

Digital Financial Transformation on Retail MSME Scalability Through Customer Engagement

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ABSTRACT

This study examines the effects of Digital Financial Inclusion, QRIS Utilization, and Embedded Finance Adoption on Retail MSME Scalability through Customer Engagement. The increasing adoption of digital financial services has created new opportunities for retail micro, small, and medium enterprises (MSMEs) to improve business performance and expand market reach. However, empirical evidence regarding how different dimensions of digital finance contribute to business scalability remains limited, particularly in emerging economies. This study employs a quantitative approach using primary data collected from 250 retail MSME owners who have adopted digital financial services. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings indicate that Digital Financial Inclusion, QRIS Utilization, and Embedded Finance Adoption significantly influence Customer Engagement. Digital Financial Inclusion and Embedded Finance Adoption also have significant positive effects on Retail MSME Scalability. Customer Engagement demonstrates the strongest direct effect on scalability. In contrast, QRIS Utilization does not have a significant direct effect on Retail MSME Scalability. These findings suggest that digital payment technology alone is insufficient to drive business growth unless it contributes to stronger customer relationships. The study highlights the strategic role of Customer Engagement in translating digital financial transformation into sustainable business expansion. The results contribute to the growing literature on digital finance and MSME development by providing evidence that customer-centered digital financial strategies are essential for improving scalability in the retail sector.

Keywords: Customer engagement; Digital financial inclusion; Digital payments; Embedded finance; MSME scalability

1. INTRODUCTION

Digital transformation has become one of the key issues in the development of micro, small, and medium-sized enterprises (MSMEs) over the past few years. According to the Organisation for Economic Co-operation and Development [OECD] (2023), digitalization is no longer viewed as an optional choice but rather as a necessity that determines a business's ability to survive and grow. The According to Demirguc-Kunt et al. (2022) also explains that the use of digital technology contributes to increased operational efficiency, market expansion, and enhanced business competitiveness. This situation is particularly relevant for MSMEs, which have long faced various resource constraints compared to large companies. Previous studies emphasize that digital transformation enables MSMEs to improve operational efficiency, market responsiveness, and long-term competitiveness despite their limited resources (Sundari et al., 2025; Sundari et al., 2026).

In Indonesia, MSMEs make a significant contribution to the national economy. This sector serves as the largest employer and a key driver of regional economic activity. However, the ability of MSMEs to scale up their operations still faces various obstacles. Yana (2026) found that limited access to financing, low digital capacity, and restricted market access remain the primary barriers

faced by many MSME operators. Similar concerns were highlighted by Ozili (2022), who argued that inadequate access to digital financial services and technological resources continues to constrain the growth potential of small businesses in developing economies. These findings indicate that business sustainability is not always accompanied by the ability to grow sustainably. Although MSMEs contribute substantially to economic growth, the ability to scale remains uneven across firms. Scalability is influenced not only by financial resources but also by firms' capacity to adopt digital technologies and leverage digital ecosystems to support business expansion (Dandi, 2024). Recent studies further suggest that the development of digital capabilities enables SMEs to improve entrepreneurial performance, identify new business opportunities, and accelerate growth in increasingly dynamic markets (Kim & Jin, 2024). In addition, active participation in digital business ecosystems allows SMEs to access external knowledge, resources, and innovation opportunities that strengthen their long-term growth potential (Priyono & Hidayat, 2024).

One approach that has been widely developed to address these issues is digital financial inclusion. Demircug-Kunt et al. (2022) define digital financial inclusion as the use of digital technology to expand public access to formal financial services. In the context of MSMEs, this access includes digital payment services, digital savings, digital credit, and various other technology-based financial services. Ozili (2022) explains that digital financial inclusion can reduce transaction barriers and improve the efficiency of business activities. Kass-Hanna et al. (2022) even found that increased access to digital financial services is associated with faster business growth and greater innovation capacity. Digital financial inclusion has increasingly been recognized as a mechanism that strengthens MSME competitiveness by improving access to financial products, facilitating business transactions, and supporting strategic decision-making. Empirical evidence from Indonesia demonstrates that digital financial inclusion contributes significantly to MSME performance through enhanced financial literacy and institutional support. (Tandilino et al., 2025). Recent evidence further indicates that digital finance contributes not only to financial accessibility but also to business expansion outcomes. A large-scale study involving MSMEs across several Asian emerging economies found that digital financial services significantly improve revenue growth, customer acquisition, inventory expansion, and overall business performance. These findings suggest that digital financial inclusion can serve as an important foundation for MSME scalability by enabling firms to access resources and growth opportunities that were previously difficult to obtain (Cambridge Centre for Alternative Finance & Asian Development Bank Institute, 2025).

