

Digitalization of Financial Inclusion: Implementation of QRIS to Support the Resilience of SMEs in Tasikmalaya City

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ABSTRACT

One of the main challenges faced by MSMEs is limited access to formal financial services. Many MSMEs still rely on cash transactions, do not have bank accounts, and have difficulty obtaining productive loans. This condition reflects the low level of financial inclusion, which ultimately limits the ability of MSMEs to survive and grow. The purpose of this study is to develop SMEs through digitalization of financial inclusion to support the resilience of SMEs in Tasikmalaya City. The research method used is a quantitative approach with Structural Equation Modeling analysis based on Partial Least Square (SEM-PLS) with the SmartPLS4 tool. The results show that QRIS influences Digital Financial Inclusion, QRIS influences SME Resilience, QRIS is able to mediate digital financial inclusion on SME resilience and QRIS moderates (strengthens) digital financial inclusion in supporting the resilience of SMEs in Tasikmalaya City. QRIS plays a role in expanding financial access for SMEs in Tasikmalaya City, so that in its implementation, Qris is used as a payment diversification, expanding the market and maintaining income stability as a resilience strategy for SMEs in Tasikmalaya City.

Keywords: QRIS, resilience SMEs, digital financial inclusion

Introduction

Small and Medium Enterprises (SMEs) are a strategic sector that plays a vital role in Indonesia's economy. According to data from the Ministry of Cooperatives and SMEs, MSMEs contribute more than 60% to the national Gross Domestic Product (GDP) and absorb over 90% of the workforce. Despite their significant contribution, MSMEs remain vulnerable to economic pressures such as pandemics, inflation, and rapid market changes. One of the main challenges faced by MSMEs is limited access to formal financial services. Many MSME actors still rely on cash transactions, do not have bank accounts, and experience difficulties in obtaining productive loans. These conditions reflect the low level of financial inclusion, which ultimately restricts the ability of MSMEs to survive and grow. Therefore, expanding access to financial services is crucial in strengthening the economic resilience of MSMEs.

Along with technological advancements, the digitalization of financial services has become a potential solution for reaching business actors who have been underserved by conventional financial systems. Financial inclusion is one of the key pillars of economic development, especially for Micro, Small, and Medium Enterprises (MSMEs), and it enables a country to reduce income inequality (Omar, 2020), alleviate poverty (Nsiah et al., 2021), and promote economic growth (Sethi & Acharya, 2018)(202 et al., 2021). One emerging innovation is the Quick Response Code Indonesian Standard (QRIS) initiated by Bank Indonesia. QRIS aims to streamline various digital payment

methods into a single QR code–based system that can be used by all payment service providers.

The implementation of QRIS is considered capable of enhancing digital financial inclusion, as it offers convenience for MSMEs in performing cashless transactions, automatically recording revenues, and establishing transaction histories that can serve as the basis for credit assessments by financial institutions. In other words, QRIS not only accelerates the digital transformation of MSMEs but also strengthens business resilience through broader access to financial services. However, not all MSMEs have successfully adopted QRIS. Barriers such as low digital and financial literacy, limited infrastructure, and a lack of understanding regarding the benefits of QRIS remain significant challenges. Many MSME actors still do not understand how to access formal financial services, indicating low financial literacy levels (Khan et al., 2022)(Chandran, 2014), and they continue to face difficulties in accessing bank financing due to various regulatory requirements (Sri Yuniar et al., 2023). Therefore, an in-depth study is needed to examine the extent to which QRIS, as a form of digital financial inclusion, can promote MSME resilience, as well as to identify the influencing factors.

This study aims to address these issues and provide empirical insights into the strategic role of financial digitalization in strengthening MSME resilience, particularly through the utilization of QRIS.

Theoretical Framework and Hypothesis

QRIS and MSME Resilience

Digital technology has become a key foundation for strengthening MSME performance, especially after the disruptions caused by COVID 19. The adoption of QRIS is one of Indonesia’s most significant steps in supporting MSMEs’ digital transition, enabling faster and more efficient transactions. Based on the Technology Acceptance Model (TAM), MSMEs are more willing to adopt technology when it is perceived as useful, easy to use, and secure. This is confirmed by Asmara et al. (2023), who find that perceived usefulness, ease of use, and security significantly shape QRIS adoption behavior, while Cahyasari et al. (2025) show that facilitating conditions, trust, and continuous usage intention strengthen sustained QRIS use ultimately supporting micro enterprise sustainability.

