

Determinants of Sustainable MSME Financing by Banks

Deni Ramdani¹, Shintya Novita Rahmawati², Affix Mareta³, Alex Johaness Simamora^{4*}, Wildan Yudhanto⁵

^{1,2,3,4,5}Universitas Tidar, Magelang, Indonesia

deni.ramdani@untidar.ac.id, shintya.nr@untidar.ac.id, affixmareta@untidar.ac.id,
alexjohanessimamora@untidar.ac.id, wildanyudhanto@untidar.ac.id

*Corresponding Author

Submitted: May 13, 2026

Accepted: May 26, 2026

Published: Oct 1, 2026

ABSTRACT

Sustainable financing for micro, small, and medium enterprises (MSMEs) has become an important strategy to support economic growth and sustainable development in Indonesia. However, limited studies examine how bank characteristics influence sustainable MSME financing. This study investigates the effects of financial integrity, bank reputation, and sustainability mechanisms on sustainable MSME financing by banks in Indonesia. This study employs a quantitative approach using panel data from 47 banking companies listed on the Indonesia Stock Exchange during 2021–2024, resulting in 187 observations. Data were analyzed using fixed-effect regression and robustness testing with two-stage least squares (2SLS). The findings show that financial integrity, bank reputation, and sustainability mechanisms positively and significantly affect sustainable MSME financing. Sustainability mechanisms become the most dominant determinant, indicating that ESG-oriented governance strengthens banks' capacity to distribute sustainable financing. The robustness test confirms that the results remain consistent after controlling for potential endogeneity problems. Theoretically, it integrates signaling theory into sustainable MSME financing by positioning banks as signal providers through financial integrity, reputation, and sustainability governance. Methodologically, it uses bank-level objective data from financial reports, annual reports, sustainability reports, and reputation indicators, rather than relying on MSMEs' survey-based perceptions. Contextually, it highlights sustainability governance as a determinant of sustainable MSME financing in an emerging market where MSMEs play a central role in economic development. Therefore, this study advances the literature by showing that sustainable MSME financing is shaped not only by MSMEs' characteristics or financing demand, but also by credible signals and governance mechanisms provided by banks.

Keywords: bank reputation; financial integrity; MSME; sustainability mechanism; sustainable financing

INTRODUCTION

Based on data from the Indonesian Central Statistics Agency, in 2023, MSMEs contributed to 61 percent of gross domestic product, equal to IDR 9,580 trillion, where there is a growth of 2.3 percent compared to the previous year, and contributed to 97 percent of national employment absorption (Azzahra et al., 2025). However, Indonesian entrepreneurship rating is still at a middle level, which is 75th of 137 countries (Arsi & Safrin, 2023). Although there are a lot of MSMEs in Indonesia, it is not followed by entrepreneurial competitive growth. One of the key success factors for MSMEs is funding availability (Singh et al., 2025). Funding availability is important to provide assets, operational activities, goods and services, and labor costs (Chang & Yang, 2022). Funding availability can be fulfilled by doing loan financing. Government Regulation (PP) No. 7 of 2021 regulates loan financing as one of the main business components.

There are some loan financing advantages for MSMEs. First, loan financing can fulfil funding

resources, especially when there are internal financing difficulties (Amoa-Gyarteng & Dhliwayo, 2024). Most people have difficulties providing capital to establish MSMEs since they only have limited money. Loan financing can be chosen as an alternative capital access. Second, loan financing allows creditors to play a monitoring role for MSMEs' performance to maximize operational activities and create profit (Buchanan & Kaya, 2024). Third, for MSMEs who have sufficient knowledge and business and financial opportunities, but do not yet have capital, loan financing is a solution for MSMEs to increase business competitiveness (Rita et al., 2022).

Loan financing for MSMEs can be performed by involving banks. Indonesian Financial Service Authority Regulation (POJK) No. 51/POJK.03/2017 regulates the obligation for financial institutions to run sustainable financing, including sustainable financing that refers to loans from banks for entrepreneurs to do sustainable business, including for MSMEs.

Sustainable financing for MSMEs can be performed by banks if there are loan financing demands from MSMEs. There are some factors that create loan financing demands. First, MSMEs consider banks' financial integrity. Banks with financial integrity tend to have lower information uncertainty and asymmetry, which can increase MSMEs' trust in accessing financing. Second, MSMEs usually consider bank reputation when seeking loan financing. Strong reputation leads the public to have the perception that banks are stable, credible, and able to maintain long-term financing with customers (Nhleko & Adelowotan, 2025). Third, MSMEs also consider whether banks have sufficient sustainability governance (Appiah-Kubi et al., 2024; Hossain et al., 2023) since MSMEs are one of the sustainability implementation targets. In the context of signaling theory (Spence, 1973), financial integrity, reputation, and sustainability governance become a positive signal that can reduce information asymmetry and increase MSMEs' confidence to access sustainable financing.

Previous studies examine MSMEs' financing, banking, and sustainability (Anggara & Nuraeni, 2025; Edobor & Sambo-Magaji, 2025; Hakam & Hakam, 2024; Smith et al., 2022), and banks' credibility, trust, and commitment (Arthur et al., 2024; Cardoso & Cardoso, 2024; Chi & Phan, 2026; Dias et al., 2025). However, there are some gaps in the previous studies. First, most previous studies explain sustainable MSME financing from the MSMEs' or debtors' perspective, while the banks' perspective as creditors is still underexplored. Second, methodologically, previous studies rely too much on survey-based perception, where there is a possibility of subjective bias. Studies that provide empirical evidence by using objective banking data from financial statements, annual reports, and sustainability reports are still limited. Third, there are limited studies that examine sustainability governance, especially ESG-oriented governance mechanisms, as a determinant factor of sustainable MSME financing. These gaps are critical in an emerging market like Indonesia, where MSMEs contribute to economic growth, while access to financing for MSMEs is held by banking institutions. In this case, this research fills the gaps by examining the banks' characteristics and sustainable MSME financing with objective banking data from banks' reporting.

