

Research Paper

Does FinTech Adoption Enhance MSME Performance? The Role of Financial Behaviour and Digital Financial Literacy

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ABSTRACT

Despite their vital contribution to Indonesia's regional economy, MSMEs continue to face challenges related to limited financial literacy and low FinTech adoption, which constrain financial behaviour and business performance in the digital era. This study examines the effects of digital financial literacy and FinTech adoption on MSME financial performance, with financial behaviour serving as a mediating variable. A quantitative explanatory design was employed using survey data from 150 MSME owners in Banten Province, Indonesia. Data were analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS) to examine both direct and indirect relationships among the constructs. The findings reveal that financial literacy significantly influences financial behaviour ($\beta = 0.151$, $p = 0.034$) and exerts the strongest direct effect on MSME financial performance ($\beta = 0.483$, $p < 0.001$). FinTech adoption significantly affects financial behaviour ($\beta = 0.713$, $p < 0.001$) and financial performance ($\beta = 0.188$, $p = 0.024$). Financial behaviour positively influences financial performance ($\beta = 0.231$, $p = 0.016$). Furthermore, financial behaviour significantly mediates the relationship between FinTech adoption and MSME financial performance ($\beta = 0.165$, $p = 0.037$), but does not significantly mediate the relationship between financial literacy and financial performance ($\beta = 0.035$, $p = 0.195$). This study contributes to the MSME digitalization literature by clarifying the distinct pathways through which financial literacy and FinTech adoption shape business performance through financial behaviour.

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Introduction

Micro, Small, and Medium Enterprises (MSMEs) constitute a fundamental pillar of economic growth, employment generation, and social resilience in emerging economies, including Indonesia. Despite their significant contribution to regional development, many MSMEs continue to face persistent challenges related to financial management, limited digital capabilities, and restricted access to formal financial services (Is & Hungund, 2025; Sukriyah et al., 2026). In today's increasingly digital economy, the integration of financial technology (henceforth FinTech) has transformed how businesses manage transactions, access financing, and improve operational efficiency (Setiawan et al., 2026). Digital payment systems, mobile banking, peer-to-peer lending, and financial management applications have created opportunities for MSMEs to expand market access and improve competitiveness (Aqilah & Tong, 2026). However, the effectiveness of these technological innovations depends largely on entrepreneurs' financial literacy and their ability to adopt digital financial tools strategically (Ramdani et al., 2026; Rohaeni et al., 2026). MSMEs with limited financial literacy often struggle to evaluate financial products, manage risks, and optimize digital opportunities, which weakens financial behaviour and business performance (Dewi & Marhaeni, 2020). Consequently, strengthening financial literacy and accelerating FinTech adoption have become increasingly important in shaping sustainable MSME growth in the digital era.

The urgency of investigating the relationships among FinTech adoption, financial literacy, financial behaviour, and MSME performance has intensified as digital transformation reshapes entrepreneurial ecosystems globally. Although governments and financial institutions increasingly promote digital financial inclusion, many MSMEs remain unable to fully capitalize on digital financial services due to inadequate financial capability and behavioural readiness (Nugraheni et al., 2025). Financial literacy is increasingly recognized as a strategic competency that influences entrepreneurs' decision-making, resource allocation, and risk management (Haddad & Hornuf, 2019; Osei et al., 2025), while FinTech adoption provides practical tools for improving efficiency, transparency, and access to finance (Adaba et al., 2026). Nevertheless, technological accessibility alone does not necessarily guarantee improved business outcomes, as the translation of knowledge and digital tools into effective financial performance often depends on financial behaviour (Agarwal et al., 2022). Understanding how financial literacy and FinTech adoption interact with behavioural dimensions is therefore critical for designing evidence-based interventions that strengthen MSME resilience, competitiveness, and sustainability. In regions such as Banten Province, where digital adoption among MSMEs remains uneven, empirical evidence is especially needed to support targeted policy formulation and inclusive economic development.

Existing scholarship has widely examined the relationships between financial literacy, FinTech adoption, financial behaviour, and MSME performance, yet findings remain fragmented and context-dependent. Research generally suggests that financial literacy positively influences entrepreneurial decision-making, financial planning, and business sustainability by improving owners' ability to manage resources effectively (Adewumi & Cele, 2023; Li & Qian, 2020; Morgan & Trinh, 2019). Similarly, studies on FinTech adoption emphasize its role in increasing financial accessibility, operational efficiency, transparency, and market expansion for small businesses (Bhowmik & Saha, 2025; Van Houten, 2025). Another stream of literature highlights the importance of financial behaviour as a

behavioural mechanism that translates financial knowledge and technological usage into measurable financial outcomes through budgeting, saving, and cash-flow management practices (Loo et al., 2023; Widjayanti et al., 2025). However, prior studies also reveal inconsistent evidence regarding mediation effects (Zaimovic et al., 2025), with some reporting strong behavioural pathways between financial literacy and performance, while others find more direct relationships influenced by contextual factors such as institutional support, digital infrastructure, and entrepreneurial readiness (Hidayat & Fitriani, 2026).

