

ACCESS TO FINANCE AS A MEDIATOR OF THE RELATIONSHIP BETWEEN FINANCIAL LITERACY AND FINANCIAL TECHNOLOGY AND THE SUSTAINABILITY OF MSMEs

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Abstract

Background - Micro, Small, and Medium Enterprises (MSMEs) are crucial for driving Indonesia's economic growth. However, their sustainability often faces challenges due to limited access to financial resources and minimal use of financial technology. Many MSMEs also exhibit low financial literacy, which impacts their ability to manage their finances efficiently and utilize digital financial instruments. In an increasingly complex and competitive market landscape, the ability of MSMEs to obtain funding and utilize financial technology is crucial for achieving sustainable growth.

Objective - This study aims to examine the mediating effect of access to finance on the relationship between financial literacy and financial technology on the sustainability of MSMEs. This study specifically examines whether financial literacy and financial technology can have a significant impact on the sustainability of MSMEs, both directly and indirectly through access to finance as a mediating factor.

Design/Methodology/Approach - This study employed a quantitative methodology using a questionnaire to collect data from 150 MSME participants in Batam City. The sampling technique used was purposive sampling, specifically aimed at financial technology users. Data were collected through Structural Equation Modeling-Partial Least Squares (SEM-PLS) using SmartPLS software. This model combines reliability, validity, and significance assessments through bootstrapping to evaluate direct and indirect influences between variables.

Find - The findings of this study indicate that financial technology significantly influences the sustainability of MSMEs, both through direct connections and through a mediation process through access to finance. Access to finance has been shown to significantly influence the sustainability of MSMEs. Conversely, financial literacy does not show a significant direct impact on sustainability, nor does it have a significant indirect effect through access to finance. These findings emphasize that the influence of financial technology is greater than financial literacy in increasing the competitiveness and sustainability of MSMEs in today's digital era.

Conclusion - The conclusion obtained in this study is that financial literacy does not have a significant direct influence on the sustainability of MSMEs. In contrast, financial technology and access to finance have a significant positive influence on the sustainability of MSMEs. Access to finance mediates the relationship

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between financial technology and MSME sustainability, but access to finance does not mediate the relationship between financial literacy and MSME sustainability. This finding confirms the importance of adopting financial technology in strengthening the sustainability of MSMEs.

Research Implications - *The findings of this study provide important insights for various parties, particularly the government, financial institutions, and business support service providers. They need to be more proactive in encouraging the use of financial technology among MSMEs to support business closures. Furthermore, financial literacy programs need to be designed with a more applicable approach and be relevant to the needs of MSMEs, particularly those related to the use of digital financial services, so that their benefits are truly felt in daily business practices.*

Limitations - *This study has several limitations. It is geographically confined to Batam City, limiting the generalizability of its findings to other regions in Indonesia. Furthermore, as a purely quantitative study, it does not explore in-depth behavioral or socio-psychological factors that may influence MSME sustainability. Future research is recommended to employ a mixed-methods approach and expand the scope to other regions to gain more comprehensive insights.*

Keywords: *Financial Literacy, Financial Technology, Access to Finance, MSME Sustainability*

Abstrak

Latar belakang - Usaha Mikro, Kecil, dan Menengah (UMKM) sangat penting dalam mendorong pertumbuhan ekonomi Indonesia. Meskipun demikian, keinginan mereka sering kali menghadapi kendala karena terbatasnya akses ke sumber daya keuangan dan minimnya penggunaan teknologi keuangan. Banyak pelaku UMKM juga menunjukkan literasi keuangan yang buruk, yang berdampak pada kapasitas mereka untuk mengelola keuangan secara efisien dan memanfaatkan perangkat keuangan digital. Dalam lanskap pasar yang semakin kompleks dan kompetitif, kapasitas UMKM untuk mendapatkan pendanaan dan memanfaatkan teknologi keuangan sangat penting untuk mencapai keinginan yang langgeng.

Tujuan - Penelitian ini berusaha menguji efek mediasi akses terhadap keuangan dalam hubungan antara literasi keuangan dan teknologi keuangan terhadap kelanjutan UMKM. Studi ini secara khusus menguji apakah literasi keuangan dan teknologi keuangan dapat berdampak signifikan terhadap keberlanjutan UMKM, baik secara langsung maupun tidak langsung melalui akses terhadap keuangan sebagai faktor mediasi.

Desain / metodologi / pendekatan - Penelitian ini menggunakan metodologi kuantitatif, dengan menggunakan kuesioner untuk mengumpulkan data dari 150 peserta UMKM di Kota Batam. Teknik pengambilan sampel yang digunakan adalah purposive sampling, yang dikhususkan khusus untuk pengguna teknologi keuangan. Data dikumpulkan melalui Structural Equation Modeling-Partial Least Squares (SEM-PLS) dengan menggunakan perangkat lunak SmartPLS. Model ini menggabungkan penilaian reliabilitas, validitas, dan signifikansi melalui bootstrapping untuk memancarkan efek langsung dan tidak langsung antar variabel.

Temuan - Temuan penelitian ini menunjukkan bahwa teknologi keuangan secara signifikan mempengaruhi keberlanjutan UMKM, baik melalui koneksi langsung maupun melalui proses mediasi melalui akses terhadap keuangan. Akses terhadap keuangan telah terbukti signifikan mempengaruhi UMKM. Sebaliknya, literasi keuangan tidak menunjukkan dampak langsung yang nyata pada keberlanjutan UMKM, juga tidak memiliki efek tidak langsung yang signifikan melalui akses terhadap keuangan. Penemuan ini menekankan bahwa pengaruh teknologi keuangan lebih besar daripada literasi keuangan dalam meningkatkan daya saing dan minat UMKM di era digital saat ini.

Kesimpulan - Kesimpulan yang didapat pada penelitian ini adalah ditemukan bahwa literasi keuangan tidak berpengaruh langsung signifikan terhadap keinginan UMKM. Sebaliknya, teknologi keuangan dan akses terhadap keuangan berpengaruh positif signifikan terhadap keberlanjutan umkm. Akses terhadap

keuangan memediasi hubungan antara teknologi keuangan dan keberlanjutan UMKM, namun pada literasi keuangan dan keberlanjutan umkm akses terhadap keuangan tidak memediasi. Temuan ini menekankan penerapan teknologi keuangan dalam memperkuat keberlanjutan UMKM.