This research examines whether financial integrity, bank reputation, and bank sustainability mechanisms affect the sustainable MSMEs' loan financing. There are some novelties in this research. First, this research extends signaling theory into sustainable MSME financing by put banks as credible signal providers. Financial integration, bank reputation, and sustainability mechanism do not only represent banks' characteristics, but also as observable signals to reduce information asymmetry and improve trust from MSME to access loan financing. Second, this research promotes methodological novelty, by using objective banking data. This research does not use the survey-based perception of MSMEs to evaluate financial integrity, bank reputation, and sustainability mechanisms, but uses quantitative data in bank reports. It makes the evaluation more accurate and objective. Third, this research contributes to financial sustainability literature by put sustainability governance as a determinant factor of sustainable MSME financing. The existence of sustainability mechanism reflects ESG-oriented governance and banks' readiness to support sustainable business. In this case, this research gives theoretical, methodological, and contextual contributions by integrating signaling theory, objective banking data, and sustainability governance in the context of sustainable MSME financing in emerging market.

LITERATURE STUDY

Theoretical Framework

Signaling theory explains how parties with more complete information give a signal to reduce information asymmetry (Spence, 1973). Information asymmetry occurs when a party has more complete information than another party, which can create uncertainty in decision-making (Piuaru et al., 2024). In the context of financial and banking, banks generally have more comprehensive information on financial condition, governance quality, and sustainability commitment than the customers, including MSMEs. Banks need to give a credible signal to reduce uncertainty and increase stakeholders' trust.

In the context of MSMEs financing, signaling theory explains that MSMEs tend to have limited comprehensive banking information, especially information on financial integrity, sustainability commitment, and governance quality. It leads to information asymmetry between MSMEs and banks. MSMEs need an observable signal from banks to decide on a loan financing strategy. When banks give a positive signal that reflects trust, transparency, and commitment, there will be demand for sustainable MSME financing. In this case, signaling theory gives a theoretical base to explain how financial integrity, bank reputation, and sustainability mechanisms can reduce information asymmetry and increase the demand for sustainable financing from MSMEs. The theoretical framework can be seen in Figure 1.

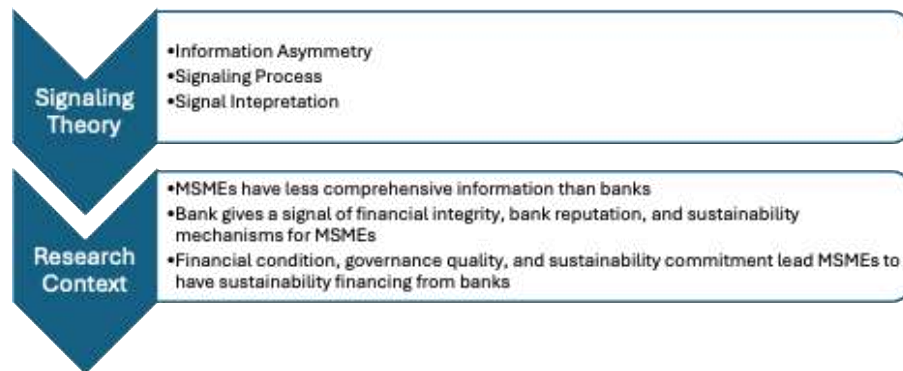


Figure 1. Theoretical Framework
Source: elaboration of previous studies and theory

