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Financial Literacy and FinTech Access as Drivers of Financial Inclusion and Business Sustainability among Women Entrepreneurs

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Abstract: Women MSME actors in Indonesia play an essential role in economic growth but still face challenges in accessing formal financial services equally. Gaps in financial knowledge, limited digital access, and structural barriers hinder equitable and sustainable financial inclusion. In response, FinTech offers a promising pathway to bridge these disparities. This study investigates the effect of financial literacy on FinTech-based financial access and its subsequent impact on financial inclusion and business sustainability among women entrepreneurs. It further explores the mediation role of FinTech access as a mediator that has rarely been examined in the context of women entrepreneurs in emerging countries. A quantitative approach was employed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The sample comprised 345 women MSME owners who had operated their businesses for at least one year and used FinTech services. The results show that financial literacy enhances FinTech access and financial inclusion. Access to digital finance mediates the link between financial literacy and inclusion, emphasizing the need for enabling factors beyond knowledge. Lastly, financial inclusion significantly drives women entrepreneurs' business sustainability. This study presents a novel perspective that views financial literacy as a personal capability and FinTech access as a strategic resource using Capability Theory and the Resource-Based View. This dual-theoretical perspective emphasizes skills and systems' interconnectedness in inclusive entrepreneurship. The findings underscore the relevance of financial acumen and inclusive digital infrastructure for women's formal finance involvement and business sustainability.

Keywords: financial literacy, financial inclusion, business sustainability, FinTech, women entrepreneurs, PLS-SEM

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INTRODUCTION

Women entrepreneurs in developing countries contribute significantly to economic development through job creation, skills development, and increased household income (Andalib & Halim, 2019; Beriso, 2021; Muhammad et al., 2021; Sugiyanto et al., 2023). Utilizing social media and e-commerce platforms, women entrepreneurs innovate

swiftly, optimize operations, and reach broader customers, therefore augmenting their ability for poverty reduction and community development (Ge et al., 2022; Basnet, 2024). Indonesia is home to over 66 million MSMEs, with women owning and managing approximately 64 percent of these enterprises (Coordinating Ministry for Human Development and Cultural Affairs of the Republic of Indonesia, 2023; Hendratmi et al., 2022; Kurniasari & Lestari, 2024).

Despite their significant achievements, women entrepreneurs continue to encounter several structural barriers that impede the expansion of their enterprises (Johnston et al., 2023; Farroñán et al., 2024; Turley et al., 2024). In comparison to male-operated enterprises, female-operated firms often function on a smaller scale, have a greater failure rate, and encounter challenges in growing (Delecourt & Fitzpatrick, 2021; Kogut & Mejri, 2022; Mahadewi, 2024; McKenzie & Puerto, 2021). A primary challenge frequently encountered by women entrepreneurs is restricted access to formal funding (Berguiga & Adair, 2021; Kurniasari & Lestari, 2024; Singh & Dash, 2021).

Many women depend on informal financial sources, such as familial loans or shark loans, sometimes at unreasonable fees (Atarah et al., 2019; Younas & Rafay, 2021). The inadequate level of financial literacy significantly contributes to the underutilization of formal financial services, including FinTech offerings that provide convenience and inclusivity (M. Hasan et al., 2023; Hasan et al., 2021; Twumasi et al., 2022). In contrast, male entrepreneurs are more likely to be perceived as "bankable" and enjoy easier access to institutional financing (Kato, 2023; Rita & Nastiti, 2024; Woldie et al., 2018).

While financial inclusion is frequently considered a driver for business sustainability, its processes are ambiguous, and empirical evidence is inconsistent. Some research indicates the positive effect of financial inclusion on business sustainability (Chozarira et al., 2023; Rani & Sundaram, 2023). On the other hand, financial inclusion also shows a threshold effect—at low levels, it may increase vulnerability due to high transaction costs, but at higher levels, it becomes a catalyst for sustainability through improved financing and financial management (Khan et al., 2022; Khémiri et al., 2023). This raises a critical question: under what conditions does financial inclusion translate into sustainable business outcomes for women entrepreneurs?

This research is based on two main theoretical frameworks, namely Capability Theory developed by Amartya Sen (Sen, 1999) and Resource-Based View (RBV), which is widely used in the study of strategic management and entrepreneurship (Barney et al., 2001; Barney 1991). Capability Theory underscores individuals' autonomy in pursuing economic possibilities, positioning financial inclusion as available and effective access, understanding, and use. Financial literacy empowers women's autonomy and agency (Cabeza-García et al., 2019; Muralidhar et al., 2019; Showkat et al., 2025).

