

Digital Financial Literacy and FinTech in Green Finance Adoption among MSMEs in South Sumatra

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ABSTRACT

This study aims to analyze the influence of digital financial literacy and financial technology on the implementation of green finance among Micro, Small, and Medium Enterprises (MSMEs) in South Sumatra Province. The research employed a quantitative approach using a survey method by distributing questionnaires to 150 MSME actors across eight districts and cities. Data were analyzed through validity, reliability, classical assumption tests, and multiple linear regression analysis. The results indicate that digital financial literacy has a positive and significant effect on the implementation of green finance. MSME actors with a high level of digital literacy are better able to utilize technology-based financial services to manage their businesses efficiently and in an environmentally sustainable manner. In addition, financial technology also shows a positive and significant influence on green finance implementation, reflecting that the use of FinTech enhances transaction efficiency, transparency, and access to green financing for MSMEs. The coefficient of determination (R^2) value of 0.648 indicates that digital financial literacy and financial technology jointly explain 64.8% of the variation in green finance implementation. These findings suggest that improving digital financial literacy and adopting financial technology are key factors in promoting the implementation of green finance and enhancing MSME performance to become more adaptive to the dynamics of the digital economy.

Keywords: Digital Financial Literacy, Financial Technology, Green Finance, MSMEs.

ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengaruh literasi keuangan digital dan teknologi keuangan terhadap penerapan green finance pada pelaku Usaha Mikro, Kecil, dan Menengah (UMKM) di Provinsi Sumatera Selatan. Pendekatan penelitian yang digunakan adalah kuantitatif dengan metode survei melalui penyebaran kuesioner kepada 150 pelaku UMKM yang tersebar di delapan kabupaten/kota. Analisis data dilakukan melalui uji validitas, reliabilitas, asumsi klasik, serta regresi linear berganda. Hasil penelitian menunjukkan bahwa literasi keuangan digital berpengaruh positif dan signifikan terhadap penerapan green finance. Pelaku UMKM dengan tingkat literasi digital yang tinggi lebih mampu memanfaatkan layanan keuangan berbasis teknologi untuk mengelola usaha secara efisien dan berorientasi pada keberlanjutan lingkungan. Selain itu, teknologi keuangan juga berpengaruh positif dan signifikan terhadap penerapan green finance, yang mencerminkan bahwa pemanfaatan FinTech mampu meningkatkan efisiensi transaksi, transparansi, dan akses pembiayaan hijau bagi UMKM. Nilai koefisien determinasi (R^2) sebesar 0,648 menunjukkan bahwa literasi keuangan digital dan teknologi keuangan secara bersama-sama menjelaskan 64,8% variasi penerapan green finance. Hasil penelitian ini menyatakan bahwa peningkatan literasi keuangan digital dan adopsi teknologi keuangan merupakan faktor penting dalam mendorong penerapan green finance dan mendorong kinerja UMKM yang lebih adaptif terhadap perkembangan ekonomi digital.

Kata Kunci: Literasi Keuangan Digital, Teknologi Keuangan, Green Finance, UMKM.

1. Introduction

Micro, Small, and Medium Enterprises (MSMEs) represent a strategic economic sector that serves as one of the principal pillars supporting national development. In addition to their critical role in promoting equitable business opportunities, generating employment, and strengthening local economies, MSMEs also function as the driving engine in responding to the challenges of

globalization, digital transformation, and environmental sustainability.

According to data from the Ministry of Cooperatives and Small–Medium Enterprises of the Republic of Indonesia MSMEs contribute approximately 61.9% to the national Gross Domestic Product (GDP) and employ more than 97% of the total national labor force (Kementerian Koperasi dan UKM Republik Indonesia, 2024). These figures highlight the

vital role of MSMEs in maintaining domestic economic stability, particularly amid the global economic shifts that demand greater efficiency, innovation, and sustainable business practices. Therefore, strengthening MSME capacity—particularly in terms of financial digitalization and sustainable business management—has become a key element in achieving inclusive, resilient, and competitive economic growth.

The financial system continues to experience a significant transformation driven by the integration of digital technology and financial innovation. These changes not only redefine how individuals conduct transactions but also reshape financial management patterns among business actors, including MSMEs. According to the Financial Services Authority of Indonesia (OJK, 2025) the national financial literacy index increased from 49.68% in 2022 to 66.46% in 2025, while financial inclusion reached 80.51%. This remarkable progress indicates an expanding access to formal financial services. Nevertheless, a substantial gap remains between financial literacy and actual utilization, suggesting that many MSMEs are familiar with digital financial products but have yet to fully optimize their potential for business management (Setiawan & Nugroho, 2022). Hence, enhancing digital financial literacy is crucial not only for expanding access to finance but also for improving the effectiveness of FinTech adoption as a tool to strengthen business competitiveness.