QRIS adoption is also closely tied to MSMEs’ digital readiness and long term performance. Herdiyeni et al. (2025) identify QRIS as a core component of digital transformation, with adopters showing higher readiness and stronger participation in digital ecosystems. Kuswoyo et al. (2024) similarly report that QRIS improves transactional efficiency and enhances business performance. These findings collectively illustrate that QRIS is more than a payment tool it is a digital capability helping MSMEs integrate into the broader digital economy, streamline operations, and build the agility required in rapidly changing market conditions.

The role of digitalization in strengthening resilience becomes clearer when viewed through resilience theory. Digital tools help MSMEs maintain stability during crises by enhancing communication, supporting faster decision making, and enabling operational

flexibility (Ekayanthi et al., 2025). Saad et al. (2022) further emphasize that resilience supported by technology adoption enables MSMEs to retain customers, adapt to disruptions, and sustain performance during shocks such as COVID 19. Because QRIS contributes to efficiency, technological capability, and improved business processes, its adoption can reasonably be expected to enhance MSME resilience. Based on this reasoning, the hypothesis is proposed as follows:

H1: QRIS adoption has a positive and significant effect on SMEs resilience

QRIS and Digital Financial Inclusion

The expanding digital payment ecosystem in Indonesia has positioned QRIS as one of the most accessible entry points for the public and MSMEs to participate in the digital economy. The literature shows that QRIS adoption is strongly influenced by perceived usefulness, ease of use, security, trust, and facilitating conditions, all of which shape users' willingness to transition from cash based transactions toward electronic payments (Hartanto et al., 2025). The widespread use of QRIS does not only simplify transactions but also increases customer experience and market accessibility, eventually enabling broader participation in digital financial services. This aligns with the Technology Acceptance Model (TAM), where increased usability and trust accelerate the shift toward digital financial behavior.

For MSMEs, QRIS adoption strengthens operational efficiency and improves performance, making business owners more likely to engage with formal digital financial systems. Kuswoyo et al. (2024) show that QRIS usage significantly improves transaction efficiency and competitiveness, which indirectly encourages MSMEs to explore other digital tools and financial services. Similarly, Asmara et al. (2023) demonstrate that perceived usefulness, ease of use, and security significantly influence QRIS adoption behavior among MSMEs meaning that QRIS becomes a gateway technology that increases their readiness to use broader forms of digital finance. As digital payments become embedded in daily operations, MSMEs naturally become more connected to formal financial channels.

Digital financial inclusion also depends on how MSMEs overcome structural barriers such as low financial literacy, data access limitations, and connectivity issues. Rahayu et al. (2023) highlight that Indonesia's fintech ecosystem supported by QRIS helps bridge financing gaps in the informal MSME sector by promoting digital participation and enabling access to financial services previously out of reach. Opportunities such as the expanding role of cooperatives and microfinance institutions further strengthen inclusion by integrating QRIS enabled MSMEs into the formal economy. Taken together, the literature suggests that QRIS functions as a catalyst that increases digital participation, reduces financial exclusion, and connects MSMEs with broader financial ecosystems.

H2: QRIS adoption has a positive and significant effect on digital financial inclusion among SMEs

Digital financial inclusion and SMEs Resilience.

Digital financial inclusion is increasingly recognized as a strategic mechanism that strengthens the capacity of MSMEs to survive, adapt, and grow in a dynamic

economic environment. Grounded in the Resource Based View (RBV) and Dynamic Capability Theory (DCV), financial resources and digital capabilities are viewed as critical assets that enable firms to respond effectively to external pressures. Digital financial inclusion provides MSMEs with broader access to capital, digital financial services, and transparent financial information elements that function as strategic resources capable of mitigating liquidity risks and supporting business continuity. Empirical studies reinforce this theoretical view: Jin and Liu (2024) demonstrate that digital inclusive finance alleviates financing constraints through improved technological infrastructure, mobile banking access, and enhanced financial transparency, enabling small enterprises to secure funding more easily. Likewise, Xie et al. (2024) show that digital finance significantly improves SME survival and growth by expanding online operations and facilitating access to information, making it particularly beneficial for early stage firms and those with limited capital.