Previous Studies

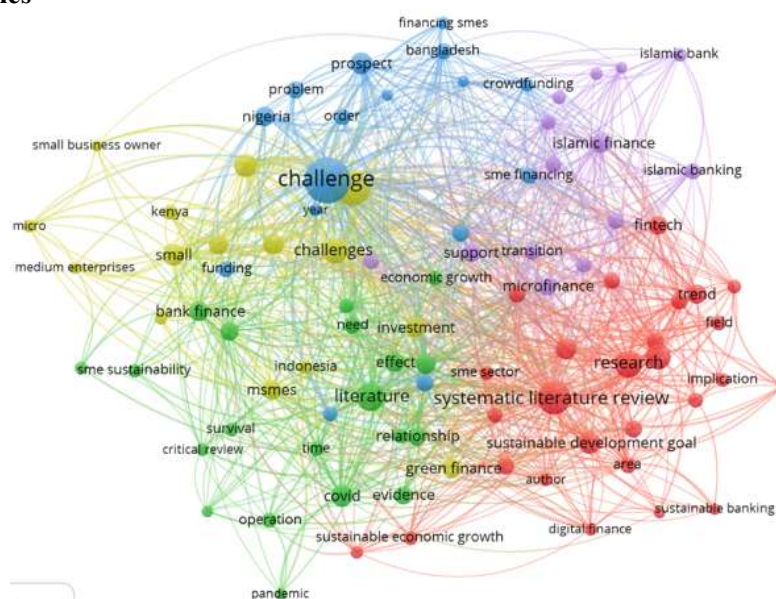


Figure 2. Previous Studies
Source: VOS viewer output

Based on Figure 2, previous studies examine MSMEs' financing, banking, and sustainability (Anggara & Nuraeni, 2025; Edobor & Sambo-Magaji, 2025; Hakam & Hakam, 2024; Smith et al., 2022). Previous studies also investigate banks' credibility, trust, and commitment (Arthur et al., 2024; Cardoso & Cardoso, 2024; Chi & Phan, 2026; Dias et al., 2025). However, there are some identified gaps from previous studies. First, most studies focus on MSMEs' characteristics, financial inclusion, digital finance, and sustainability, while the concerns about banks' characteristics are still limited, especially in explaining sustainable MSME financing. Second, most studies explain sustainable financing from the MSMEs' perspective. It is important to examine the banking perspective since banks are the main funding provider, monitor, and controller of sustainable financing. Third, previous studies examine credibility, commitment, and sustainability in general, but do not specifically put financial integrity, bank reputation, and sustainability mechanisms as a signal from banks to reduce information asymmetry in sustainable MSME financing. Fourth, previous studies in general use a survey-based perception approach, while it is important to use objective indicators from financial statements, annual reports, and sustainability reports to reduce subjective bias. Objective indicators from banks' reporting are important since they can be verified, especially for variables of financial integrity, reputation, governance structure, and financing allocation. Fifth, studies of sustainable MSME financing are slightly examined in Indonesia, whereas MSMEs make a big contribution to the national economy but still have limitation to get loan financing.

Based on previous gaps, this research promotes contribution by integrating signaling theory, objective banking data, and sustainability governance in the context of sustainable MSME financing in a single model. This research suggests that sustainable MSME financing is not only determined by MSMEs' characteristics but also the signal quality from banks. Financial integrity represents transparency and reliability. Bank reputation reflects institutional credibility and quality. Sustainability mechanisms show the ESG-oriented governance and long-term commitment to business sustainability. By using objective data from banks' reporting, this research gives verifiable evidence on how banks support sustainable MSME financing in emerging markets.

Financial Integrity and MSMEs' Sustainable Financing

Financial integrity becomes a critical factor in the relationship between a financial institution and its customers, especially in loan financing. Based on signaling theory, financial integrity serves as a signal that shows banks' transparency, credibility, consistency, and reliability in financial activities (Bhiri & BenMabrouk, 2026). Banks with better financial integrity tend to reduce information asymmetry and uncertainty from MSMEs that relate to financial condition and financing reliability (Jiang & Liu, 2025).

Financial integrity also shows lower opportunistic behavior and stronger commitment to ethical and transparent financial implementation (Xue et al., 2024). Transparent and credible information from banks allows MSMEs to consider banks as a trusted partner in loan financing. MSMEs are more confident in accessing sustainable financing from banks. Banks need to build trust with MSMEs by providing information openly, transparently, and without fraud (Gama & Pedroso, 2025; Utami & Setiawan, 2023). Higher financial integrity reinforces MSME perception of banks' credibility and financial health, which can promote higher sustainable financing demands. Previous studies find that transparency, credibility, and trust reinforce long-term relationships between creditor and debtor and determine financial decision-making (Gama & Pedroso, 2025; Utami & Setiawan, 2023). In the context of sustainable financing, financial integrity becomes an indicator that banks have a commitment to responsible business implementation and do not harm customers.

H1: Financial integrity has a positive effect on sustainable MSMEs financing.

Reputation and MSMEs' Sustainable Financing

Bank reputation reflects the public perceptions of bank quality, credibility, and performance in running the operational activities. Based on signaling theory, reputation plays the signal that can reduce information asymmetry. Reputable banks are considered stable, reliable, and capable of maintaining long-term financing relationships with customers (Nhleko & Adelowotan, 2025).

Since MSMEs' loan financing is an official contract between banks and MSMEs, both parties

must have trust in each other by building a reputation (Becchetti & Manfredonia, 2022; Cardoso & Cardoso, 2024). Bank reputation represents the public evaluation of banks' credibility, service quality, financial performance, and institutional reliability (Cardoso & Cardoso, 2024). Banks with a good reputation tend to be considered safer and more trustworthy, thus increasing the interest of MSMEs in accessing financing. Reputation also relates to the bank's track record in distributing credits, maintaining financial stability, and implementing prudent principles. Previous studies show that financial institution reputation determines the financing decision since reputation ensures credibility and professionalism (Becchetti & Manfredonia, 2022; Cardoso & Cardoso, 2024). In the context of sustainable financing, a good bank reputation shows a commitment to the ESG principles that can be considered for MSMEs to secure loan financing.

H2: Banks' reputation has a positive effect on sustainable MSMEs financing.

Sustainability Mechanism and MSMEs' Sustainable Financing

Banks' sustainability mechanism reflects how far banks integrate sustainability principles into operational activities, including in financing policy. Based on signaling theory, the sustainability mechanism is a signal of a bank's commitment to perform business that considers long-term sustainability, ESG implementation, and responsible financing promotion. Sustainability mechanisms also capture the commitment to sustainable financing, including for MSMEs.

Sustainability governance mechanism refers to how far banks integrate ESG aspects into operational activities and loan financing policy. For MSMEs, ESG sustainability disclosure reduces information asymmetry and can assess sustainability orientation, ESG commitment, and sustainable financing. Sustainability disclosure reflects a sustainability mechanism that communicates banks' sustainability performance as an indicator that banks can distribute sustainable financing to MSMEs. It leads to an increase in MSMEs' trust and financing assurance, where the loan is distributed not only for a for-profit orientation but also for business sustainability. For MSMEs, sustainability governance reduces the risk of banks' long-term consistency and commitment in supporting sustainable business. Previous studies show that the implementation of sustainability principles supports sustainable financing practices, including MSMEs (Appiah-Kubi et al., 2024; Hossain et al., 2023). In this case, the sustainability mechanism leads banks to be ready to distribute loan financing to MSMEs that also have a sustainability orientation.

