International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Resolving Micro Enterprise Bookkeeping Deficiencies Via QRIS Implementation: An Empirical SEM-PLS Assessment Using TAM

Budi Al Amin[1], Sumaryanto[2], Heribertus Ary Setyadi[3]

[1,3]Lecture, Department of Engineering and Informatics, Universitas Bina Sarana Informatika, Indonesia.
[2]Lecture, Department of Economy and Business, Universitas Slamet Riyadi, Indonesia.

Abstract

Traditional MSMEs face structural financial vulnerabilities due to poor bookkeeping and intermingled funds. Grounded in the Technology Acceptance Model (TAM), this quantitative causal associative study evaluates how QRIS efficiency and effectiveness upgrade internal micro-financial governance. Primary data were collected via structured questionnaires from 32 active MSME operators selected through purposive sampling, and analyzed using variance-based SEM-PLS via SmartPLS. The novelty lies in reframing financial technology from a retail medium to an internal digital intervention for administrative weaknesses. Findings demonstrate that QRIS efficiency (β = 0.382, T = 2.419, p = 0.016) and effectiveness (β = 0.500, T = 3.371, p = 0.001) exert positive, significant direct effects on financial management quality, explaining 67.4% of the total variance (R2 = 0.674). Efficiency shortens cash reconciliation time, while effectiveness drives bookkeeping automation and fund segregation. This study expands TAM into firm governance and aids regulators in optimizing digital literacy mentoring for micro merchants.

Keywords: Financial Management, MSMEs, QRIS, SEM-PLS, TAM.

INTRODUCTION

Predicated upon a contemporary landscape characterized by pervasive economic digitalization, the systematic structural transformation of financial payment mechanisms serves as a critically vital catalyst for accelerating financial inclusion pathways among MSMEs within emerging market economies, most notably exemplified by Indonesia (Badjeber et al., 2026). The institutional implementation and deployment of the Quick Response Code Indonesian Standard (QRIS) framework constitutes a monumental, highly disruptive milestone within the broader domain of QR Code centric cashless

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

innovations and electronic payment paradigms (Aryowiloto et al., 2024). Furthermore, empirical observations of the 2021–2025 historical epoch exhibit an exponential proliferation of QRIS technological integration across highly heterogeneous, multi sectoral MSME landscapes in Indonesia, thereby signaling a profound and permanent paradigmatic transition toward socially inclusive and operationally optimized transactional ecosystems (Chyntia et al., 2025). Evaluated from a macroeconomic standpoint, these deeply digitalized transaction networks successfully construct the fundamental infrastructural cornerstone underpinning future economic systems, substantively amplifying transaction processing efficiency, augmenting corporate operational transparency, and sharpening the strategic market positioning of enterprise level firms operating within the hyper competitive contemporary digital topography (Syafaa et al., 2026).

Nonetheless, the institutional deployment of the QRIS platform across the heterogeneous MSME landscape does not inherently or spontaneously guarantee a seamless, triumphant assimilation into the contemporary digital economy (Humayroh et al., 2024). A multitude of profound structural vulnerabilities remain conspicuously evident, primarily manifested in deficient human capital preparedness, constrained financial literacy, and acute operational inconsistencies regarding digital system utilization frameworks (Nurohim et al., 2026). Fauziah et al., (2025) explicitly substantiated in their empirical inquiry that notwithstanding the capacity of QRIS to fulfill fundamental functional performance and convenience benchmarks, the baseline digital literacy among MSME proprietors remains critically suboptimal and highly fragmented. Furthermore, the scholarship of Sutrisno & Nainggolan, (2025) accentuates that deeply ingrained conventional financial behaviors and socio psychological readiness function as significant behavioral constraints, thereby postulating that top down technological interventions are structurally inadequate in the absence of concurrent, grassroots behavioral adaptations. Consequently, this socio technical phenomenon underscores a profound structural divergence between macro level digital advancement policies and the micro level operational capacities inherent within these small business enterprises.

Accordingly, this empirical inquiry is epistemologically calibrated and designed to effectively bridge the contemporary scholarly lacuna persisting within extant financial technology, micro enterprise economics, and digital commerce literature. The fundamental novelty of this scientific investigation is firmly anchored upon its critical, paradigm shifting re-conceptualization of digital payment architecture; rather than conventionalizing QRIS usage efficiency and transacting effectiveness merely as peripheral operational facilities or exogenous sales driving instruments, this theoretical framework operationalizes them as endogenous, active digital intervention mechanisms explicitly engineered to structurally optimize the real time quality, precision, and systemic

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

discipline of MSMEs' micro financial management frameworks. Furthermore, the strategic designation of Ngringo, Jaten within the Karanganyar Regency as the empirical research locus provides a highly idiosyncratic, rich, and compelling analytical environment. To ground these operational propositions into a rigorous scientific structure, the subsequent section establishes the underlying theoretical boundaries, reviews the contemporary empirical milestones, and systematically derives the research hypotheses.