Meanwhile, RBV posits that competitive advantage stems from access to strategic resources that are valuable, rare, inimitable, and non-substitutable (VRIN) (Gueler & Schneider, 2021; Seddon, 2014). Financial resources, particularly through FinTech, can be essential for women-led MSMEs (Adbi & Natarajan, 2023; Kedir & Kouame, 2022). Financial literacy supports effective resource management, while access to finance enables growth and competitiveness (Hussain et al., 2018; Okello et al., 2016). Several studies have highlighted the role of financial literacy, FinTech accessibility, and financial inclusion in promoting women's entrepreneurship (Dura & Wardana, 2024; R. Hasan et al., 2023; Peter et al., 2025), but few models explain how these elements affect business sustainability. The connection between financial literacy and digital financial access, especially FinTech, is understudied in entrepreneurship and financial inclusion frameworks (Badra et al., 2025). Previous research has focused on financial literacy as a skill rather than an enabler of inclusive digital finance (Kempson et al., 2013; Lusardi & Mitchell, 2014).

Moreover, FinTech access is often examined from a technological acceptance lens (Hoque et al., 2024; Kurniasari & Lestari, 2024; Venkatesh et al., 2012) without a thorough examination of its role as a strategic resource, particularly for women entrepreneurs who have disproportionate financial limitations. This study addresses a gap in understanding by linking Capability Theory (Sen, 1999), which focuses on economic empowerment, with Resource-Based View (RBV) (Barney, 1991), which sees financial access as an essential resource for keeping women-led businesses competitive. This study provides a nuanced view of the role of digital financial skills and access as combined precursors to financial inclusion and business sustainability.

Empirically, most studies focus on Africa and South Asia (Lontchi et al., 2023; Twumasi et al., 2022). Consequently, a research gap remains in the ASEAN context, particularly in Indonesia, where women entrepreneurs face distinct structural and digital challenges. Due to socioeconomic and gender-specific constraints such as digital disparities, lack of paperwork, and inadequate training, digital financial literacy and FinTech usage must be contextualized to effect inclusiveness and business sustainability (Amnas et al., 2024; Ratnawati et al., 2024).

Further, the research underscores that financial literacy enhances FinTech adoption and improves decision-making and business outcomes (Egbo et al., 2020; Kurniasari & Lestari, 2024; Prabha, 2024). Nevertheless, women face awareness gaps, and gender disparity persists in FinTech adoption (21% women vs. 29% men) (Hoque et al., 2024; Karki et al., 2021).

Digital financial literacy, thus, plays a pivotal role in entrepreneurial empowerment and financial inclusion (Andriamahery & Qamruzzaman, 2022; R. Hasan et al., 2023; Kurniasari, 2023; Sadiq et al., 2023; Syahnur et al., 2024). Research demonstrates a significant positive association between financial literacy and business performance metrics for female entrepreneurs (Culebro-Martínez et al., 2024; Tumba et al., 2022), highlighting the necessity for legislative initiatives to enhance access to financial education (Prabha, 2024). Moreover, women entrepreneurs possessing elevated digital financial literacy are more inclined to utilize formal banking channels, indicating that digital competencies are crucial for financial inclusion (Al-Shami et al., 2024; Hasan et al., 2021). These findings highlight the significance of financial literacy programs in promoting economic empowerment and business success for women entrepreneurs in diverse circumstances.

While FinTech possesses transformational potential for bridging the inclusion gap, its efficacy depends on comprehensive institutional support. In environments with substantial gender equality, FinTech promotes women's empowerment; conversely, its influence diminishes in conditions with poor equality (Babar, 2023; Baber, 2019; Moghadam & Karami, 2023). These findings indicate that although FinTech possesses promise, it needs accompanying governmental actions to tackle systemic gender-based obstacles.

Financial inclusion fosters business sustainability by improving access, usage, and quality of financial services (Chen et al., 2022; Chozarira et al., 2023; Rani & Sundaram, 2023). Financial inclusion in rural and indigenous contexts enhances sustainable livelihoods, with microentrepreneurship as a mediator (Mahato & Jha, 2023). Yet the pandemic exposed structural weaknesses, revealing the fragility of informal enterprises during economic shocks (Chozarira et al., 2023). ICT adoption, business experience, and innovation capacity significantly influence women's financial inclusion levels (San et al., 2023; Sherwani et al., 2023).

Recent studies highlight the intricate relationship between financial literacy, access, and inclusion. In Cameroon, financial literacy mediates the relationship between financial inclusion and sustainable development (Lontchi et al., 2023). In Ghana, improved access to financial services increases household income (Twumasi et al., 2022). In Indonesia's North Sumatra region, financial literacy does not directly influence the growth and welfare of MSMEs; however, inclusion and access play a significant role (Harahap et al., 2024). In India, digital financial literacy mediates FinTech usage and financial inclusion (Amnas et al., 2024).