Implikasi penelitian - Hasil penelitian ini memberikan kesan penting bagi berbagai pihak, khususnya pemerintah, lembaga keuangan, dan penyedia layanan pendampingan usaha. Mereka perlu lebih aktif dalam mendorong penggunaan teknologi finansial di kalangan UMKM guna mendukung terlaksananya usaha. Di sisi lain, program literasi keuangan perlu dirancang dengan pendekatan yang lebih aplikatif dan relevan dengan kebutuhan UMKM, khususnya yang terkait dengan pemanfaatan layanan keuangan digital, agar manfaatnya benar-benar terasa dalam praktik bisnis sehari-hari.

Batasan Penelitian - Penelitian ini memiliki beberapa kekurangan. Penelitian ini terbatas secara geografis di Kota Batam, sehingga tidak dapat digeneralisasikan ke wilayah lain di Indonesia. Selain itu, sebagai penelitian kuantitatif murni, penelitian ini tidak mengeksplorasi faktor perilaku atau sosio-psikologis yang lebih mendalam yang dapat mempengaruhi keinginan UMKM. Penelitian selanjutnya disarankan untuk menggunakan metode pendekatan pencampuran dan memperluas cakupan ke wilayah lain untuk memperoleh wawasan yang lebih komprehensif.

Kata Kunci : Literasi Keuangan, Teknologi Keuangan, Akses terhadap Keuangan, Keberlanjutan UMKM.

INTRODUCTION

Enterprises (MSMEs) are the most effective economic sector in developing entrepreneurship and are the main driver of the national economy, playing a crucial role in building a resilient industrial sector and making a significant contribution to national economic growth (Hikmah et al., 2024) . The sustainability of MSMEs is influenced by various factors, including financial literacy and financial technology, which are crucial variables in increasing MSME competitiveness and their ability to survive and thrive in the long term. However, the most closely related and crucial variable in bridging the influence of financial literacy and financial technology on MSME sustainability is access to finance.

MSMEs provide solutions to overcome the problems of poverty and unemployment by

strengthening economic competitiveness through job creation, technological improvement, and production of goods, which ultimately have a positive impact on the sustainability and welfare of society (Limgestu & Hesniati, 2024; Susanto et al., 2023; Yuwono, 2020) The strategic role of MSMEs as the foundation of the national economy is increasingly visible along with the increasing number of MSMEs every year (Cuandra & Candy, 2024) . Currently, there are around 64.2 million MSMEs in Indonesia which contribute around 61.07% to the Gross Domestic Product (GDP), equivalent to IDR 8,573.89 trillion (Junaidi, 2023) .

Despite their significant contribution, the competitiveness of Indonesian MSMEs remains relatively low compared to other ASEAN countries. MSMEs need to explore



tactics to improve innovation and competitiveness (Sentoso et al., 2024). One of the main limiting factors is the lack of knowledge regarding access to financial services and understanding of the use of financial technology, which makes it difficult for MSMEs to adapt to rapid technological developments. This condition can reduce MSME competitiveness in an increasingly complex and competitive market (Prasetya et al., 2021; Putra & Meliana, 2024).

Therefore, to achieve sustainability, MSMEs need to improve their financial literacy and adoption of financial technology, supported by adequate access to finance as the main bridge in sustainable entrepreneurship. Access to finance is a key variable that connects the role of financial literacy and financial technology with the sustainability of MSMEs so they can compete in the market, survive in the long term, and achieve sustainability. This research will examine MSME actors in the Batam region, Riau Islands, because many MSMEs in this area have not yet optimally utilized financial technology and require increased financial literacy and access to finance to support the sustainability of their businesses.

Various previous studies (Masdupi et al., 2024; Nurwulandari, 2023; Prasetya et al., 2021; Winarsih et al., 2020; Ye & Kulathunga, 2019) have revealed that high financial literacy

contributes significantly to supporting the sustainability of MSMEs. Financial literacy allows MSMEs to have greater flexibility in adapting to changing market conditions, thus achieving more optimal results and long-term sustainability (Burchi et al., 2021). This close relationship between financial literacy and MSME sustainability makes it easier for entrepreneurs to manage their businesses more effectively.

On the other hand, financial technology also makes a positive contribution to the sustainability of MSMEs, although research findings vary, as demonstrated by (Papulasih et al., 2024), which suggests the possibility of no positive effect of financial technology on MSME sustainability. These discrepancies indicate the need for more in-depth research to understand the complex relationship between financial technology and MSME sustainability.

Access to finance has been identified as a crucial factor in the sustainability of MSMEs by providing essential initial capital for long-term business continuity (Masdupi et al., 2024; Ye & Kulathunga, 2019). Access to finance also plays a mediating role in the relationship between financial literacy and MSME sustainability. However, mediation models involving the role of financial access as a mediator between financial technology, financial literacy, and MSME sustainability

have rarely been comprehensively researched. This represents an important research gap that needs to be filled to provide a more holistic picture of the dynamics of MSME financial management.

Recent data shows that financial literacy and technology in Indonesia remain relatively low. According to a report (Corps, 2024), 38% of MSMEs admitted to lacking a good understanding of digital literacy and financial technology, while 35% reported experiencing difficulties adopting financial technology in their business management. Indonesia's digital literacy index in 2022 was only 3.54 on a scale of 5, indicating a significant gap between technological awareness and skills in using it effectively. This low level of financial technology literacy is a major obstacle to increasing financial inclusion and the sustainability of MSMEs in the digital era.

This research is crucial because it has the potential to make substantial contributions to the development of theory and practice in the field of MSME management. By exploring the role of access to finance as a mediator, this research will provide a deeper understanding of how financial literacy and financial technology can be optimized to improve MSME sustainability. Furthermore, the results of this study can serve as strategic considerations for policymakers, financial institutions, and MSMEs in designing more targeted and

effective financial education and service programs.

