



The impact of fintech on sustainability performance through financial inclusion: A case study of MSME actors in Indonesia using diffusion of innovation theory (DIT)

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ARTICLE INFO

Article history:

Received Dec 8, 2025
Revised Dec 15, 2025
Accepted Dec 30, 2025

Keywords:

Diffusion of Innovation Theory;
Financial Inclusion;
Sustainability Performance;
UMKM.

ABSTRACT

This study analyzes the role of Financial Technology (FinTech) in improving the sustainability performance of MSMEs in Indonesia by positioning financial inclusion as a mediating mechanism within the Diffusion of Innovation Theory (DIT) framework. Although various studies acknowledge the contribution of FinTech to business sustainability, the mechanisms explaining how FinTech adoption translates into sustainable performance achievements have not been empirically studied, especially in the context of MSMEs in developing countries. To fill this gap, this study uses a quantitative survey-based approach involving 205 MSME actors who use FinTech services in Indonesia. The data is analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the direct and indirect relationships between FinTech, financial inclusion, and sustainability performance. The results of the study indicate that FinTech has a positive and significant effect on financial inclusion and sustainability performance. In addition, financial inclusion also has a positive and significant effect on sustainability performance and acts as a significant mediator in the relationship between FinTech and sustainability performance. These findings indicate that FinTech will be more effective in promoting the sustainability of MSMEs if accompanied by the expansion of inclusive digital financial access. Theoretically, this study expands the application of DIT from merely explaining innovation adoption to understanding the performance implications of digital financial innovation. Practically, these findings emphasize the importance of strengthening an inclusive digital financial ecosystem to support the sustainability of MSMEs in Indonesia.

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1. INTRODUCTION

Financial Technology (FinTech) has served as a major catalyst for the transformation of the global financial system by providing faster, more efficient, and more inclusive services (Arner et al., 2015). In Indonesia, FinTech development has grown rapidly, as reflected in more than 300 entities registered with the Financial Services Authority and projections of digital transaction growth

reaching hundreds of trillions of rupiah by 2024 (Asia, T.in., 2024). This development has encouraged the digitization of MSMEs and changes in people's financial behavior. However, the effectiveness of FinTech adoption is still hampered by low financial literacy, digital infrastructure inequality, and the operational risks of FinTech lending services (Oktapriana et al., 2023; Lehmann, 2020; Suryadarma & Faqih, 2024). Previous studies have largely emphasized the availability and diffusion of FinTech services, but have not sufficiently explained the mechanism through which FinTech adoption translates into sustainable business outcomes at the firm level, particularly among MSMEs.

In MSMEs, FinTech helps overcome barriers to formal financing. Mobile banking, e-wallets, and digital credit services enhance financial inclusion and transaction management (Ullah & Begum, 2025). Sustainability, encompassing economic, social, and environmental aspects, indicates long-term competitiveness (Elkington, 1998). FinTech also improves cost efficiency, transparency, and reduces physical resource use (Almaqtari, 2024). Evidence shows FinTech adoption boosts financial access and sustainability performance through innovation (Rohman & Saefudin, 2024). Nevertheless, most prior research treats financial inclusion either as an end outcome or as a parallel consequence of FinTech adoption, rather than as an explanatory mechanism linking FinTech to sustainability performance.

However, research examining the relationship between these three variables in the context of Indonesian MSMEs is still limited. Most studies focus on the macro or cross-country level (Udeagha & Ngepah, 2023; Atayah et al., 2023), thus failing to reflect the conditions of Indonesian MSMEs, which face capital constraints, low digital literacy, and uneven technology adoption. Cross-country studies tend to assume institutional homogeneity and comparable levels of digital readiness, which is not the case for Indonesia, where regional disparities in infrastructure, financial access, and regulatory enforcement remain substantial. In addition, studies that place financial inclusion as a mediating variable in the Diffusion of Innovation Theory framework (Rogers, 2003) are still rare. Factors such as relative advantage, compatibility, complexity, and trialability have been proven to influence technology adoption decisions, as confirmed in studies related to MSME behavior towards digital services (Huda et al., 2025; Novitaningtyas et al., 2025). However, previous studies have not explicitly operationalized these DIT attributes as antecedents that explain how FinTech adoption indirectly enhances sustainability performance through improved financial inclusion.