Despite growing scholarly attention, several gaps remain insufficiently addressed in the existing literature. First, previous studies have predominantly examined financial literacy, FinTech adoption, and MSME performance independently, with limited integration of these variables into a unified explanatory framework. Second, empirical findings concerning the mediating role of financial behaviour remain inconclusive, particularly in regional contexts where digital financial ecosystems are still evolving. Third, evidence from Indonesia, especially Banten Province, remains limited despite the region's substantial MSME population and uneven digital financial adoption. Addressing these gaps, the present study introduces an integrated model examining the direct and indirect effects of digital financial literacy and FinTech adoption on MSME financial performance through financial behaviour. By positioning financial behaviour as a mediating mechanism, this study offers a more comprehensive understanding of how financial knowledge and technological adoption shape business outcomes. Therefore, this study aims to examine the influence of digital financial literacy and FinTech adoption on MSME financial performance and examine the mediating role of financial behaviour among MSMEs in Banten Province, Indonesia.

Hypotheses Development

Financial Literacy and Financial Behaviour

Financial literacy plays a crucial role in shaping how entrepreneurs manage financial resources, make business decisions, and respond to economic uncertainty. MSME owners with higher levels of financial literacy tend to possess better understanding of budgeting, saving, debt management, and financial planning, which strengthens responsible financial behaviour. From the perspective of human capital theory, financial knowledge constitutes an intangible capability that enables entrepreneurs to allocate resources more efficiently and make informed financial decisions (Nufakho et al., 2004). Prior studies suggest that financially literate individuals are more likely to demonstrate disciplined financial behaviour, including expenditure planning, record-keeping, and prudent borrowing practices (Alkhalwaldeh et al., 2023; Hermawan & Sudarsono, 2023; Widjayanti et al., 2025). In the context of MSMEs, financial literacy is expected to improve behavioural discipline and support sustainable business management. Therefore, the following hypothesis is proposed:

H1: Financial literacy positively affects financial behaviour among MSMEs.

FinTech Adoption and Financial Behaviour

The increasing integration of FinTech into business activities has substantially transformed how MSMEs manage their financial transactions and operational processes.

According to the Technology Acceptance Model (TAM), technology adoption can influence behavioural outcomes by enhancing perceived usefulness and ease of use (Marangunić & Granić, 2015). FinTech services, including mobile banking, digital payments, and financial management applications, facilitate more systematic budgeting, transparent record-keeping, and efficient cash-flow monitoring. Previous studies indicate that digital financial tools encourage entrepreneurs to adopt more disciplined financial habits and reduce dependence on informal financial mechanisms (Nugraheni et al., 2025; Zaimovic et al., 2025). In developing economies, where access to conventional financial systems remains uneven, FinTech adoption may significantly reshape financial behaviour by promoting formal and data-driven financial practices. Therefore, the hypothesis below is formulated:

H₂: FinTech adoption positively affects financial behaviour among MSMEs.

Financial Literacy and MSME Financial Performance

Financial literacy is widely regarded as a fundamental determinant of business sustainability and performance because it enables entrepreneurs to make informed financial decisions and manage business risks effectively (Arner et al., 2020). MSME owners with strong financial literacy are generally better equipped to evaluate financing alternatives, optimize cash flow, control expenditures, and make strategic investment decisions. Human capital theory suggests that financial knowledge enhances productivity and improves organizational outcomes through better managerial capability. Empirical evidence consistently demonstrates that financial literacy contributes positively to business growth, profitability, and financial resilience among small enterprises (Chen et al., 2019; Pham & Doan, 2020). In highly competitive and uncertain economic environments, financially literate entrepreneurs are more likely to sustain business operations and improve performance outcomes. Therefore, the following hypothesis is proposed:

H₃: Financial literacy positively affects MSME financial performance.

FinTech Adoption and MSME Financial Performance

FinTech adoption has emerged as an important driver of MSME growth by improving access to financial services, reducing transaction costs, and increasing operational efficiency. Through digital financial platforms, MSMEs can simplify payment systems, improve financial reporting, access alternative financing, and expand market opportunities (Putra & Soma, 2025). The diffusion of innovation perspective suggests that businesses adopting technological innovations are better positioned to improve competitiveness and performance outcomes (Khairani et al., 2025). Prior research demonstrates that FinTech adoption enhances profitability, productivity, and financial sustainability among small businesses by facilitating more efficient financial management and customer engagement (Setiawan et al., 2026; Nurcahyati et al., 2024). In the context of MSMEs in Banten Province, greater adoption of FinTech is expected to improve business performance through enhanced efficiency and financial accessibility. Therefore, the following hypothesis is formulated:

H₄: FinTech adoption positively affects MSME financial performance.

Financial Behaviour and MSME Financial Performance

Financial behaviour reflects how entrepreneurs manage their financial resources through practices such as budgeting, saving, debt management, financial planning, and

record-keeping. Behavioural finance theory argues that positive financial behaviour contributes to better economic outcomes by reducing irrational decision-making and promoting long-term financial discipline (Kapoor & Prosad, 2017). MSME owners who regularly monitor expenditures, maintain financial records, and plan investments are more likely to improve profitability and sustain business growth (Risman, 2024). Previous studies have shown that sound financial behaviour significantly enhances business resilience and performance, particularly among small enterprises operating in uncertain environments (Jathanna et al., 2025; Rahayu et al., 2023). Therefore, effective financial behaviour is expected to contribute positively to MSME financial performance. Thus, the following hypothesis is proposed:

H5: Financial behaviour positively affects MSME financial performance.

