

TAX AWARENESS AND TAX SANCTIONS ON TAX COMPLIANCE OF QRIS USERS IN SAMARINDA WITH TAX SOCIALIZATION AS A MODERATING VARIABLE

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Abstrak

This study aims to analyze the effect of tax awareness and tax sanctions on the tax compliance of QRIS-using business owners in Samarinda City, and to examine the role of tax socialization as a moderating variable. A quantitative approach was used with a survey method involving 100 individual taxpayers who are Micro, Small, and Medium Enterprise (MSME) operators using QRIS, selected through purposive sampling. Data were collected using a Likert-scale questionnaire developed from the Theory of Planned Behaviour and analyzed with Partial Least Squares-based Structural Equation Modeling (SEM-PLS) using SmartPLS 4. The results show that tax awareness (coefficient 0.480; $t = 3.420$; $p = 0.001$) and tax sanctions (coefficient 0.664; $t = 8.166$; $p = 0.000$) each have a positive and significant effect on tax compliance, with tax sanctions as the most dominant predictor. Tax socialization did not significantly moderate either the effect of tax awareness (coefficient -0.320; $p = 0.661$) or tax sanctions (coefficient 0.051; $p = 0.480$) on tax compliance. The model explains 95.8% of the variance in tax compliance, a very strong result that is acknowledged as unusually high for social-science research and is discussed as a methodological limitation. These findings suggest that the compliance of QRIS users is shaped more by internal awareness and the deterrent effect embedded in QRIS's automatic transaction trail than by the intensity of conventional socialization. This study recommends that tax authorities shift tax socialization away from conventional formats toward embedded digital nudges delivered directly through QRIS payment-gateway applications, alongside consistent and risk-based enforcement of sanctions

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INTRODUCTION

The development of information technology in the digital era has driven a shift in economic transaction patterns from conventional systems to electronic-based commerce (e-commerce). The number of national e-commerce users reached 58.63 million in 2023 and is projected to increase to 99.1 million by 2029 [1]. This transformation is also evident at the regional level, including East Kalimantan Province, reflected in the rapid growth of Quick Response Code Indonesian Standard (QRIS) usage. In Q1 of 2024, the number of QRIS users in East Kalimantan reached 744,469 people, or grew by more than 70%, with a total of 501,456 merchants, an increase of about 36% each year, and a transaction value through the end of 2024 exceeding IDR 520 trillion from around 70 million transactions [2].

Samarinda City is the largest contributor, with around 205,000 merchants, or about 25% of the total QRIS merchants in East Kalimantan. In January 2025, QRIS transactions

in Samarinda even saw a surge of up to 232%, reaching 3.4 million transactions worth IDR 457 billion [3]. This significant increase indicates that e-commerce activity in Samarinda is growing massively, both in terms of the number of business actors and transaction volume. However, this high level of digital transaction activity does not necessarily align with the tax compliance of QRIS-using business actors, since to date there is no public data showing that the increase in QRIS transactions in Samarinda has been accompanied by a proportional increase in tax compliance. This condition raises questions about the factors that affect tax compliance among QRIS users in the region, so a theoretical approach is needed to explain that behavior.

Tax compliance behavior can be explained through the Theory of Planned Behavior (TPB), which states that individual behavior is influenced by intention formed from attitude, subjective norms, and perceived behavioral control [4]. In taxation, compliance is an actual behavior influenced by these three constructs, so tax awareness can be seen as a reflection of taxpayers' positive attitude, while tax sanctions relate to perceived behavioral control because perceptions of the threat of punishment also affect the decision to comply. Beyond internal factors, deterrence theory explains that individuals weigh benefits and risks before making a decision, including a tax compliance decision, so that firm sanctions function as a law-enforcement instrument that produces a deterrent effect [5]. Previous studies show that tax awareness has a significant effect on the tax compliance of MSME taxpayers using digital platforms [6], although other findings show that tax sanctions do not always have a significant effect on MSME compliance [7], indicating the need for a moderating variable to explain this dynamic.

The dominant behavioral role of coercive instruments observed in digital settings can be further explained through the concept of digital transparency and the audit trail inherent in the QRIS ecosystem. Unlike cash transactions, every QRIS transaction generates a real-time, system-recorded digital footprint that is directly accessible to payment service providers and, potentially, tax authorities. This digital footprint increases taxpayers' perceived probability of audit, which under deterrence theory amplifies the deterrent effect of sanctions well beyond what is typically observed in conventional, cash-based settings [5]. In other words, the digital architecture of QRIS itself functions as an implicit enforcement mechanism that reinforces the behavioral impact of formal sanctions, providing a stronger theoretical basis for why tax sanctions can be expected to emerge as the most dominant predictor of compliance among digital business operators.