H3: Banks' sustainability mechanism has a positive effect on sustainable MSMEs financing.

METHOD

Population and Sample

Research populations are all banking companies in Indonesia. This research uses a purposive sampling method to determine the sample with certain criteria that relate to the research context and needs. The first criterion is bank companies that are listed on the Indonesian Stock Exchange. The consideration of listed banking companies on the Indonesian Stock Exchange relates to the free data access of financial statements, annual reports, and sustainability reports. The second criterion is that banking companies must be listed from 2021 to 2024. The period of 2021-2024 is based on the reporting of sustainable MSMEs financing that is initiated in 2021, as stated in Indonesian Financial Service Authority Circular Letter (SEOJK) No. 16 /SEOJK.04/2021. The third criterion is that bank companies have complete data. The research sample can be seen in Table 1.

Table 1. Research Sample

Year	Banks
2021	46
2022	47
2023	47
2024	47
Total Observation	187

Source: www.idx.co.id

Research Variables and Data Source

The dependent variable is sustainable MSMEs financing. Sustainable MSMEs financing is measured by sustainable loan financing that is distributed by banks to MSMEs, divided by total loans (Muhammad & Lubis, 2025). The data source of sustainable MSMEs financing comes from sustainability reports through companies' webpages or www.idx.co.id.

Independent variables include financial integrity, reputation, and the sustainability monitoring mechanism. Financial integrity is measured by the level of bank financial reporting quality. Financial reporting quality can determine public trust in companies (Jaswadi et al., 2024). Financial reporting quality is calculated by discretionary loan loss provisions (Vo et al., 2022). Discretionary loan loss provisions refer to managers' freedom in managing or evaluating the loan loss estimation. Discretionary loan loss provisions are calculated as in equations 1-2 (Vo et al., 2022).

$$LLP_t = a + b1NLP_{t-1} + b2\Delta NLP_t + b3\Delta TL_t + e \quad (1)$$

$$DLLP = LLP - e \quad (2)$$

The LLP_t is the loan loss provision that is calculated by allowance for credit impairment losses divided by total loans in period t . The NLP_{t-1} is a non-performing loan that is calculated by loans that fall into the categories of bad, doubtful, and substandard, divided by the total loans period of $t-1$. The ΔNLP_t is a change of non-performing loans that is calculated by loans that fall into the categories of bad, doubtful, and substandard period of t minus loans that fall into the categories of bad, doubtful, and substandard period of $t-1$ divided by total loans period of t . The ΔTL_t is the change of total loans that is calculated by total loans period of t minus total loans period of $t-1$ divided by total loans period of t . Notation of e is a residual regression in equation q . The DLLP is the discretionary loan loss provisions. Since higher DLLP reflects lower public trust in the banks, this research does a reverse measurement by multiplying DLLP by -1 . Data resource in equations 1-2 comes from financial reports through companies' webpages or www.idx.co.id.

The discretionary loan loss provision is used as a financial integrity measurement since the loan loss provision is one of the most important accounting elements that uses judgment in the banking industry. Since banks heavily rely on credit intermediation, loan loss provision represents how well banks can evaluate the credit risk. A higher discretionary loan loss provision indicates that banks with a higher probability cover up the credit risk. Based on signaling theory, loan loss provision integrity gives a signal to the MSMEs market through the financial statement that is publicly available. Although MSMEs do not directly calculate the discretionary loan loss provision, the signal can still be observed by banks' revenue stability, asset quality, and non-performing loans. The signals help MSMEs to evaluate whether banks are transparent, reliable, and prudent as financing partners.

Bank reputation refers to the public evaluation of a bank's performance (Carè et al., 2024). Bank reputation is measured by the corporate image index (Respati et al., 2024). The corporate image index is a survey held by Marketing Magazine in Indonesia that assesses corporate image in front of the public. A higher corporate image index shows that banks have a higher reputation. The data source of bank reputation comes from www.marketing.co.id.

Bank sustainability mechanisms can be seen from the sustainability disclosure index. Sustainability disclosure index follows the disclosure in the sustainability report based on Indonesian Financial Service Authority Circular Letter (SEOJK) No. 16/SEOJK.04/2021. The disclosure items in Indonesian Financial Service Authority Circular Letter (SEOJK) No. 16/SEOJK.04/2021 consists of 52 items of sustainability strategy, sustainability governance, economic performance, environmental performance, social performance, and sustainable responsibility. The sustainability disclosure index is calculated as in equation 3. The data resource of the sustainability disclosure comes from sustainability reports through companies' webpages or www.idx.co.id.

$$\text{Sustainability Disclosure Index} = \frac{\text{Number of Disclosed Items}}{52} \quad (3)$$

This research uses bank size and return on assets (ROA) as control variables to reduce potential

bias in explaining sustainable MSMEs financing. Control variables are important to ensure that the relationship between the independent variables and the dependent variable is not affected by other bank characteristics. Bank size reflects operational capacity and scale in promoting loans. A bigger size shows that banks have more resources, stronger capital, wider networking, and better risk management, which leads to more loan distribution (Kharabsheh, 2026). Banks with higher ROA show that banks have a better ability to use assets to generate profits, which shows internal source availability for customers to have access to loan financing (Kharabsheh, 2026). Bank size is measured by the natural logarithm of total assets, while ROA is measured by the ratio of net income to total assets (Kharabsheh, 2026).