The Mediating Role of Financial Behaviour in the Relationship between Financial Literacy and MSME Financial Performance

Financial literacy may not only directly influence business performance but also shape performance indirectly through financial behaviour. Entrepreneurs who possess stronger financial knowledge are more likely to adopt disciplined financial practices, such as budgeting, cash-flow management, and strategic financial planning, which subsequently improve business performance. The Theory of Planned Behaviour (Ajzen, 1991) suggests that knowledge and attitudes can influence behavioural patterns that ultimately shape outcomes. Prior studies report that financial behaviour often mediates the relationship between financial literacy and financial well-being or business performance, suggesting that financial knowledge translates into performance when reflected in responsible financial actions (Kalapriya, 2024; Sugih & Fitriyah, 2024). Therefore, financial behaviour is expected to function as an important mechanism linking financial literacy and MSME financial performance. Accordingly, the following hypothesis is formulated:

H6: Financial behaviour mediates the relationship between financial literacy and MSME financial performance.

The Mediating Role of Financial Behaviour in the Relationship between FinTech Adoption and MSME Financial Performance

The relationship between FinTech adoption and business performance may also operate indirectly through financial behaviour. FinTech tools facilitate financial monitoring, digital transactions, expenditure control, and financial planning, thereby encouraging more responsible financial practices among MSME owners. According to behavioural perspectives on technology adoption, technological innovations influence organizational outcomes not only directly but also by changing user behaviour and decision-making processes (Pradnyani et al., 2025). Empirical studies suggest that digital financial tools improve performance when entrepreneurs consistently integrate them into disciplined financial routines and management practices (Asad et al., 2025; Bedaduri et al., 2025). Consequently, financial behaviour may serve as an important mediating mechanism through which FinTech adoption enhances MSME financial performance. Therefore, the following hypothesis is proposed:

H7: Financial behaviour mediates the relationship between FinTech adoption and MSME financial performance.

Figure 1 illustrates the proposed research model and the hypothesized relationships among the constructs. The model posits that Financial Literacy and FinTech Adoption influence MSME Financial Performance both directly and indirectly through Financial Behaviour as a mediating variable. Specifically, Financial Literacy is hypothesized to positively affect Financial Behaviour (H1) and MSME Financial Performance (H3), while FinTech Adoption is expected to positively influence Financial Behaviour (H2) and MSME Financial Performance (H4). Furthermore, Financial Behaviour is proposed to positively affect MSME Financial Performance (H5) and mediate the relationships between Financial Literacy and MSME Financial Performance (H6), as well as between FinTech Adoption and MSME Financial Performance (H7). The research model therefore provides an integrated framework for understanding how financial capability and digital financial technology shape MSME performance outcomes in the context of Banten Province, Indonesia.

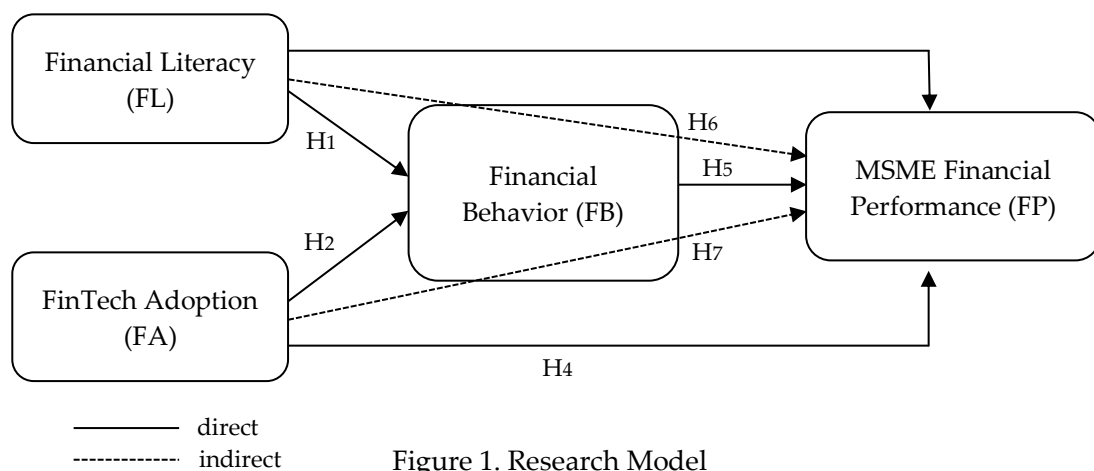


Figure 1. Research Model

Method

Research Design and Participants

This study employed a quantitative explanatory research design to examine the relationships among digital financial literacy, FinTech adoption, financial behaviour, and MSME financial performance in Banten Province, Indonesia. A quantitative design was considered appropriate because the study aimed to test hypothesized causal relationships and assess both direct and mediating effects among latent constructs using statistical modeling. Given the complexity of the proposed model involving multiple interrelated variables and mediation pathways, Structural Equation Modeling–Partial Least Squares (SEM-PLS) was selected as the primary analytical approach due to its suitability for predictive and exploratory models involving latent variables and relatively small sample sizes. The study population consisted of active Micro, Small, and Medium Enterprises (MSMEs) operating across eight regencies and municipalities in Banten Province. A stratified random sampling technique was employed to ensure proportional representation across business sectors, including trade, services, manufacturing, and agriculture, as well as geographic variation between urban and rural areas. A total of 180 questionnaires were distributed, of which 150 valid responses were returned and analyzed, yielding an 83% response rate. The sample size met the minimum adequacy requirements for SEM-PLS analysis based on the “10-times rule” and statistical power considerations.