LITERATURE REVIEW

Review of Extant Literature

Extant scholarly literature has comprehensively operationalized and investigated the systemic implementation paradigms and multi faceted socioeconomic impacts of the QRIS within the matrix of the contemporary digitalized economy, thereby deploying a highly diversified array of analytical frameworks and heterogeneous empirical subjects. A prominent empirical inquiry scrutinizing the dynamics of QRIS structural efficiency was executed by Angelicia et al., (2024). By utilizing a rigorous quantitative multiple linear regression methodology over an empirical cohort comprising 100 MSME units within the Pontianak municipality, the investigators demonstrated that both strategic QRIS integration and standardized user satisfaction index thresholds function as statistically significant catalysts for accelerating organizational revenue streams. Conversely, separate analytical variables specifically technological literacy indices, operational convenience parameters, and transactional service fee structures yielded no statistically significant partial effects on cumulative merchant turnover. This empirical derivation decisively validates the core theoretical tenets of TAM, effectively substantiating the critical, predictive roles of perceived usefulness and perceived ease of use in maximizing corporate profitability metrics. Complementing this quantitative paradigm, the underlying dimension of transactional effectiveness was meticulously scrutinized by Ramadhan & Afandi, (2025) via an inductive qualitative case study methodology, focusing their investigation explicitly on an artisanal coffee enterprise designated as Circle Coffee Medan. Their qualitative case documentation conclusively established that the QRIS architecture constitutes a highly efficacious transactional mechanism, an outcome robustly reinforced by an active contemporary demographic shift wherein consumer cohorts overwhelmingly favor QRIS digital modalities over conventional physical fiat currency. Nevertheless, the researchers crucially accentuated that deep seated technical impediments most notably unstable network infrastructure connectivity and a pervasive deficiency in sustained grassroots digital literacy socialization continue to impose pronounced operational constraints within the micro enterprise topography.

Positioned within a concurrent chronological trajectory, the empirical investigation conducted by Zalukhu & Sembiring, (2025) redirected the analytical lens toward the

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Sukabumi municipal topography by meticulously modeling the direct, multi faceted causal configurations of QRIS adoption parameters on consumer purchasing dynamics utilizing Partial Least Squares Structural Equation Modeling (PLS-SEM). Supported by a robust empirical dataset aggregating 400 individual respondents, the derived structural pathways conclusively demonstrated that perceived usefulness, evaluative attitudinal frameworks, and prospective behavioral intentions function as highly potent, statistically significant predictors of final purchasing decisions, thereby establishing that behavioral intention operates as the primary psychological mechanism driving actualized transacting modalities. Advancing this academic dialogue through a highly innovative synthesis, Sabrina et al., (2026) executed a distinct evaluation by intersecting conventional TAM dimensions with the macro level payment system efficiency benchmarks established by the Bank for International Settlements (BIS) to analyze a demographic cohort of Generation Z consumers within the Medan metropolitan area. Their rigorous quantitative methodology, encompassing 100 youth participants, empirically established that the regional QRIS ecosystem exhibits a moderate cumulative efficiency quotient of 79.85%. Although the platform's digital architecture registered superior performance thresholds regarding transaction throughput velocity at 83.4% and ergonomic interface navigation at 83.6%, the empirical synthesis deduces that structural cost transparency and holistic platform dependability remain fundamentally contingent upon the systemic, institutional optimization of regional telecommunication networks and infrastructural stability.

However a pronounced theoretical lacuna persists, prior scholarship predominantly evaluates QRIS through exogenous consumer trajectories or immediate gross sales turnover. This study bridges the gap by evaluating how supply side technological acceptance parameters act as internal governance controllers to mitigate chronic bookkeeping deficiencies.

Hypothesis Development

When micro enterprises perceive a cashless payment platform as intuitive, friction free, and requiring minimal technical literacy, it significantly lowers psychological resistance and minimizes the administrative labor hours historically lost to manual, error prone bookkeeping. Integrated digital scanning features shorten daily cash reconciliation from several hours to mere seconds while eliminating manual arithmetic oversights. This structural operational relief allows operators to bypass administrative bottlenecks and redirect managerial focus toward proactive liquidity forecasting and working capital optimization. Thus, higher efficiency directly upgrades the quality and clarity of micro financial governance. H1: QRIS Usage Efficiency (X1) exerts a positive and statistically significant direct effect on MSME Financial Management (Y).

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

The structural assimilation of effective payment technology operates fundamentally as an endogenous, automated ledger that intrinsically fortifies transactional transparency and mathematical precision within the corporate ledger. By comprehensively neutralizing operational vulnerabilities inherent to cash laden environments such as capital leakage, unrecorded transaction receipts, and currency conversion mistakes QRIS endows merchants with an insulated, real time digital statement. Furthermore, it empowers conventional merchants to fluidly absorb dynamic market trajectories driven by tech-savvy consumers, optimizing granular liquidity tracking and systematically curtailing the co-mingling of household expenditures with corporate capital. Therefore, platform utility acts as a profound administrative catalyst for structural discipline. H2: QRIS Usage Effectiveness (X2) exerts a positive and statistically significant direct effect on MSME Financial Management (Y).

RESEARCH METHOD

This research employs a quantitative approach with a causal associative research design. This specific design is implemented to examine and analyze the causal effects of the independent variables namely, QRIS Usage Efficiency (X1) and QRIS Usage Effectiveness (X2) on the dependent variable, which is MSME Financial Management (Y). The conceptual framework of this study integrates the constructs of TAM, wherein the dimension of efficiency operationalizes perceived ease of use, and the dimension of effectiveness operationalizes perceived usefulness. The choice of TAM as the theoretical foundation is driven by its exceptional empirical robustness and parsimony in predicting user acceptance toward technological innovations (Latif et al., 2025). Structurally, TAM offers a powerful predictive capability by isolating internal psychological perceptions convenience and utility as the primary drivers that translate technological adoption into actual operational improvements (Rohmah et al., 2025). By leveraging these validated constructs, this study extends the traditional boundaries of TAM, transitioning its focus from merely assessing technology acceptance to evaluating its practical implications on strengthening internal firm governance and financial quality (Lee et al., 2025).