Based on these gaps, this study aims to analyze the effect of FinTech on the sustainability performance of MSMEs with financial inclusion as a mediating variable. The theoretical novelty of this study lies in integrating Diffusion of Innovation Theory with the Triple Bottom Line framework by positioning financial inclusion as a transmission mechanism that converts FinTech adoption into measurable sustainability outcomes. Unlike prior research that models financial inclusion as a moderator or final outcome, this study conceptualizes financial inclusion as a mediator because access to and effective use of financial services represent an intermediate process through which FinTech adoption influences MSMEs' economic resilience, social contribution, and environmental efficiency. The contribution of this article lies in expanding the literature on the role of FinTech in the context of developing countries and strengthening the relevance of DIT in explaining the adoption of digital financial innovations. In addition, the findings of this study are expected to support the government, the FinTech industry, and MSME players in strengthening an inclusive and sustainable digital financial ecosystem.

This study is based on Rogers' Diffusion of Innovations Theory (DIT) Rogers (1962;2003), which explains that the diffusion of innovations is influenced by users' perceptions of relative advantage, compatibility, complexity, ease of trial, and observability. In the empirical model, these attributes are operationalized through MSMEs' perceptions of the usefulness of FinTech for business performance (relative advantage), alignment with existing business practices (compatibility), ease of understanding and use (complexity), opportunities for limited-scale adoption (trialability), and visibility of benefits experienced by other MSMEs (observability). The five FinTech attributes reflect SMEs' assessment of benefits, suitability, ease of use, opportunity to try, and observation of other users' results. Positive perceptions of innovation attributes encourage high FinTech adoption, in line with (Saefudin et al., 2024). who emphasize the importance of innovation

and organizational adaptation in facing the dynamics of modern business. FinTech as a digital financial innovation improves transaction efficiency, transparency, and access to financing, thereby expanding financial inclusion for MSMEs. Better financial inclusion has the potential to drive sustainability performance in economic, social, and environmental aspects, in line with the Triple Bottom Line concept (Elkington, 1998). Saefudin, (2024) also shows that digital transformation can strengthen the performance and competitiveness of MSMEs.

A number of empirical studies support the link between FinTech, financial inclusion, and sustainability. Ullah & Begum (2025) found that financial inclusion mediates the relationship between FinTech and sustainability. Almaqtari (2024) shows the influence of FinTech on sustainability performance with IT governance as a moderator. Safii & Anom (2024) emphasize that FinTech improves the sustainability of MSMEs through the mediation of financial literacy and inclusion. Other studies. Vergara & Agudo (2021); Hasan et al. (2024); Marlina & Fatwa, (2021); Rahmi, (2019); (Dunbar et al., 2024); Tian et al. (2024) show the contribution of FinTech to SDGs, financial inclusion, environmental efficiency, and green innovation. On the other hand, Widyastuti et al. (2025) found that financial literacy and financial inclusion strengthen the sustainability of MSMEs, although FinTech was not a significant variable in the study. Meanwhile, Nugraha et al. (2022) found that FinTech influences MSME innovation in Indonesia, although the study did not directly examine sustainability performance. These mixed findings indicate that the relationship between FinTech and sustainability is context-dependent and mediated by internal firm capabilities, particularly financial inclusion, which has not been sufficiently examined in previous Indonesian MSME studies.

However, there is a research gap, particularly a lack of studies that simultaneously analyze FinTech, financial inclusion, and sustainability performance in Indonesian MSMEs with unique characteristics (Udeagha & Ngepah, 2023; Atayah et al., 2023). The results of cross-country studies cannot be directly generalized to Indonesia due to differences in regulatory maturity, MSME informality levels, digital literacy, and unequal access to financial infrastructure. In addition, the application of the DIT perspective in the MSME context remains limited. This study contributes by examining the mediating role of financial inclusion in the relationship between FinTech and sustainability performance, thereby strengthening the understanding of how innovation attributes influence MSME sustainability. Based on prior theories and empirical studies, this research hypothesizes that the adoption of Financial Technology (FinTech) enhances financial inclusion among MSMEs in Indonesia, which in turn improves sustainability performance. Financial inclusion thus plays a crucial mediating role in linking FinTech adoption to MSME sustainability outcomes.