Instrument and Data Collection

Primary data were collected through a structured questionnaire administered to MSME owners and managers in Banten Province between January and June 2025. The questionnaire was developed by adapting validated measurement instruments from previous studies on financial literacy (Agarwal et al., 2022), FinTech adoption (Asad et al., 2025), financial behaviour (Alkhawaldeh et al., 2023), and MSME performance (Aqilah & Tong, 2026). The detailed measurement of constructs, dimensions, and questionnaire items is presented in Table 1.

Table 1. Measurement of Research Variables

Constructs	Dimensions	Measurement Items
Financial Literacy	Financial knowledge, budgeting, financial planning	FL1. I understand various financial products for business purposes. FL2. I am able to compare financial products before making decisions. FL3. I regularly prepare financial plans for my business. FL4. I understand business cash-flow management. FL5. I can evaluate financial risks in business activities.
FinTech Adoption	Usage frequency, perceived usefulness, ease of use	FA1. I regularly use digital payment applications for business transactions. FA2. FinTech services improve my business efficiency. FA3. Digital financial applications are easy to use. FA4. I use mobile banking or digital lending platforms for business purposes. FA5. FinTech helps improve financial transparency in my business.
Financial Behaviour	Budgeting, saving, debt management, financial records	FB1. I regularly prepare business budgets. FB2. I separate personal and business finances. FB3. I carefully manage business debt and credit. FB4. I maintain financial transaction records consistently. FB5. I prioritize saving or reinvestment for business sustainability.
MSME Financial Performance	Revenue growth, profitability, business sustainability	FP1. My business revenue has increased over time. FP2. My business profitability has improved. FP3. My business maintains stable financial performance. FP4. I am able to reinvest profits into business growth. FP5. My business has shown stronger financial resilience.

Source: Agarwal et al. (2022); Alkhawaldeh et al. (2023); Aqilah and Tong (2026); Asad et al. (2025)

Prior to the main survey, a pilot test involving a small group of MSME owners was conducted to ensure item clarity, readability, and contextual relevance. Data collection was carried out using a hybrid approach, combining face-to-face distribution and online forms

to accommodate participants' varying levels of digital accessibility. All measurement items were assessed using a five-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree. The Likert scale was selected because it enables respondents to express varying levels of agreement toward specific statements while facilitating statistical analysis of latent constructs in SEM-PLS. Higher scores indicate stronger perceptions or behavioural tendencies associated with each construct.

Data Analysis

Data were analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS) with SmartPLS software to examine the direct and indirect relationships among the constructs. SEM-PLS was selected because it is effective for analyzing complex predictive models involving latent variables, mediation effects, and non-normal data distributions. The analysis followed a two-stage procedure consisting of measurement model evaluation and structural model evaluation. In the measurement model, reliability and validity of the constructs were assessed through outer loadings, Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). Indicator loadings above 0.70, reliability coefficients exceeding 0.70, and AVE values greater than 0.50 were considered acceptable thresholds. Discriminant validity was examined using the Fornell–Larcker criterion and the Heterotrait–Monotrait Ratio (HTMT) to ensure adequate distinction among constructs. In the structural model, multicollinearity was assessed using the Variance Inflation Factor (VIF), while predictive accuracy was evaluated using R^2 . Hypothesis testing and mediation analysis were performed through a bootstrapping procedure, where path coefficients, *t*-values, and *p*-values were used to determine statistical significance.

Results

Respondent Profile

Table 2 presents the demographic and business characteristics of the respondents involved in this study. Of the 150 MSME owners surveyed, female entrepreneurs represented a slightly larger proportion (54.7%) than male entrepreneurs (45.3%), indicating a substantial participation of women in local entrepreneurial activities. In terms of age, the majority of respondents were between 31–40 years old (32.7%), followed by those aged 41–50 years (28.7%), suggesting that most participants were in economically productive and entrepreneurial stages. Regarding educational attainment, bachelor's degree holders constituted the largest group (40.7%), followed by respondents with high school education (37.3%). The MSMEs operated across diverse sectors, with trade (34.7%) and services (26.0%) dominating the sample, reflecting the economic structure of Banten Province. Most businesses had been operating for 6–10 years (31.3%), indicating moderate business maturity. Furthermore, respondents were distributed across urban (59.3%) and rural areas (40.7%), ensuring representation of different levels of digital and financial accessibility.