The development of digital financial inclusion in Indonesia has progressed in tandem with the growth of digital payment systems. One innovation that has experienced rapid adoption is the Quick Response Code Indonesian Standard (QRIS), which has become an important instrument for promoting financial inclusion and accelerating MSME participation in the digital economy (Suseno, 2025). Nugraheni et al. (2025) explain that the use of QRIS enhances transaction convenience and expands consumer access to various payment methods. Similar findings were reported by Wahdiniawati et al. (2025), who demonstrated that payment digitization helps SMEs improve transaction efficiency and the quality of customer service. The growing acceptance of QRIS is also driven by its perceived usefulness and ease of use, making it an increasingly important component of digital business operations among MSMEs (Purwatiningsih et al., 2025).

For retail SMEs, the use of QRIS is not limited to payment aspects alone. Purwatiningsih et al. (2025) explain that the ease of transactions experienced by customers can influence the overall consumer experience. When customers experience a fast and simple transaction process, they are more likely to make repeat purchases. Ady et al. (2025) also found that the use of QRIS can improve perceptions of a business's professionalism, thereby increasing customer trust.

Another development gaining increasing attention is embedded finance. According to Sambakiu (2025), embedded finance involves the integration of financial services into non-financial platforms, allowing users to access various financial services without having to switch platforms. Institute of International Finance & Deloitte (2023) explains that embedded finance

enables businesses to achieve a more efficient transaction experience because payment, financing, and other financial services can be conducted within a single digital ecosystem. Boot et al. (2021) add that this model has the potential to transform the relationship between the financial sector and the real economy as financial services become increasingly integrated into day-to-day business activities.

Although financial technology is evolving rapidly, previous research findings remain mixed. Appiah-Otoo & Song (2021) found that digital financial inclusion has a positive impact on the growth of small businesses. Zhang et al. (2025) also demonstrated that access to digital financial services helps business owners gain broader economic opportunities. However, Wibowo & Rajput (2025) found that these benefits are often influenced by behavioral factors and entrepreneurs' ability to utilize available technology.

Research gaps are also evident in studies on QRIS. Most research still focuses on factors influencing the intention to use QRIS rather than its impact on business development. Usman et al. (2024) highlight the importance of perceptions of ease of use and transaction security in driving QRIS adoption. However, empirical evidence explaining how QRIS contributes to the scalability of MSMEs remains relatively limited.

A similar situation is found in research on embedded finance. Gomber et al. (2017) explain that most embedded finance research still focuses on the fintech industry and financial institutions. Studies linking embedded finance to SME development particularly retail SMEs in developing countries, remain very scarce. Consequently, understanding of embedded finance's contribution to business growth has not yet developed optimally.

This study is grounded in the perspective that technology does not automatically drive business growth. Morgan & Hunt (1994) explain that business success is heavily influenced by the quality of relationships built with customers. In the context of modern marketing, these relationships are reflected through customer engagement. Brodie et al. (2011) define customer engagement as the level of cognitive, emotional, and behavioral involvement customers have with a brand or company. Customers with high levels of engagement tend to demonstrate stronger loyalty and provide greater economic value to the company.

The theoretical foundation of this study also draws on the Technology Acceptance Model developed by Davis (1989). This theory explains that technology acceptance is influenced by perceptions of benefits and ease of use. This study also employs Barney (1991) Resource-Based View, which positions digital capabilities as strategic resources capable of creating sustainable competitive advantage.

Based on the above discussion, there are three research gaps that form the basis for this study. First, research integrating digital financial inclusion, QRIS utilization, and embedded finance adoption into a single research model remains very limited. Second, previous studies have predominantly used business performance or financial performance as the dependent variable. Third, the role of customer engagement as a mechanism linking digital financial innovation and the scalability of retail MSMEs has rarely been empirically tested.