The target population designated for this empirical investigation encompasses the entire universe of active and formally registered Micro, Small, and Medium Enterprises (MSMEs) operating within the administrative boundaries of Ngringo, Jaten, Karanganyar Regency, which statistically aggregates to a total of 174 distinct business units. To establish an empirically justifiable representative sample size from this finite population, the mathematical parameters of the Slovin Formula were rigidly applied. Under a specified margin of error (tolerance level) of 15%, the computational derivation yielded a definitive minimum sample requirement of 32 individual MSME operators. Furthermore, to ensure that the gathered data yields specialized insights aligned with the research core

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

objectives, a non probability purposive sampling technique was strategically deployed. The selection process was tightly governed by a set of predefined sample inclusion criteria, detailed as follows:

1. Enterprise Scale and Location Constraints: The business entity must be fundamentally categorized under the micro, small, or medium enterprise classification, with its primary physical or operational base strictly situated within the jurisdiction of Ngringo, Karanganyar.
2. Technological Maturity and Duration: The respective business operator must have systematically adopted, integrated, and continuously utilized the Quick Response Code Indonesian Standard (QRIS) cashless payment framework as a core transactional medium within their daily business operations for a minimum uninterrupted duration of three months.

The rigorous elicitation of empirical primary data was systematically executed through the manual hand delivery and direct, face to face distribution of highly structured questionnaires among the designated targeted respondents within the specified research universe. To ensure psychometric measurement precision and minimize response variance, each operational statement embedded within the standardized survey instrument was quantified using a traditional 5 point Likert Scale architecture. This psychometric scale was explicitly anchored from a minimum ordinal score of 1 (denoting Strongly Disagree) to a maximum ceiling score of 5 (denoting Strongly Agree), thereby incorporating an equidistant neutral vector at score 3. For the explicit purpose of establishing a robustly coherent and systematic conceptual framework, the methodological translation of abstract theoretical constructs into their respective empirical variables and concrete operational indicators is comprehensively synthesized and explicitly summarized in Table 1.

Table 1. Operational Variables and Indicators Matrix

Variable	TAM Construct	Empirical Indicators	Scale
QRIS Efficiency (X1)	Perceived Ease of Use	1. Financial transaction processing speed. 2. Ease of system setup and operation. 3. Shorter daily cash reconciliation time. 4. Minimal daily operational labor.	Likert 1–5
QRIS Effectiveness (X2)	Perceived Usefulness	1. Automated cash inflow recording. 2. Nominal value accuracy (error free cash change). 3. Capturing student transaction preferences.	Likert 1–5

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

		4. Improved transaction history transparency.	
MSME Financial Management (Y)	Micro Financial Management	1. Regular monthly cash flow tracking. 2. Segregation of personal and business cash accounts. 3. Accurate net profit and loss evaluation.	Likert 1–5

The statistical computational architecture for data analysis in this inquiry systematically operationalizes the SEM-PLS methodology executed via the SmartPLS software application environment. The methodological selection of the SEM-PLS framework is fundamentally predicated upon its exceptional empirical robustness in generating reliable estimations for structural networks derived from restricted, small scale sample size matrices (n = 32), while simultaneously circumventing the necessity for stringent, classic data normality distribution benchmarks (Prasetyo et al., 2024). Structurally, SEM-PLS yields distinct epistemological and mathematical benefits compared to conventional covariance based structural equation modeling (CB-SEM) typologies (Sarstedt & Liu, 2024). Being a variance based causal modeling architecture, it exhibits superior statistical power and demonstrates high adaptability when parsing exploratory, predictive structural designs that contain an elevated degree of multi layered construct complexity (Guenther et al., 2023). Crucially, the definitive mathematical strength undergirding the SEM-PLS algorithm rests upon its optimization capability to maximize the explained variance of the targeted endogenous latent variables while functioning under a strictly non parametric distribution framework (Zhang, 2026). Consequently, this robust estimation technique guarantees highly stable path coefficients and vector estimations even when manipulating highly skewed or heavily non normal empirical distributions. The definitive causal linkages and path pathways interconnecting the latent constructs within this structural model are explicitly diagrammed in Figure 1.

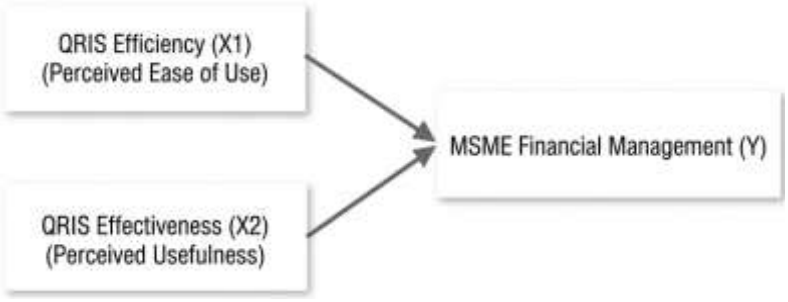


Figure 1. Conceptual Framework of the Research

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Figure 1 represents the causal associative path analysis formulated to evaluate the implications of digital payment adoption on firm governance. The structural model hypothesizes a concurrent direct relationship where both QRIS Efficiency (X1) and QRIS Effectiveness (X2) serve as critical exogenous predictors that dictate the variance of the endogenous variable, MSME Financial Management (Y). Mechanistically, the pathway is grounded upon the core configurations of TAM. Within this operational scope, efficiency serves as the empirical proxy for perceived ease of use, focusing on system simplicity and operational timesaving. Concurrently, effectiveness acts as the proxy for perceived usefulness, emphasizing the strategic benefits of transaction tracking, data accuracy, and consumer adaptation. The model seeks to empirically verify how these dual dimensions of technology acceptance drive the rationalization and strategic financial choice optimization of small enterprise operators. The evaluation of the research model consists of two essential phases:

1. Measurement Model Evaluation (Outer Model)

This step tests the validity and reliability of the research instrument using three key parameters:

a. Convergent Validity: Indicated by outer loading factors greater than 0,70 and an Average Variance Extracted (AVE) value exceeding 0.50.
b. Discriminant Validity: Measured through the Heterotrait Monotrait Ratio (HTMT) criteria, where cross construct ratios must remain below 0.90.
c. Reliability Test: Measures the internal consistency using Composite Reliability (CR) and Cronbach's Alpha, with a minimum standard value of 0.70.