The findings support the effectiveness of integrated strategies for enhancing financial literacy, access, and inclusion as mechanisms for sustainable development, business growth, and economic empowerment, especially in developing economies (Amnas et al., 2024; Harahap et al., 2024; Lontchi et al., 2023; Twumasi et al., 2022).

This study investigates the theoretical, empirical, and contextual deficiencies by analyzing the interaction between financial literacy, FinTech accessibility, and financial inclusion in promoting the sustainability of women-led MSMEs in Indonesia. This research integrates Capability Theory and a Resource-Based View to provide a complete model that regards digital financial access and literacy as strategic facilitators of inclusive and sustainable entrepreneurship rather than isolated components.

Grounded in this conceptual framework, the subsequent hypotheses are posited:

H1: Financial literacy has a positive effect on financial access by FinTech for women entrepreneurs in Indonesia

H2: Financial literacy has a positive impact on financial inclusion by FinTech in women entrepreneurs in Indonesia

H3: Financial access by FinTech has a positive effect on financial inclusion for women entrepreneurs in Indonesia

H4: Financial inclusion has a positive impact on business sustainability for women entrepreneurs in Indonesia

H5: Financial access by FinTech mediates the relationship between financial literacy and financial inclusion in women entrepreneurs in Indonesia.

Figure 1 shows the research model in this study.

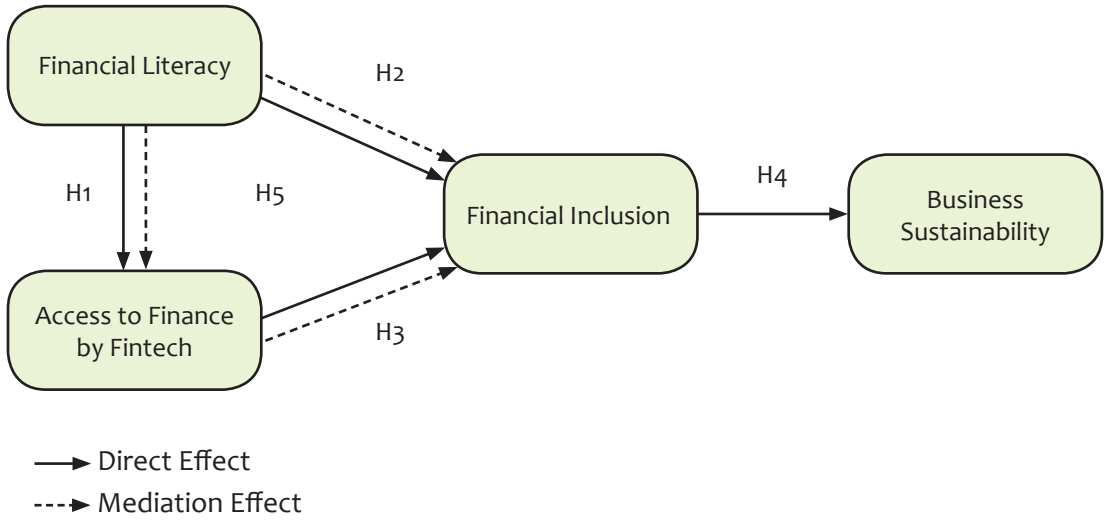


Figure 1 Research Framework

METHODS

This study uses a quantitative methodology employing Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the interrelations among the variables: financial literacy, financial access, financial inclusion, and company sustainability. PLS-SEM is chosen for its capacity to manage intricate models, facilitate mediating interactions, and promote theoretical advancement in predictive research (Batra, 2025; Kapoor & Aggarwal, 2021). In contrast to CB-SEM, PLS-SEM provides enhanced flexibility in managing non-normal data, limited

sample sizes, and formative constructs, which are prevalent in social science and development research settings (Hair et al., 2014). It enhances construct reliability and better prediction accuracy, particularly in modeling complex, multi-dimensional interactions (Dash & Paul, 2021; Nitzl, 2016). Consequently, PLS-SEM is considered the most appropriate tool for this study's aim of investigating the dynamic connections between financial literacy and FinTech access to inclusivity and sustainability.

The study is explanatory, aiming to examine causal relationships between variables. It uses a cross-sectional design, with data collected at a single point in time. The demographic comprises female entrepreneurs who operate Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. The sample was identified using a judgmental sampling strategy, a non-probability method wherein participants are chosen based on characteristics pertinent to the study aims. The eligibility requirements are: (1) the respondent must be a female proprietor or primary manager of a micro, small, or medium enterprise (MSME), (2) the firm must have been operational for a minimum of one year, and (3) the respondent must possess expertise in obtaining loans from FinTech financial platforms. The required sample size was determined using G*Power, a statistical tool for power analysis, to guarantee the sufficiency of the sample for structural equation modeling. The suggested minimal sample size, considering model complexity and a moderate effect size ($f^2 = 0.15$), was 77. This study gathered valid responses from 345 participants, surpassing the minimum sample size of 300 specified by (Hair et al., 2021) and (Kline, 2016) for PLS-SEM analyses, including several components and mediating interactions.