Tax socialization is a relevant factor to consider as a moderating variable. Within the TPB framework, socialization relates to the formation of subjective norms, because socialization builds the perception that paying taxes is a social obligation. The positioning of tax socialization as a moderating rather than a direct antecedent or mediating variable is grounded in a contingency, interactionist reading of TPB, in which the strength of the relationship between an internal driver (attitude/awareness) or a coercive driver (perceived behavioral control/sanctions) and actual compliant behavior is theorized to depend on a third, boundary-defining condition. Under this perspective, socialization is not modeled as an independent generator of compliance intention, but as a contextual condition that may strengthen or weaken the extent to which awareness and sanctions are translated into compliant behavior justifying its treatment as a moderator of the awareness-compliance and sanction-compliance paths rather than as a separate direct predictor or an intervening mechanism. Previous research shows that tax socialization can moderate the influence of awareness and sanctions on taxpayer

compliance [8], while another study instead found that tax socialization has a negative effect on the compliance of individual taxpayers [9]. This inconsistency indicates that the role of tax socialization as a moderator still requires further testing, especially in the context of taxpayers who transact through digital payment systems that are inherently more transparent and documented.

Bank Indonesia data shows that, nationally, the composition of QRIS merchants is dominated by MSME players, amounting to 93.01% up to mid-2025 (micro enterprises 57.52%, small enterprises 29.59%, medium enterprises 5.89%), while the remaining 3.37% comes from the large business sector [10]. This proportion underscores the relevance of MSMEs as the main unit of analysis in research on tax compliance of QRIS users. Although various studies have examined the relationship between awareness, sanctions, and tax compliance, most have been conducted in the MSME sector in general and have not specifically studied QRIS-using taxpayers in Samarinda City, while the role of tax socialization as a moderating variable still shows varied results. Therefore, this research aims to: (1) analyze the effect of tax awareness on tax compliance of QRIS-using business actors; (2) analyze the effect of tax sanctions on tax compliance of QRIS-using business actors; (3) analyze the role of tax socialization in moderating the effect of tax awareness on tax compliance of QRIS-using business actors; and (4) analyze the role of tax socialization in moderating the effect of tax sanctions on tax compliance of QRIS-using business actors, thereby filling the research gap in the digital economic context in Samarinda City.

RESEARCH METHOD

This study uses a quantitative approach with a hypothesis-testing design to analyze the relationships among variables. The data source is primary data collected through a five-point Likert-scale questionnaire distributed to respondents meeting the research criteria. The population of this study is individual taxpayers who are Micro, Small, and Medium Enterprise (MSME) operators using QRIS as a payment method for their business activities in Samarinda City, with the population estimate referring to approximately 205,000 active QRIS merchants in the city [2], [10]. The sampling technique uses non-probability sampling with the purposive sampling method, applying the following criteria: (1) individual taxpayers who have an NPWP (Taxpayer Identification Number) and are registered with KPP Pratama Samarinda; (2) business actors who use QRIS as a payment method; (3) operators who earn income from business activities either digitally or through a combination of digital and conventional means; and (4) operators classified as MSMEs based on the turnover/asset criteria under Law No. 20 of 2008 on MSMEs.

Because this study relies on non-probability purposive sampling, sample adequacy was not determined using the classical Slovin formula, which is derived under simple random sampling assumptions and is therefore not statistically appropriate for a purposive sampling design. Instead, sample size adequacy was assessed using the ten-times rule commonly applied in PLS-SEM research, under which the minimum sample size should be at least ten times the largest number of structural paths directed at any single construct in the model [11]. In this study, the endogenous construct Taxpayer Compliance (Y) receives four structural paths (two direct effects and two moderation/interaction effects), implying a minimum required sample of 40 respondents. Because moderation tests generally require greater statistical power than main-effect-only models, sample adequacy was additionally cross-checked against

conventional a priori power benchmarks for detecting a medium interaction effect size ($f^2 = 0.15$) at a significance level of $\alpha = 0.05$ and a power of 0.80, which under standard power tables for multiple-predictor models corresponds to a minimum sample of approximately 70-80 respondents [23]. The final sample of 100 respondents therefore exceeds both the ten-times rule and the power-based minimum requirement, reducing the risk of Type II error in the moderation tests (H3 and H4). All 100 distributed questionnaires were returned and could be processed.