(Septianawati & Abdillah, 2023)

2. Structural Model Evaluation (Inner Model) and Hypothesis Testing

This stage assesses the model's predictive capability and tests the causal linkages between variables:

a. R-Square (R2): Measures the percentage of variation in the dependent variable explained simultaneously by the independent predictors.
b. Bootstrapping: Performs repeated random resampling to determine path coefficients, T-statistics (significant if > 1.96), and p-values (significant if < 0.05) under a 95% confidence interval.
c. Multicollinearity: Examines inter variable correlation based on the Variance Inflation Factor (VIF) with a critical threshold of 5.

(Ma et al., 2026)

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

RESULT AND DISCUSSION

Measurement Model Assessment (Outer Model)

To verify the rigorous psychometric properties and reliability of the research instrument before analyzing the structural equation pathways, a comprehensive measurement model assessment was carried out. This exploratory phase determines the statistical baseline of the research data by evaluating three fundamental components: convergent validity, discriminant validity, and internal consistency reliability. Completing this assessment ensures that the operational indicators effectively align with their theoretical definitions, thereby providing the necessary empirical validation needed for a professional and accurate structural model analysis.

The convergent validity of the latent constructs was fundamentally operationalized through two indicators: outer loading factors and the AVE. Based on the initial computational execution in SmartPLS, all individual items across the constructs exhibited high outer loading factor values well above the mandatory standard threshold of 0.70. Furthermore, the calculated AVE scores for QRIS Usage Efficiency (X1), QRIS Usage Effectiveness (X2), and MSME Financial Management (Y) successfully surpassed the baseline requirement of 0.50. This explicitly demonstrates that the indicators possess a highly robust correlation and accurately capture the theoretical substance of their respective latent variables. The empirical metrics for the convergent validity and reliability testing are systematically summarized in Table 2.

Table 2. Convergent Validity and Internal Consistency Reliability Results

Construct (Variable)	Item Code	Outer Loading	Cronbach's Alpha	CR	AVE
QRIS Efficiency (X1) (Perceived Ease of Use)	EFF1 EFF2 EFF3 EFF4	0.846 0.876 0.866 0.871	0.892	0.915	0.752
QRIS Effectiveness (X2) (Perceived Usefulness)	EFT1 EFT2 EFT3 EFT4	0.890 0.864 0.875 0.849	0.921	0.934	0.771
MSME Financial Management (Y) (Microfinancial Management)	FIN1 FIN2 FIN3	0.927 0.893 0.875	0.912	0.935	0.754

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Statistical Interpretation of Table 2. The initial computational execution through SmartPLS securely confirms that the dataset meets all rigorous convergent validity standards. As tabulated in Table 2, the individual outer loading factors for the independent variable QRIS Efficiency (X1) range from a minimum of 0.846 (EFF1) to a maximum of 0.876 (EFF2). Similarly, the item loadings for QRIS Effectiveness (X2) span tightly between 0.849 (EFT4) and 0.890 (EFT1). The endogenous variable, MSME Financial Management (Y), also showcases high item to construct correlations, with loading coefficients ranging from 0.875 (FIN3) to 0.927 (FIN1). Because every single indicator exhibits an outer loading vastly exceeding the 0.70 threshold, no item purification or deletion was required. On a macro level, the AVE scores for QRIS Efficiency (X1), QRIS Effectiveness (X2), and MSME Financial Management (Y) are calculated at 0.752, 0.771, and 0.754, respectively. These metrics demonstrate that each construct explains approximately 75% to 77% of its assigned indicator variance, validating that the empirical measures are highly representative of their underlying theoretical dimensions.

To mathematically substantiate that the designated latent constructs are empirically distinct and exhibit sufficient statistical divergence from one another, discriminant validity was rigorously evaluated utilizing the contemporary HTMT criterion, which is widely recognized as a more robust diagnostic tool than traditional methods. The empirical path analysis results indicated that all cross construct ratio coefficients fell strictly below the conservative threshold of 0.90, satisfying the strict requirements for construct distinctiveness. This statistical baseline confirms that there are no overlapping cross loading anomalies, thereby validating that each distinct construct successfully operationalizes and measures a fundamentally independent phenomenon within the overarching structural model framework. The complete HTMT cross construct correlation matrix is comprehensively detailed in Table 3.

Table 3. Discriminant Validity Criteria Using Heterotrait Monotrait Ratio (HTMT)

Construct	QRIS Efficiency (X1)	QRIS Effectiveness (X2)	MSME Financial Management (Y)
QRIS Efficiency (X1)	—		
QRIS Effectiveness (X2)	0.712	—	
MSME Financial Management (Y)	0.759	0.658	—

The computational matrix in Table 3 explicitly reveals that the highest cross construct correlation ratio occurs between QRIS Efficiency (X1) and MSME Financial

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Management (Y) with a value of 0.759, followed by the relationship between QRIS Efficiency (X1) and QRIS Effectiveness (X2) at 0.712. Crucially, every single ratio coefficient within the structural matrix sits securely below the conservative and strict statistical threshold of 0.90. This empirical trend confirms that there are no severe multicollinearity or overlapping correlation anomalies among the variables. Therefore, the measurement model firmly satisfies the requirements for discriminant validity, proving that the independent and dependent constructs are validly distinct and fully prepared for structural path analysis. The reliability baseline of the empirical indicators was established through two complementary statistical metrics: Cronbach's Alpha and CR. As documented in Table 2, the measurement model demonstrated exceptional internal consistency, with both Cronbach's Alpha and CR coefficients for all latent constructs vastly exceeding the minimum critical benchmark of 0.70. These high values guarantee that the survey instrument is highly stable, reliable, and free from random measurement errors.