2. RESEARCH METHOD

This study uses a quantitative approach with a causal design and cross-sectional nature to analyze the relationship between Financial Technology (FinTech), financial inclusion, and sustainability performance in MSMEs in Indonesia. This approach was chosen because it allows for objective testing of the theory through the analysis of statistically measurable relationships between variables, in line with Creswell (2018). The cross-sectional design was used to capture the perceptions and experiences of MSME actors at a specific point in time, so that the relationship tested is understood as a theoretical causal relationship based on Diffusion of Innovation Theory, rather than a temporal cause-and-effect relationship that is longitudinal in nature.

The research population includes MSMEs in Indonesia that use FinTech services, such as e-wallets, mobile banking, and peer-to-peer lending. Since there is no single national database, the sample framework was constructed through a previous research approach that adjusted the sampling method for FinTech MSMEs. This framework represents MSMEs that have adopted innovation, which is relevant for researching the impact of FinTech on financial inclusion and sustainability performance. The sampling technique used probability sampling with the stratified random sampling method to ensure national representativeness. Stratification was based on business sector and geographical region, taking into account the heterogeneity of MSME characteristics and digital infrastructure gaps between regions in Indonesia. From each stratum, sample units were selected randomly using the RAND function in Microsoft Excel, so that every MSME in the sample frame had an equal chance of being selected. This randomization procedure

is designed to minimize selection bias and increase the external validity of the research findings. The sample size is determined based on Structural Equation Modeling requirements, which is a minimum of 5-10 times the number of estimated parameters (Hair, 2019), resulting in a sample range of 200-400 respondents.

Data collection was conducted through an online survey during the period from October 27 to November 18, 2025. An online survey was chosen because it was appropriate for the characteristics of the respondents, who were active users of digital financial services. To control for potential self-selection bias, the distribution of questionnaires was limited to MSMEs identified in the sample frame, with survey invitations sent directly rather than through open links. In addition, screening questions were used to ensure that respondents actually used FinTech services and had businesses that were still operating. The inclusion of MSMEs with less than one year of business age was based on the conceptual consideration that sustainability performance in this study reflects initial economic resilience and short-term operational sustainability, rather than long-term social and environmental impacts that require a longer observation period.

The research instrument was a structured questionnaire developed by adapting indicators from previous studies (Almaqtari, 2024; Ullah & Begum, 2025; Zheng et al., 2021). The instrument measures three main constructs, namely FinTech as an independent variable, Financial Inclusion as a mediating variable, and Sustainability Performance as a dependent variable, using a five-point Likert scale. FinTech indicators cover aspects of efficiency, accessibility, and digital integration that serve as characteristics of digital financial innovation to promote financial inclusion and improve business performance, rather than as outputs. Meanwhile, Sustainability Performance is measured primarily through economic dimensions, as data limitations and cross-sectional design restrict the measurement of social and environmental dimensions and long-term non-financial impacts. Data analysis was performed using Partial Least Squares Structural Equation Modeling (PLS-SEM), which is suitable for causal models with mediating variables and medium sample sizes (Hair, 2019). The analysis stages included testing the measurement model to assess construct validity and reliability, as well as testing the structural model to evaluate the relationships between variables through path coefficients, t-statistics, and p-values. Potential endogeneity and common method variance were controlled through instrument design, such as construct separation, respondent anonymity, and clear item formulation, as well as through statistical checks for collinearity. The generalization of these research findings is limited to MSMEs that have adopted FinTech services and does not directly represent the entire MSME population in Indonesia.