The research approach uses the Resource-Based View (RBV) perspective, which emphasizes that competitive advantage is obtained from utilizing unique and difficult-to-imitate internal resources (Willie, 2024). Adequate financial literacy and the ability to adopt financial technology are strategic resources that enable MSMEs to manage their finances efficiently and effectively (Masdupi et al., 2024). Furthermore, the financial capability framework emphasizes the importance of not only theoretical knowledge but also attitudes, habits, and ease of access to financial products in supporting wise financial decision-making (Birkenmaier et al., 2013; Kempson et al., 2017).

By improving financial literacy and utilizing financial technology, MSMEs can expand access to capital and financial services, thereby strengthening their business's adaptability and sustainability in facing today's dynamic and competitive market challenges.

LITERATURE REVIEW

The Relationship Between Financial Literacy and MSME Sustainability

MSMEs play a strategic role in supporting the Indonesian economy, as they contribute significantly to economic expansion, job



creation, and a more equitable distribution of income (Salsabillah et al., 2023) . Financial literacy is crucial for MSMEs, as it provides optimal learning for wisely using financial resources. Financial literacy is a source of knowledge that determines MSMEs' aspirations, demonstrating that financial literacy significantly impacts value creation, ultimately supporting MSMEs' sustainable performance (Ye & Kulathunga, 2019) .

However, the development of this hypothesis can be bidirectional, meaning the relationship between financial literacy and MSME sustainability is not always absolutely positive or negative. On the one hand, high financial literacy provides MSMEs with the basic knowledge to manage their businesses effectively and make appropriate financial decisions, thus promoting long-term sustainability (Buchdadi et al., 2020; Masdupi et al., 2024) . On the other hand, poor financial literacy or inappropriate use of financial knowledge can lead to the risk of suboptimal decision-making, potentially hindering MSME sustainability. Therefore, financial literacy can act as a factor that supports or hinders sustainability, depending on how the knowledge is applied and other contexts (Ambarwati et al., 2020; Ye & Kulathunga, 2019) .

Thus, financial literacy acts as a flexible factor in relation to the sustainability of MSMEs,

which can lead to different outcomes according to the context and application in business practices.

H₁: Financial literacy has a significant influence on the sustainability of MSMEs

The Relationship between Financial Technology and MSME Sustainability

Financial technology provides convenience for MSMEs that have the potential to optimize their financial literacy (Mustika & Noviardy, 2020) . The existence of financial technology simplifies financial transactions between sellers and buyers (Cahyawati et al., 2023) . Understanding financial technology can impact the sustainability of MSMEs, especially because the increasingly broad network of social media users can motivate financial institutions to increase creativity and innovation in creating financial technology platforms (Choo & Teh, 2019) . Improved management components will drive significant growth of financial technology platforms as an initiative to offer financial services that are more tailored to user needs (Dang & Vu, 2020)

However, the development of this hypothesis can be two-way, so the relationship between financial technology and MSME sustainability is not always absolutely positive or negative. On the one hand, financial technology provides convenience, creativity, security, cost-effectiveness, simplicity, and

speed in digital payment services that can attract consumer interest and provide benefits for MSMEs, which ultimately can maintain and improve their business sustainability (Caisar Darma et al., 2020; Krah et al., 2024; Winarsih et al., 2020) . On the other hand, less than optimal understanding and adoption of financial technology or inappropriate use of technology can also pose risks such as transaction errors or dependence on certain unsecured technologies, which have the potential to hinder MSME sustainability.

Thus, understanding and using financial technology has the potential to have various impacts on the sustainability of MSMEs, both as a driving factor and a hindering factor, depending on how the technology is implemented and the business context of the MSME itself.

H₂: Financial technology has a significant impact on the sustainability of MSMEs

The Relationship between Access to Finance and MSME Sustainability

Access to finance plays a crucial role in the sustainability of MSMEs. Adequate financing can help MSMEs develop their businesses to become competitive in the market and facilitate their ability to face financial challenges. Access to finance is a precursor to MSME sustainability and recommends ways to optimize MSME sustainability. Furthermore,

access to financing directly impacts MSME sustainability (Ye & Kulathunga, 2019) . MSMEs with access to financing can maintain their performance (Masdupi et al., 2024) .

However, the development of this hypothesis can be two-way, so the relationship between access to finance and MSME sustainability is not always absolutely positive or negative. On the one hand, good access to finance enables MSMEs to develop capacity and competitiveness, leading to long-term business sustainability. On the other hand, inappropriate access to finance or the use of financing without proper management can increase financial risks and potentially undermine MSME sustainability. Therefore, access to finance can act as a factor that encourages or hinders MSME sustainability, depending on the conditions and management carried out by MSME actors themselves.

H₃: Access to financing has a significant impact on the sustainability of MSMEs.

The Relationship between Financial Access, Financial Literacy and MSME Sustainability

Finance acts as a key indicator of access to finance and sustainability in SMEs. (Ye & Kulathunga, 2019) . According to (Frimpong et al., 2022) in a study that chose MSME performance as a variable, Access to digital finance slightly mediates the relationship between financial literacy and MSME

performance. This suggests that management can achieve faster performance by implementing digital platforms in their operations. This suggests that access to digital finance significantly impacts MSME performance. Access to finance influences the relationship between financial literacy and MSME performance . sustainability . (Ye and Kulathunga, 2019) .

H₄ :Access to finance mediates the relationship between financial literacy and MSME sustainability.

The Relationship between Access to Finance, Financial Technology, and MSME Sustainability

Access to finance has changed significantly with the advent of financial technology. Financial technology enables small businesses

that previously struggled to obtain funding through traditional channels to gain broader access (Bollaert et al., 2021) . Understanding financial technology provides convenience and security for digital payments for businesses, thereby attracting consumer interest and providing benefits for MSMEs (Nurohman et al., 2021). There is a significant correlation between financial technology and MSME sustainability, as financial technology can help address MSMEs' financial challenges (Winarsih et al., 2020) , with mediating access to finance that can help MSMEs' sustainable performance.