The respondent profile suggests several important implications for understanding MSME financial behaviour and digital transformation in Banten Province. The relatively higher participation of female entrepreneurs reflects the increasing role of women in MSME development, particularly in trade and service-oriented sectors, which may influence patterns of financial management and technology adoption. The dominance of respondents

in the productive age range (31–50 years) indicates that most participants possess sufficient entrepreneurial experience while remaining adaptable to digital innovation, potentially strengthening the relevance of FinTech adoption in business practices. Furthermore, the relatively high proportion of respondents with tertiary education may indicate a stronger capacity for understanding financial concepts and utilizing digital financial services, although the substantial presence of high school graduates also highlights varying levels of financial capability within the MSME ecosystem. The balanced representation of urban and rural MSMEs strengthens the study's contextual relevance, as differences in infrastructure, financial access, and digital readiness may shape the effectiveness of financial literacy and FinTech adoption in influencing business performance.

Table 2. Respondent Demographic Profile

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	68	45.3
	Female	82	54.7
Age	20-30 years	32	21.3
	31-40 years	49	32.7
	41-50 years	43	28.7
	>50 years	26	17.3
	Education level	High school	56
Business sector	Diploma	24	16.0
	Bachelor's degree	61	40.7
	Postgraduate	9	6.0
	Trade	52	34.7
Business duration	Services	39	26.0
	Manufacturing	34	22.7
	Agriculture/Food processing	25	16.6
	<3 years	28	18.7
	3-5 years	41	27.3
Location	6-10 years	47	31.3
	>10 years	34	22.7
	Urban	89	59.3
	Rural	61	40.7

Source: Authors' data (2025)

Measurement Model Analysis

The measurement model was assessed through convergent validity, reliability, and discriminant validity analyses to ensure the adequacy of the latent constructs prior to hypothesis testing. As presented in Table 3, all indicators demonstrate satisfactory factor loadings, ranging from 0.775 to 0.871, exceeding the recommended threshold of 0.70, thereby confirming acceptable indicator reliability. Likewise, Variance Inflation Factor (VIF) values range between 1.885 and 2.976, indicating no serious multicollinearity issues among indicators, as all values remain below the critical threshold of 5.0. Regarding construct reliability and convergent validity, the findings reveal that all constructs achieve acceptable levels of Cronbach's Alpha (0.868–0.897) and Composite Reliability (0.905–0.924),

surpassing the recommended cut-off value of 0.70, thus indicating strong internal consistency. Similarly, Average Variance Extracted (AVE) values range from 0.655 to 0.709, exceeding the threshold of 0.50, which confirms that each construct adequately explains the variance of its indicators.

Table 3. Convergent Validity and Reliability

Construct	Measure	Factor Loading	VIF	AVE	Cronbach's Alpha	Composite Reliability
Financial literacy	FL1	0.781	2.014	0.671	0.887	0.911
	FL2	0.826	2.345			
	FL3	0.843	2.601			
	FL4	0.854	2.727			
	FL5	0.799	2.168			
Fintech adoption	FA1	0.812	2.431	0.709	0.897	0.924
	FA2	0.847	2.804			
	FA3	0.871	2.976			
	FA4	0.856	2.692			
	FA5	0.826	2.521			
Financial behaviour	FB1	0.829	2.547	0.693	0.889	0.919
	FB2	0.857	2.924			
	FB3	0.841	2.678			
	FB4	0.822	2.355			
	FB5	0.789	2.481			
Financial performance	FP1	0.786	1.932	0.655	0.858	0.905
	FP2	0.814	2.118			
	FP3	0.835	2.507			
	FP4	0.842	2.633			
	FP5	0.775	1.885			

Source: SEM-PLS analysis (2025)

Discriminant validity was further assessed using the Fornell–Larcker criterion and the Heterotrait–Monotrait Ratio (HTMT) to ensure that each construct captured conceptually distinct phenomena within the proposed model. As presented in Table 4, the square root of the Average Variance Extracted (AVE) for each construct exceeds its correlations with other latent variables. Specifically, the diagonal values representing the square root of AVE for Digital Financial Literacy (0.819), FinTech Adoption (0.842), Financial Behaviour (0.833), and MSME Financial Performance (0.809) are consistently higher than the corresponding inter-construct correlation coefficients. This result indicates that each construct shares greater variance with its own indicators than with other constructs, thereby satisfying the Fornell–Larcker criterion and confirming adequate discriminant validity. In other words, the latent variables in the model are empirically distinguishable and measure unique conceptual domains rather than overlapping dimensions.

Table 4. Fornell-Larcker Criterion

Construct	Financial Literacy	FinTech Adoption	Financial Behaviour	Financial Performance
Financial Literacy	0.819			
FinTech Adoption	0.541	0.842		
Financial Behaviour	0.472	0.708	0.833	
Financial Performance	0.661	0.547	0.493	0.809

Source: SEM-PLS analysis (2025)

Furthermore, discriminant validity was reinforced through the Heterotrait–Monotrait Ratio (HTMT) analysis, as reported in Table 5. HTMT values ranged from 0.551 to 0.792, remaining below the conservative threshold of 0.85, which is widely accepted as evidence of satisfactory discriminant validity in SEM-PLS analysis. The highest HTMT value was observed between FinTech Adoption and Financial Behaviour (0.792), suggesting a relatively strong conceptual association between the two constructs while still maintaining sufficient distinctiveness. The remaining construct pairs exhibited moderate HTMT values, indicating that although the variables are theoretically related, they remain statistically separate constructs. Collectively, the findings from both the Fornell–Larcker criterion and HTMT analysis provide strong evidence that the measurement model possesses robust discriminant validity and is suitable for subsequent structural model estimation.