The acceleration of digital economic transformation in Indonesia is also reflected in the rapid growth of electronic payment systems. Based on data from Bank Indonesia (2025), the number of users of the Quick Response Code Indonesian Standard (QRIS) increased from 48 million in the first quarter of 2024 to 56.3 million in the first quarter of 2025, with a total of 38.1 million active merchants, of which more than 92% are MSMEs. This trend illustrates a structural shift in economic behavior toward faster, safer, and more efficient digital transactions. The digitalization of payment systems opens new opportunities for MSMEs to expand their market reach, improve cash flow efficiency, and strengthen financial transparency. However, most MSMEs still use digital tools primarily for daily transactions rather than integrating them into long-term financial strategies that support business sustainability and *green finance*. When strategically utilized, financial digitalization has the potential to become a key instrument in promoting environmentally friendly business practices through energy efficiency, waste reduction, and the adoption of green innovations.

The issue of green finance has gained increasing global attention in recent years, in line with the growing awareness of environmental degradation and climate change. Green finance refers to all forms of financial funding and investment that support environmentally friendly economic activities, efficient resource utilization, and carbon emission reduction (OECD, 2023). Implementing green finance within the MSME sector plays a strategic role in directing economic activities

toward greater sustainability, while simultaneously generating value-added benefits through operational efficiency and an enhanced business image. Nevertheless, findings from a Bappenas (2024) survey reveal that only about 12% of MSMEs in Indonesia have adopted elements of sustainable business practices, such as energy efficiency, the use of eco-friendly materials, or waste management. The majority of MSMEs still perceive green finance as an additional operational cost rather than a long-term investment capable of enhancing competitiveness.

Kraus et al., (2022) found that the integration between digital innovation and green finance makes a significant contribution to MSME sustainability in developing economies. The adoption of FinTech, when accompanied by environmental awareness, can reduce production costs, improve energy efficiency, and create new investment opportunities in the green economy sector. This demonstrates that green finance is not merely a financial mechanism but a comprehensive sustainable development strategy that can strengthen the long-term resilience of MSMEs.

The integration of digital financial literacy and FinTech adoption holds substantial potential as a catalyst for accelerating the implementation of green finance among MSMEs. FinTech serves not only as a transactional medium but also as an innovative financing platform that expands access to capital, improves operational efficiency, and promotes financial transparency. According to Yadav (2024) the development of FinTech plays an essential role in accelerating the transition toward a green financial system by facilitating business data collection, mitigating moral hazard risks, and expediting environmentally based financing. This argument is reinforced by Rizwana et al., (2025) who found that FinTech adoption across Southeast Asia positively influences green finance implementation particularly when supported by adequate levels of digital financial literacy among business actors.

In Indonesia, MSME awareness of financial digitalization has begun to increase, as many entrepreneurs are now familiar with services such as e-wallets, mobile banking, and digital bookkeeping applications. However, their understanding of green financing concepts—such as *green lending*, *eco-crowdfunding*, or *sustainable microfinance*—remains limited. The lack of digital financial literacy with a sustainability focus serves as a major barrier to MSME participation in green financing programs. (Purnamasari & Asharie, 2024a) emphasize that insufficient digital literacy not only slows the adoption of FinTech but also impedes MSME decision-making regarding environmentally responsible investment.

The Indonesian government has demonstrated a strong commitment to strengthening the digital and green finance ecosystem through various strategic initiatives. Key policies include the Indonesia Digital Financial Innovation Blueprint and the National Strategy for Financial Inclusion both of which emphasize

improving digital capacity and fostering institutional synergy to expand access to inclusive and environmentally responsible finance. Additionally, the Sustainable Finance Roadmap Phase II (OJK, 2023) underscores the importance of developing green financial products for the real sector, including MSMEs. Despite these efforts, several challenges remain, such as uneven digital infrastructure development across regions, low environmental awareness, and limited economic incentives for businesses to transition toward sustainable practices.

Based on this context, a clear research gap emerges that justifies the need for this study. First, empirical studies examining the relationship between digital financial literacy, FinTech adoption, and green finance implementation among MSMEs particularly at the regional economic level are still limited. Second, most prior studies have focused on large financial institutions, whereas MSMEs possess distinct characteristics in terms of adaptability, access to information, and sustainability motivation. Third, existing digital literacy programs in Indonesia have yet to be explicitly designed to support the Sustainable Development Goals (SDGs), particularly those related to green economy, industrial innovation, and financial inclusion.

In light of the identified research gaps, this study seeks to explore and empirically validate the role of digital financial literacy and FinTech adoption in promoting green finance practices among MSMEs in South Sumatra, Indonesia. The research specifically addresses the following questions:

1. Does digital financial literacy significantly influence the adoption of green finance among MSME actors?
2. Does Financial Technology (FinTech) have a significant impact on the adoption of green finance among MSMEs?
3. Do digital financial literacy and FinTech jointly and simultaneously influence the implementation of green finance among MSMEs?

This research is expected to provide empirical evidence that strengthens the understanding of how digital financial literacy and FinTech adoption can accelerate MSME transformation toward a green and competitive financial system. Furthermore, the findings aim to offer strategic recommendations for policymakers, financial institutions, and MSME stakeholders in developing a robust green finance ecosystem at the microeconomic level. By integrating digital literacy, technological innovation, and environmental awareness, Indonesia's MSME sector can become a key driver of sustainable economic growth and environmental resilience.