To verify that the empirical indicators are stable and consistently yield uniform results across repeated measurements, internal consistency reliability was examined. This study deploys two complementary metrics: Cronbach's Alpha (which assumes unweighted item configurations) and Composite Reliability (CR, which accounts for weighted outer loadings). The standard acceptable threshold for both coefficients is fixed at a minimum of 0.70. As documented in Table 2, the reflective measurement framework demonstrates exceptional reliability. The Cronbach's Alpha values for QRIS Efficiency (0.892), QRIS Effectiveness (0.921), and MSME Financial Management (0.912) are well above the 0.70 benchmark. Correspondingly, the CR values yield equally powerful coefficients, recorded at 0.915 for X1, 0.934 for X2, and 0.935 for Y. These highly robust values mathematically guarantee that the structural framework is entirely free from random measurement errors and possesses excellent internal consistency.

Structural Model Assessment (Inner Model) and Hypothesis Testing

Subsequent to the empirical validation of the measurement model framework, the structural network conceptually designated as the inner model was rigorously scrutinized to evaluate its systemic predictive capacity and mathematically test the hypothesized causal relationships. Prior to any formal interpretation of the structural path architectures, the potential inflation of multicollinearity variance was rigorously audited utilizing the Variance Inflation Factor (VIF) diagnostic tool. The empirical computations demonstrated that the VIF coefficients for the localized independent predictors fell strictly and safely below the critical institutional tolerance threshold of 5.0. This statistical diagnosis robustly confirms that the structural path estimations remain entirely insulated from

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

multicollinearity distortions, thereby guaranteeing the mathematical stability, accuracy, and interpretative integrity of the derived regression coefficients (β).

Prior to interpreting the structural path coefficients, the presence of potential collinearity inflation among the independent predictors was audited via the Variance Inflation Factor (VIF). The empirical execution yielded VIF coefficients below the critical tolerance threshold of 5.0, confirming that the structural pathways are entirely free from multicollinearity distortions. Subsequently, the model's predictive power was quantified utilizing the R-Square (R2) coefficient of determination. The structural model yielded an R2 value of 0.674 for the endogenous variable, MSME Financial Management (Y). This indicates that QRIS Usage Efficiency (X1) and QRIS Usage Effectiveness (X2) simultaneously explain 67.4% of the total variance in the quality of small business financial management. According to the structural modeling benchmarks formulated by J. Hair & Alamer, (2022), an R2 score of 0.674 is classified as highly substantial and robust for exploratory behavioral frameworks, proving that the model possesses an exceptionally strong predictive capability.

Following model's explanatory power evaluation and multicollinearity constraints, structural path coefficients, standard errors, and corresponding significance levels were computed. To achieve this, study executed non parametric bootstrapping procedure in SmartPLS, using a rigorous setup of 5,000 resamples with no sign changes. This statistical technique generates stable standard errors and accurate statistical significance intervals, which are essential for conducting a precise hypothesis testing matrix on localized, non normally distributed data pools. Final inner model graphical representation showing the calculated path coefficients (β) along the structural pathways and the cumulative explanatory capacity (R2) embedded within the endogenous variable is visually presented in Figure 2.

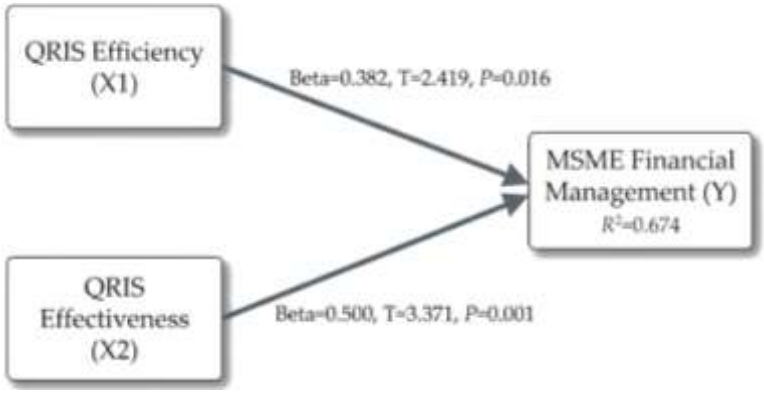


Figure 2. Final Structural Path Model Estimation Results from SmartPLS

Empirical path estimation model generated through SmartPLS bootstrapping algorithm, as visually demonstrated in Figure 2, provides a structural blueprint of the