H₅: Access to finance mediates the relationship between financial technology and MSME sustainability.

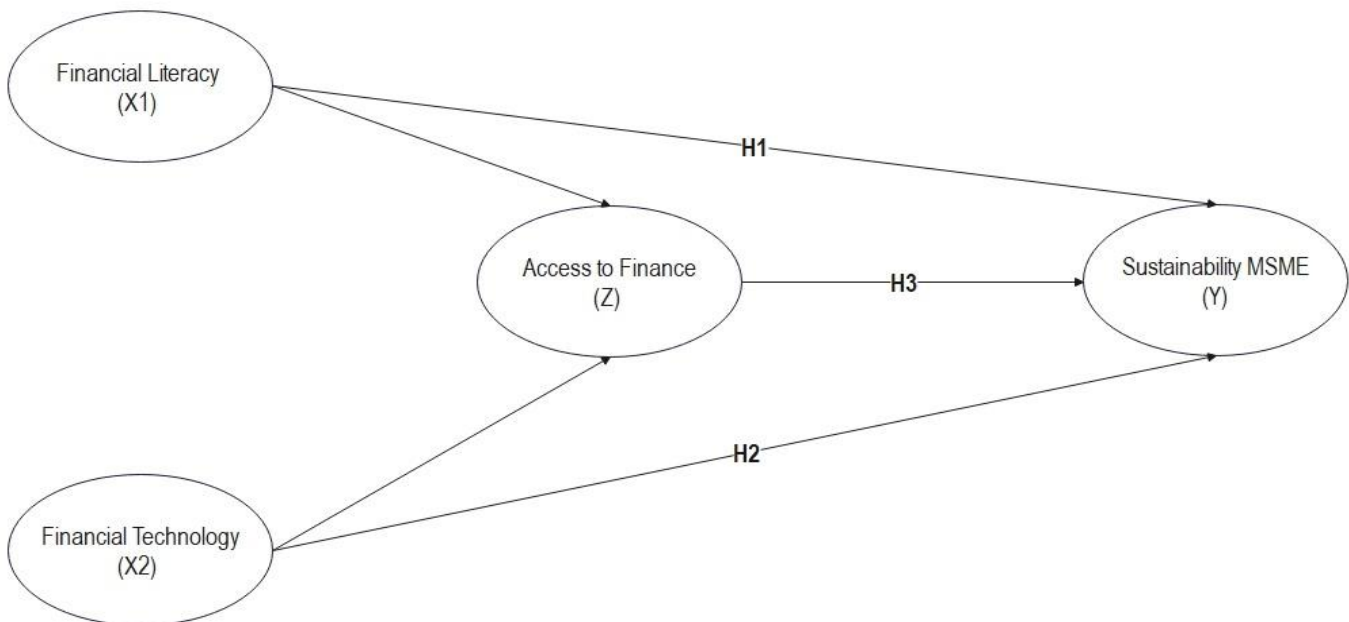


Figure 1. Research Model

RESEARCH METHODS

This study employed a quantitative approach. This method was used to test previously formulated hypotheses. The data used were primary data obtained directly from the source by providing respondents with a list of questions in the form of a questionnaire. The questions were divided into two sections: construct questions and demographic questions. A five-point Likert scale was used to collect responses ranging from 1 (strongly disagree) to 5 (strongly agree).

The subjects in this study consisted of MSMEs in the Batam region, Riau Islands, Indonesia, operating in various business sectors with specific criteria as users of financial technology. Only financial technology users were selected as samples using a purposive sampling technique. The main reason for this selection was because the research focused on examining the relationship between financial literacy, financial technology, financial access, and MSME sustainability, specifically within the group that has adopted financial technology. Financial technology users are a group directly relevant to financial technology, thus providing more accurate results in analyzing the impact of financial technology on MSME sustainability. Furthermore, according to (Putra & Meliana, 2024; Romadhon & Fitri, 2020) , financial technology users exhibit

unique financial behaviors and needs compared to non-users. Therefore, understanding the factors influencing MSME sustainability through financial technology is more effective if limited to active financial technology users. This approach also avoids data bias that can arise from respondents who have not yet used financial technology, making the research findings more specific and applicable to the development of policy and business solutions.

The sample size of the study was determined using G Power 3.1 software, which was chosen for its ability to calculate sample size based on statistical power analysis, thus ensuring a sufficiently high probability (power) of the study (power ≥ 0.80) to detect a significant effect (Cohen, 1988; Erdfelder et al., 2009) . Based on this calculation, the minimum sample required was 92 respondents, but from the distributed questionnaires, data from 150 respondents were successfully obtained. Data from these respondents were then analyzed using the Structural Equation Modeling Partial Least Squares (SEM-PLS) approach due to its ability to handle complex research models, including mediating variables, as well as its effectiveness for a relatively small sample size, using the SmartPLS application.



RESULTS AND DISCUSSION

Respondent Demographic

survey distribution process, aimed at Micro, Small, and Medium Enterprises (MSMEs), resulted in 150 respondents. These data were used as the basis for further analysis and for hypothesis testing in this study. A clearer picture of participant characteristics is also provided in the demographic table 1.

Based on the demographic data of respondents, significant heterogeneity is evident, particularly in terms of age and education, which warrant further study as they impact the sustainability of MSMEs. The largest age group of respondents was between 41 and 50 years old, representing 39.3%. This age group is considered a productive age group, where individuals generally possess sufficient experience in managing a business, an established customer network, and the ability to make informed decisions, including financial ones. Therefore, this age group tends to have greater business resilience and stability.

However, younger and older age groups also have different business management characteristics. While younger age groups are more adaptable to technology and financial innovation, they have more limited experience. Conversely, those over 50 may have extensive experience but are less responsive to digital technology developments

that can support their businesses. Therefore, this age heterogeneity needs to be controlled for in the analysis to ensure that the research results accurately reflect the real situation.