2. Theoretical Framework

Digital Financial Literacy

Digital financial literacy can be defined as an individual's cognitive and practical ability to understand, evaluate, and utilize technology-based financial instruments to make sound, effective, and secure financial decisions (Lusardi & Mitchell, 2011). In the

context of the digital economy, financial literacy extends beyond an understanding of conventional financial products to include knowledge of digital financial systems, online transactions, and the risks associated with financial technology usage. According to the OECD (2023), digital financial literacy encompasses the ability to interpret financial information, recognize digital security risks, and use digital devices and applications in daily financial activities such as saving, investing, borrowing, and budgeting.

Setiawan & Nugroho (2022) classify digital financial literacy into four key dimensions: digital financial knowledge, attitudes toward financial technology, digital application skills, and digital financial behavior. Digital financial knowledge reflects an understanding of technology based financial products and services; attitudes toward FinTech represent trust and openness to digital innovation; digital application skills refer to the technical ability to operate e-wallets, mobile banking, or accounting applications; while digital financial behavior indicates the extent to which individuals use financial technology responsibly and ethically. These four dimensions form a fundamental basis for enhancing the capacity of entrepreneurs to manage financial resources effectively in the digital era.

For Micro, Small, and Medium Enterprises (MSMEs), digital financial literacy is a critical prerequisite for effective, transparent, and sustainable business management. Entrepreneurs with high levels of digital literacy are better able to maintain accurate financial records, manage cash flows efficiently, and make prudent investment decisions. Purnamasari & Asharie (2024) emphasize that MSME actors with strong digital literacy are more capable of adapting to technology-driven economic changes and identifying green financing opportunities that support business sustainability.

Digital financial literacy also plays an essential role in mitigating financial risks that arise from limited understanding of online transaction security and data protection. Entrepreneurs who comprehend digital security principles can protect financial assets and maintain business credibility. Therefore, digital financial literacy should be viewed not merely as knowledge acquisition but as a behavioral competency that promotes intelligent, ethical, and sustainability-oriented financial decision-making. Ultimately, this ability enhances MSME competitiveness through greater efficiency, transaction security, and environmental awareness in business activities.

Financial Technology (FinTech)

FinTech refers to the application of technological innovation in the delivery of financial services, aimed at expanding access, improving operational efficiency, and strengthening transparency within the financial system (Davis, 1989). FinTech encompasses a wide range of digital applications including mobile banking, digital wallets, peer-to-peer (P2P) lending, crowdfunding, blockchain, and QR code-based payment systems.

According to the Technology Acceptance Model (TAM), an individual's decision to adopt technology is influenced by two main perceptions: perceived usefulness and perceived ease of use. These perceptions jointly determine the degree of user acceptance toward new technology. In the MSME context, FinTech plays an important role in accelerating digital transformation, improving transaction efficiency, expanding financing access, and strengthening the accuracy of financial records.

Safii et al., (2024) found that FinTech adoption positively influences business performance and sustainability by facilitating digital transactions, bookkeeping, and sales analysis. Rizwana et al., (2025) further argue that FinTech serves as a catalyst for implementing green finance, as it enables faster, more transparent, and more inclusive distribution of environmentally oriented financing. Through FinTech, financial institutions can provide green funding with lower transaction costs and more efficient digital reporting systems.

FinTech also contributes to the implementation of green economic principles. Paperless transactions, cloud-based systems, and automated reporting help reduce the use of physical resources and administrative waste. Hence, FinTech functions not only as a tool for economic efficiency but also as part of the broader solution for environmental sustainability. Integrating FinTech with green finance principles enables MSMEs to achieve a balance between economic efficiency, financial transparency, and environmental responsibility.

Green Finance

Green finance refers to financial practices that support environmentally friendly economic activities, energy efficiency, and sustainable development (OECD, 2023). Its implementation can take the form of green loans, green bonds, and sustainability-based investments. The main objective of green finance is to direct financial resources toward projects that deliver positive environmental impacts and contribute to climate change mitigation.

Kraus et al., (2022) explain that green finance improves operational efficiency, reduces resource consumption, and strengthens a firm's public image. For MSMEs, adopting green finance creates dual benefits: reducing operational costs while enhancing competitiveness in environmentally conscious markets. Nevertheless, in Indonesia, the application of green finance among MSMEs remains limited. A report by (Bappenas, 2024) revealed that only about 12 percent of MSMEs have implemented elements of sustainable business practices such as energy efficiency, eco-friendly materials, or waste management.

This limitation is primarily due to low digital financial literacy, lack of fiscal incentives, and limited access to green financing schemes. Many MSME owners still perceive green financing as an additional cost rather than a long-term investment that strengthens business sustainability. Therefore, enhancing digital financial

literacy and promoting FinTech adoption are key factors in expanding MSME participation in green finance initiatives. By understanding sustainability concepts and utilizing FinTech platforms, entrepreneurs can more easily access green capital and manage their operations with a focus on resource efficiency and emission reduction.