2. LITERATURE REVIEW

2.1 Digital Financial Inclusion

Digital financial inclusion refers to the use of digital technology to expand access to formal financial services. This concept evolved from the idea of financial inclusion, which previously focused on the availability of financial services for segments of society not yet served by the formal financial system. Advances in digital technology have since broadened the scope of this concept through the use of the internet, mobile banking, digital wallets, fintech, and various digital platform-based financial services.

According to Demirguc-Kunt et al. (2022) digital financial inclusion enables both individuals and businesses to gain faster, cheaper, and more efficient access to financial services.

Ozili (2022) explains that digital financial inclusion not only improves access to financial services but also helps reduce transaction costs and geographical barriers. In the context of MSMEs, access to digital financial services is crucial because limited capital remains one of the main obstacles to business development.

Previous studies generally suggest that digital financial inclusion contributes positively to MSME development and business performance. Kass-Hanna et al. (2022) found that fintech expansion encourages innovation among micro and small enterprises by improving access to financial resources and digital financial services. Demirguc-Kunt et al. (2022) reported that greater access to digital financial services enables small businesses to conduct transactions more efficiently, strengthen financial resilience, and expand economic opportunities. Similarly, Kass-Hanna et al. (2022) showed that digital financial inclusion supports business growth by facilitating access to financial products, improving resource allocation, and enhancing firms' ability to adapt to changing market conditions.

However, some studies suggest that the benefits of digital financial inclusion do not always materialize immediately. Zhang et al. (2025) explain that the successful adoption of digital financial services is often influenced by business owners' ability to integrate these technologies into their daily business operations. These findings indicate that there are other factors that may mediate the relationship between digital financial inclusion and business growth.

2.2 QRIS Utilization

The Quick Response Code Indonesian Standard (QRIS) is a national QR code-based payment standard developed to enhance the interoperability of digital payment systems in Indonesia. QRIS enables various payment applications to use the same code, thereby making the transaction process simpler and more efficient.

QRIS has experienced substantial growth in recent years and has become an important instrument for promoting inclusive digital payments among Indonesian MSMEs. Suseno (2025) argues that QRIS supports financial inclusion by simplifying digital transactions, improving interoperability across payment providers, and facilitating MSME participation in the digital economy. The increasing adoption of QRIS is also influenced by changing consumer preferences, as customers are becoming more accustomed to cashless and mobile-based payment methods.

Research on QRIS has largely focused on the factors influencing technology adoption. Usman et al. (2024) found that perceptions of ease of use, security, and perceived benefits influence the use of QRIS by SME operators. These findings are consistent with the Technology Acceptance Model, which explains that technology acceptance is influenced by perceptions of utility and ease of use.

Empirical studies examining the relationship between QRIS adoption and MSME performance remain relatively limited. Pamungkas & Noviaristanti (2024) found that QRIS adoption is associated with better MSME performance through more efficient transaction processes and organizational readiness. Alifia et al. (2024) further reported that the growth of QRIS transactions contributes to higher MSME revenues by simplifying payment processes and expanding access to digital consumers.

Previous studies indicate that QRIS adoption improves transaction convenience and reduces payment friction, creating a more seamless customer experience. Sari et al. (2025) reported that perceived usefulness, ease of use, and trust significantly encourage QRIS utilization among MSMEs, while QRIS adoption contributes to improved business performance. These findings imply that digital payment systems may generate greater value when they enhance customer interactions and strengthen customer engagement with the business.

2.3 Adoption of Embedded Finance

Embedded finance refers to the integration of financial services into non-financial platforms, allowing users to access payment, financing, savings, and insurance services without having to switch platforms. This phenomenon is growing rapidly alongside the increasing use of marketplaces, digital trading platforms, and ecosystem-based applications.

According to Sambakiu (2025), embedded finance is transforming how financial services are provided and consumed. Financial services no longer stand as separate products but become part of the overall user experience. . Institute of International Finance & Deloitte (2023) explains that embedded finance can create simpler transaction processes and enhance customer convenience.