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

causal linkages within the technology acceptance framework. The structural diagram explicitly illustrates the directional path coefficients (β) along the respective internal pathways alongside the cumulative explanatory capacity (R2) embedded within the endogenous target construct.As visualized in the model, the structural arrow tracing from QRIS Efficiency (X1) to MSME Financial Management (Y) yields an empirical path coefficient (β) of 0.382. This linear trajectory is supported by a robust critical statistical weight, characterized by a T-statistic score of 2.419 and a corresponding p-value of 0.016. Concurrently, the lower structural pathway tracing from QRIS Effectiveness (X2) to MSME Financial Management (Y) yields a substantially higher path coefficient (β) of 0.500, backed by an exceptional T-statistic value of 3.371 and a highly significant p-value of 0.001. A comparative analysis of these dual directional pathways demonstrates that while both dimensions of technology acceptance act as positive and statistically significant drivers, the effectiveness configuration (β = 0.500) functions as the most dominant exogenous determinant within the overall inner structural network. Ultimately, the collective predictive strength of these integrated constructs is firmly captured by the Coefficient of Determination (R2) coefficient noted inside the endogenous box in Figure 2. The model yields an R2 score of 0.674, which mathematically indicates that QRIS Usage Efficiency and QRIS Usage Effectiveness simultaneously account for exactly 67.4% of the total variance in the quality of MSME Financial Management. According to the structural equation modeling evaluation benchmarks established by Hair et al., (2022), an R2 value of this magnitude confirms that the conceptual framework possesses a highly substantial, robust, and empirically powerful predictive capability for exploratory behavioral research.

To systematically evaluate statistical significance of each specific directional arrow modeled above, individual path coefficients (β) were audited against their respective empirical standard errors, T-statistics, and exact p-values. Under a standard 95% confidence level, an individual pathway is recognized as statistically significant if its generated T-value surpasses the critical two tailed benchmark of 1.96, and its p-value falls below the alpha limit of 0.05.The comprehensive, empirical data pool tracking the results of the structural hypothesis testing is summarized in Table 4.

Table 4. Structural Path Coefficients and Hypothesis Testing Results

Hypothesis	Structural Path	Path Coefficient	T-Statistics	P-Values	Information
H1	QRIS Efficiency (X1) -> MSME Financial Management (Y)	0.382	2.419	0.016	Accepted

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

H2	QRIS Effectiveness (X2) -> MSME Financial Management (Y)	0.500	3.371	0.001	Accepted

The empirical data pool tracking the results of the structural hypothesis testing is systematically summarized in Table 4. To evaluate the statistical significance of each specific directional pathway, the individual path coefficients (β) were rigorously audited against their respective empirical standard errors, T-statistics, and exact p-values derived from the bootstrapping procedure. Under a standard 95% confidence level, an individual hypothesis is recognized as statistically significant if its generated T-value surpasses the critical two-tailed benchmark of 1.96, and its corresponding p-value falls below the maximum alpha limit of 0.05.As documented in Table 4, the evaluation of the first pathway (H1) reveals that QRIS Efficiency (X1) exerts a positive and statistically significant direct effect on MSME Financial Management (Y). This structural relationship is validated by a standardized path coefficient (β) of 0.382 and a T-statistic value of 2.419, which comfortably exceeds the standard critical distribution threshold. Furthermore, the exact generated p-value of 0.016 sits safely below the alpha significance level of 0.05, thereby justifying the formal acceptance of H1. This statistical trend mathematically proves that every single unit enhancement in the user perceived efficiency and operational simplicity of digital payment systems will directly optimize the quality index of micro financial governance by 38.2%.

Concurrently, the second structural pathway evaluation (H2) demonstrates that QRIS Effectiveness (X2) demonstrates a positive and highly significant direct impact on MSME Financial Management (Y). The computational derivation yielded a substantial standardized path coefficient (β) of 0.500, backed by a powerful T-statistic score of 3.371 (>1.96) and an extremely low p-value of 0.001 (<0.05). Consequently, hypothesis H2 is robustly accepted. Statistically, these metrics reveal that QRIS Effectiveness stands out as the most dominant exogenous determinant within the entire structural model, as its path coefficient (β = 0.500) is substantially higher than that of efficiency (β = 0.382). In terms of practical interpretation, this confirms that a strategic improvement in system effectiveness, utility, and target consumer adaptation will trigger a substantial 50.0% increase in the structural regularity, data accuracy, and discipline of small business financial management.

DISCUSSION

The empirical validation of H1 firmly and conclusively demonstrates that the efficiency dimension of digital payment adoptions acts as a critical catalyst in substantially upgrading the overall quality and reliability of micro financial management systems.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Within the established theoretical architecture of the TAM, this specific efficiency dimension directly operationalizes the core construct of perceived ease of use. When traditional small business operators perceive the integrated QRIS platform as an intuitive, highly user friendly, and completely friction free financial infrastructure that requires minimal technical training or digital literacy, it significantly mitigates the heavy cognitive load and natural psychological resistance traditionally associated with new technology integration.

In practical terms, this distinct ease of use successfully minimizes the structural labor hours that were historically lost to manual, slow, and error prone bookkeeping systems. The integrated digital features of QRIS inherently shorten the duration required for daily cash reconciliation from several hours to mere seconds, while systematically eliminating manual arithmetic oversights, calculation errors, and accounting discrepancies. When small business owners fully rationalize the digital scanning process as a zero effort transaction infrastructure, they can seamlessly bypass administrative bottlenecks. This much needed operational relief ultimately allows them to redirect their finite managerial focus away from tedious, day to day transaction processing and toward strategic, long term financial planning, liquidity forecasting, and proactive working capital optimization.

Concurrently, the statistical validation and subsequent empirical acceptance of hypothesis H2 unequivocally demonstrates that the operational effectiveness of the QRIS infrastructure constitutes the most dominant structural determinant driving the optimization of internal financial governance mechanisms within small enterprise ecosystems. Synthesizing the conceptual tenets of the perceived usefulness construct articulated within the TAM paradigm, this multidimensional effectiveness translates directly into quantifiable, high utility strategic assets for the firm. The structural assimilation of QRIS operates not merely as an exogenous, passive point of sale mechanism, but functions fundamentally as an endogenous, automated ledger that intrinsically fortifies transactional transparency, systematic auditability, and absolute mathematical precision within the corporate ledger.