Data analysis

Data analysis uses fixed-effect regression. Fixed-effect aims to control for the fact that each bank has different characteristics and a sustainability profile. Regression analysis is followed by the classical assumption. This research also uses the Chow test and the Hausman test to determine whether fixed-effect regression is the best model. The regression model can be seen in equation 4.

$$LOAN = a + b_1INTEGRITY + b_2REPUTATION + b_3SUSTAINABILITY + b_4SIZE + b_5ROA + \sum bank + e \quad (4)$$

LOAN is a sustainable MSME loan financing. INTEGRITY is financial integrity. REPUTATION is the bank's reputation. SUSTAINABILITY is a bank sustainability mechanism. SIZE is the bank size. ROA is return on assets. Notation of $\sum bank$ is fixed-effect. Hypotheses are accepted if the coefficient values of b_1 - b_3 are positive and significant.

RESULTS

Descriptive Statistics

Table 2. Descriptive Statistics

Variable	Minimum	Maximum	Average	Standard Deviation
LOAN	0.051	0.623	0.284	0.121
INTEGRITY	-0.352	0.488	0.012	0.152
REPUTATION	0.100	3.617	0.489	0.721
SUSTAINABILITY	0.231	0.904	0.654	0.168
SIZE	27.115	34.842	31.426	1.842
ROA	-0.084	0.153	0.021	0.034
LOAN = sustainable MSME loan financing, INTEGRITY = financial integrity, REPUTATION = bank's reputation, SUSTAINABILITY = bank sustainability mechanism, SIZE = bank size, ROA = return on assets				

Source: statistical output

Table 2 shows that sustainable MSME loan financing (LOAN) has a range of 0.051 to 0.623, where the average value is 0.284 with a deviation of 0.121. Financial integrity (INTEGRITY) has a range of -0.352 to -0.488, where the average value is 0.012 with a deviation of 0.152. Bank reputation (REPUTATION) has a range of 0.100 to 3.617, where the average value is 0.489 with a deviation of 0.721. Bank sustainability mechanism (SUSTAINABILITY) has a range of 0.231 to 0.904, where the average value is 0.654 with a deviation of 0.168. Bank size (SIZE) has a range of 27.115 to 34.842, where the average value is 31.426 with a deviation of 1.842. Return on assets (ROA) has a range of -0.084 to 0.153, where the average value is 0.021 with a deviation of 0.034.

Model Selection

Table 3. Model Selection Test

Test	Model Comparison	Statistic	Prob.	Decision
Chow Test	Common-Effect vs	4.218	0.000	Fixed Effect

	Fixed-Effect			Model
Hausman Test	Random-Effect vs Fixed-Effect	18.635	0.002	Fixed Effect Model

Source: statistical output

The Chow test aims to compare the common-effect model and the fixed-effect model. The Hausman test aims to compare the random-effect model and the fixed-effect model. Based on Table 3, the Chow test has a probability value of 0.000 (below 0.05), which indicates that the fixed-effect model is better than the common-effect model. The Hausman test has a probability value of 0.002 (below 0.05), which indicates that the fixed-effect model is better than the random-effect model. In conclusion, fixed-effect regression is used in this research as the main analysis. Conceptually, fixed-effect aims to control for the fact that each bank has different characteristics and a sustainability profile

Classical Assumption

Table 4. Classical Assumption

Test	Indicators	Result	Criteria	Notes
Normality	Jarque-Bera Prob.	0.087	above 0.05	Data are distributed normally
Multicollinearity	VIF	below 10	below 10	There is no multicollinearity
Heteroscedasticity	Breusch-Pagan Prob.	0.214	Above 0.05	There is no heteroscedasticity
Autocorrelation	Durbin-Watson	1.982	1.5 – 2.5	There is no autocorrelation

Source: statistical output

Table 4 shows the classical assumption test. Normality test uses Jarque-Bera, where the probability value is 0.087, which is above 0.05. It indicates that the data are distributed normally. The multicollinearity test shows that the Variance Inflation Factor (VIF) for all independent variables is below 10, which indicates that there is no multicollinearity problem. The heteroscedasticity test uses Breusch-Pagan, where the probability value is 0.214, which is above 0.05. It indicates that there is no heteroscedasticity problem. Autocorrelation test uses Durbin-Watson, where the value is 1.982, which is between 1.5 and 2.5. It indicates that there is no autocorrelation problem.

Regression Analysis

Table 5. Regression Analysis

Variable	Coefficient	t-Statistic	Prob.
Constant	0.092		
INTEGRITY	0.178	2.781*	0.006
REPUTATION	0.205	2.148**	0.033
SUSTAINABILITY	0.292	3.947*	0.000
SIZE	0.061	2.012**	0.046
ROA	0.147	2.421**	0.017
Adjusted R-squared	0.389		
F-statistic	37.148*		
*Significant at 0.01, **Significant at 0.05, LOAN = sustainable MSME loan financing, INTEGRITY = financial integrity, REPUTATION = bank’s reputation, SUSTAINABILITY = bank sustainability mechanism. SIZE = bank size. ROA = return on assets			

Source: statistical output

Table 5 shows that financial integrity (INTEGRITY) has a coefficient of 0.178 and a t-statistic of 2.781 (significant at 0.01) with a probability value of 0.006. It indicates that H1 is accepted, where trust in banks has a positive effect on sustainable MSMEs' financing. Bank reputation (REPUTATION) has a coefficient of 0.205 and a t-statistic of 2.148 (significant at 0.05) with a probability value of 0.033. Higher bank reputation leads to bigger loan financing for MSMEs. It indicates that H2 is accepted, where banks' reputation has a positive effect on sustainable MSMEs' financing. Bank sustainability mechanism (SUSTAINABILITY) has a coefficient of 0.292 and a t-statistic of 3.947 (significant at 0.01) with a probability value of 0.000. A better bank sustainability mechanism leads to bigger loan financing for MSMEs. It indicates that H3 is accepted, where banks' sustainability mechanisms have a positive effect on MSMEs' sustainable financing.