Table 5. Heterotrait–Monotrait Ratio (HTMT)

Construct	Financial Literacy	FinTech Adoption	Financial Behaviour	Financial Performance
Financial Literacy	-			
FinTech Adoption	0.624	-		
Financial Behaviour	0.551	0.792	-	
Financial Performance	0.741	0.653	0.582	-

Source: SEM-PLS analysis (2025)

The overall measurement model results indicate that the research instrument possesses strong psychometric properties and is suitable for structural model estimation. The satisfactory validity and reliability values suggest that the indicators consistently capture the intended dimensions of digital financial literacy, FinTech adoption, financial

behaviour, and MSME financial performance. Furthermore, the absence of multicollinearity issues and the strong discriminant validity provide evidence that each construct measures conceptually distinct phenomena rather than overlapping concepts. These findings imply that the proposed model is statistically robust and appropriate for examining the direct and mediating relationships among the variables in the subsequent structural model analysis.

Structural Model Analysis

Following the confirmation of measurement model adequacy, the structural model was evaluated to examine the predictive power of the model and test the proposed hypotheses. The structural assessment involved R-square (R^2) analysis and bootstrapping procedures to evaluate the significance of direct and indirect relationships among constructs. The structural model analysis was conducted to assess the predictive accuracy of the proposed model and examine the hypothesized relationships among the constructs.

Table 6. R-square Test

Endogenous Construct	R-Square	R-Square Adjusted	Interpretation
Financial behaviour	0.592	0.586	Moderate
MSME Financial performance	0.648	0.639	Moderate-substantial

Source: SEM-PLS analysis (2025)

As presented in Table 6, the R-square (R^2) value for Financial Behaviour (FB) is 0.592, indicating that digital financial literacy and FinTech adoption jointly explain approximately 59.2% of the variance in financial behaviour. This suggests a moderate explanatory power, implying that the two exogenous variables substantially contribute to shaping MSME financial behaviour. Meanwhile, the R^2 value for MSME Financial Performance (FP) is 0.648, indicating that financial literacy, FinTech adoption, and financial behaviour collectively explain 64.8% of the variance in financial performance, reflecting moderate-to-substantial predictive power.

The hypothesis testing results in Table 7 demonstrate that most direct relationships are statistically significant. Financial literacy significantly influences financial behaviour ($\beta = 0.151$, $p = 0.034$) and MSME financial performance ($\beta = 0.483$, $p < 0.001$), supporting H₁ and H₃. FinTech adoption exhibits a strong positive effect on financial behaviour ($\beta = 0.713$, $p < 0.001$) and a significant direct effect on financial performance ($\beta = 0.188$, $p = 0.024$), thereby supporting H₂ and H₄. Furthermore, financial behaviour significantly affects financial performance ($\beta = 0.231$, $p = 0.016$), confirming H₅. Regarding mediation effects, financial behaviour does not significantly mediate the relationship between financial literacy and financial performance ($\beta = 0.035$, $p = 0.195$), leading to the rejection of H₆. Conversely, financial behaviour significantly mediates the relationship between FinTech adoption and MSME financial performance ($\beta = 0.165$, $p = 0.037$), supporting H₇.

The structural model findings indicate that financial literacy and FinTech adoption are important determinants of MSME financial performance, although they operate through different mechanisms. Financial literacy demonstrates the strongest direct influence on performance, suggesting that entrepreneurs' financial knowledge enables more effective

resource management and strategic decision-making independent of behavioural mediation. By contrast, FinTech adoption affects performance both directly and indirectly through financial behaviour, indicating that digital financial technologies become most effective when translated into disciplined financial practices such as budgeting, record-keeping, and expenditure control. The insignificant mediation effect of financial behaviour in the relationship between financial literacy and performance implies that financial knowledge may directly shape business outcomes without necessarily transforming routine financial habits. Overall, the model demonstrates substantial explanatory capability and highlights the importance of integrating financial capability and digital transformation strategies to improve MSME competitiveness and sustainability.

Table 7. Hypotheses Testing Results

Hypotheses	Original Sample (β)	Sample Mean	Standard Deviation	T - Statistics	P Values
H1: FL -> FB	0.151	0.149	0.071	2.127	0.034
H2: FA -> FB	0.713	0.715	0.064	11.141	0.001
H3: FL -> FP	0.483	0.486	0.068	7.103	0.001
H4: FA -> FP	0.188	0.191	0.083	2.265	0.024
H5:FB -> FP	0.231	0.227	0.096	2.406	0.016
H6: FL -> FB -> FP	0.035	0.037	0.027	1.296	0.195
H7: FA ->FB ->FP	0.165	0.161	0.079	2.089	0.037

Source: SEM-PLS analysis (2025)

Discussion

The findings demonstrate that both digital financial literacy (H1) and FinTech adoption (H2) significantly influence financial behavior among MSMEs in Banten Province, although the magnitude of influence differs considerably. Financial literacy exhibits a positive but relatively modest effect on financial behavior, indicating that financial knowledge alone may not automatically transform entrepreneurs' financial habits. This finding suggests the presence of a "knowledge-behavior gap," where MSME owners understand financial concepts but may struggle to consistently apply them in routine business management. From the perspective of human capital theory, financial literacy enhances cognitive capability; however, behavioral change often requires reinforcement through contextual and technological support (Nufakho et al., 2024). Conversely, FinTech adoption demonstrates a substantially stronger influence on financial behavior, implying that digital financial tools function not merely as transactional instruments but as behavioral enablers. Applications such as mobile banking, e-wallets, and automated bookkeeping systems may encourage budgeting discipline, expenditure monitoring, and record-keeping through embedded digital features (Nugraheni et al., 2024; Putra & Soma, 2025). This finding reinforces the Technology Acceptance Model, which posits that perceived usefulness and ease of use stimulate behavioral change in technology utilization (Marangunic & Granic, 2015).