Empirical research on embedded finance is still relatively new compared to studies on fintech or digital payments. Gomber et al. (2017) note that most research remains focused on the banking sector and financial service providers. Studies linking embedded finance to the development of SMEs are still limited. Consequently, empirical evidence regarding the contribution of embedded finance to the scalability of SMEs is not yet widely available.

These limitations present an opportunity to expand research on embedded finance in the context of retail SMEs. Easier integration of financial services is expected to enhance the customer experience while supporting long-term business development.

2.4 Customer Engagement

Customer engagement is a concept increasingly used in modern marketing literature. Brodie et al. (2011) define customer engagement as the level of cognitive, emotional, and behavioral involvement of customers toward a brand or company. This concept emphasizes that customers do not merely act as buyers but also as participants in value creation.

Hollebeek et al. (2019) explain that customer engagement contributes to customer loyalty, repeat purchases, and positive recommendations to other customers. Harrigan et al. (2017) also found that high customer engagement strengthens long-term relationships between companies and consumers.

In the context of MSMEs, customer engagement is becoming increasingly important because business competition is not determined solely by price and product quality. Customer experience, ease of transactions, and service convenience are also factors that influence purchasing decisions. Therefore, various digital innovations that enhance the customer experience have the potential to strengthen customer engagement and ultimately drive business growth.

2.5 Retail MSME Scalability

Retail MSME scalability refers to the ability of retail MSMEs to increase business capacity, expand markets, boost transaction volume, and sustain long-term growth. This concept differs from business performance, which generally focuses on current performance achievements. Scalability places greater emphasis on a business's ability to grow sustainably.

According to Demircug-Kunt et al. (2022) explains that a business's ability to scale up is one of the key indicators in MSME development. The OECD (2023) also emphasizes that access to technology and financial services plays a crucial role in supporting the growth of small and medium-sized enterprises.

Research on SME scalability shows that business growth is not determined solely by internal factors. Support from digital technology, access to financing, innovation, and customer relationships also influence a business's ability to grow. Therefore, scalability is a relevant variable for measuring the impact of digital transformation on SME development.

2.6 Research Gaps

Based on the literature review, there are several research gaps that still require attention. First, previous studies generally examined digital financial inclusion, QRIS utilization, and embedded finance adoption separately. Studies that integrate these three variables into a single research model remain very limited.

Second, most previous studies have used business performance or financial performance as the dependent variable. Studies that use retail MSME scalability as an indicator of the success of digital transformation are still relatively few.

Third, previous research has largely emphasized the direct impact of digital financial innovations on business performance. The mechanisms explaining how these innovations drive

business growth have not been extensively explored. The role of customer engagement as a mediating variable linking digital financial inclusion, QRIS utilization, embedded finance adoption, and retail MSME scalability has rarely been empirically tested.

This study aims to fill this gap by developing a model that integrates digital financial inclusion, QRIS utilization, embedded finance adoption, customer engagement, and retail MSME scalability into a single comprehensive research framework.

3. METHODOLOGY

3.1 Research Design

This study employs a quantitative approach with an explanatory research design. This approach was chosen because the study's objective is not only to describe phenomena but also to explain the causal relationships among the variables in the research model. The primary focus of the study is to test the effects of Digital Financial Inclusion, QRIS Utilization, and Embedded Finance Adoption on Retail MSME Scalability through Customer Engagement as a mediating variable.

The research model consists of several interrelated latent constructs. These relationships involve both direct and indirect effects. Therefore, the analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with the assistance of SmartPLS 4 software. The PLS-SEM method was chosen because it is well-suited for testing complex research models, accommodates mediation models, and is oriented toward theory development and prediction. This approach is also relatively flexible regarding non-normal data distributions and has been widely used in research on SMEs, digital transformation, and digital finance in recent years (Hair et al., 2022; Sarstedt et al., 2021).

3.2 Population and Sample

The study population consists of retail SME operators in Indonesia who have utilized digital financial services in their business activities. The retail sector was chosen because it involves intense interaction with customers and has a relatively high rate of digital payment usage compared to other business sectors.

Respondents were selected using purposive sampling. This technique was used because not all SME operators possess characteristics aligned with the study's objectives. Selected respondents must meet several criteria. First, the business must have been operating for at least two years. Second, it must use QRIS as a payment method. Third, it must have used digital financial services such as mobile banking, digital wallets, fintech lending, or embedded finance services integrated with digital platforms. Fourth, the business owner or manager must be directly involved in business decisionmaking.

