they report their taxes incorrectly.
SP3	Taxpayers are subject to administrative sanctions if they do not pay taxes.
SP4	Sanctions provide a deterrent effect for taxpayers.
SP5	Sanctions educate taxpayers to comply with the rules.
SP6	Tax sanctions are strict.
SP7	Sanctions can be imposed on taxpayers who do not pay their obligations.
e-filing	
EF1	Through e-Filing, taxpayers' tax reporting speeds are increased.
EF2	Using e-Filing makes it easier for taxpayers to complete their tax reporting.
EF3	Tax calculations via e-Filing are faster and more accurate.
EF4	Using e-Filing is more economical and less cumbersome for taxpayers.
EF5	e-Filing access is broader and more flexible for taxpayers.
Tax compliance	
Compliance of individual taxpayers in registering themselves as taxpayers	
KWP1	I registered as a taxpayer at the tax office.
KWP2	I registered as a taxpayer to obtain a Taxpayer Identification Number as my taxpayer identification.
Compliance of individual taxpayers in completing tax reporting	
KWP3	I always complete my tax reporting in accordance with applicable tax regulations.
Compliance of individual taxpayers in submitting tax reporting	
KWP4	I always report my taxes on time.
KWP5	I always submit my tax reporting to the tax office before the deadline.
Compliance of individual taxpayers in paying taxes	
KWP6	I always calculate my income tax obligations.
KWP7	I always pay my tax installments.
KWP8	I always calculate my tax debt and pay it on time.
KWP9	I always pay any tax shortfalls before an audit is conducted.