In terms of education, the majority of respondents (42.7%) had a high school diploma, followed by 28% of junior high school graduates and 15.3% of elementary school graduates. This level of education influences financial literacy and understanding of financial technology. The majority of respondents without a higher education indicated challenges in accepting and implementing more complex financial management concepts. This limited knowledge can lead to less than optimal business decision-making, thus impacting the aspirations of MSMEs. Higher education typically allows for better access to and utilization of financial information, as demonstrated by several previous studies.

The length of time a business has been in operation is also an important indicator in assessing options. As many as 38.7% of respondents' businesses have been running for 6 to 10 years, indicating that most MSMEs have passed their initial stages and are capable of sustaining their businesses in the medium term. The annual revenue of most MSMEs is below Rp300,000,000 and the assets owned by most are less than Rp50,000,000, indicating that even though



the businesses have been established for a long time, capital constraints and business scale remain challenges that must be overcome.

Overall, age, education, and length of business existence are important variables that need to be controlled in research to accurately analyze the relationship between financial literacy, financial technology, and MSME sustainability and to provide more valid results. This approach also aligns with literature that emphasizes the importance of considering demographic characteristics when assessing the effectiveness of financial literacy and digital technology in MSMEs.

Validity Test

Results displayed in Table 2 show that the indicators for each variable have outer loading and Average Variance Extracted (AVE) values higher than the recommended minimum threshold values, namely an outer loading of 0.60 and an AVE value of 0.50. (Hair et al., 2017) , it can be seen in the table that the outer loading has a value ranging from 0.724 to 0.860 and the AVE value is in the range of 0.580 to 0.675, which can be seen in this case that each indicator is valid.

To verify discriminant validity, the Fornell-Larcker criterion and heterotrait-monotrait ratio analysis (HTMT) were used. With the Fornell-Larcker method in Table 3,

discriminant validity is considered fulfilled if the square root value of the AVE is of a higher construct compared to the value of the relationship between different structures (Hair et al., 2017) , shown in the figure that the square root value of AVE for each concept is higher in relation to the correlation of additional constructs, then this model has good discriminant validity. The results of the study (Henseller et al., 2015) a good HTMT (table 4) value should be below 0.90 so that it can be stated that each construct in the model has a clear difference or discriminant validity has been met . It is determined that each component in this model has valid discriminant validity. based on HTML approach.

Reliability Test

Table 5 shows results indicating that all structures have appropriate item factor loadings , meaning that each variable contributes to the question markers in the framework. All constructs reflecting this have Cronbach's alpha values and composite reliabilities exceeding 0.70, indicating internal consistency and reliability. (Hair et al., 2017)

R Square and F Square

It is explained in table 6 that the adjusted R-square value for The variable of access to finance shows that approximately 47.3 % of access to finance for MSMEs can be explained



by the parameters of financial literacy and financial technology as independent variables. The model developed in this study can explain almost half of the factors influencing access to finance, the remainder formed by additional elements outside the framework. Similarly, the MSME sustainability variable with the adjusted R-squared value for MSME sustainability . It is shown that 66.7% of the variation in MSME sustainability can be explained by the independent variables in the model, more than half of the factors influencing MSME sustainability in this study have been successfully explained by these constructs. While others formed by other factors outside the model.

Based on the results of the f-square analysis, it is known that the financial technology variable has the greatest influence on other variables in the model. The financial technology path regarding access to finance and financial technology on the sustainability of MSMEs, both fall into the category of having

a large influence according to the criteria (Cohen, 1988) which states that $f\text{-square} \geq 0.35$ indicates a significant influence. Furthermore, access to finance on the sustainability of MSMEs falls into the small effect category, meaning access to finance contributes to the sustainability of MSMEs, although not as significantly as financial technology. Meanwhile, financial literacy shows a relatively small effect, namely financial literacy on financial access and financial literacy on the sustainability of MSMEs. This indicates that financial literacy influences both variables, but with a low effect strength. This finding emphasizes the important role of financial technology in supporting access to finance and the overall sustainability of MSMEs.

Structural Model And Hypothesis Testing

The researchers conducted bootstrapping on 5,000 subsamples. The results indicate that the research hypotheses are significant, except for H_1 and H_4 .

Table 1
Demographics

Characteristics	Criteria	Frequency	Percentage
Gender	Man	79	52.7%
	Woman	71	47.3%
Age	< 20 years	3	2%
	20 - 30 years	11	12%
	31 - 40 years old	35	23.4%



Characteristics	Criteria	Frequency	Percentage
	41 - 50 years old	59	39.3%
	> 50 years	35	23.3%
last education	Elementary school	23	15.3%
	Junior high school	42	28%
	Senior High School	64	42.7%
	Bachelor's degree	20	13.3%
	Postgraduate (S2/S3)	1	0.7%
Length of Business Establishment	< 1 year	6	4%
	15 years	56	37.3%
	6 - 10 years	58	38.7%
	> 10 years	30	20%
Income/Year	< Rp. 300,000,000	83	55.3%
	Rp. 300,000,001 - Rp . 2,500,000,000	59	39.3%
	Rp 2,500,000,001 - Rp 50,000,000,000	8	5.4%
Total Business Assets	< Rp. 50,000,000,-	72	48%
	IDR 50,000,001 – IDR 500,000,000,-	56	37.3%
	Rp. 500,000,001 – Rp. 10,000,000,000	22	14.7%

Source: Processed Data (2025)

Table 2
 External Model Validity Test Results

Variables	External Loading	ROAD
Financial Access 1	0.840	
Financial Access 2	0.851	
Financial Access 3	0.846	0.650
Financial Access 4	0.724	
Financial Access 5	0.761	
Financial Literacy 1	0.693	
Financial Literacy 2	0.744	
Financial Literacy 3	0.829	0.580
Financial Literacy 4	0.751	
Financial Literacy 5	0.783	
Financial Technology 1	0.860	
Financial Technology 2	0.821	0.675
Financial Technology 3	0.787	