By comprehensively neutralizing the pervasive operational vulnerabilities explicitly inherent to cash laden transaction topographies including, but not limited to, human error in physical currency conversion, capital leakage, and systemic prevalence of unrecorded transaction receipts the QRIS framework endows merchants with an insulated, error free, and real time digital accounting statement. Furthermore, within specific localized clusters characterized as demographic epikentrums for digital native student consumers, the institutionalization of this cashless transactional interface empowers conventional merchants to fluidly absorb dynamic market trajectories without structural inertia. This strategic integration effectively attenuates historical bifurcation between contemporary

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

demand side preferences and supply side micro enterprise administrative capabilities. Consequently, it engenders perpetual, real time surveillance of capital inflows, optimizes granular liquidity tracking, and systematically curtails the pervasive, path dependent practice of co-mingling idiosyncratic household expenditures with enterprise operational cash reserves.

CONCLUSION

Based on empirical findings generated from SEM-PLS approach executed via SmartPLS, this study concludes that QRIS usage efficiency exerts a positive and statistically significant direct effect on the financial management quality of MSMEs in Ngringo Village, Karanganyar ($\beta = 0.382$, $T = 2.419$, $p = 0.016$), proving that minimizing technological friction directly optimizes operational clarity. Concurrently, QRIS usage effectiveness stands out as the most dominant structural determinant within the framework ($\beta = 0.500$ $T = 3.371$, $p = 0.001$), demonstrating that the strategic utility of digital payment infrastructures acts as a profound administrative catalyst for small business operators. Together, these dual dimensions of the TAM exhibit an exceptionally robust predictive power, simultaneously accounting for exactly 67.4% of the total variance in internal financial governance quality ($R2 = 0.674$). The explicit scholarly novelty contributed by this research lies in shifting the analytical paradigm of financial technology from a mere retail transaction medium to an internal digital intervention mechanism engineered to resolve chronic administrative deficiencies. While prior literature predominantly evaluates standardized QR codes through macro adoption scales, sales revenue, or client retention benchmarks, this study successfully reframes technology acceptance parameters as internal governance controllers that mitigate longstanding micro enterprise vulnerabilities, such as substandard manual bookkeeping and the severe intermingling of household expenditures with corporate capital. Furthermore, by evaluating this behavior within the distinctive contextual environment of Ngringo, Jaten, Karanganyar a traditional merchant cluster facing an intense demand shock driven by tech savvy, digital native student consumers this study establishes a unique behavioral baseline regarding how traditional firms reorganize internal cash flows when confronted with external digital constraints.

Notwithstanding these rigorous contributions, several vital limitations remain apparent, outlining opportunities for improvement in future research. First, the structural model relies on a relatively restricted sample size ($n = 32$) derived from a specific geographical region; although mathematically valid and robust under the non parametric parameters of PLS-SEM bootstrapping heuristics, this localized sample prevents broad generalization to macro scale urban economies or cross regional traditional clusters. Second, the current model architecture operates entirely within the boundaries of the

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

traditional TAM framework, thereby excluding other highly dynamic behavioral parameters such as explicit cybersecurity risk perceptions, digital transaction costs, or user trust, which could introduce critical variations into the structural pathway. Lastly, the cross sectional data collection method captures only a stationary snapshot of merchant behavior, leaving the long term temporal stability of automated bookkeeping habits unexamined. Future investigations should actively expand upon these boundaries by utilizing longitudinal research designs across multi regional samples and incorporating advanced structural models like UTAUT2 to further enrich the predictive framework of corporate digital transitions.

REFERENCES

Angelicia, A., Ikhsan, S., Hamzani, U., Desyana, G., & Indah, D. P. (2024). The Impact of QRIS Payment Usage on Business Income Growth in MSMEs. *JURNAL ILMIAH KOMPUTERISASI AKUNTANSI*, *17*(2), 450–459. https://doi.org/10.51903/kompak.v17i2

Aryowiloto, J., Numadi, K. R., & Manggo, T. N. (2024). QRIS Cross-Border: Indonesia's Soft Power Diplomacy Instrument in Payment Digitalization in Southeast Asia. *WIMAYA: Interdisciplinary Journal of International Affairs*, *05*(02), 108–121. https://doi.org/10.33005/wimaya.v5.i02

Badjeber, F. H., Hasanah, U., Mangge, I. R., & Ikbal, M. (2026). The Influence of Financial Literacy , Financial Inclusion , and Social Environment on the Decision to Use QRIS by " MSMEs " in Palu City. *Tazkia Islamic Finance and Business Review*, *20*(1), 1–28. https://doi.org/10.30993/tifbr.v20i1.490

Chyntia, E., Maisyrah, S., & Shalawati, S. (2025). Dampak Sistem Pembayaran Qris Terhadap Peningkatan Pendapatan UMKM di Kabupaten Bireuen. *SOLUSI : Jurnal Ilmiah Bidang Ilmu Ekonomi*, *23*(2), 241–259. https://doi.org/10.26623/slsi.v23i2.11892

Fauziah, K. W. A., Juwiyan, Y. L., Lestari, M. I., Kurniawati, H., & Deviarti, H. (2025). The QRIS Effect : What Truly Motivates MSMEs to Go Digital ? *Airlangga Journal of Innovation Management*, *06*(02), 280–302. https://doi.org/10.20473/ajim.v6i2.72231

Guenther, P., Guenther, M., Ringle, C. M., Zaefarian, G., & Cartwright, S. (2023). Improving PLS-SEM use for business marketing research. *Industrial Marketing Management*, *111*(March), 127–142. https://doi.org/10.1016/j.indmarman.2023.03.010

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)* (third). SAGE.