Technological advancements further amplify the benefits of digital financial inclusion. Through the lens of technology enabled resilience, digital tools reinforce firms' adaptive abilities by enhancing decision making and operational flexibility. Lomas and Reeta (2024) highlight how AI driven FinTech platforms improve credit scoring, risk assessment, and personalized financial solutions, enabling MSMEs to overcome structural barriers such as limited credit histories and high transaction costs. These innovations expand financial access in underserved areas, strengthen financial management, and support more resilient business operations. Complementing this, evidence from Dou et al. (2024) shows that digital financial inclusion accelerates SME market entry and reduces exit risks, particularly in regions with strong internet infrastructure and deep digital penetration, indicating its broad influence on entrepreneurial sustainability. From a resilience perspective, SMEs with greater financial access, reduced credit constraints, and enhanced digital capabilities are inherently better equipped to absorb shocks, adapt to market disruptions, and sustain long term operations. Consistent with RBV and resilience theory, financial inclusion functions as a strategic resource that stabilizes cash flow, supports risk management, and enhances MSMEs' ability to withstand uncertainty. Thus, digital financial inclusion serves not only as an economic enabler but as a resilience building mechanism that strengthens firms' capacity to recover and maintain performance under adverse conditions. Based on this reasoning, the following hypothesis is proposed:

H3: Digital financial inclusion has a positive effect on SMEs resilience

Digital financial inclusion, SMEs resilience, and QRIS as mediator

Digital financial inclusion plays a crucial role in enhancing MSME resilience by expanding access to cashless payments, lowering transaction costs, and improving business liquidity. According to Financial Inclusion Theory, broader access to digital financial services enables firms to mitigate shocks and maintain operational continuity. Empirical studies confirm that digital adoption increases MSME adaptability and performance, particularly during economic disruptions (Supari & Anton, 2022; Beck et al., 2018). By providing more accessible financial resources and operational flexibility, digital financial inclusion strengthens MSMEs' capacity to absorb shocks and adapt to dynamic economic environments.

The introduction of QRIS as a standardized national payment system further reinforces this effect. QRIS streamlines transactions, reduces frictions in digital payment adoption, and enables real time sales recording, which directly supports operational resilience. From the perspective of the Technology Acceptance Model (TAM), simplified and unified digital tools increase perceived usefulness and ease of use, accelerating adoption and magnifying the benefits of digital financial services. Empirical research in Indonesia shows that QRIS adoption enhances financial inclusion and strengthens MSME financial management capacity (Rahmawati & Lubis, 2021; Bank Indonesia, 2023; Kuswoyo et al., 2024). QRIS is therefore expected to act as a moderating variable that amplifies the relationship between digital financial inclusion and MSME resilience. With QRIS adoption, digital transactions become more accessible, traceable, and efficient, allowing MSMEs to better manage liquidity, respond quickly to market changes, and maintain operational continuity during crises (Aqmal & Putra, 2024; Supari & Anton, 2022). By combining financial access with practical digital tools, MSMEs can leverage digital financial inclusion more effectively to withstand disruptions and sustain growth. Based on this reasoning, the following hypothesis is proposed:

H5: Digital financial inclusion positively affects SMEs resilience, and QRIS adoption strengthens this relationship