This study uses four variables: two independent variables, Tax Awareness (X1) and Tax Sanctions (X2); one moderating variable, Tax Socialization (Z); and one dependent variable, Taxpayer Compliance (Y). Taxpayer compliance is measured using five indicators adapted from Herlina (2016) and adjusted to the QRIS context, including timely payment, the appropriateness of reporting relative to actual turnover, the absence of arrears, willingness to disclose transaction data, and awareness that digitally recorded transactions must still be reported. Tax awareness is measured using seven indicators adapted from Cahyidi (2021), including understanding of the tax object, willingness to pay as a contribution, and motivation for voluntary reporting. Tax sanctions are measured using indicators adapted from Asih (2020), including the firmness of the sanctions, the appropriateness of the sanctions relative to the violations, and the consistency of applying the sanctions in accordance with regulations. Tax socialization is measured using indicators adapted from Indriyani & Jayanto (2020), covering the implementation of socialization, socialization media, and the perceived benefits of socialization; the socialization-media indicator already includes an item capturing the role of social media and the internet in facilitating access to tax information, providing partial coverage of the digital dimension of socialization, although the instrument does not further differentiate specific digital channels such as in-app payment-provider notifications or e-Filing/e-Bupot tutorials. This represents a refinement recommended for future instrument development, as discussed in the Conclusion.

Data analysis uses the Partial Least Square (SEM-PLS)-based Structural Equation Modeling method with the help of the SmartPLS 4 application [11]. This method was chosen because it does not require normally distributed data, can be used with relatively small sample sizes, and is able to test relationships among latent variables, including moderation effects through the formation of interaction variables. Evaluation of the measurement model (outer model) is carried out through tests of convergent validity (outer loading ≥ 0.70 and Average Variance Extracted/AVE > 0.50), discriminant validity (cross-loading method), and reliability (Cronbach's Alpha and Composite Reliability > 0.70). Evaluation of the structural model (inner model) is carried out through the R-Square value to measure the model's predictive power, as well as hypothesis testing through path coefficients, t-statistics (significant if > 1.96), and p-values (significant if < 0.05) using bootstrapping procedures.

RESULTS AND DISCUSSION

Respondent Characteristics

All 100 distributed questionnaires were returned and could be processed (100% response rate). All respondents reside and run their businesses in Samarinda City, hold a Taxpayer Identification Number (NPWP), and the majority have been running their businesses for more than one year, so the respondents are considered to have sufficient

business experience to understand the tax obligations attached to their business activities.

Table 1. Mean Scores of Research Variables

Variable	Number of Indicators	Mean	Category
Tax Awareness (X1)	7	4.14	High
Tax Sanctions (X2)	6	4.12	High
Tax Socialization (Z)	7	4.13	High
Taxpayer Compliance (Y)	10	4.16	High

Source: Processed data (2026)

Measurement Model Evaluation (Outer Model)

The convergent validity test showed that all indicators for the four variables had outer loadings ranging from 0.821 to 0.912, meaning all values exceeded the 0.70 threshold. The Average Variance Extracted (AVE) values for each construct are also above 0.50, namely Tax Compliance (0.755), Tax Awareness (0.762), Tax Sanctions (0.746), and Tax Socialization (0.765), so all indicators are deemed to have convergent validity. A discriminant validity test using the cross-loading method showed that each indicator had the highest loading value on the construct it measured compared to other constructs, meaning the measurement model meets the criteria for discriminant validity.

Table 2. Summary of Construct Validity and Reliability

Construct	Outer Loading	AVE	Cronbach's Alpha	Composite Reliability
Tax Compliance (Y)	0.821-0.909	0.755	0.964	0.969
Tax Awareness (X1)	0.851-0.891	0.762	0.948	0.957
Tax Sanctions (X2)	0.857-0.912	0.746	0.943	0.954
Tax Socialization (Z)	0.842-0.888	0.765	0.938	0.951

Source: Processed data (2026)

The reliability test showed that all constructs had Cronbach's Alpha and Composite Reliability values above 0.70 (Table 2), so all instruments were deemed reliable and consistent in measuring their respective constructs.

Structural Model Evaluation (Inner Model) and Hypothesis Testing

The results of the structural model testing showed an R-Square value of 0.958 and an Adjusted R-Square of 0.956, meaning that the variables Tax Awareness, Tax Sanctions, and the moderating interaction of Tax Socialization in the model were able to explain 95.8% of the variation in Taxpayer Compliance, while the remaining 4.2% was influenced by other factors outside the model. This value indicates that the model has very strong (substantial) explanatory power.