Data were collected using a structured physical questionnaire of items measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The study instrument was created using reliable indicators derived from prior investigations. Financial literacy was assessed utilizing measures from Okello et al. (2017), financial access from Ye & Kulathunga (2019), financial inclusion from Nandru et al. (2021), and company sustainability from Hudson et al. (2001).

To ensure the validity and reliability of the questionnaire by employing face validity through consultations with multiple women MSME owners who fit the profile of our target respondents. The participants were requested to evaluate the questionnaire items for clarity, relevance, and linguistic appropriateness. This step enabled the identification and revision of ambiguous or potentially misunderstood items before the distribution of the final survey. Face validity is a prevalent approach in the initial stages of instrument development, aimed at confirming that the items ostensibly measure their intended constructs (Saw et al., 2025). Furthermore, internal consistency was evaluated through Cronbach's alpha, with all constructs exhibiting acceptable reliability levels ($\alpha > 0.7$) as per Hair et al. (2022).

RESULTS AND DISCUSSION

Based on Table 1, 345 women entrepreneurs participated in the study. The majority of respondents were aged 41–45, married, and had operated their business for 1–3 years. Most respondents earned a daily income between Rp100.000 and Rp250.000, indicating the predominance of micro-scale business operations among the sample.

According to Hair et al. (2022), the first step in analyzing the measurement model is to evaluate the outer loading value of the research question indicator. Based on the data in Table 2, it can be seen that all outer loading values of all observed variables in this study have a value of 0.7. In other words, this study has a good reliability indicator (Hair et al., 2012, 2016). The next stage is to conduct an internal consistency reliability analysis by evaluating the Composite reliability (CR) and Cronbach's alpha (α) values. According to (Urbach & Ahlemann, 2010), a model is said to have good internal consistency reliability if the CR value and Cronbach's alpha (α) are

greater than 0.7. Based on data from the Table. 2, the CR and Cronbach's alpha (α) values of all the research components are more than 0.7, so it can be concluded that this study has good internal consistency reliability.

The final stage of the measurement model analysis is the evaluation of validity, namely convergent validity and discriminant validity. Convergent analysis was performed by evaluating the Average Variance Extracted (AVE) value. According to Fornell & Larcker (1981) , a model has a good AVE value if it has a value above 0.5. Based on Table 2, it can be seen that the AVE value of all constructs already meets the criteria above 0.5.

The measurement of discriminant validity was carried out using the Fornell-Larcker criterion (Fornell & Larcker, 1981) and the value of the Heterotrait-Monotrait ratio (HTMT) (Henseler et al., 2015). The Fornell-Larcker criteria evaluate each construct's square root of the Average Variance Extracted (AVE) against the correlation coefficients among constructs. Discriminant validity is confirmed when the square root of a concept's AVE exceeds its correlation with other constructs, signifying that each construct is empirically unique (Fornell & Larcker, 1981). Recent research indicates that the Fornell-Larcker criteria alone may be inadequate for consistently evaluating discriminant validity, particularly in intricate models (Hair et al., 2016; Henseler et al., 2015). Augmenting this methodology with supplementary assessments, such as the Heterotrait-Monotrait Ratio (HTMT), is advisable for enhanced validity. Henseler et al. (2015) recommend a threshold value of 0.9 for good discriminant validity. Table 3 indicates that all HTMT scores were below the 0.9 threshold.

Table 1 Demography Profile

Variable	Indicator	Qty	%
Age	20 - 25	11	3.67%
	26 - 30	23	7.38%
	31 - 35	46	13.75%
	36 - 40	58	16.82%
	41 - 45	73	22.01%
	46 - 50	56	15.60%
	51 - 55	57	14.76%
	> 55	21	6.02%
Marital Status	Divorced	1	0.37%
	Married	341	99.23%
	Single	3	0.40%
business length	< 1 year	7	2.10%
	> 10 year	61	17.40%
	1 - 3 year	79	23.79%
	4 - 5 year	75	22.02%
	5 - 7 year	53	15.16%
	8 - 10 years/	70	19.53%
Daily Income	< Rp100,000	42	11.35%
	Rp100,000 - Rp250,000	222	63.87%
	Rp250,001 - Rp500,000	58	18.57%
	> Rp500,000	23	6.21%