Green finance contributes directly to the achievement of the Sustainable Development Goals (SDGs), particularly Goal 8 (Decent Work and Economic Growth), Goal 9 (Industry, Innovation, and Infrastructure), and Goal 13 (Climate Action). The Indonesian government has supported this agenda through policies such as the Indonesia Digital Financial Innovation Blueprint and the National Strategy for Financial Inclusion which emphasize the integration of digitalization and environmental sustainability within the financial sector (Bank Indonesia, 2019; BPK, 2020).

Relationship Among Variables

Digital financial literacy, financial technology, and green finance are interrelated variables that collectively foster the establishment of a sustainable financial ecosystem for MSMEs. Digital financial literacy improves entrepreneurs' ability to manage finances efficiently, understand risks, and make environmentally conscious investment decisions. Mangawing et al., (2023) found that the higher the level of digital financial literacy among MSME actors, the greater their likelihood of participating in green financing programs.

FinTech directly contributes to the implementation of green finance by providing fast, transparent, and inclusive digital financial services (Yadav, 2024). FinTech helps reduce transaction costs and facilitates environmental data collection required by financial institutions to assess sustainability impacts. The integration of digital financial literacy and FinTech utilization simultaneously strengthens MSMEs' ability to apply green finance principles and enhances their competitiveness in sustainability-oriented markets.

This relationship can be explained using the Technology Acceptance Model (TAM) and Behavioral Finance Theory. TAM explains that technology adoption is driven by perceived usefulness and perceived ease of use, both of which are influenced by the level of digital literacy. Meanwhile, Behavioral Finance Theory posits that financial decisions are shaped not only by rational considerations but also by psychological and social factors. Hence, digital financial literacy strengthens rationality and adaptability among entrepreneurs, while FinTech serves as the medium that enables the practical implementation of green finance principles.

Hypothesis Development

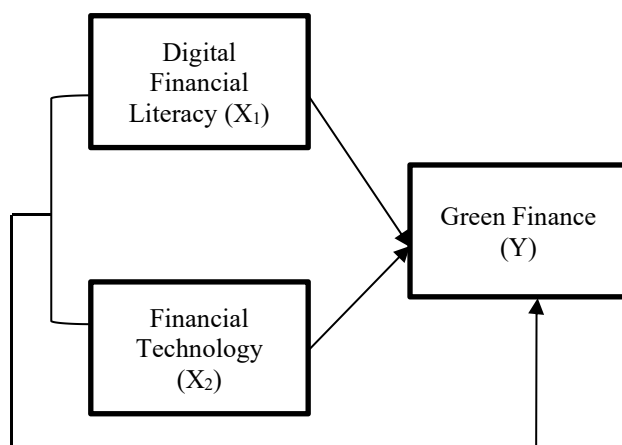
Based on the theoretical review and previous empirical findings, the following hypotheses are proposed:

- H₁: Digital financial literacy has a positive and significant effect on the implementation of green finance among MSMEs.

- H₂: FinTech has a positive and significant effect on the implementation of green finance among MSMEs.
- H₃: Digital financial literacy and FinTech jointly have a positive and significant effect on the implementation of green finance among MSMEs.

These hypotheses suggest that improving digital financial literacy and expanding FinTech adoption together act as key catalysts for accelerating the implementation of green finance within the MSME sector. Both factors not only enhance financial efficiency and accessibility but also play a strategic role in building a sustainable, adaptive, and competitive business ecosystem aligned with the global green economy agenda.

The research framework in this study is developed to illustrate the conceptual relationship between the independent variables *Digital Financial Literacy* (X_1) and *Financial Technology* (X_2) and the dependent variable, *Green Finance* (Y). This framework highlights the assumption that higher levels of digital financial literacy and greater utilization of FinTech services among MSMEs play a critical role in enhancing the adoption of environmentally sustainable financial practices. The model presented in Figure 1 serves as the basis for formulating the research hypotheses and determining the analytical approach used to examine the relationships among the variables.



Source: Developed by the authors (2025).

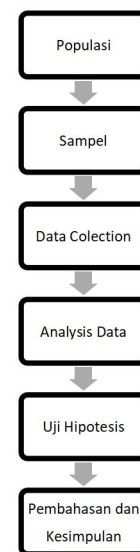
Figure 1. Research Framework

As illustrated in the figure, Digital Financial Literacy (X_1) is assumed to have a direct influence on Green Finance (Y), indicating that MSME actors with strong digital capabilities are better equipped to access, manage, and optimize technology-based financial services in ways that support sustainability. Similarly, Financial Technology (X_2) is proposed to significantly affect Green Finance (Y) by improving transaction efficiency, enhancing transparency, and expanding access to green funding schemes. Together, these independent variables are expected to contribute simultaneously to the strengthening of green finance implementation within the MSME sector.

3. Methodology

This study adopts a quantitative research approach aimed at analyzing the influence of digital financial literacy and Financial Technology (FinTech) on the implementation of green finance among Micro, Small, and Medium Enterprises (MSMEs) in South Sumatra Province, Indonesia. The quantitative method was selected because it enables objective measurement of relationships between variables using numerical data that can be statistically tested, producing empirical and generalizable findings. Moreover, this approach aligns with the characteristics of explanatory research, which focuses on hypothesis testing to explain causal relationships between independent and dependent variables.