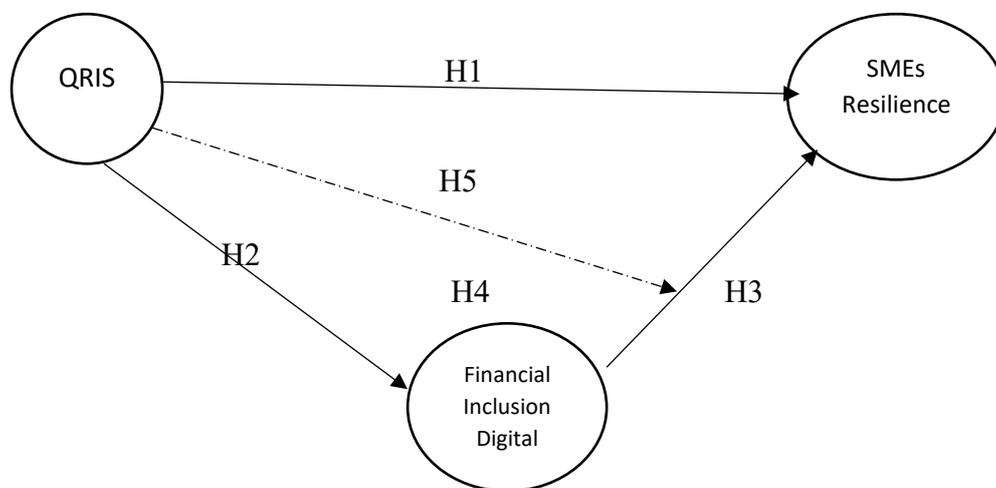


Figure. 1 Conceptual Framework

Research Methods

Samples and sampling techniques

This study employs a quantitative research approach with a population consisting of 100 MSME actors in Tasikmalaya City who use QRIS for digital payments. The sampling technique follows Roscoe's rule, which suggests that an appropriate sample size for research ranges from 30 to 500 observations (Sugiyono, 2017). The analytical tool used is Structural Equation Modeling (SEM) with Partial Least Squares (PLS) version 4 to assess and process the research data, including validity testing, reliability testing, and evaluation of the structural model.

Results And Discussion

Results

Evaluation Of The Measurement Model (Outer Model)

The validity test in this study was conducted using Structural Equation Modeling–Partial Least Squares (SEM-PLS) version 4. The analysis included evaluating indicator validity through outer loading values, convergent validity using Average Variance Extracted (AVE), and discriminant validity based on the Fornell–Larcker criterion and cross-loading results.

Table. 1 Outer Model

Variable	Indicator	Outer Loading	AVE	Result
QRIS	Q1	0.595	0.517	Valid
	Q2	0.703		
	Q3	0.813		
	Q4	0.827		
	Q5	0.746		
	Q6	0.740		
	Q7	0.785		
	Q8	0.760		
	Q9	0.840		
	Q10	0.804		
	Q11	0.667		
	Q12	0.686		
Financial Inclusion Digital	IKD1	0.726	0.627	Valid
	IKD3	0.684		
	IKD4	0.744		
	IKD5	0.798		
	IKD6	0.764		
	IKD7	0.733		
	IKD8	0.630		
	IKD9	0.621		
	IKD10	0.650		
	IKD11	0.785		
Resilience UMKM	Indicator	Outer Loading	AVE	Result
	R1	0.742		
	R2	0.797		

R3	0.781		
R4	0.814		
R5	0.805		
R6	0.725		
R7	0.775	0.563	Valid
R8	0.708		
R9	0.850		
R10	0.814		
R11	0.822		
R12	0.857		

The validity test results, based on the outer loading values, show that all indicators have loadings greater than 0.50. An outer loading is considered valid when its value exceeds 0.50–0.60 (Imam Ghozali, 2017). These results indicate that the construct validity of each indicator is met, and therefore, the measurement items are deemed valid and appropriate to proceed to the next stage of analysis.

Table. 2 Reliability Value

	Cronbach's Alpha	Composite reliability (rho_c)	Results
QRIS	0.928	0.921	Reliable
Resilience UMKM	0.946	0.923	Reliable
Financial Inclusion Digital	0.906	0.939	Reliable

The reliability test results, based on the outer loading values, show that all indicators have loadings greater than 0.70 (Imam Ghozali, 2017). An outer loading is considered reliable when its value exceeds 0.70. These findings indicate that the construct measurements for each variable are reliable and appropriate to proceed to the subsequent stages of the analysis.