Source: Own data, 2025

Table 2 Reliability and convergent validity

Construct	Construct/Item	Loadings	Cronbach Alpha	CR	AVE
Financial Access	ACTF_01	0.788	0.838	0.839	0.607
	ACTF_02	0.768			
	ACTF_03	0.813			
	ACTF_04	0.787			
	ACTF_05	0.739			
Financial Literacy	FL_01	0.827	0.800	0.809	0.869
	FL_02	0.793			
	FL_03	0.733			
	FL_04	0.804			
Financial Inclusion	INCL_01	0.772	0.810	0.812	0.868
	INCL_02	0.708			
	INCL_03	0.782			
	INCL_04	0.756			
	INCL_05	0.747			
Business Sustainability	BS_01	0.861	0.797	0.801	0.712
	BS_02	0.842			
	BS_03	0.827			

Source: Processed Data, 2025

Table 3 Discriminant Validity

	Fornell Larcker Criterion				HTMT			
Contructs	**ACTF**	**B S**	**INCL**	**FL**	**ACTF**	**B S**	**INCL**	**FL**
ACTF	0.779							
BS	0.554	**0.844**			0.676			
INCL	0.624	0.607	**0.753**		0.754	0.749		
FL	0.526	0.322	0.402	**0.790**	0.633	0.399	0.494	

Note= FL=Financial Literacy, ACTF=Access to Finance, INCL=inclusion, and BS=Business susitainability

Source: SmartPLS output, 2025

The inner model evaluation involved testing for multicollinearity using the Variance Inflation Factor (VIF), assessing the coefficient of determination (R^2) and predictive relevance (Q^2), and testing the significance of path coefficients through bootstrapping with 5,000 subsamples. The first step of structural model analysis involves checking for the presence or absence of collinearity symptoms in the research model by evaluating the variance inflation factor (VIF) value. A VIF value of 5 or greater suggests a potential issue with collinearity. Based on Table 4, the obtained VIF values remain within the acceptable threshold (VIF < 5). Therefore, collinearity was not a concern in the study (Akinwande et al., 2015).

Table 4 VIF Value (Variance Inflation Value)

Constructs	Access to Finance by FinTech	Business Sustainability	Financial Inclusion	Financial Literacy
Access to Finance by FinTech			1,382	
Business Sustainability				
Financial Inclusion		1,000		
Financial Literacy	1,000		1,382	

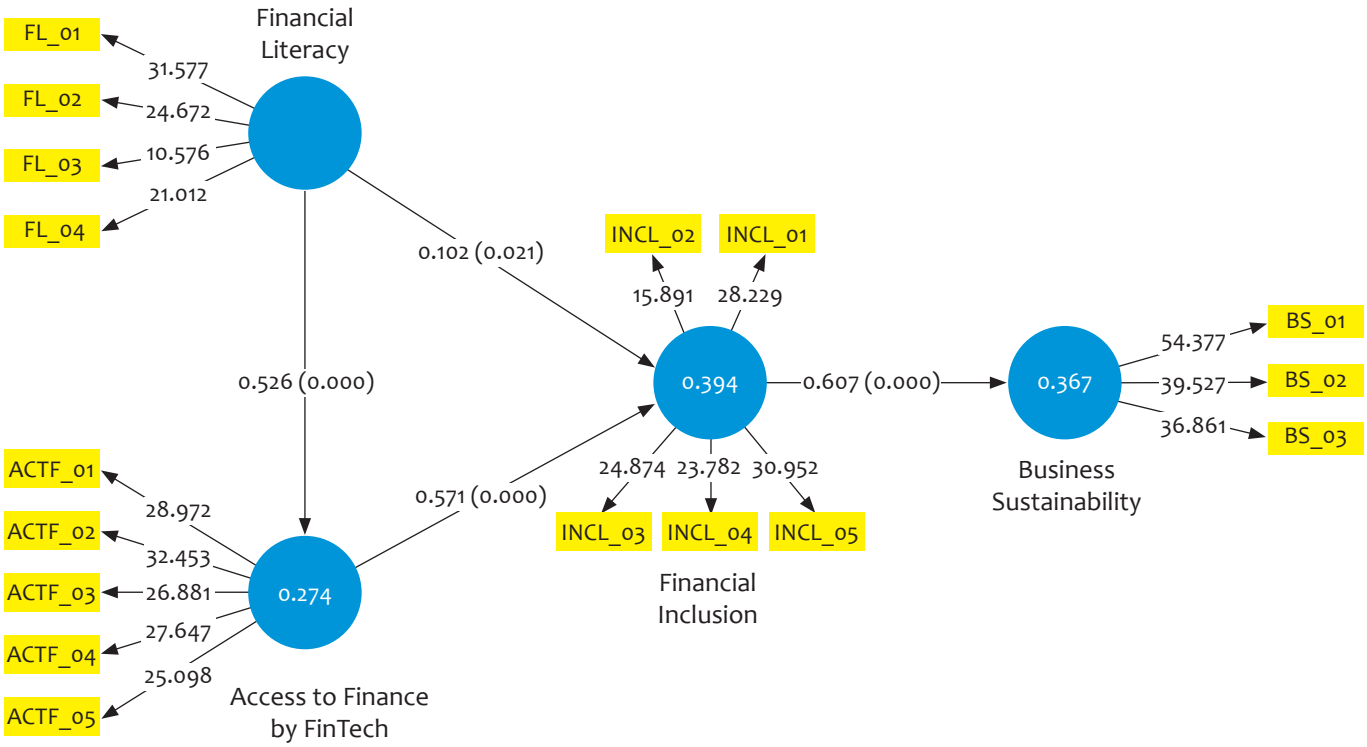
Source: Processed Data (2025)