To provide a clearer and more systematic overview of the research procedures, the methodology is illustrated through a flow diagram. This diagram outlines the sequential stages of the study, starting from the determination of the population, the selection of 150 MSME respondents, data collection through surveys, followed by validity and reliability testing, classical assumption tests, and regression analysis used to examine the proposed hypotheses. These methodological steps are presented in Figure 2 below.



Source: Developed by the authors (2025).

Figure 2. Research Methodology Flow

3.1. Population and Sample

The population of this research consists of all MSME actors actively engaged in business activities within the South Sumatra Province who have utilized digital financial services or FinTech platforms in their operations. The selection of South Sumatra as the research location was based on its rapid MSME growth and increasing adoption of digital financial services, particularly through the use of QRIS (Quick Response Code Indonesian Standard) and digital banking systems.

The sampling technique employed is purposive sampling, which involves selecting respondents based on

specific criteria relevant to the research objectives. The criteria are as follows:

1. MSME owners who have operated their businesses for at least one year.
2. MSME owners who have used digital financial services such as mobile banking, e-wallets, or other FinTech platforms for business transactions.
3. Respondents who voluntarily agreed to participate and completed the questionnaire accurately and fully.

The sample size was determined based on the recommendation of (Hair et al., 2019a), who suggest that an adequate sample should be five to ten times the number of indicators in the research model. This study involves three variables, each with five indicators, resulting in a total of 15 indicators. Accordingly, the minimum required sample size ranges between 75 and 150 respondents. To enhance the reliability and representativeness of the data, this research involved 150 respondents distributed across several cities and regencies in South Sumatra, including Palembang, Banyuasin, Ogan Ilir, Ogan Komering Ilir, Ogan Komering Ulu, Prabumulih, Lubuk Linggau, and Pagar Alam. The selection of these areas aimed to reflect diverse socio-economic conditions and provide a comprehensive overview of digital finance adoption within the MSME sector.

3.2. Types and Sources of Data

The study utilizes both primary and secondary data. Primary data were collected directly from respondents through a structured questionnaire developed based on the indicators of each research variable. The questionnaire employed a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), as it effectively captures the intensity of respondents' attitudes and perceptions toward the given statements.

Secondary data were obtained from various official sources such as the Financial Services Authority of Indonesia (OJK) annual reports, publications from Statistics Indonesia (BPS), and documents issued by the Ministry of Cooperatives and SMEs related to MSME development, financial literacy, and digital economic transformation. Additionally, relevant scholarly works from national and international journals were reviewed to strengthen the theoretical framework and support the discussion of the findings.

3.3. Data Collection Techniques

Data collection was carried out using both online and offline survey methods. The online questionnaires were distributed through digital platforms such as Google Forms, targeting MSME actors active in business social networks and entrepreneurial communities. Meanwhile, the offline questionnaires were administered during training sessions and mentoring programs for MSMEs conducted in several regencies and cities across South Sumatra.

This mixed data collection method was designed to reach a more diverse group of respondents in terms of location, business sector, and digital literacy level. To ensure content validity, the questionnaire was first tested with ten MSME participants and two academic experts specializing in digital finance and sustainable business. Feedback from the pilot test was used to revise the wording, structure, and clarity of the items to enhance their comprehensibility.

3.4. Variables and Measurement

This study involves three primary variables: digital financial literacy (X_1), FinTech (X_2), and green finance implementation (Y).

1. Digital financial literacy (X_1) was measured using five indicators: understanding of digital financial products, ability to use financial applications, attitude toward financial technology, awareness of digital risks, and responsible financial behavior.
2. FinTech (X_2) was measured using five indicators: accessibility of FinTech services, transaction efficiency, information transparency, digital service innovation, and user convenience.
3. Green finance implementation (Y) was measured using five indicators: utilization of environmentally friendly financing sources, energy efficiency practices, waste management, environmental awareness in investment decisions, and adoption of sustainable business practices.

Each indicator was operationalized into specific questionnaire items developed based on prior literature, and was adapted to fit the context of MSMEs in Indonesia (Kraus et al., 2022; OECD, 2023; Rizwana et al., 2025).

3.5. Data Analysis Techniques

Data analysis was conducted through several systematic stages. The first stage involved validity and reliability testing.

- Validity testing was performed using the Pearson Product Moment correlation, where each item is considered valid if the correlation coefficient (r -calculated) exceeds the critical value of r -table at a 5% significance level ($\alpha = 0.05$).
- Reliability testing employed Cronbach's Alpha coefficient, with a threshold value of 0.70 indicating acceptable internal consistency (Hair et al., 2019).

The second stage involved testing for classical assumptions, which include:

1. Normality Test – conducted using the Kolmogorov–Smirnov method to ensure that residual data are normally distributed. A significance value greater than 0.05 indicates normal distribution.
2. Multicollinearity Test – conducted to detect correlation among independent variables. A model is considered free from multicollinearity if the Variance Inflation Factor (VIF) is less than 10 and the Tolerance value exceeds 0.10.