Robustness Test: Two-Stage Least Squares

This research performs robustness by using two-stage least squares (2SLS) to mitigate the potential of endogeneity. Endogeneity occurs when there is a possibility that sustainable MSME financing can increase bank reputation since loans for MSMEs improve economic growth in the informal sector (Dinutistomo & Lubis, 2021). On one hand, banks with a stronger reputation attract MSMEs. On the other hand, banks that distribute more sustainable MSME financing can receive more public image since it relates to financial inclusion, economic growth, and social contribution. This reciprocal relationship may create reverse causality and lead to biased regression estimates. In this case, the 2SLS method is used to ensure that the effect of reputation is still consistent after controlling for potential simultaneity bias.

In this research, bank reputation is treated as a variable that is potentially endogenous since higher loan distribution can increase reputation and credibility in front of the public (Dinutistomo & Lubis, 2021). This research uses lagged bank reputation as an instrumental variable. Lagged bank reputation is considered to capture the idea that previous reputation affects current reputation. Although lagged bank reputation does not directly affect sustainable MSME financing, lagged bank reputation affects sustainable MSME financing through current reputation.

First, the relevance assumption requires that the instrument must be correlated with the endogenous variable. Theoretically, bank reputation is cumulative and persistent since it is created by repeated public evaluation of service quality, financial stability, and institutional credibility over time. In this case, lagged reputation is expected to correlate significantly with current reputation. Methodologically, the relevance assumption is examined in the first stage of regression to investigate whether lagged reputation significantly predicts current reputation.

Second, the exogeneity assumption requires that the instrument cannot affect the dependent variable directly, except through the endogenous variable. Lagged reputation is considered an exogenous variable since previous reputation does not directly determine current sustainable MSME financing. Lagged reputation is expected to determine sustainable MSME financing through current reputation. This argument is also supported by the temporal order of the instrument, where lagged reputation is measured before the current financing outcome. In this case, lagged reputation is expected to reduce simultaneity bias between current reputation and sustainable MSME financing.

In the first stage, bank reputation is regressed on an instrumental variable (lagged bank reputation) and control variables (bank size and ROA). The regression model for the first stage can be seen in equation 5. In the second stage, the predictive value of bank reputation in the first-stage regression is used in the main regression model to explain sustainable MSME financing. The regression model for the second stage can be seen in equation 6. Regression of 2SLS can be seen in Table 6.

$$REPUTATION = a + b1REPUTATION_{lagged} + b2SIZE + b3ROA + e \quad (5)$$

$$LOAN = a + b1INTEGRITY + b2REPUTATION_{predictive} + b3SUSTAINABILITY + b4SIZE + b5ROA + e \quad (6)$$

Table 6. Two-Stage Least Squares

Variable	First Stage Coef.	t-Statistic	Second Stage Coef.	t-Statistic
Constant	0.176		0.081	
REPUTATION _{lagged}	0.629	8.493*		
INTEGRITY			0.170	2.703*
REPUTATION _{predictive}			0.193	2.196**
SUSTAINABILITY			0.276	3.521*
SIZE	0.058	2.052**	0.060	2.074**
ROA	0.118	2.374**	0.142	2.641*
Dependent Variable	REPUTATION		LOAN	
Adjusted R-squared	0.393		0.397	
F-statistic	41.652*		37.804*	
*Significant at 0.01, **Significant at 0.05, LOAN = sustainable MSME loan financing, INTEGRITY = financial integrity, REPUTATION = bank’s reputation, SUSTAINABILITY = bank sustainability mechanism, SIZE = bank size, ROA = return on assets				

Source: statistical output

In the first stage regression, Table 6 shows that lagged bank reputation (REPUTATION_{lagged}) has a coefficient value of 0.629 with a t-statistic of 8.493 (significant at 0.01), which indicates that lagged bank reputation has a positive effect on current bank reputation. It indicates that the relevance assumption is supported. Theoretically, this finding is consistent with the idea that reputation is cumulative and persistent, where lagged reputation becomes an important predictor of current reputation. The exogeneity is justified theoretically through the temporal structure of the instrument. Lagged reputation occurs before current sustainable MSME financing, where there is a lower possibility that lagged reputation can directly affect sustainable MSME financing. After controlling for current reputation, financial integrity, sustainability mechanisms, bank size, and ROA, the direct effect of lagged reputation on current sustainable MSME financing is expected to be limited. In this case, lagged reputation is considered to affect sustainable MSME financing mainly through current reputation.

In the second stage regression, financial integrity (INTEGRITY), bank reputation (REPUTATION_{predictive}), and the sustainability mechanism have a positive effect on sustainable MSME loan financing. The result shows that the main result is robust after controlling for the potential of an endogeneity problem. In this case, the 2SLS result confirms that the main findings are robust and are not driven only by simultaneity bias between bank reputation and sustainable MSME financing.