The determination of the sample size is based on the recommendations of Hair et al. (2022), who state that the sample size for PLS-SEM analysis can be determined based on the number of structural paths leading to the endogenous construct. In this research model, there are four paths leading to Retail MSME Scalability. Based on this criterion, the minimum sample size requirement has been met. To enhance the stability of model estimates and statistical power, this study uses 250 retail MSME respondents as the unit of analysis. This number is considered sufficient to produce more robust estimates in the PLS-SEM model.

3.3 Data Collection Procedure

Research data were collected through a survey using a structured questionnaire. The questionnaire was distributed both online and offline from January through March 2026. The online approach was used to reach MSME operators who actively use digital platforms, while the offline approach was employed to increase the response rate and ensure the quality of the data collected.

Before the main data collection process began, the research instrument was first tested via a pilot study involving 30 SME owners with characteristics similar to those of the study's

respondents. This stage aimed to ensure that each question item was easy to understand and relevant to the respondents' business contexts. Feedback obtained during the pilot study was used to refine the wording of several indicators to make them easier for SME owners to understand.

Each respondent was provided with an explanation of the research objectives and the confidentiality of the data provided. Respondent participation was voluntary, and all information obtained was used solely for academic purposes.

3.4 Measurement of Variables

All constructs were measured using a five-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree. The measurement of variables was adapted from previous studies that had been tested for validity and reliability.

Digital financial inclusion is measured through the dimensions of access, usage, service quality, and ease of obtaining digital financial services, as adapted from Demircug-Kunt et al. (2022) and Ozili (2022).

QRIS Utilization is measured through frequency of use, ease of transactions, payment efficiency, transaction security, and benefits perceived by business owners. This measurement is based on research by Nugraheni et al. (2025) and (Usman et al., 2024).

Embedded Finance Adoption is measured through the level of financial service integration within digital platforms, ease of access to financing, transaction convenience, and the use of financial services embedded within the digital ecosystem. The indicators are adapted from Sambakiu (2025) and Institute of International Finance & Deloitte (2023).

Customer Engagement is measured through customers' cognitive, emotional, and behavioral engagement with the business. This measurement is based on Brodie et al. (2011) and Hollebeek et al. (2019).

Retail MSME Scalability is measured by a business's ability to increase its customer base, expand its market, boost transaction volume, strengthen customer loyalty, and enhance business competitiveness. The indicators are based on OECD (2023) the According to Demircug-Kunt et al. (2022), and recent research on MSME growth.

3.5 Data Analysis Technique

Data analysis was conducted in two stages. The first stage involved evaluating the measurement model (outer model). This stage aimed to ensure that each indicator accurately measured the intended construct. Testing was conducted using convergent validity, discriminant validity, composite reliability, and Cronbach's alpha.

Convergent validity was evaluated using outer loadings and Average Variance Extracted (AVE). The recommended outer loading value is above 0.70, while the minimum AVE value is 0.50. Construct reliability was evaluated using composite reliability and Cronbach's alpha, with a minimum value of 0.70 (Hair et al., 2022).

The second stage involved evaluating the structural model (inner model). Analyses were conducted to test the relationships among variables within the research model. The tests included path coefficients, the coefficient of determination (R^2), predictive relevance (Q^2), effect size (f^2), and hypothesis testing using a bootstrapping procedure with 5,000 subsamples. A hypothesis is accepted if the t-statistic is greater than 1.96 and the p-value is less than 0.05 at a 5% significance level (Hair et al., 2022).

The mediation test for Customer Engagement was conducted through an indirect effect analysis using the bootstrapping procedure. This approach was chosen because it provides more accurate estimates of indirect effects compared to conventional methods. The test results were used to determine whether Customer Engagement acts as a mechanism linking Digital Financial Inclusion, QRIS Utilization, and Embedded Finance Adoption to Retail MSME Scalability.

4. RESULTS AND DISCUSSION

4.1 Results

4.1.1 Respondent Profile

This study involved 250 retail MSME operators who have used digital financial services in their business activities. All respondents have adopted QRIS as a payment method and have experience using digital financial services. These characteristics align with the study's objective, which focuses on digital financial transformation in the retail MSME sector.