3. Heteroskedasticity Test – conducted using the Glejser method to detect inequality of residual variance. A significance value greater than 0.05 indicates the absence of heteroskedasticity.

The final stage of the analysis used multiple linear regression to examine both the partial and simultaneous effects of the independent variables (digital financial literacy and FinTech) on the dependent variable (green finance implementation).

The regression model employed in this study is formulated as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + e$$

Where:

Y = Green Finance Implementation

X₁ = Digital Financial Literacy

X₂ = FinTech

β₀ = Constant

β₁, β₂ = Regression Coefficients

e = Error Term

Subsequently, the t-test was conducted to examine the partial effect of each independent variable on the dependent variable, while the F-test was employed to evaluate the simultaneous influence of the independent variables on the dependent variable. In addition, the coefficient of determination (R²) was used to measure the proportion of variance in the dependent variable (green finance) that can be explained by the independent variables (digital financial literacy and FinTech). A higher R² value indicates a greater explanatory power of the model in capturing the variation within the observed phenomenon.

Hypothesis testing was carried out at a 95% confidence level (α = 0.05). A significance value (Sig.) less than 0.05 indicates a statistically significant relationship, whereas a Sig. value greater than 0.05 suggests that the relationship is not significant. The results of these tests were then interpreted descriptively and linked to relevant theories and prior empirical studies to provide a comprehensive understanding of the role of digital financial literacy and FinTech in the implementation of green finance.

4. Results and Discussion

Descriptive Analysis of Respondents

Respondents were selected based on three main criteria:

1. Having operated their business for at least one year,
2. Using digital financial services in business operations, and
3. Voluntarily completing the questionnaire in full

Table 1. Distribution of Respondents by Region

Region	Frequency (n)	Percentage (%)
Palembang	45	30
Banyuasin	30	20
Ogan Ilir	22	15
Ogan Komering Ilir	18	12
Ogan Komering Ulu	15	10
Lubuk Linggau	10	7
Prabumulih	9	6
Total	150	100

Source: Processed by the author (2025)

The distribution of respondents reflects proportional representation across various regions in South Sumatra Province. The highest number of respondents came from Palembang City (30%), followed by Banyuasin (20%), Ogan Ilir (15%), Ogan Komering Ilir (12%), Ogan Komering Ulu (10%), Lubuk Linggau (7%), and Prabumulih (6%). This distribution indicates a geographically balanced sample aligned with the actual distribution of MSME activities in the province.

Table 2. Respondents' Demographic Characteristics

Characteristic	Category	Frequency	Percent
Gender	Male	65	43
	Female	85	57
Age	18–25 years	38	25
	26–40 years	83	55
	> 40 years	29	20
Characteristic	Category	Frequency	Percent
Education Level	High School	53	35
	Diploma	18	12
	Bachelor's Degree	69	46
	Postgraduate	10	7
Business Duration	< 3 years	29	19
	3–5 years	34	23
	> 5 years	87	58
Business Sector	Trade and Services	90	60
	Culinary	37	25
	Handicrafts/Small Industry	23	15

Source: Processed by the author (2025)

From a demographic perspective, most respondents were female (57%), while male respondents comprised 43%. This finding highlights the strategic role of women in MSME-based economic activities, particularly in trade, culinary, and creative service sectors.

In terms of age distribution, the productive age group (26–40 years) dominated with 55%, followed by respondents aged 18–25 years (25%) and those over 40 years (20%). This indicates that most MSME actors are within the productive age range, which tends to be more adaptive to technological change and open to innovation.

Regarding educational background, the majority of respondents held a bachelor's degree (46%), followed by high school graduates (35%), diploma holders (12%), and postgraduates (7%). The relatively high education level supports the assumption that MSME entrepreneurs possess strong adaptive potential toward digital innovation and financial technology adoption.

In terms of business duration, 58% of respondents had operated for more than five years, 23% between three and five years, and 19% less than three years. This

reflects a generally stable level of business resilience and experience in managing operations.

Finally, in terms of business sector, trade and services (60%) accounted for the majority, followed by culinary (25%), and handicrafts or small industries (15%). These sectors are also the most active in adopting digital financial services due to their high transaction volume and need for flexibility.

Overall, the descriptive results suggest that younger, well-educated, and digitally adaptive entrepreneurs are more likely to implement sustainable financial systems through the use of financial technology.

Validity and Reliability Tests

Before conducting regression analysis, validity and reliability tests were performed to ensure the quality and consistency of the data. Validity testing was conducted using the Pearson Product Moment correlation to determine the extent to which each questionnaire item measured the intended construct.

Table 3. Results of Validity and Reliability Tests

Variable	r-count (min–max)	Cronbach's Alpha	Description
Digital Financial Literacy (X ₁)	0.512–0.789	0.841	Valid and Reliable
FinTech (X ₂)	0.534–0.771	0.856	Valid and Reliable
Green Finance (Y)	0.501–0.804	0.832	Valid and Reliable

Source: Processed by the author (2025)

The analysis results indicate that all questionnaire items have correlation coefficients (r-count) ranging from 0.501 to 0.804, exceeding the r-table value of 0.300 with a significance level of $p < 0.05$. This confirms that all items are valid and strongly correlated with their respective variables.