DISCUSSION

Analysis data shows that financial integrity, bank reputation, and sustainability mechanisms affect sustainability MSME financing. It shows that trust, transparency, and commitment to sustainability have important roles in encouraging sustainable financing distribution for MSMEs.

The positive effect of financial integrity shows that MSMEs consider banks' transparency, credibility, and reliability before accessing loan financing. Financial integrity represents the trusted relationship between banks and MSMEs. Financial integrity also indicates that banks can reduce uncertainty and information asymmetry in financing relationships. In this case, financial integrity leads MSMEs to have confidence in a financial institution. The findings correlate with signaling theory, where transparent and credible financial information gives a positive signal to reduce the uncertainty perceived by the debtor. This research is consistent with previous studies that find transparency, credibility, and trust reinforce long-term relationships between creditor and debtor and determine financial decision-making (Gama & Pedroso, 2025; Utami & Setiawan, 2023).

Bank reputation also has a positive effect on sustainable MSME financing. Reputation shows the public's legitimization of banks' credibility, professionalism, service quality, and financial stability. This finding relates to signaling theory, where reputation gives a signal of institution quality that can reduce information asymmetry between banks and MSMEs. Reputable banks tend to be

perceived as stable institutions and can maintain long-term financing relationships. It indicates that MSMEs consider credibility and public image before accessing loan financing. This research is consistent with previous studies that find financial institution reputation determines the financing decision since reputation ensures credibility and professionalism (Becchetti & Manfredonia, 2022; Cardoso & Cardoso, 2024).

Sustainability mechanisms also have a positive effect on sustainable MSME financing. This research is consistent with previous studies that find the implementation of sustainability principles supports sustainable financing practices, including MSMEs (Appiah-Kubi et al., 2024; Hossain et al., 2023). Sustainability disclosure index becomes the dominant determinant of sustainable MSME financing in this research. This result shows that sustainability disclosure is not only reported as a regulatory obligation but also plays an important signal of a strategic mechanism that represents a bank's readiness to implement sustainable financing. Compared to financial integrity and bank reputation, sustainability disclosure gives wider information on sustainability strategy, governance, economic performance, environmental responsibility, social performance, and product responsibility. In this case, banks with more sustainability disclosure are perceived to have stronger institutional capacity and long-term commitment to support sustainable MSME financing.

The dominance of sustainability mechanisms to explain sustainable MSME financing gives implications to regulators since sustainability mechanisms are measured by disclosure items that are based on Indonesian Financial Service Authority Circular Letter (SEOJK) No. 16/SEOJK.04/2021. This finding implies that sustainability disclosure relates to banks' capacity to distribute sustainable financing to MSMEs. In this case, the implementation of Indonesian Financial Service Authority Circular Letter (SEOJK) No. 16/SEOJK.04/2021 should not just be seen as reporting compliance but also as an instrument that reinforces banking sustainability. For regulators, especially the Indonesian Financial Service Authority, a comprehensive sustainability disclosure can be used to evaluate sustainability principles in banks' governance, risk management, and financing distribution.

In the context of MSME financing, this finding implies that sustainable finance regulation needs to be more directly connected with inclusive financing policy. MSMEs are central to Indonesia's economic structure, but their access to sustainable financing remains highly dependent on banking institutions. Therefore, green banking regulation should not only focus on large-scale green projects but also encourage banks to develop sustainable financing schemes for MSMEs. This can be done by strengthening disclosure requirements related to MSME-based sustainable financing, green credit allocation, social financing, capacity-building programs, and monitoring of sustainability-oriented loan distribution.

CONCLUSION

In conclusion, this research finds that financial integrity, bank reputation, and sustainability mechanisms have positive effects on sustainable MSME financing. Sustainability mechanisms have the strongest effect, indicating that comprehensive disclosure based on SEOJK No. 16/SEOJK.04/2021 is a key governance signal for banks in supporting sustainable MSME financing. Theoretically, this research implies signaling theory by extending the signaling process in the context of sustainable MSME financing by integrating financial integrity, bank reputation, and sustainability mechanisms. Practically, this research implies that banks should improve financial reporting integrity and transparency, maintain their reputation, and improve sustainability governance.

Strategically, bank management should use the sustainability governance ecosystem as an instrument to expand MSME financial inclusion by integrating sustainability principles into credit policy, risk assessment, product innovation, and customer assistance. Banks should translate sustainability disclosure into concrete financing programs, such as sustainability-based credit scoring, green and inclusive loan products, and capacity-building support for MSMEs transitioning toward sustainable business practices. For regulators such as the Indonesian Financial Services Authority, the findings imply that sustainability governance should be strengthened not only as a reporting requirement, but also as a policy tool to evaluate banks' real contribution to sustainable and inclusive finance. Therefore, OJK can encourage banks to link disclosure under SEOJK No.

16/SEOJK.04/2021 with measurable sustainable MSME financing outcomes, including financing allocation, sectoral distribution, green credit schemes, and social or environmental impact.

This study is limited to listed banks and uses publicly disclosed sustainability information. Future research may include non-listed banks, cross-country emerging market comparisons, and additional factors such as digital banking, green credit policy, financial inclusion, and MSME sustainability readiness.