The coefficient of determination (R^2) indicates the proportion of variation in the endogenous variables elucidated by the exogenous variables within the model. This study revealed an R^2 value of 0.274 for access to financing via FinTech, signifying limited explanatory power. Financial inclusion had an R^2 value of 0.394, indicating a moderate degree of variance accounted for by financial knowledge and access to financing. The R^2 score for business sustainability was 0.367, suggesting a moderate degree of explanatory power. The findings indicate that the model adequately accounts for the variance in the endogenous variables, specifically financial inclusion and business sustainability, as per Hair et al. (2019), with an explanation of approximately 50.8% of the variance in business sustainability, deemed substantial by Sarstedt et al. (2019). Hair et al. (2019) categorize R^2 values of 0.75, 0.50, and 0.25 as substantial, moderate, and weak, respectively.

The predictive relevance (Q^2) was evaluated using the blindfolding method. A Q^2 score beyond zero signifies the model's predictive significance, with values of 0.35, 0.15, and 0.02 denoting high, moderate, and weak predictive accuracy, respectively (Hair et al., 2019). Predictive relevance (Q^2) was assessed through the blindfolding procedure. Q^2 measures the model's capability to predict the endogenous constructs. In this study, the Q^2 values for the constructs ranged from moderate to strong, with financial access by FinTech ($Q^2 = 0.266$) and financial inclusion ($Q^2 = 0.154$) showing moderate predictive relevance, while business sustainability ($Q^2 = 0.094$) indicated a weaker predictive power.

Effect size (f^2) was also evaluated to assess the impact of exogenous constructs on endogenous constructs. According to Cohen (1988), f^2 values of 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively. The results showed that financial literacy had a large effect on access to finance ($f^2 = 0.382$), while access to finance had a large effect on financial inclusion ($f^2 = 0.391$), and financial inclusion had a large effect on business sustainability ($f^2 = 0.585$). In contrast, the direct effect of financial literacy on financial inclusion was small ($f^2 = 0.012$). These findings support the mediating role of access to finance in the relationship between financial literacy and financial inclusion. A visual summary of the inner model, including the path relationships and explained variance (R^2) for each endogenous construct, can be seen in Figure 2. This illustration helps provide a more straightforward overview of how financial literacy, financial access, and financial inclusion are interrelated in shaping business sustainability.

The statistical significance of the route coefficients (β) was assessed by the bootstrapping method utilizing 5,000 subsamples. A route is deemed significant at a 5% significance level when the p-value is below 0.05, and the t-value surpasses 1.65 (Streukens & Leroi-Werelds, 2016). The results showed that all hypotheses in this study were significant at a significance level of 5% (Table 5). The path of influence between financial literacy and financial access through FinTech (H1) shows that financial literacy significantly contributes to increasing women entrepreneurs' financial access through financial technology (β value = 0.526; t value = 10.586; p-value = 0.000). Thus, the H1 hypothesis is accepted.



Source: SmartPLS output, 2025

Figure 2 PLS Algorithm Model

Table 5 Path Analysis

hypotheses		Beta (β)	T Statistic	P value	Result	R2 Adjusted	f2	Q2
H1	Financial Literacy → Access to Finance by FinTech	0.526	10.586	0.000	Supported	0.274	0.382	0.266
H2	Financial Literacy → Financial Inclusion	0.102	2,026	0.021	Supported	0.394	0.012	0.154
H3	Access to Finance by FinTech → Financial Inclusion	0.571	12,421	0.000	Supported		0.391	
H4	Financial inclusion → Business sustainability	0.607	17,903	0.000	Supported	0.367	0.585	0.094

Source: Processed Data (2025)

Furthermore, the effect of financial literacy on financial inclusion (H2) was also proven to be significant (β value = 0.102; t value = 2.026; p-value = 0.021), which shows that financial literacy ability also directly encourages financial inclusion. Therefore, the H2 hypothesis is accepted. The effect of financial access on financial inclusion (H3) was recorded as one of the strongest influences (β value = 0.571; t value = 12.421; p-value = 0.000), showing that the higher the level of financial access that women entrepreneurs have through FinTech, the higher the level of financial inclusion they experience. Thus, the H3 hypothesis is accepted.