The stronger effect of FinTech adoption compared to financial literacy also reflects the changing entrepreneurial landscape in emerging economies, where technology increasingly

shapes financial routines more effectively than knowledge alone. In Banten Province, many MSMEs operate under time constraints and limited managerial resources, making practical digital solutions more immediately impactful than conceptual financial understanding. This finding aligns with previous studies showing that FinTech adoption facilitates more responsible financial management through automation, transaction transparency, and improved access to financial information (Adaba et al., 2026; Asad et al., 2025). Nevertheless, the significant role of financial literacy should not be overlooked, as entrepreneurs with stronger financial understanding are generally better positioned to evaluate digital financial services critically and avoid poor financial decisions (Hermawan & Sudarsono, 2023). Therefore, the interplay between financial literacy and FinTech adoption appears complementary rather than substitutive. While literacy provides the cognitive foundation for decision-making, FinTech adoption operationalizes those capabilities into concrete financial behaviors, thereby strengthening financial discipline among MSMEs.

The results reveal that both digital financial literacy (H3) and FinTech adoption (H4) positively influence MSME financial performance, although financial literacy exerts the stronger direct effect. This finding indicates that entrepreneurs' financial capability remains a foundational determinant of business sustainability and growth. Financially literate MSME owners are more likely to allocate resources strategically, manage debt prudently, and anticipate financial risks, thereby improving profitability and long-term resilience. From the lens of human capital theory, financial literacy functions as an intangible entrepreneurial asset that strengthens managerial decision-making and business productivity (Nufakho et al., 2004). This finding is consistent with studies demonstrating that entrepreneurs with higher financial capability tend to achieve stronger financial outcomes because they possess better understanding of budgeting, financing alternatives, and investment opportunities (Osei et al., 2025; Morgan & Trinh, 2019). In developing economies, where institutional support may be uneven, financial literacy often becomes a substitute mechanism for weak external financial advisory systems.

Meanwhile, the significant effect of FinTech adoption on financial performance suggests that digital transformation has become an increasingly important driver of MSME competitiveness. FinTech enables businesses to reduce transaction costs, improve cash-flow management, expand access to financing, and engage customers through digital payment systems (Nurchayati et al., 2024). However, the comparatively smaller effect size of FinTech adoption indicates that technology alone is insufficient to guarantee performance enhancement. Rather, its effectiveness depends on how entrepreneurs integrate digital tools into broader financial management practices. This finding supports the argument that digital innovation functions as an enabler rather than an independent determinant of success (Setiawan et al., 2026). It also aligns with prior evidence suggesting that MSMEs adopting financial technologies experience stronger business performance due to increased efficiency and transparency, particularly in emerging markets with expanding digital ecosystems (Bedaduri et al., 2025; Zaimovic et al., 2025). In Banten Province, this underscores the growing importance of combining technological readiness with financial capability to sustain MSME growth.

The positive and significant relationship between financial behavior and MSME financial performance (H5) highlights the central role of everyday financial practices in shaping business outcomes. MSME owners who consistently engage in budgeting, saving, financial record-keeping, and prudent debt management are more likely to maintain

business stability and profitability. This finding suggests that financial behavior acts as a practical mechanism through which financial resources are managed efficiently and risks are minimized. Behavioral finance theory emphasizes that decision-making patterns, self-control, and disciplined financial habits substantially influence financial outcomes by reducing impulsive choices and promoting long-term planning (Dewi & marhaeni, 2020; Jathanna et al., 2025). In the context of MSMEs, where financial vulnerability often stems from poor cash-flow management and informal practices, disciplined financial behavior becomes particularly important for sustaining operations and coping with uncertainty.

However, the moderate effect size of financial behavior indicates that performance outcomes are influenced by multiple interacting factors beyond behavioral discipline alone. External market conditions, digital infrastructure, entrepreneurial capability, and access to financing may simultaneously shape business performance (Khairani et al., 2025). Nonetheless, the significance of financial behavior reinforces the notion that entrepreneurial success is not solely dependent on financial knowledge or technological access but also on the consistency with which those resources are translated into daily financial management practices. This finding supports previous studies demonstrating that positive financial behavior significantly enhances business sustainability and resilience among small enterprises (Li & Qian, 2020; Nugraheni et al., 2025). For MSMEs in Banten Province, strengthening financial discipline may therefore represent a practical and cost-effective strategy for improving financial performance, particularly among businesses operating in uncertain and resource-constrained environments.