Variables	External Loading	ROAD
Financial Technology 4	0.854	
Financial Technology 5	0.783	
Sustainable MSMEs 1	0.779	
Sustainable MSMEs 2	0.769	
Sustainable MSMEs 3	0.750	
Sustainable MSMEs 4	0.828	0.613
Sustainable MSMEs 5	0.794	
Sustainable MSMEs 6	0.774	

Source: SmartPLS 4 (2025)

Table 3
 Outer Model: Results of Discriminant Validity Test (Fornell Larcker Criteria)

Variables	AF	FL	FT	Milk UMKM
AF	0.806			
FL	0.506	0.761		
FT	0.685	0.622	0.822	
Milk UMKM	0.694	0.593	0.786	0.783

Source: SmartPLS 4 (2025)

Table 4
 External Model: Results of Discriminant Validity Test (Heterotrait-Monotrait Ratio)

Variables	AF	FL	FT	Milk UMKM
AF				
FL	0.580			
FT	0.755	0.700		
Milk UMKM	0.780	0.677	0.888	

Source: SmartPLS 4 (2025)

Table 5
External Model Reliability Test Results

Variables	Cronbach's alpha	Composite reliability
AF	0.867	0.885
FL	0.819	0.827
FT	0.879	0.887
Milk UMKM	0.873	0.874

Source: SmartPLS 4 (2025)

Table 6
Internal Model: Adjusted R Square Test Results

	Adjusted R-squared
AF	0.473
Milk UMKM	0.667

Source: SmartPLS 4 (2025)

Table 7
Inner Model: F Square Test Results

Variables	f-squared
AF -> MSMEs	0.118
FL -> AF	0.020
FL -> SusMSMEs	0.033
FT -> AF	0.431
FT -> SusMSMEs	0.350

Source: SmartPLS 4 (2025)

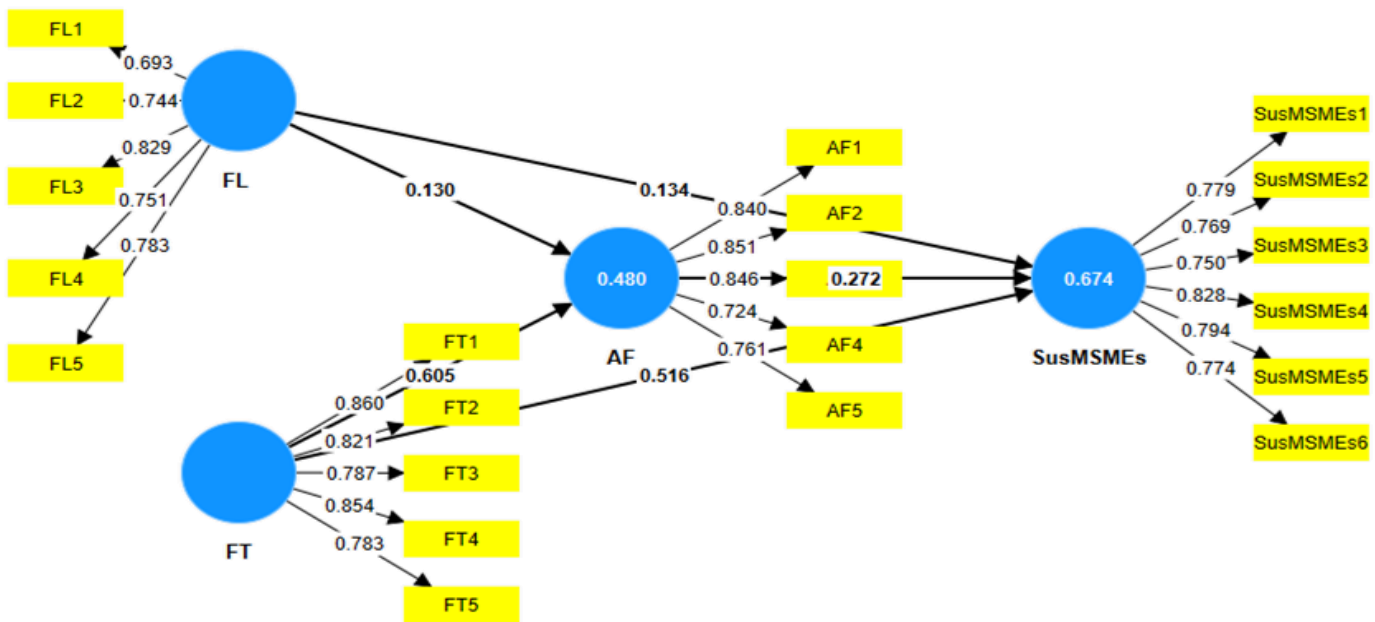


Figure 2. Results of the structural model

Source: SmartPLS 4 (2025)

Table 8
 Inner Model: Path Coefficient Test Results and P-Value

	Direct variables	Coefficient	Std.dev	T Statistics	P value	Decision
H1	Financial Literacy -> MSME Sustainability	0.134	0.078	1,724	0.085	Rejected
H2	Financial Technology -> Sustainable MSMEs	0.516	0.124	4,173	0.000	Accepted
H3	Access to Finance -> Sustainability MSMEs	0.272	0.112	2,434	0.015	Accepted

Source: SmartPLS 4 (2025)

Table 9
 Inner Model: Path Coefficient Test Results and P-Value

	Mediating variables	Coefficient	Standard. developer	T Statistics	P -value	Decision
H4	Financial Literacy -> Access to Finance -> Sustainability from MSMEs	0.035	0.036	0.988	0.323	Rejected
H5	Financial Technology -> Access to Finance -> Sustainable MSMEs	0.164	0.069	2,385	0.017	Accepted

Source: SmartPLS 4 (2025)

Discussion

The Relationship Between Financial Literacy and MSME Sustainability

Hypothesis 1 was rejected, as the test results for the direct relationship between financial literacy and MSME sustainability showed no significant effect. This finding differs from several previous studies that found a positive effect of financial literacy on MSME sustainability (Masdupi et al., 2024; Nurwulandari, 2023; Okello Candiya Bongomin et al., 2025; Prasetya et al., 2021; Winarsih et al., 2020; Ye & Kulathunga, 2019). This discrepancy in results indicates a complexity in the relationship between financial literacy and MSME sustainability that has not yet been fully revealed.