Table 3. Hypothesis Testing Results

Hypothesis	Path Coefficient	t-statistics	p-values	Notes
H1: Tax Awareness → Tax Compliance	0.480	3.420	0.001	Accepted
H2: Tax Sanctions → Tax Compliance	0.664	8.166	0.000	Accepted
H3: Socialization x Tax Awareness → Tax Compliance	-0.320	0.439	0.661	Rejected
H4: Socialization x Tax Sanctions → Tax Compliance	0.051	0.072	0.480	Rejected

Compliance

Source: Processed data (2026)

The results of the first hypothesis test indicate that tax awareness has a positive and significant effect on tax compliance among QRIS users in Samarinda City (coefficient 0.480; $t = 3.420 > 1.96$; $p = 0.001 < 0.05$), thus H1 is accepted. This finding aligns with the Theory of Planned Behavior, in which tax awareness reflects taxpayers' positive attitudes that shape their intention to voluntarily comply [4]. Taxpayers with high tax awareness tend to view taxes as a tangible contribution to development rather than merely a burden, and are thus motivated to report their income honestly even though QRIS transactions are already transparently recorded. These results are consistent with research on MSME operators using e-commerce platforms in West Java [6] as well as among e-commerce business owners, which showed that tax knowledge and awareness positively influence compliance [12].

The results of the second hypothesis test indicate that tax sanctions have a positive and significant effect on taxpayer compliance (coefficient 0.664; $t = 8.166$; $p = 0.000 < 0.05$), so H2 is accepted, with the highest path coefficient among all independent variables in the model. This finding is explained by deterrence theory, which states that rational individuals will avoid behavior that carries the risk of punishment if their perception of the likelihood of detection and the severity of sanctions is high [5]. The characteristics of QRIS transactions which are recorded automatically and in real time increase the probability of detecting non-compliance compared to cash transactions, thereby strengthening the deterrent effect of tax sanctions, consistent with the digital audit-trail argument developed earlier in this paper. These results are consistent with research demonstrating that the perceived severity of sanctions is more effective at promoting compliance than positive incentives alone among digital-based businesses [13].

The results of the tests for the third and fourth hypotheses show that tax socialization was not found to moderate either the effect of tax awareness (coefficient -0.320; $t = 0.439$; $p = 0.661 > 0.05$, H3 rejected) or the effect of tax sanctions (coefficient 0.051; $t = 0.072$; $p = 0.480 > 0.05$, H4 rejected) on taxpayer compliance. Both interaction coefficients are considerably smaller than the direct effects of tax awareness (0.480) and sanctions (0.664), indicating that compliance in this study is shaped more by internal cognitive factors and external coercive factors that act directly, rather than by reinforcement from socialization. Within the TPB framework, when tax awareness as an internal factor and the deterrent effect of sanctions are already at a strong level, socialization as an external stimulus no longer provides a significant additional boost to the intention to comply, consistent with the concept of information saturation.

This lack of moderating effect can also be interpreted through the lens of information overload and digital fatigue commonly experienced by MSME operators, who are simultaneously exposed to a high volume of digital communication ranging from marketing promotions and platform notifications to regulatory updates delivered through the very devices and applications used for their daily business transactions. Under conditions of information overload, additional tax-related messaging, regardless of its formal socialization value, is more likely to be filtered out or treated as low-priority noise rather than cognitively processed into reinforced compliance intention, which may further explain why the interaction effects of socialization on both the awareness-compliance and sanction-compliance paths remain statistically negligible in this study. This justification is supported by the profile of the respondents, who are

business owners using QRIS a relatively digitally literate segment that already has independent access to tax information through various digital channels, making formal socialization from tax authorities no longer a strongly differentiating factor.

These findings are also consistent with recent developments in Indonesia's tax policy architecture. The Harmonization of Tax Regulations Law (UU HPP) [19] explicitly embraces the principle of *ultimum remedium*, whereby administrative and coercive instruments rather than persuasive outreach alone are positioned as the primary mechanism for securing compliance, with criminal sanctions reserved as a last resort. Likewise, the integration of the National Identification Number (NIK) with the Taxpayer Identification Number (NPWP) mandated under Minister of Finance Regulation No. 112/PMK.03/2022 [22] further strengthens the state's administrative capacity to trace and enforce compliance directly through identity-based data integration, rather than relying primarily on socialization efforts. This finding differs from research showing that tax socialization positively moderates the influence of awareness and sanctions on individual taxpayers' compliance in contexts where information on sanctions had not yet been widely disseminated [8], but aligns with findings that tax socialization can negatively affect individual taxpayers' compliance under certain conditions [9], underscoring that the moderating effect of socialization is highly dependent on the context and characteristics of the respondents studied.