Table. 3 path Coefficient T statistics dan P Values

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ((O/STDEV))	P values
IKD -> R	0.513	0.523	0.114	4.500	0.000
Q -> IKD	0.732	0.740	0.047	15.640	0.000
Q -> R	0.538	0.540	0.087	6.167	0.000
Q x IKD -> R	-0.137	-0.137	0.056	2.454	0.014

Structure Models Test

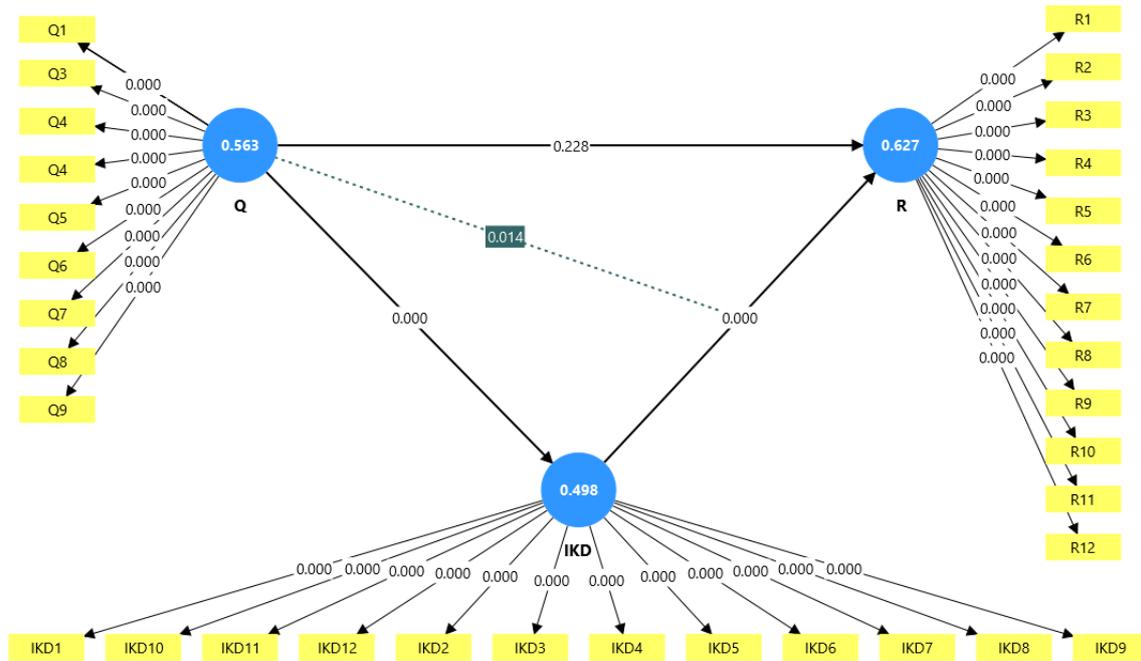


Figure 2
Inner Models Results

The P-value analysis was conducted to determine the significance of the relationships among the variables examined in this study, as presented in the table below.

Table. 4 Results of Hypotesis-testing

Hypotesis	Relationship	Original Sample	T-stat	P values	Conclusion
H1	Q -> R	0.538	6.167	0.000	Accepted
H2	Q -> IKD	0.732	15.640	0.000	Accepted
H3	IKD -> R	0.513	4.500	0.000	Accepted
H4	Q -> R -> IKD	0.415	6.125	0.000	Accepted
H5	Q x IKD -> R	-0.137	2.454	0.000	Accepted

Discussion

QRIS Influences the Resilience of SMEs in Tasikmalaya City

The positive effect of QRIS on MSME resilience indicates that the adoption of digital payment technology enhances business capacity in responding to economic shocks. QRIS provides a faster, more secure, and more efficient payment system, thereby reducing the risk of transaction errors, cash losses, and liquidity constraints. Furthermore, the use of QRIS allows MSMEs to maintain a more stable cash flow, as transactions are recorded automatically and can be accessed digitally. Accurate financial information

supports better decision-making, particularly when MSMEs need to adjust operational strategies amid market fluctuations. Thus, QRIS functions not only as a payment tool but also as a financial management instrument that significantly strengthens business resilience. Digital tools help MSMEs maintain stability during crises by enhancing communication, supporting faster decision making, and enabling operational flexibility (Ekayanthi et al., 2025).