The results of this study indicate that although financial literacy is considered a crucial resource for supporting the sustainability of MSMEs, according to the Resource-Based View (RBV) perspective (Barney, 1991), this knowledge has not been optimally utilized in daily business practices. This is likely due to other factors such as the low quality of formal education of respondents, the majority of whom only have a junior high, senior high, or elementary school education, which impacts their understanding of the more complex concept of financial literacy. This finding aligns with findings (Budyastuti, 2021; Ulianti & Purbadharmaja, 2023) that

indicate that financial knowledge is perceived as difficult to grasp, and MSMEs tend to prefer practical application over theoretical understanding.

Furthermore, these findings align with recent studies that found that financial literacy among Indonesian MSMEs is still difficult to translate into effective and consistent financial behavior, so its impact on business sustainability is not immediately visible (Hidayah et al., 2024; Ilfi et al., 2024; Molina-García et al., 2025; Widagdo & Sa'diyah, 2023). Research (Rizki & Hendarman, 2024) also shows that low financial literacy can hinder MSMEs' ability in long-term financial planning and risk management, which are crucial components of business sustainability.

From another aspect, financial literacy has the potential to increase MSMEs' access to financing and reduce detrimental lending practices, which will indirectly support sustainability. (Babajide et al., 2023; Suci Damayanti et al., 2024). However, without the support of appropriate behavior, systems, and adequate implementation strategies as described in the RBV (Salsabila et al., 2022), financial literacy alone is not enough to directly drive MSME sustainability.

Thus, while financial literacy is an important foundation, the success of MSMEs in achieving sustainability also depends on



their ability to integrate this knowledge into effective business practices, which must be accompanied by improving support systems and strengthening managerial capacity.

The Relationship between Financial Technology and MSME Sustainability

Hypothesis 2 was accepted, indicating that financial technology has a significant impact on the existence of MSMEs. The demonstrated positive impact, where advances in financial technology facilitate transaction processes, enabling MSMEs to improve cash flow and operational efficiency. By utilizing financial technology, MSMEs can reduce reliance on manual processes that are often time-consuming and costly, thereby increasing business productivity. Furthermore, financial technology provides faster and more flexible access to funding, becoming an important complement to traditional financial institutions that often struggle to reach MSMEs, especially in underserved areas (Makina, 2019; Sifwah et al., 2024) .

From the Resource-Based View (RBV) perspective, financial technology is a strategic resource characterized by its value, rarity, and inability to be easily imitated by competitors (Barney, 1991; Estensoro et al., 2022) . This technology is not merely a tool, but an integral part of MSMEs' business strategy to maintain competitiveness in the digital marketplace.

With financial technology, MSMEs can reach a wider range of consumers and obtain easier access to financing, which directly supports business continuity in a dynamic market environment.

These findings are consistent with previous studies showing that the use of finance significantly improves the sustainability of MSMEs through various mechanisms, ranging from increased efficiency, optimal working capital management, to expanding marketing networks (Najib et al., 2021; Nurohman et al., 2021; Nurwulandari, 2023; Sharma et al., 2024; Winarsih et al., 2020; Yaniar et al., 2021) . These findings confirm that financial technology is a key driver for MSMEs in facing the challenges of the digital era, strengthening the hypothesis that the use of financial technology can directly improve performance and business termination.

However, the impetus for financial technology adoption also deserves attention, such as the still-low level of digital literacy among some MSMEs, resistance to change, and data security risks (Afrizal & Megananda, 2025) . Therefore, educational support, facilitation of training on the use of fintech applications, and data protection regulations are crucial aspects that must be developed to ensure that technology truly has a positive impact on MSMEs across the board.



The relationship between access to finance and sustainable MSMEs

Hypothesis 3 was accepted, with the analysis results showing that access to finance has a positive and significant relationship with the sustainability of MSMEs. Ease of access to finance makes a real contribution to increasing economic resilience, competitiveness, and the ability of MSMEs to face the dynamics and challenges of the global market (Firmansyah & Imani, 2024) . With adequate financing support, MSMEs can optimize their business potential, expand their scale of operations, and strengthen their contribution to national economic development, especially in developing countries (Geriadi et al., 2021) . From a Resource-Based View (RBV) perspective, access to finance is an important strategic resource for accumulating, managing, and developing MSMEs' internal resources to achieve sustainable growth and competitive advantage (Adomako et al., 2016) . Access to finance enables MSMEs to obtain working capital and investment essential for market expansion and product innovation, creating a strong foundation for long-term business sustainability.

This research is supported by previous studies that also found that easy access to finance is a key element driving the

development and resilience of MSMEs (Avendano et al., 2023; Ekayani et al., 2024; Masdupi et al., 2024; Ye & Kulathunga, 2019) . However, challenges in accessing finance, such as strict credit requirements and a lack of proper financial documentation, remain major barriers for some MSMEs in accessing formal financing. Therefore, improving financial literacy and strengthening capital access support systems through training programs, mentoring, and streamlining regulations are crucial to improving MSME sustainability. The government and financial institutions are expected to focus more on opening MSME-friendly financing schemes, for example through revolving funds, interest subsidies, and simplified loan procedures. This holistic approach is crucial to ensuring that financial access can be a key driver of MSME growth and migration amidst increasingly complex economic challenges.

The relationship between financial literacy, access to finance and the sustainability of MSMEs

Hypothesis 4 was not accepted, indicating that financial literacy did not have a significant impact on MSME sustainability through mediating access to finance. This finding confirms that financial literacy alone is not sufficient to encourage MSMEs' desire and ability to optimally utilize access to finance for their business objectives. Based on the



Financial Capability Framework, MSME financial capability depends not only on knowledge (literacy) but also on how that knowledge is applied through appropriate financial behavior and easy access to formal financial services (Birkenmaier et al., 2013) . Although MSMEs understand the basic concepts of financial literacy, this does not automatically increase the utilization of access to formal finance without sustainable changes in financial attitudes and behaviors. Positive financial behaviors such as good financial record-keeping, careful risk management, and disciplined capital management are crucial for effective utilization of financial access. In line with research (Xiao & Huang, 2022) , strengthening financial literacy needs to be balanced with strategies that build positive financial behavior and expand the reach of formal financial services for a tangible impact on MSME tourism.