Meanwhile, financial inclusion's influence on business sustainability (H4) was the path with the most significant influence in the model (β value = 0.607; t value = 17.903; p-value = 0.000), which confirms the importance of financial inclusion in supporting the sustainability of businesses run by women entrepreneurs. Therefore, the H4 hypothesis is accepted.

Table 6 shows the results of the mediation test of access to finance in the relationship between financial literacy and financial inclusion. In this study, to test the mediating power of financial access in the relationship between financial literacy and financial inclusion, a Variance Accounted For (VAF) calculation was performed. Based on the results of the analysis, the value of the indirect effect (financial literacy → financial access → financial inclusion) was 0.300. Meanwhile, the direct effect value (financial literacy → financial inclusion) is 0.102. So, the total effect is 0.402.

The following formula carries out the calculation of VAF:

$$VAF = \left(\frac{\text{Inderect effect}}{\text{Total effect}}\right) \times 100\%$$

With a VAF value of 74.6%, it can be concluded that there is partial mediation because the value is between 20% and 80%. This means that financial access through FinTech does not entirely replace the direct role of financial literacy in financial inclusion but plays a vital role in strengthening these relationships.

These results show that although financial literacy can directly affect the level of financial inclusion, its influence will be much greater if it is supported by the ease of access to finance through FinTech services. In other words, financial literacy alone is not enough. Women entrepreneurs also need the support of an inclusive digital financial ecosystem to participate in the formal financial system fully.

Based on Table 6, the mediation effect analysis (H5) shows that financial access by FinTech significantly mediates the relationship between financial literacy and financial inclusion (β = 0.300; t = 7.876; p = 0.000). These findings confirm that financial literacy has a direct impact on financial inclusion and indirectly through increased access to digital finance. Thus, the H5 hypothesis is accepted. Overall, the pathway analysis results show that financial literacy, financial access, and financial inclusion have mutually reinforcing relationships and play an essential role in supporting the business sustainability of women entrepreneurs in Indonesia, primarily through FinTech services.

Table 6 Mediation Analysis

Path		β value	T-Value	P Value	LL 95% CI	UL 95% CI	VAF	Decision
H5	Financial Literacy → Access to Finance by FinTech → Financial Inclusion	0.300	7,876	0.000	0.241	0.365	74.6	Supported (Partial Mediation)

Source: Processed Data (2025)

This research was conducted to analyze the influence of financial literacy on financial access through FinTech and its impact on women's financial inclusion and business sustainability. Using a quantitative approach and the PLS-SEM method, this study also examines the mediating role of FinTech-based financial access in strengthening the relationship between financial literacy and financial inclusion in the context of women entrepreneurship.

This study confirms that financial literacy significantly influences FinTech-based financial access (H1) and financial inclusion (H2). This outcome aligns with Capability Theory (Sen, 1999), wherein financial literacy serves as an enabling capability that helps women entrepreneurs access and employ formal financial systems. Previous studies corroborate this perspective, where women with elevated digital financial literacy are more inclined to interact with formal institutions and utilize technology-driven financial instruments (Babar, 2023; M. Hasan et al., 2023; Prabha, 2024). These capacities not only raise financial knowledge but also create confidence and trust, which are prerequisites for involvement in formal financial ecosystems.

Furthermore, these results reinforce the findings of Younas & Rafay (2021) and Sadiq et al. (2023), which emphasize that the ability to understand and use financial products and services is an essential key for women MSME actors to be more involved in the formal financial system. However, this study discovers that the direct effect of financial literacy on inclusion is small compared to its indirect influence via FinTech-based access. This demonstrates that, while financial literacy is essential, it is insufficient. Without accessible and inclusive digital financial services, financial knowledge may not successfully lead to financial inclusion, emphasizing the need to combine competence with enabling infrastructure customized to the requirements of female entrepreneurs.

Financial access through FinTech also positively affected financial inclusion (H3 is supported). This is congruent with the Resource-Based View (Barney, 1991), which posits that access to technology-mediated financial services is a strategic resource that improves involvement in the larger economic ecosystem. FinTech, unlike traditional banks, lowers entrance hurdles, making it a feasible option for women with no collateral or credit history (Baber, 2019). These findings expand on the results of research by Ye & Kulathunga (2019) and Mahato & Jha (2023) by providing empirical evidence in the context of Indonesian women's MSMEs. In this context, FinTech is a means of access and a medium of empowerment because it allows women to carry out transactions flexibly and securely without the geographical and social barriers often faced in conventional financial systems.