Table 1. Operational definition of variables

Variable name	Operational Definition of Variables	Indicators/Dimensions	Item	statement	Source
FinTech	FinTech is the use of digital technology in financial services used by MSME players to facilitate transactions, access financing, and manage finances efficiently and sustainably.	Ease of transactions	FT 1	Using FinTech makes it easier for me to conduct business transactions.	(Almaqtari, 2024; Ullah & Begum, 2021)
		Access to financing	FT 2	FinTech makes it easier for me to access sustainable financing.	
		Financial management efficiency	FT 3	FinTech helps me manage my finances efficiently.	
		Support for business continuity	FT 4	FinTech helps me support environmentally friendly and sustainability-oriented business activities.	
Financial Inclusion	Financial inclusion is the level of access to and use of formal financial services by MSME players through digital financial technology (FinTech), enabling them to conduct transactions, obtain financing, and connect more easily to the formal financial system.	Access to financial services	FI1	I use FinTech to support smooth transactions and access to capital.	(Almaqtari, 2024; Ullah & Begum, 2025)
		Frequency of FinTech usage	FI2	I regularly use FinTech for business transactions.	
		Ease of financing	FI3	I obtained business financing easily through FinTech.	
		Integration of formal financial systems	FI4	My business is more formally connected to the financial system through FinTech.	

Sustainability Performance	Sustainability Performance is the level of success of MSMEs in achieving economic, social, and environmental goals in a balanced, sustainable manner through the application of digital financial technology (FinTech).	Economic Dimension	EC 1	FinTech helps me increase my business profits.	(Almaqtri, 2024;Zheng et al., 2021;Raihan, 2019; Raihan, 2019)	
			EC 2	FinTech helps me manage operational costs efficiently.		
			EC 3	FinTech helps me expand my market and increase my business sales.		
			EC 4	FinTech helps me speed up cash flow calculations and business financial transactions.		
			Environmental Dimension	EN 1	<i>This FinTech helps me reduce the use of paper in business financial recordkeeping.</i>	(Almaqtri, 2024;Jaiswal & Kant, 2018;Kumar et al., 2017;Taneja & Ali, 2021)
				EN 2	FinTech helps me minimize resource usage through digital transactions.	
				EN 3	FinTech encourages me to run a healthier and more sustainable business.	
				EN 4	FinTech helps me reduce the environmental impact of my business activities.	
		Social Dimension	SO 1	FinTech helps me improve and expand relationships with customers and suppliers.	(Almaqtri, 2024;Zheng et al., 2021;Zahid et al., 2021)	
			SO 2	FinTech helps me improve my business reputation and image.		
			SO 3	FinTech helps my business increase participation in social activities and sustainability programs in the future.		
			SO 4	FinTech helps me improve compliance in my business with evolving social and environmental standards.		

Based on theoretical foundations, previous research results, and explanations of methods and operational definitions of variables, this study developed a conceptual framework that describes the relationships between variables in the research model. This framework serves as a conceptual illustration of the relationships analyzed, as shown in the following figure.

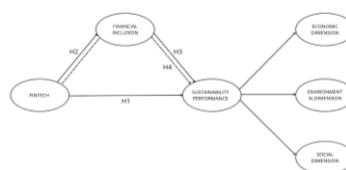


Figure 1. Thinking framework model

3. RESULTS AND DISCUSSIONS

Respondent Characteristics

Based on Table 2, this study involved 205 MSME actors in Indonesia. The respondents were dominated by 120 men (58.5%) and 85 women (41.5%). Their places of residence covered various regions, with the highest number in Java (33.7%), followed by Bali-Nusa Tenggara (17.6%), Kalimantan (15.6%), Sulawesi-Maluku (12.2%), Sumatra (11.2%), and Papua (9.8%). The majority were aged 18-30 years (62.4%), followed by 31-45 years (18.5%), 46-60 years (11.2%), above 60 years (2.4%), and below 18 years (5.4%). The majority of respondents were high school/vocational school graduates (58%), followed by college graduates (33.2%), junior high school graduates (7.8%), and elementary school graduates (1%). Based on the length of business operation, 1-3 years (37.1%) was the largest group, followed by <1 year (35.6%), 4-6 years (19.5%), and >6 years (7.8%). A total of 163 respondents (79.5%) have used FinTech services, with the longest duration of use being 0.6-1 year (45.4%). Although the descriptive statistics in this