Respondents came from various types of retail businesses, including food and beverage businesses, daily necessities stores, fashion businesses, and digital-based trading businesses. This diversity of respondents provides a more representative picture of the conditions of retail MSMEs that are currently adapting to developments in financial technology.

4.1.2 Measurement Model Assessment

An evaluation of the measurement model was conducted to ensure the validity and reliability of the research constructs.

Table 1. Reliability and Convergent Validity

Variable	Cronbach's Alpha	AVE
Digital Financial Inclusion	0.862	0.783
QRIS Utilization	0.872	0.658
Embedded Finance Adoption	0.824	0.650
Customer Engagement	0.811	0.571
Retail MSME Scalability	0.885	0.636

Source: data analysis results, SmartPLS 2026

All constructs have Cronbach's Alpha values above 0.70. The AVE values are also above the minimum threshold of 0.50. These results indicate that all constructs meet the criteria for reliability and convergent validity.

4.1.3 Structural Model Assessment

The model's ability to explain the endogenous variables was evaluated using the coefficient of determination (R^2).

Table 2. Coefficient of Determination

Endogenous Variable	R^2
Customer Engagement	0.549
Retail MSME Scalability	0.720

Source: data analysis results, SmartPLS 2026

An R^2 value of 0.549 indicates that Digital Financial Inclusion, QRIS Utilization, and Embedded Finance Adoption account for 54.9% of the variation in Customer Engagement.

Retail MSME Scalability has an R^2 value of 0.720. These results show that the research model can explain 72.0% of the variation in MSMEs' ability to scale their businesses. This value indicates a strong level of explanatory power.

4.1.4 Hypothesis Testing

Hypothesis testing was conducted using the bootstrapping procedure.

Table 3. Direct Effect Testing

Hypothesis	Path	β	t-value	p-value	Decision
H1	DFI $\rightarrow$ CE	0.473	8.831	0.000	Supported
H2	QU $\rightarrow$ CE	0.374	6.435	0.000	Supported
H3	EFA $\rightarrow$ CE	0.425	5.757	0.000	Supported
H4	DFI $\rightarrow$ RMS	0.298	4.244	0.000	Supported
H5	QU $\rightarrow$ RMS	0.073	1.078	0.281	Not Supported
H6	EFA $\rightarrow$ RMS	0.324	5.395	0.000	Supported
H7	CE $\rightarrow$ RMS	0.465	6.398	0.000	Supported

Source: data analysis results, SmartPLS 2026

The test results show that six hypotheses received empirical support. One hypothesis did not receive support, namely the direct relationship between QRIS Utilization and Retail MSME Scalability.

4.1.5 Relative Importance Analysis

To gain a deeper understanding of the strength of each structural relationship, an analysis was conducted based on the magnitude of the path coefficients.

Table 4. Relative Importance of Structural Paths

Rank	Structural Relationship	β
1	DFI $\rightarrow$ CE	0.473
2	CE $\rightarrow$ RMS	0.465
3	EFA $\rightarrow$ CE	0.425
4	QU $\rightarrow$ CE	0.374
5	EFA $\rightarrow$ RMS	0.324
6	DFI $\rightarrow$ RMS	0.298
7	QU $\rightarrow$ RMS	0.073

These results indicate that Digital Financial Inclusion has the greatest influence on Customer Engagement, while Customer Engagement is the strongest determinant of Retail MSME Scalability.