In general, these findings confirm that within the QRIS-based digital payment ecosystem, taxpayer compliance is primarily shaped by a combination of internal awareness and the direct deterrent effect of sanctions reinforced by QRIS's digital audit trail and Indonesia's coercive, data-integration-based tax policy direction rather than by the intensity of formal socialization, consistent with evidence that digital literacy and trust also influence tax compliance among platform-based taxpayers [14], and that the effectiveness of digital outreach heavily depends on the level of awareness taxpayers already possess [15].

CONCLUSION

Based on the results of this study on the influence of tax awareness and tax sanctions on the tax compliance of QRIS users in Samarinda City, with tax socialization as a moderating variable, it can be concluded that tax awareness and tax sanctions each have a positive and significant effect on tax compliance, with tax sanctions being the most dominant predictor. Conversely, tax socialization was not found to moderate the influence of either tax awareness or tax sanctions on taxpayer compliance, indicating that, among digital business operators, compliance is shaped more by direct internal and coercive factors than by the intensity of formal socialization. The research model explains 95.8% of the variation in taxpayer compliance, demonstrating very strong explanatory power.

METHODOLOGICAL LIMITATIONS

This study is subject to several methodological limitations that should be considered when interpreting its findings. First, the data were collected using a cross-sectional design, capturing taxpayer perceptions and compliance behavior at a single point in time, which precludes causal or longitudinal inference among the studied variables. Second, the use of non-probability purposive sampling, while appropriate for reaching the specific population of QRIS-using MSME taxpayers, limits the statistical generalizability of the findings to the broader population of taxpayers in Samarinda City

or beyond. Third, all data were collected through a self-reported Likert-scale questionnaire from a single respondent per business, and this study did not carry out supplementary diagnostic tests such as the Variance Inflation Factor (VIF) or Harman's single-factor test, so the possibility of multicollinearity among predictor constructs or common method bias (CMB) cannot be ruled out. Finally, the unusually high R-Square value (0.958) obtained in this study should therefore be interpreted with appropriate caution, as such explanatory strength is uncommon in behavioral and social-science research and may partly reflect the relatively homogeneous and digitally literate character of the sampled respondents rather than a universally generalizable relationship. Future replications of this model are strongly encouraged to incorporate VIF and common-method-bias diagnostics to further validate this explanatory strength.

Recommendations

Future research is encouraged to employ a longitudinal or panel design to better capture the dynamics of taxpayer compliance over time, to apply probability-based sampling frames where feasible, and to extend the model to other cities or regions with varying levels of digital payment adoption. Future studies may also test tax socialization as a direct antecedent or mediating variable, in addition to its role as a moderator, to more comprehensively capture its behavioral function.

For policy and practice, this study offers two operational recommendations for the Directorate General of Taxes and KPP Pratama Samarinda, moving beyond generic calls for more segmented socialization. First, tax authorities are encouraged to collaborate with QRIS Payment Service Providers (Penyelenggara Jasa Pembayaran/PJP) to implement automated, in-app tax notifications and reminders embedded directly within the QRIS payment-gateway ecosystem, replacing or complementing conventional seminar- and print-based socialization with contextual digital nudges delivered at the point of transaction. Second, QRIS transaction data given its transparent and real-time character should be further optimized as an input for risk-based supervision through a Compliance Risk Management (CRM) framework, enabling tax authorities to prioritize audit and enforcement resources toward taxpayer segments with the highest indicated non-compliance risk. Both recommendations are consistent with the ultimum remedium principle and the data-integration direction embraced under the UU HPP and the NIK-NPWP integration policy [19], [22].

Statement on the Use of Artificial Intelligence

AI was used in the preparation of this manuscript. The authors used artificial intelligence tools solely to assist with language improvement, grammar checking, and editing for clarity and readability. The authors remain fully responsible for the accuracy, originality, integrity, and academic content of the manuscript. All AI-assisted content was reviewed and verified by the authors before submission.

Conflicts of Interest

The authors declare no conflict of interest.

Author Contributions

Conceptualization, E.O.S.; methodology, E.O.S.; formal analysis, E.O.S.; investigation, E.O.S.; data curation, E.O.S.; writing original draft preparation, E.O.S.; writing review and editing, E.O.S. and I.; visualization, E.O.S.; supervision, I.; validation, I. Irwansyah acted as the thesis supervisor, providing overall research direction, methodological guidance,

and critical suggestions throughout the study and manuscript preparation. All authors have read and agreed to the published version of the manuscript.

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