study include both FinTech user and non-user respondents, the structural equation modeling (SEM) analysis was conducted exclusively on respondents who had adopted FinTech services. Non-FinTech user respondents were retained only for descriptive purposes and excluded from the SEM estimation to maintain conceptual consistency between the FinTech construct and the characteristics of the sample analyzed. This approach is in line with the research objective, which focuses on the implications of FinTech adoption, rather than on the process or decision of FinTech adoption itself. Overall, the characteristics of the respondents indicate that the majority of MSME players in this study are younger, have a medium to high level of education, and exhibit a relatively high level of FinTech adoption. This condition reflects the increasingly important role of financial technology in supporting business activities in Indonesia's MSME segment. In this study, sustainability performance is modeled as a first-order latent construct that primarily reflects the economic dimension of sustainability. The social and environmental dimensions are not modeled as separate empirical constructs due to data limitations and the cross-sectional nature of the study, which limits observations of long-term non-financial impacts. Therefore, sustainability performance is not defined as a second-order construct, but is operationalized as a unidimensional outcome variable consistent with the scope of this study's analysis.

Table 2. Respondent Characteristics

Item	Description	Total	%
Gender	Male	120	58,5
	Female	85	41,5
Residence	Sumatra	23	11,2
	Java	69	33,7
	Bali and Nusa Tenggara Islands	36	17,6
	Kalimantan (Borneo)	32	15,6
	Sulawesi and Maluku Islands	25	12,2
Age	Papua	20	9,8
	<18 years old	11	5,4
	18-30 years old	120	62,4
	31-45 years old	38	18,5
	46-60 years old	23	11,2
Highest Level of Education	>60 years old	5	2,4
	Equivalent to Elementary School	2	1
	Junior High School Equivalent	16	7,8
	Vocational High School/Senior High School Equivalent	119	58
Business Age	Higher Education (Diploma/Bachelor's Degree/Master's Degree/Doctorate Degree)	68	33,2
	<0,6 -1 year	73	35,6
	1-3 years	76	37,1
	4-6 years	40	19,5
Total	> 6 years	16	7,8
		205	100%

Research Variable Characteristics

The results of the descriptive analysis in Table 3 show that the three research variables are in the good to very good category. FinTech is the highest (4.35), indicating optimal use of financial technology services, especially ease of transactions. Financial Inclusion (3.69) reflects MSME access to formal digital services, although its use still needs to be improved. Sustainability Performance (3.76) shows a positive perception of business sustainability. Overall, MSME players have a constructive perception of FinTech, financial inclusion, and their contribution to sustainability performance.

Table 3. Research variable characteristics

Variable	Indicator	Item	Average indicator	Average Variable	Description
FinTech	Ease of transactions	FT1	3.92	4.35 (SB)	Very good
		FT2	3.87		
		FT3	3.77		
		FT4	3.83		
Financial Inclusion	Access to financial services	FI1	3.78	3.69 (B)	

Variable	Indicator	Item	Average indicator	Average Variable	Description	
Sustainability Performance	Frequency of FinTech usage	FI2	3.64	3.76 (B)	Good	
		Ease of financing	FI3			3.65
		Integration of formal financial systems	FI4			3.67
		Economic dimension	EC1			3.70
	Environment aldimension	EC2	3.78	3.82 (B)	Good	
		EC3	3.75			
		EC4	3.80			
		EN1	3.82			
	Social dimension	EN2	3.80	3.83 (B)	Good	
		EN3	3.83			
		EN4	3.82			
		SO1	3.84			
		SO2	3.79			
		SO3	3.83			
		SO4	3.87			

Outer Model Evaluation

Outer model testing was conducted to assess the feasibility of the instrument through convergent validity, composite reliability, and discriminant validity. Based on Table 4, all indicators in the FinTech, Financial Inclusion, and Sustainability Performance variables had factor loadings above 0.70, thus meeting the criteria for convergent validity. The Cronbach's Alpha and Composite Reliability values for all variables also exceed 0.70, indicating good internal consistency. In addition, all constructs have AVE values above 0.50, confirming the fulfillment of discriminant validity. Thus, all indicators and research variables are declared feasible and can be used in the inner model evaluation stage. This study did not apply the Heterotrait–Monotrait Ratio (HTMT) approach in testing discriminant validity because the evaluation was conducted using Average Variance Extracted (AVE) criteria and factor loadings, which are still widely used and accepted in PLS-SEM studies with reflective constructs that have clear conceptual differences. Furthermore, the research model was constructed based on a strong theoretical framework, so the potential for overlap between constructs was considered relatively low.