Reliability testing using Cronbach's Alpha shows that all variables have alpha coefficients above 0.70, which indicates high internal consistency. Based on Hair et al. (2019), an alpha value above 0.70 demonstrates that the research instrument is reliable and suitable for consistent empirical data collection.

Classical Assumption Tests

The classical assumption tests were performed to ensure that the regression model satisfies the fundamental statistical requirements.

Table 4. Results of Classical Assumption Tests

Test Type	Result	Significance Value	Criteria
Normality (Kolmogorov–Smirnov)	0.065	0.1388	Sig. > 0.05
Multicollinearity (Tolerance/VIF)	0.642 / 1.557	–	Tolerance > 0.10; VIF < 10
Heteroskedasticity (Glejser)	–	0.376 (X ₁); 0.441 (X ₂)	Sig. > 0.05

Source: Processed by the author (2025)

The Kolmogorov–Smirnov test result shows a significance value of 0.1388 (> 0.05), indicating that the data are normally distributed. The multicollinearity test shows that the Tolerance value ($0.642 > 0.10$) and VIF value ($1.557 < 10$) fall within acceptable limits, implying no multicollinearity issues among independent variables. The Glejser test results show significance values of 0.376 for X₁ and 0.441 for X₂, both exceeding 0.05, which confirms the absence of heteroskedasticity. Therefore, the regression model is free from classical assumption violations and suitable for hypothesis testing.

Multiple Linear Regression Analysis

The results of the multiple linear regression analysis assessing the influence of digital financial literacy (X₁) and FinTech (X₂) on the implementation of green finance (Y) are presented in Table 5.

Table 5. Results of Multiple Linear Regression Analysis

Variable	Regression Coefficient (β)	t-Statistic	Sig	Description
Constant	2.113	–	–	–
Digital Financial Literacy (X ₁)	0.352	4.721	0.000	Significant
FinTech (X ₂)	0.419	5.103	0.000	Significant

R² = 0.648	F = 66.751	Sig. F = 0.000
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Source: Processed by the author (2025)

The regression equation derived from the analysis is as follows:

$$Y = 2.113 + 0.352X_1 + 0.419X_2 + \varepsilon$$

The equation indicates that a one-unit increase in digital financial literacy (X₁) leads to a 0.352 increase in green finance implementation, while a one-unit increase in FinTech utilization (X₂) results in a 0.419 increase in green finance implementation, assuming other variables remain constant.

The F-test produced a significance value of 0.000 < 0.05, indicating that both independent variables jointly exert a significant effect on green finance implementation. The t-test results show that both digital financial literacy and FinTech have positive and statistically significant partial effects on green finance. The coefficient of determination ($R^2 = 0.648$) suggests that 64.8% of the variation in green finance implementation can be explained by digital financial literacy and FinTech, while the remaining 35.2% is influenced by other factors such as government policies, access to green financing, and organizational culture.

These findings confirm that MSME actors' ability to understand and utilize digital financial services and FinTech plays a vital role in strengthening environmentally conscious business practices. Consequently, improving digital financial literacy and

promoting FinTech adoption are strategic factors in accelerating the transition toward a green economy within the MSME sector in South Sumatra.

Discussion

The findings reveal that digital financial literacy has a positive and significant effect on the implementation of green finance among Micro, Small, and Medium Enterprises (MSMEs) in South Sumatra Province. This indicates that the higher the level of digital financial literacy possessed by MSME actors, the greater their ability to manage finances efficiently, understand financial risks, and utilize Financial Technology (FinTech) services appropriately and responsibly in relation to environmental concerns. In other words, MSME actors with strong digital understanding and skills are not only more economically efficient but also more aware of the social and ecological impacts of their financial decisions.

Digital financial literacy encompasses not only technical proficiency in using digital financial applications such as mobile banking or e-wallets but also cognitive, affective, and behavioral aspects related to understanding the benefits, risks, data security, and sustainability implications of financial decisions. According to Mitchell & Lusardi, (2011) financial literacy is the fundamental ability to understand and apply financial principles in economic life. In the digital context, this concept extends to the ability to manage financial resources by effectively and securely leveraging technology.

MSME actors with a high level of digital financial literacy tend to be more capable of utilizing technology-based financial services to support business operational efficiency. For instance, they can use mobile banking, internet banking, digital payment gateways, or the Quick Response Code Indonesian Standard (QRIS) system to accelerate transactions and minimize operational costs. Moreover, the use of digital bookkeeping applications and cloud accounting systems enables entrepreneurs to monitor cash flows, analyze financial statements, and make investment decisions more quickly and accurately.

This capability directly supports the implementation of green finance principles, as the digitalization of financial transactions reduces the use of physical resources such as paper, ink, and energy, thereby minimizing carbon emissions from manual administrative activities. Furthermore, digital financial literacy expands MSMEs' access to green financing products such as green loans, renewable energy-based business credits, and sustainable investment funds. Hence, digital financial literacy not only improves business efficiency but also strengthens MSME actors' awareness of environmentally friendly and long-term sustainable investment practices.