The significant effect of financial inclusion on business sustainability (H4) underscores its long-term value. These findings confirm previous studies explaining that involvement in the formal financial system encourages business actors' efficiency, stability, and adaptive capacity when facing long-term business challenges (Chozarira et al., 2023; Rani & Sundaram, 2023). Furthermore, these results also support the argument in the literature that financial inclusion has a threshold effect, where the positive effects are only felt significantly if the access obtained is of quality and used productively (Khan et al., 2022; Khémiri et al., 2023). Therefore, women entrepreneurs must have access to and the capabilities to strategically manage financial services to support the sustainability of their businesses.

Notably, the mediating role of FinTech-enabled financial access (H5) between financial literacy and inclusion highlights a layered dynamic. These findings suggest that enhancing women's financial literacy is more successful when accompanied by readily available digital financial services. FinTech is a transaction instrument and a catalyst for women to transition from informal consumers to active participants in an inclusive digital finance system (Amnas et al., 2024; Kurniasari & Lestari, 2024). This demonstrates the complementarity of internal capabilities and external access mechanisms. Financial literacy offers the knowledge and confidence to participate, but the availability of user-friendly, trustworthy, and gender-sensitive FinTech platforms transforms this potential into actual inclusion. This interaction highlights the theoretical convergence of Capability Theory and the Resource-Based View (RBV), in which inclusion is accomplished through human competency and strategic access to enabling resources.

CONCLUSION

The findings show financial literacy, directly and indirectly, promotes financial inclusion via FinTech-based financial access. This demonstrates the interdependence of internal capacities and external enablers, with financial knowledge requiring accessible digital finance infrastructure to promote actual inclusion. The mediating role of FinTech access highlights that literacy alone is insufficient; women entrepreneurs require

practical instruments to implement their knowledge efficiently. This insight extends and refines prior financial inclusion models by integrating Capability Theory and the Resource-Based View (RBV). While Capability Theory focuses on empowerment through the ability to make informed decisions, RBV highlights the relevance of strategic resources. In countries such as Indonesia, where women entrepreneurs frequently encounter impediments to formal financing, this theoretical integration offers a more comprehensive lens to understand how personal competence and enabling resources must interact to foster inclusive financial participation. Furthermore, the study confirms that financial inclusion significantly supports the sustainability of women-led MSMEs. This underlines the notion that financial inclusion is about more than just providing access to capital; it is also about promoting long-term entrepreneurial stability, operational resilience, and strategic expansion. Women's engagement in formal financial institutions, notably through FinTech, enables them to manage cash flow better, manage shocks, and invest in growing their businesses. In this regard, enhancing financial literacy and improving access to inclusive FinTech services are not separate activities but rather mutually reinforcing measures that contribute to overall economic sustainability. This is especially important in the Indonesian MSME sector, where women entrepreneurs make up the majority yet still experience challenges in growing their businesses. Thus, promoting inclusive finance is not only an issue of equality but also a strategic tool for national economic resilience and inclusive growth. Finally, this study adds to the current literature on women's financial inclusion and entrepreneurship by identifying financial literacy as a critical enabler of FinTech-based financial access. It provides empirical evidence that financial technology, combined with capability-building measures, may help bridge persisting access gaps between men and women and between firms in affluent and underserved areas. This supports FinTech's potential to be a transformative factor in decreasing inequality and supporting equitable economic development. These results encourage the need to design financial literacy programs that are responsive to the needs of women MSME actors, especially those in the informal sector and remote areas. The development of FinTech services must also be more adaptive, inclusive, and accessible. Cross-sectoral collaboration, including the role of local governments and communities, is critical in strengthening a women-friendly digital finance ecosystem. This research has several limitations. First, the quantitative approach used is less likely to be able to deeply capture subjective experiences, cultural barriers, and social dynamics that may influence the adoption of FinTech by women. Aspects such as gender norms, trust in technology, and risk perception have not been comprehensively explored in this study. Second, the number of samples used by 345 respondents does not fully represent the diversity of the conditions of women MSME actors throughout Indonesia, especially those in underdeveloped areas or not optimally exposed to digital technology. Third, the scope of research only focuses on FinTech-based financial access, even though many other financial institutions, such as cooperatives or other micro-institutions, are also alternative financial access for women. Therefore, further research is expected to expand the scope of types of financial institutions and consider other variables, such as digital literacy and socio-cultural aspects that affect business inclusion and sustainability. Based on these findings and limitations, it is recommended that further research use a mixed approach (mixed methods) to explore a deeper qualitative dimension. By combining quantitative surveys and interviews or FGDs, researchers can better understand women's behaviors, motivations, and barriers to accessing FinTech services. Another recommendation is to expand the scope of the research area to areas with low FinTech adoption rates to get a more representative picture nationally. In addition, future research can also consider additional variables such as digital literacy, trust in technology, and the role of local institutions in supporting the digital transformation of women's MSMEs inclusively and sustainably.

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