Table 4. Outer model test results

Variable	Item	Loading factor	Cronbach ALpha	PC/CR	AVE	Conclusion
FinTech	FT1	0.871	0.903	0.933	0.776	Valid & Reliabel
	FT2	0.891				
	FT3	0.851				
	FT4	0.909				
Financial Inclusion	FI1	0.901	0.907	0.935	0.781	Valid & Reliabel
	FI2	0.867				
	FI3	0.879				
	FI4	0.888				
Sustainability Performance	EC1	0.781	0.942	0.950	0.612	Valid & Reliabel
	EC2	0.760				
	EC3	0.754				
	EC4	0.784				
	EN1	0.765				
	EN2	0.783				
	EN3	0.797				
	EN4	0.829				
	SO1	0.772				
	SO2	0.742				
	SO3	0.808				
	SO4	0.809				
Economic dimension	EC1	0.869	0.899	0.930	0.768	Valid & Reliabel
	EC2	0.883				
	EC3	0.858				
	EC4	0.895				
Environment aldimension	EN1	0.867	0.913	0.939	0.792	Valid & Reliabel
	EN2	0.886				
	EN3	0.896				
	EN4	0.911				
Social dimension	SO1	0.904	0.910	0.937	0.787	Valid & Reliabel

Variable	Item	Loading factor	Cronbach ALpha	PC/CR	AVE	Conclusion
	SO2	0.874				
	SO3	0.886				
	SO4	0.885				

Inner Model Evaluation

Evaluation of the inner model using R^2 and Q^2 shows adequate results. The Financial Inclusion variable has an R^2 of 0.345, meaning that 34.5% of the variance is explained by the constructs in the model, with a Q^2 of 0.267 indicating sufficient predictive ability. The Sustainability Performance variable has an R^2 of 0.461 and a Q^2 of 0.277, which is in the moderate category. At the dimensional level, the R^2 for economy is 0.772, environment 0.795, and social 0.780, each with a high Q^2 (economy 0.587; environment 0.623; social 0.608), indicating strong predictive ability. Overall, the model has good explanatory and predictive power, suitable for interpretation and conclusions. The relatively high R^2 value indicates the strong explanatory power of the model constructed theoretically based on Diffusion of Innovation Theory, in which the relationship between FinTech, financial inclusion, and sustainability performance is directional and conceptual. The potential for overfitting is controlled through limiting model complexity, testing construct validity and reliability, and estimating path significance using bootstrapping procedures. Thus, the R^2 value obtained reflects both the theoretical suitability and predictive power of the model, not merely its fit to the research sample.

Table 5. Inner model test results

Variable	R2	Q2
Financial Inclusion	0.345	0.267
Sustainability Performance	0.461	0.277
Economic dimension	0.772	0.587
Environment aldimension	0.795	0.623
Social dimension	0.780	0.608

Hypothesis Test Results

This study examines the direct and indirect relationships between FinTech, Financial Inclusion, and Sustainability Performance. The results (Table 6) indicate that FinTech has a significant effect on Sustainability Performance ($\beta = 0.269$; $t = 3.703$; $p < 0.05$) and Financial Inclusion ($\beta = 0.587$; $t = 11.596$; $p < 0.05$), supporting H1 and H2. Financial Inclusion also significantly influences Sustainability Performance ($\beta = 0.485$; $t = 6.928$; $p < 0.05$), supporting H3. Mediation analysis confirms that Financial Inclusion significantly mediates the effect of FinTech on Sustainability Performance ($\beta = 0.285$; $t = 5.739$; $p < 0.05$), supporting H4 and reinforcing prior studies that identify financial inclusion as a key mechanism linking FinTech to MSME sustainability. Furthermore, Sustainability Performance significantly affects the economic ($\beta = 0.878$), environmental ($\beta = 0.892$), and social ($\beta = 0.883$) dimensions (all $p = 0.000$), confirming that MSME sustainability is formed through the integration of these three dimensions. The analysis results show that the direct effect of FinTech on sustainability performance remains significant after the financial inclusion variable is included in the model. This finding indicates that the mediating role of financial inclusion in this study is partial, rather than full mediation.