These findings align with the report by the Organisation for Economic Co-operation and Development ((OECD), 2020) which emphasizes that digital financial literacy is a key factor in accelerating the transition toward a sustainable financial system.

Digital literacy enables business actors to understand the economic, social, and ecological benefits of environmentally friendly practices while enhancing their ability to manage financial risks in the face of rapid digital technological advancements.

The results of this study are also consistent with the findings of Putra et al., (2023) who assert that MSME actors with higher levels of digital financial literacy are more capable of adopting efficient, adaptive, and environmentally conscious financial behaviors. They argue that digital literacy strengthens entrepreneurs' capacity to integrate economic and environmental dimensions into business decision-making processes. Therefore, digital financial literacy can be regarded as a fundamental pillar in shaping rational, intelligent, and sustainability oriented financial behavior.

The findings confirm that FinTech contributes significantly to green finance adoption through improved efficiency, transparency, and accessibility of digital transactions. By reducing manual processes and promoting paperless systems, FinTech directly supports environmental sustainability. This aligns with Gomber et al. (2018) and Rizwana et al. (2025), who emphasize that FinTech acts as a catalyst for sustainable finance by lowering transaction costs, improving reporting accuracy, and expanding access to green funding. In the MSME context, FinTech enables faster financing processes and enhances accountability, strengthening its role in facilitating green economic transformation.

The results of this study indicate that both digital financial literacy and FinTech exhibit a synergistic relationship in promoting the implementation of green finance. Digital financial literacy serves as a foundation of knowledge and awareness for entrepreneurs to understand risks, benefits, and responsibilities in financial management, while FinTech functions as a facilitating medium that enables the effective and efficient application of green financial principles. The synergy between the two creates an inclusive, adaptive, and environmentally conscious financial ecosystem.

With a high level of digital financial literacy, MSME actors are more capable of adopting FinTech innovations and utilizing various digital financial products such as peer-to-peer lending, crowdfunding, or invoice financing to expand their businesses. Beyond increasing access to finance, these platforms also provide opportunities for MSMEs to engage in green financing initiatives that support renewable energy projects, waste management, or energy efficiency. Thus, digital transformation through FinTech not only strengthens financial inclusion but also supports the broader agenda of national sustainability.

These findings are consistent with TAM and Green Finance Theory, where perceived usefulness and technological readiness drive sustainability adoption. Digital financial literacy strengthens MSME actors' ability to evaluate the usefulness of technology, while FinTech enhances ease of use and accessibility, thereby facilitating the adoption of green finance practices. The findings of this study also have important implications

for policymakers, financial institutions, and MSME practitioners. First, local governments and regulatory agencies such as OJK need to strengthen digital financial literacy programs that incorporate green awareness, particularly targeting entrepreneurs in rural areas. Second, financial institutions and FinTech service providers should develop digital financing products based on ESG (Environmental, Social, and Governance) principles to promote access to green finance. Third, for MSMEs themselves, enhancing digital literacy and adopting FinTech should not merely be viewed as efficiency strategies but also as tangible contributions to green economic development and the achievement of the Sustainable Development Goals (SDGs), particularly Goal 8 (Decent Work and Economic Growth) and Goal 13 (Climate Action).

Practical Implications, The results indicate that policymakers should strengthen MSME-oriented digital literacy programs that incorporate environmental awareness. Financial institutions and FinTech providers are encouraged to design ESG-based financing products that are accessible to MSMEs. MSME owners are advised to integrate digital tools into financial management to increase efficiency and support sustainability goals.

Theoretical Implications, This study extends the Technology Acceptance Model (TAM) and green finance theory by demonstrating how digital financial literacy enhances perceived usefulness and behavioral intention in adopting sustainable financial practices. The findings contribute to the literature by empirically validating the dual role of digital literacy and FinTech in supporting green finance at the MSME level.

5. Conclusion

Based on the results of the analysis, it can be concluded that digital financial literacy and FinTech have a positive and significant influence on the implementation of green finance among Micro, Small, and Medium Enterprises (MSMEs) in South Sumatra Province. The findings demonstrate that the higher the level of digital financial literacy possessed by MSME actors, the greater their ability to understand, manage, and utilize technology-based financial services effectively to support efficient, transparent, and environmentally conscious business management. Strong digital literacy encourages business actors to make prudent financial decisions, minimize the risk of financial mismanagement, and direct business activities toward sustainable practices.

The utilization of FinTech has been proven to make a tangible contribution to enhancing accessibility, efficiency, and transparency in financial transactions. FinTech not only facilitates MSMEs' access to formal financial services but also helps reduce operational costs through transaction digitalization and the implementation of paperless systems. This condition aligns with the principles of the green economy, in which technology plays a critical role in mitigating

negative environmental impacts while simultaneously enhancing business competitiveness.

Therefore, the synergy between digital financial literacy and FinTech serves as a vital foundation for transforming MSMEs toward an inclusive and sustainable green financial system. Strengthening these two aspects not only promotes financial inclusion but also supports Indonesia's long-term goals of fostering environmental sustainability and advancing the national green economy agenda.

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