Furthermore, limited theoretical financial literacy without behavioral training and easy access to services creates a gap between existing knowledge and practice. Many MSMEs still struggle to access formal financing despite understanding financial concepts, due to factors such as complex administrative requirements, lack of mentoring, and low trust in financial institutions.

Therefore, MSME development interventions need to focus on a more holistic approach. The focus should not only be on improving theoretical financial literacy but also on developing healthy financial behaviors and providing easy, affordable, and inclusive access to financial services. Personal mentoring, practical training, and the use of user-friendly financial technology are key to translating financial literacy into concrete actions that support MSMEs' aspirations.

The Relationship between Financial Technology, Access to Finance, and MSME Sustainability

Hypothesis 5 is accepted, indicating that financial technology significantly influences the existence of MSMEs through access to finance as a mediating variable. In other words, access to finance mediates the relationship between financial technology and MSME sustainability. Financial technology makes it easier for MSMEs to overcome financing constraints from traditional financial institutions, thus making access to finance faster, more flexible, and more tailored to their needs, ultimately strengthening MSME business continuity. (Pranoto & Hwihanus, 2023) . This finding is consistent with research by Siddik et al., 2023 , which states that the implementation of financial technology improves sustainability performance by



increasing access to finance, where access to finance acts as a significant mediator.

According to the classical mediation model proposed by (Baron & Kenny, 1986) , if the mediation hypothesis is accepted, then access to finance can act as a partial or full mediator. Partial mediation means that financial technology still has a direct effect on MSMEs that want to access finance after the account, while full mediation means that financial technology impacts the continuation of MSMEs entirely through access to finance. This approach was later complemented by (Preacher & Hayes, 2004) The importance of using bootstrapping procedures in SPSS and SAS to estimate indirect effects in simple mediation models. Bootstrapping allows for more accurate testing of the significance of mediation by forming confidence intervals without guaranteeing a normal distribution. Therefore, in the context of this study, the mediation that occurs is mediation due to the effect where access to finance is the primary pathway through which financial technology influences the sustainability of MSMEs. This indicates that the influence of financial technology is not only direct but also indirect through the mechanism of increasing access to financial services (Baron & Kenny, 1986; Preacher & Hayes, 2004).

CONCLUSION

This study aims to analyze the role of access to finance as a mediating variable in the relationship between financial literacy and financial technology on the sustainability of MSMEs in Batam City, Riau Islands Province. Through a quantitative approach with 150 respondents using financial technology and analysis using SmartPLS, it was found that financial literacy does not have a significant direct influence on the sustainability of MSMEs. This finding confirms that financial knowledge alone is insufficient without being accompanied by behavior and access to adequate financial services, as emphasized in the Financial Capability Framework. Furthermore, financial technology significantly contributes to the growth of MSMEs by facilitating transactions, accelerating access to capital, and expanding markets. This aligns with the Resource-Based View (RBV) perspective, which states that financial technology is a strategic resource and asset that plays a crucial role in maintaining sustainable business competitiveness.

Access to finance has also been shown to have a significant positive impact on MSME tourism. However, as a mediator, access to finance does not mediate the relationship between financial literacy and MSME sustainability, but significantly mediates the relationship between financial technology and

MSME sustainability. This finding suggests that the use of financial technology is more effective in opening up financing opportunities that directly impact business resilience. The novelty of this research lies in strengthening the role of financial technology as a key channel in driving MSME interest, furthering the understanding that digital transformation plays a greater role than simply improving financial literacy. The theoretical implications of this research expand the RBV and Financial Capability Framework by emphasizing the importance of synergy between technological resources and adaptive behavior in achieving MSME sustainability in the digital era.

RESEARCH IMPLICATIONS

This research has important implications for the development of MSME empowerment policies in the digital era, particularly in Batam City. The findings emphasize that MSME empowerment strategies require strengthening access to financial technology and integrating digital financial services that are easily accessible and usable by business actors. Therefore, the Batam regional government, financial institutions such as Bank BTN, which is a partner in the interest subsidy program for MSMEs, and financial technology service providers need to work together to promote education that not only improves theoretical financial literacy but also

provides practical training in utilizing financial technology applications. This training should focus on hands-on practice and simulations of real-life financial decision-making so that MSMEs can truly experience the benefits of technology (Batam City Government, 2025).

Furthermore, the training and mentoring program conducted by the Integrated Business Service Center (PLUT) in Batam provides consulting services, facilitates access to financing, and develops digital marketing, which are highly relevant to supporting the adoption of financial technology by MSMEs. Increasing the capacity of mentoring consultants and optimizing the PLUT digital platform is recommended to expand this positive impact. (Batam City Cooperatives Office, 2024) The government has also launched a revolving fund and business incubation program, which must continue to be supported by fintech education and training so that MSMEs can increase their effective access to capital and strengthen their business continuity.

This study is not without several limitations and potential biases. One possible bias is that the study sample only included MSMEs using financial technology, which could influence the generalizability of the results to MSMEs that have not yet utilized financial technology services or have different characteristics. Furthermore, the quantitative



approach using purposive sampling technique may also introduce selection bias. Other moderating variables, such as demographic factors, technology adoption rates, and psychological and social aspects, have not been included in this model, even though these variables can significantly influence the relationship between financial literacy, access to finance, and MSME sustainability. Therefore, further research is recommended to examine additional moderating and mediating variables, such as trust in technology, financial risk behavior, and MSME social network support.

Furthermore, it is recommended to expand the study to other regions with different MSME characteristics and use mixed methods,

combining qualitative and quantitative data, to gain a deeper understanding of the psychosocial factors influencing the successful adoption of financial technology to support business continuity. Further research could also examine the effectiveness of financial technology training programs in Batam City and their impact on improving MSME performance more comprehensively.

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