Table 6. Hypothesis Test Results

Inter-variable influence	β	Tstat	PValue	Conclusion
FinTech > Sustainability Performance	0.269	3.703	0,000**	H1 Accepted
FinTech > Financial Inclusion	0.587	11.596	0,000**	H2 Accepted
Financial Inclusion > Sustainability Performance	0.485	6.928	0,000**	H3 Accepted
FinTech > Financial Inclusion > Sustainability Performance	0.285	5.739	0,000**	H4 Accepted
Sustainability performance -> Economic Dimension	0.878	45.895	0,000**	H5 Accepted
Sustainability performance -> Environment al Dimension	0.892	49.339	0,000**	H6 Accepted
Sustainability performance -> Social dimension	0.883	45.064	0,000**	H7 Accepted

The relatively moderate β coefficient indicates that the influence of FinTech and financial inclusion on the sustainability performance of MSMEs is significant, but not dominant. This indicates that improving the sustainability of MSMEs requires more than just the adoption of

FinTech; it also requires other supporting factors, such as financial literacy, managerial capacity, and institutional readiness. Therefore, FinTech implementation policies and strategies need to be designed in an integrated manner with supporting interventions so that their impact on the sustainability of MSMEs is more optimal and sustainable.

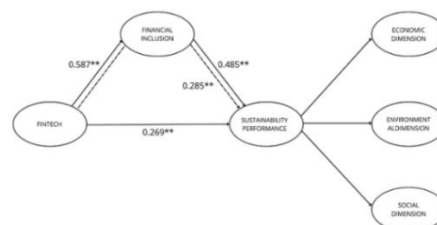


Figure 2. Summary of research results

4. CONCLUSION

This study confirms that Financial Technology (FinTech) plays a strategic role in improving the sustainability performance of MSMEs in Indonesia, both directly and through financial inclusion as the main mediating mechanism. These findings expand on the contributions of Diffusion of Innovation Theory (DIT) by showing that the adoption of digital financial innovations not only explains the adoption process, but also the achievement of sustainability performance. Thus, this study confirms that FinTech adoption does not stop at the decision to use technology, but results in performance impacts through expanded access to and utilization of formal financial services. The main theoretical contribution of this study lies in the role of Financial Inclusion as a mediating variable that bridges the relationship between FinTech and Sustainability Performance. Unlike previous studies that placed financial inclusion as an outcome variable or moderator, this study shows that financial inclusion is an important mechanism for explaining how the benefits of FinTech are realized in improving economic performance. This study reinforces the DIT causal framework, which shows that perceptions of superiority, compatibility, and ease of use drive FinTech adoption, which in turn expands financial inclusion as the basis for MSME sustainability. This study also offers a key distinction from previous research through the development of a conceptual model that is specifically contextualized to Indonesian MSMEs. Unlike cross-country studies or research focused on developed countries, the findings of this study reflect the structural reality of Indonesian MSMEs, characterized by limited capital, digital literacy inequality, and uneven technology adoption. By placing the Indonesian context as the main focus, this study demonstrates that global findings on FinTech and sustainability cannot be directly generalized without considering each country's institutional context and digital readiness. Overall, the findings enrich the literature by showing that FinTech serves not only as a technological innovation but also as a driver of financial transformation that enhances MSME sustainability through financial inclusion, thereby reinforcing the explanatory relevance of Diffusion of Innovation Theory in developing countries. In addition to theoretical implications, the findings of this study also provide a conceptual basis for policymakers and industry players to design a more inclusive and sustainable digital financial ecosystem for MSMEs in Indonesia.

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