4.1.6 Structural Model

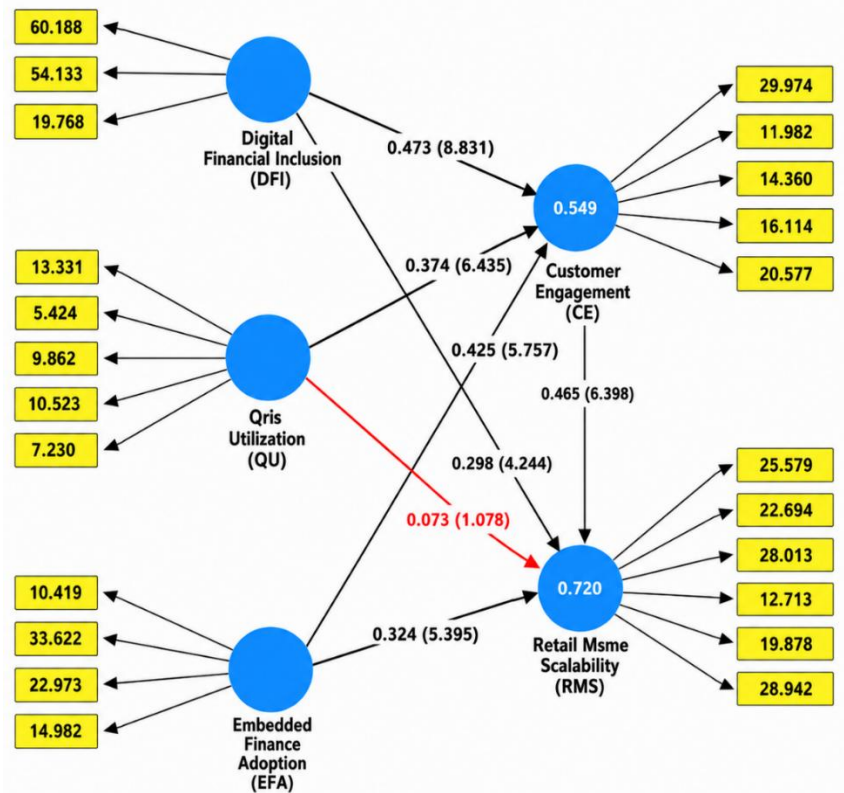


Figure 1. Final Structural Model

Note: *** $p < 0.001$; ns = not significant.

4.2 Discussion

4.2.1 Digital Financial Inclusion as a Driver of Customer Engagement and Scalability

The research findings indicate that Digital Financial Inclusion has a positive effect on Customer Engagement and Retail MSME Scalability. These results suggest that access to digital financial services not only improves transaction efficiency but also strengthens the relationship between business owners and customers.

Customers increasingly expect transaction processes that are fast, secure, and easily accessible. When MSMEs are able to provide a variety of digital financial facilities, customers enjoy a more convenient experience. This experience fosters higher engagement and increases the likelihood of repeat purchases.

These findings align with those of Demirguc-Kunt et al. (2022), Zhang et al. (2025), and Ozili (2022), who confirm that digital financial inclusion contributes to improved service quality and business growth.

From the perspective of the Technology Acceptance Model, digital financial services are viewed as offering clear benefits to users. The perception of these benefits drives technology acceptance and results in more intense interactions between customers and businesses.

4.2.2 QRIS Utilization: Improving Engagement but Not Directly Driving Scalability

The research results show that QRIS utilization has a positive effect on customer engagement but does not directly affect the scalability of retail MSMEs.

This finding offers an interesting perspective. QRIS successfully enhances transaction convenience and the customer experience. Customers can make payments more quickly without having to carry cash. This creates a more positive interaction between customers and businesses.

No direct impact on business scalability was found. These results indicate that the use of QRIS alone is not sufficient to drive business expansion. QRIS functions more as a transaction tool than as a source of competitive advantage.

These findings differ from several studies that have identified a direct relationship between digital payments and business performance. This discrepancy is likely due to the characteristics of retail MSMEs, which have made QRIS a relatively common technology. Under these conditions, QRIS is no longer a differentiating factor among businesses.

4.2.3 Embedded Finance Adoption and Business Growth

The adoption of embedded finance has been shown to have a positive impact on customer engagement and the scalability of retail MSMEs.

These results indicate that the integration of financial services into digital platforms offers broader benefits compared to conventional digital payment systems. Business owners gain faster access to financial services that support business operations. Customers also enjoy a simpler and more integrated transaction experience.

These findings support the research by Sambakiu (2025) as well as Gomber et al. (2017) which identifies embedded finance as one of the most promising innovations in the digital financial ecosystem.

The Resource-Based View perspective explains that the ability to leverage embedded finance is a strategic resource that is difficult for competitors to replicate. This capability can create a competitive advantage and support long-term business growth.

4.2.4 Customer Engagement as the Key Mechanism

The most significant finding in this study is the strong influence of customer engagement on the scalability of retail MSMEs.