The mediation analysis reveals contrasting findings regarding the role of financial behavior in linking financial literacy and FinTech adoption to MSME financial performance. The insignificant mediation effect of financial behavior in the relationship between financial literacy and performance (H₆) suggests that financial knowledge may influence business outcomes more directly rather than through routine behavioral changes. This finding implies that MSME owners with adequate financial literacy are capable of making strategic financial decisions, such as evaluating credit options, managing investments, or allocating resources efficiently, without necessarily demonstrating highly disciplined financial routines. Such a pattern may reflect the practical realities of MSMEs in Banten, where entrepreneurs often rely on experience-based decision-making and adaptive problem-solving rather than formalized financial management systems. This result differs from studies arguing that financial behavior serves as a strong intermediary mechanism between literacy and financial outcomes (Nurcahyati et al., 2024; Pradnyani et al., 2025), yet it aligns with evidence suggesting that contextual factors, entrepreneurial intuition, and informal business norms may weaken behavioral mediation pathways (Sugih et al., 2024). Thus, financial literacy appears to function as a direct managerial capability rather than an exclusively behavioral driver of MSME performance.

In contrast, the significant mediating role of financial behavior in the relationship between FinTech adoption and financial performance (H₇) highlights the importance of behavioral adaptation in maximizing technological benefits. FinTech tools do not automatically improve business outcomes; instead, their effectiveness depends on whether entrepreneurs incorporate them into systematic financial routines such as budgeting, transaction monitoring, and financial planning. This finding supports behavioral perspectives on technology adoption, which argue that digital innovations shape organizational outcomes by transforming user behavior and decision-making processes

(Ajzen, 1991). MSME owners who actively integrate digital payment systems, mobile banking, and bookkeeping applications into daily business activities are more likely to develop disciplined financial habits that ultimately enhance financial performance. Consistent with previous studies, this finding suggests that the value of FinTech lies not only in accessibility and efficiency but also in its ability to encourage structured financial behavior through automation and transparency (Rahayu et al., 2023; Ramdani et al., 2026). Therefore, financial behavior emerges as a crucial mechanism through which digital financial technology contributes to MSME competitiveness and sustainability.

The findings offer several important implications for theory, practice, and policy. Theoretically, this study extends existing literature on MSME financial capability and digital transformation by integrating financial literacy, FinTech adoption, financial behavior, and business performance within a unified explanatory framework. The study contributes to the Theory of Planned Behavior and the Technology Acceptance Model by demonstrating that financial behavior functions selectively as a mediating mechanism, particularly in the relationship between FinTech adoption and performance. This finding suggests that technology-driven behavioral transformation may be more immediate than knowledge-driven behavioral change, thereby enriching scholarly understanding of how financial capability and digital technology interact in entrepreneurial contexts. Practically, the findings imply that MSME development programs should simultaneously strengthen financial literacy and encourage effective FinTech utilization rather than prioritizing one dimension alone. Entrepreneurs require not only conceptual financial knowledge but also practical digital tools that facilitate budgeting, bookkeeping, and expenditure monitoring. From a policy perspective, local governments and financial institutions in Banten Province should expand digital financial infrastructure, strengthen financial education initiatives, and develop MSME-focused FinTech ecosystems that are accessible and user-friendly. Collaborative interventions involving government agencies, financial institutions, universities, and digital service providers could significantly improve MSME resilience, competitiveness, and long-term sustainability within Indonesia's rapidly evolving digital economy.

Conclusion

This study demonstrates that digital financial literacy, FinTech adoption, and financial behaviour significantly shape MSME financial performance in Banten Province, although their pathways of influence differ. Financial literacy emerges as the strongest direct predictor of MSME financial performance, suggesting that entrepreneurs' ability to understand and manage financial resources constitutes a fundamental capability for sustaining business growth and resilience. FinTech adoption also positively affects performance, both directly and indirectly through financial behaviour, indicating that digital financial technologies become more effective when accompanied by disciplined financial practices such as budgeting, record-keeping, and cash-flow management. Furthermore, financial behaviour significantly contributes to financial performance and acts as an important mediating mechanism linking FinTech adoption to business outcomes, although it does not significantly mediate the relationship between financial literacy and performance. These findings imply that strengthening MSME competitiveness in the digital

economy requires integrated interventions combining financial capability enhancement, behavioural reinforcement, and accessible digital financial ecosystems.

Despite its contributions, this study has several limitations that should be acknowledged. First, the research focuses exclusively on MSMEs in Banten Province, which may limit the generalizability of findings to other regional contexts with different levels of economic development, digital infrastructure, and financial accessibility. Second, the study adopts a cross-sectional design, restricting the ability to examine long-term changes in financial behaviour and performance over time. Third, the reliance on self-reported questionnaire data may introduce response bias and subjective interpretation among participants. Future studies are encouraged to employ longitudinal designs to capture dynamic behavioural changes and include broader geographical coverage to enhance generalizability. Additionally, future research may explore other influential variables such as entrepreneurial orientation, digital capability, organizational innovation, or institutional support as moderating or mediating factors to provide a more comprehensive understanding of MSME financial performance in the digital era.

Authors' Declaration

The authors made substantial contributions to the conception and design of this study. The authors take responsibility for the data analysis, interpretation, and discussion of the results. The authors have read and approved the final manuscript.

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