Humayroh, S. S., Riawan, R., & Rapini, T. (2024). QRIS Adoption Among Students is

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Reviewed from Financial Literacy, Digital Literacy, and Information Security. *Jurnal Riset Akuntansi Dan Keuangan*, *12*(1), 635–650. https://doi.org/10.17509/jrak.v12i1.67819

Latif, I. S., Saputro, R. E., & Barkah, A. S. (2025). Improvement of Technology Acceptance Model (TAM) with PLS-SEM : A Systematic Literature Review. *Journal of Information Systems and Informatics*, *7*(2), 1376–1399. https://doi.org/10.51519/journalisi.v7i2.1104

Lee, A. T., Ramasamy, R. K., & Subbarao, A. (2025). Understanding Psychosocial Barriers to Healthcare Technology Adoption : A Review of TAM Technology Acceptance Model and Unified Theory of Acceptance and Use of Technology and UTAUT Frameworks. *Healthcare*, *13*(3), 1–35. https://doi.org/10.3390/healthcare13030250

Ma, X., Xu, M., Huang, L., & Nor, K. (2026). How Virtual Influencers Shape Consumers ' Green Purchase Intention Among Chinese Consumers : Evidence from PLS-SEM and fsQCA. *Journal of Theoretical and Applied Electronic Commerce Research*, *21*(9), 1–25. https://doi.org/10.3390/jtaer21090300

Nurohim, G. S., Setyadi, H. A., Widodo, P., & Sutanto, Y. (2026). LEVERAGING CONTINUAL FINE-TUNING FOR EMOTION CLASSIFICATION IN PRODUCT REVIEWS ON MSME SUSTAINABILITY SUPPORT. *JITK (Jurnal Ilmu Pengetahuan Dan Teknologi Komputer)*, *11*(4), 1382–1390. https://doi.org/10.33480/jitk.v11i4.7729

Prasetyo, F. H., Warsito, B., & Sugiharto, A. (2024). Aplikasi Analisis PLS-SEM berbasis R Shiny dan Penerapan UTAUT2 untuk Evaluasi Penerimaan Sistem Informasi. *Jurnal Sains Dan Teknologi*, *13*(1), 147–158. https://doi.org/10.23887/jstundiksha.v13i1.68568

Ramadhan, R., & Afandi, A. (2025). Effectiveness of Using QRIS Payment as a Digital Payment Solution in Coffee Shop Business (Case Study of Circle Coffee Medan Coffee Shop). *The Indonesian Interdisciplinary Journal of Sharia Economics*, *8*(2), 4371–4387. https://doi.org/10.31538/iijse.v8i2.6750

Rohmah, A., Bangsawan, L., & Susanto, F. (2025). ADOPTION OF AI IN FINANCIAL AUDITING AN EMPIRICAL ANALYSIS USING THE TECHNOLOGY ACCEPTANCE MODEL (TAM). *Jurnal TAM (Technology Acceptance Model)*, *16*(2), 78–83. https://doi.org/https://doi.org/10.56327/jurnaltam.v16i2.1869

Sabrina, L., Inayah, N., & Syahbudi, M. (2026). QRIS Dan Fenomena Cashless Society : Efisiensi Pembayaran Digital Terhadap Perspektif Gen Z. *Owner: Riset & Jurnal Akuntansi*, *10*(1), 509–526. https://doi.org/10.33395/owner.v10i1.3042

Sarstedt, M., & Liu, Y. (2024). Advanced marketing analytics using partial least squares structural equation modeling (PLS - SEM). *Journal of Marketing Analytics*, *12*(1),

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

1–5. https://doi.org/10.1057/s41270-023-00279-7

Septianawati, E., & Abdillah, E. (2023). Structural Equation Modeling (SEM) on Mechanisms of Non- Science Students ' Attitudes Toward Statistics Courses. *Focus ACTion Of Research Mathematic*, *6*(02), 25–40. https://doi.org/10.30762/f_m.v6i2.1987

Sutrisno, E., & Nainggolan, R. (2025). UNLOCKING THE POTENTIAL OF DIGITAL PAYMENT: HOW FINANCIAL HABITS DRIVE DIGITAL PAYMENT ADOPTION AMONG INDONESIA'S MSMEs. *JURNAL APLIKASI MANAJEMEN*, *23*(1), 111–133. https://doi.org/10.21776/ub.jam.2025.023.1.07.

Syafaa, Y. A., Nurmalasari, M. R., Pendidikan, U., & Denpasar, N. (2026). THE ROLE OF QRIS IN INFLUENCING CUSTOMERS ' DECISION TO USE DIGITAL PAYMENTS AT UBUD TRADITIONAL MARKET. *Jurnal Valuasi: Jurnal Ilmiah Ilmu Manajemen Dan Kewirausahaan*, *6*(1), 139–175. https://doi.org/10.46306/vls.v6i1

Zalukhu, S., & Sembiring, F. (2025). The Effect of QRIS Payment on Consumer Purchase Decisions Using Technology Acceptance Model. *Research Horizon*, *5*(4), 1359–1374. https://doi.org/10.54518/rh.5.4.2025.764

Zhang, T. (2026). Warmth and competence in affective companion virtual humans : differential effects on behavioral intention via hedonic benefits. *Frontiers in Psychology*, *177*(September), 1–15. https://doi.org/10.3389/fpsyg.2026.1877802

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.