The path coefficient value of 0.465 represents the strongest influence identified in the structural model. These results indicate that customer engagement is the primary factor determining the ability of MSMEs to scale their businesses.

Customers who are engaged with a business tend to make repeat purchases, recommend the business to others, and build long-term relationships with the company. These activities directly contribute to an increase in the number of customers and business growth.

This finding supports the Relationship Marketing Theory developed by Morgan & Hunt (1994). A strong relationship between a company and its customers is a strategic asset that ensures business sustainability.

4.2.5 Theoretical and Empirical Contributions

This study makes three main contributions.

First, this study integrates Digital Financial Inclusion, QRIS Utilization, and Embedded Finance Adoption into a single comprehensive model.

Second, this study expands the literature on the digital transformation of MSMEs by using Retail MSME Scalability as the dependent variable. Most previous studies have primarily used business performance or financial performance.

Third, this study demonstrates that Customer Engagement is a key mechanism that explains how digital financial innovations translate into business growth.

5. CONCLUSION AND SUGGESTION

This study aims to analyze the effects of Digital Financial Inclusion, QRIS Utilization, and Embedded Finance Adoption on Retail MSME Scalability through Customer Engagement among retail MSME operators. The results indicate that most of the tested relationships are empirically supported. Digital Financial Inclusion was found to have a positive effect on Customer Engagement and Retail MSME Scalability. Embedded Finance Adoption also showed a positive

effect on both Customer Engagement and Retail MSME Scalability. Customer Engagement itself emerged as the variable with the strongest influence on MSMEs' ability to scale their businesses.

An interesting finding emerged regarding the relationship between QRIS Utilization and Retail MSME Scalability. The expected direct effect was not found to be significant. This result suggests that the use of QRIS does not necessarily automatically enhance a business's ability to grow. QRIS serves more as a transactional facility that supports the customer experience. Its added value emerges when the technology is able to increase customer engagement in business activities.

The research findings provide insight that the growth of MSMEs in the digital era is not solely determined by the level of technology adoption. A more important factor is how the technology can foster better relationships with customers. Customers who feel comfortable, engaged, and have positive experiences tend to contribute more significantly to business development. This explains why Customer Engagement is a central factor in the research model.

From an academic perspective, this study expands the literature on digital financial transformation in MSMEs by integrating Digital Financial Inclusion, QRIS Utilization, and Embedded Finance Adoption into a single research framework. Previous studies generally addressed these three variables separately. This study also enriches the literature by incorporating Retail MSME Scalability as an outcome variable. This approach remains relatively uncommon compared to the use of business performance or financial performance as dependent variables. The study's findings also reinforce the relevance of the Technology Acceptance Model, the Resource-Based View, and Relationship Marketing Theory in explaining the relationship between digital financial innovation, customer engagement, and business growth.

From a practical perspective, the research results offer several implications for MSME operators, digital financial service providers, and policymakers. MSME operators need to view digital technology not merely as a payment or transaction tool. Technology should be leveraged to create a better customer experience. Digital financial service providers can develop more integrated and user-friendly services to enhance interactions between customers and business owners. Policymakers can also expand digital financial inclusion programs that focus not only on increasing the number of users but also on improving the quality of digital service utilization by SMEs.

This study still has several limitations. The research data was collected using a cross-sectional approach, so it only describes the respondents' conditions at a specific point in time. Long-term changes in technology usage behavior and business development cannot yet be fully observed. The scope of the study is also limited to retail SMEs that have already adopted digital financial services. The research findings should be interpreted with caution when applied to other business sectors with different characteristics.

Future research could employ a longitudinal design to examine how the impact of digital financial technology on business growth changes over time. Other variables, such as digital capability, innovation capability, customer trust, business resilience, or entrepreneurial orientation, could also be considered as mediating or moderating variables. Developing such a model has the potential to provide a deeper understanding of the factors that determine the success of digital transformation among SMEs in the digital economy era.

Overall, this study demonstrates that the success of digital financial transformation does not depend solely on the availability of technology. A greater impact emerges when technology is able to strengthen customer engagement and create valuable experiences. In this context, customer engagement serves as a crucial bridge linking digital financial innovation with the ability of SMEs to grow and scale their businesses sustainably.

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