QRIS Influences Digital Financial Inclusion

The increase in digital financial inclusion through QRIS can be explained by its ability to simplify access to financial services that were previously difficult for SMEs to obtain. As a universal QR code standard, QRIS removes barriers associated with the use of various e-wallets or banking services because all transactions can be conducted through a single system. Through QRIS, SMEs become integrated into the formal financial system by: generating digital transaction histories, gaining access to additional financial products such as digital savings, micro-loans, and banking services, and gradually improving their digital and financial literacy through daily usage. Therefore, QRIS serves as a strong entry point for MSMEs to participate in the digital financial ecosystem, significantly enhancing the level of digital financial inclusion. Complementing this, evidence from Dou et al. (2024) shows that digital financial inclusion accelerates SME market entry and reduces exit risks, particularly in regions with strong internet infrastructure and deep digital penetration.

Digital Financial Inclusion Influences the Resilience of SMEs in Tasikmalaya City

Digital financial inclusion plays a crucial role in increasing MSME resilience. When MSMEs gain broader access to digital financial services, they become more capable of: managing working capital, conducting more effective financial planning, obtaining financing during urgent conditions, and utilizing financial instruments to reduce risks. Access to products such as digital working capital loans, automated savings, and digital payment services enables MSMEs to maintain business operations even under economic uncertainty. With stronger financial inclusion, MSMEs gain improved liquidity resilience, financial flexibility, and adaptive capacity—making digital financial inclusion a strategic driver of business resilience.

QRIS Moderates the Influence of Digital Financial Inclusion on MSME Resilience

As a moderating variable, QRIS strengthens the relationship between digital financial inclusion and MSME resilience. This implies that the positive impact of financial inclusion on resilience becomes more substantial for MSMEs that use QRIS intensively. Mechanistically: (1) Digitally included MSMEs that actively use QRIS experience more stable cash flows and better financial record-keeping. (2) QRIS enhances the effectiveness of digital financial services utilization. (3) MSMEs with low digital literacy become more adaptive to financial technologies through frequent QRIS usage. Thus, QRIS serves as an amplifier that optimizes the effect of digital financial inclusion in building MSME resilience. Empirical research in Indonesia shows that QRIS adoption enhances financial inclusion and strengthens MSME financial management capacity (Rahmawati & Lubis, 2021; Bank Indonesia, 2023; Kuswoyo et al., 2024).

Conclusion, Implications, Suggestions, and Limitations

The results of this study underscore the pivotal role of QRIS adoption in advancing digital financial inclusion and strengthening MSME resilience in Tasikmalaya City. QRIS enhances operational efficiency through secure and real-time transactions, while simultaneously generating digital financial footprints that integrate MSMEs into the formal financial system. Digital financial inclusion further contributes to resilience by improving liquidity management, expanding access to financing, and supporting timely financial decision-making. Beyond its direct effects, QRIS also operates as a mediating and moderating mechanism, amplifying the positive influence of digital financial inclusion on MSME resilience. These findings position the digital payment ecosystem as a critical enabler of MSME adaptability and long-term sustainability in an increasingly digital economy. QRIS improves transaction efficiency, strengthens cash-flow stability, and generates digital financial footprints that integrate MSMEs into the formal financial system. Digital financial inclusion further enhances MSME resilience by expanding access to financing, improving liquidity management, and supporting data-driven decision-making. Moreover, QRIS also acts as a moderating variable that amplifies the effect of digital financial inclusion on business resilience, underscoring the strategic importance of digital payment systems in strengthening MSME sustainability in the digital era.

Theoretically, this study enriches the literature by demonstrating how standardized digital payment systems can influence financial inclusion and MSME resilience, particularly in the context of developing economies. The mediation and moderation findings provide new empirical evidence that digital payment infrastructures function not only as transactional tools but also as financial-enabling mechanisms that enhance business sustainability. Practically, the results highlight the need to accelerate QRIS adoption, strengthen digital and financial literacy, and expand finance products based on QRIS transaction data. Policymakers, financial institutions, and technology providers may leverage these insights to design more targeted strategies for empowering MSMEs in digital ecosystems. This study has several limitations. First, the **cross-sectional** design restricts the ability to analyze changes in MSME resilience over time. Second, the use of self-reported survey data may introduce perceptual bias. Third, the geographic scope is limited to MSMEs in Tasikmalaya City, which may limit the generalizability of the findings to other regions. Future studies are recommended to employ longitudinal datasets, expand the geographic coverage, and incorporate additional variables—such as digital capability, financial literacy, or environmental business factors—to achieve a more comprehensive understanding of MSME resilience within digital payment ecosystems.

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