REFERENSI

- Amoa-Gyarteng, K., & Dhliwayo, S. (2024). Overcoming the liability of newness: The interplay of debt, equity, and profitability in nascent SMEs. *Journal of the International Council for Small Business*, 5(3), 246–258. <https://doi.org/10.1080/26437015.2024.2336454>
- Anggara, M. R., & Nuraeni, N. (2025). Enhancing the Sustainability of Small and Medium Enterprises (SMEs) through Islamic FinTech: A Comprehensive Review of Emerging Trends (2018-2024). *Civilization Research: Journal of Islamic Studies*, 4(1), 21–37. <https://doi.org/10.61630/crjis.v4i1.50>
- Appiah-Kubi, E., Koranteng, F. O., Dura, C. C., Mihăilă, A. A., Drigă, I., & Preda, A. (2024). Green financing and sustainability reporting among SMEs: The role of pro-environmental behavior and digitization. *Journal of Cleaner Production*, 478, 143939. <https://doi.org/10.1016/j.jclepro.2024.143939>
- Arsi, N., & Safrin, F. A. (2023). The Effect Of Family Background, Lifestyle, And Association On Interest In The Entrepreneurship Of The Young Generation (Gen-Z) In Medan City. *Journal of Economics and Business (JECOMBI)*, 3(02), 55–63. <https://doi.org/10.58471/jecombi.v3i02.47>
- Arthur, E., Agbemabiese, G. C., Amoako, G. K., & Anim, P. A. (2024). Commitment, trust, relative dependence, and customer loyalty in the B2B setting: the role of customer satisfaction. *Journal of Business & Industrial Marketing*, 39(5), 933–948. <https://doi.org/10.1108/JBIM-08-2022-0375>
- Azzahra, R. N., Larasati, P., Rizki, M., & Priyono, B. (2025). The Role of MSMEs in Driving Sustainable Development in Indonesia. *KnE Social Sciences*, 10(15), 643–657. <https://doi.org/10.18502/kss.v10i15.19218>
- Becchetti, L., & Manfredonia, S. (2022). Media, reputational risk, and bank loan contracting. *Journal of Financial Stability*, 60, 100990. <https://doi.org/10.1016/j.jfs.2022.100990>
- Bhiri, S., & BenMabrouk, H. (2026). The Architecture of Central Bank Transparency: Accounting Information and Financial Stability as Structural Pillars of Monetary Policy Transparency. *Economies*, 14(3), 81. <https://doi.org/10.3390/economies14030081>
- Buchanan, B., & Kaya, C. (2024). Foundation ownership and creditor governance: Evidence from publicly listed companies. *Journal of International Financial Markets, Institutions and Money*, 93, 101982. <https://doi.org/10.1016/j.intfin.2024.101982>
- Cardoso, A., & Cardoso, M. (2024). Bank Reputation and Trust: Impact on Client Satisfaction and Loyalty for Portuguese Clients. *Journal of Risk and Financial Management*, 17(7), 277. <https://doi.org/10.3390/jrfm17070277>
- Carè, R., Fatima, R., & Lèvy, N. (2024). Assessing the evolution of banking reputation literature: a bibliometric analysis. *International Journal of Bank Marketing*, 42(5), 1059–1091. <https://doi.org/10.1108/IJBM-07-2023-0417>

- Chang, C.-C., & Yang, H. (2022). The role of cash holdings during financial crises. *Pacific-Basin Finance Journal*, 72, 101733. <https://doi.org/10.1016/j.pacfin.2022.101733>
- Chi, H.-K., & Phan, H.-T. (2026). The impact of CSR on reputation, image, and identification in customer loyalty: the moderating role of customer commitment. *Cogent Business & Management*, 13(1). <https://doi.org/10.1080/23311975.2026.2630434>
- Dias, R. P., Wisker, Z. L., & Alani, N. H. S. (2025). Between Firewalls and Feelings: Modelling Trust and Commitment in Digital Banking Platforms. *Journal of Cybersecurity and Privacy*, 5(4), 89. <https://doi.org/10.3390/jcp5040089>
- Dinutistomo, I. A., & Lubis, A. W. (2021). MSME lending and bank efficiency: Evidence from Indonesia. *Banks and Bank Systems*, 16(3), 93–103. [https://doi.org/10.21511/bbs.16\(3\).2021.09](https://doi.org/10.21511/bbs.16(3).2021.09)
- Edobor, F., & Sambo-Magaji, A. (2025). Small and Medium Enterprises (SMEs) and Sustainable Economic Development. In *Digital Transformation for Business Sustainability and Growth in Emerging Markets* (Vol. 8, Number 2, pp. 197–222). Emerald Publishing Limited. <https://doi.org/10.1108/978-1-83549-109-620251008>
- Gama, P. M., & Pedroso, E. (2025). Trust and SME short-term financial policy. European evidence. *International Journal of Managerial Finance*, 21(1), 67–86. <https://doi.org/10.1108/IJMF-12-2022-0557>
- Hakam, D. F., & Hakam, L. I. (2024). Sustainability in small and medium sized enterprises (SME) financing. *Development and Sustainability in Economics and Finance*, 2–4, 100031. <https://doi.org/10.1016/j.dsef.2024.100031>
- Hossain, M., Yoshino, N., & Tsubota, K. (2023). Sustainable Financing Strategies for the SMEs: Two Alternative Models. *Sustainability*, 15(11), 8488. <https://doi.org/10.3390/su15118488>
- Jaswadi, J., Purnomo, H., & Sumiadji, S. (2024). Financial statement fraud in Indonesia: a longitudinal study of financial misstatement in the pre- and post-establishment of financial services authority. *Journal of Financial Reporting and Accounting*, 22(3), 634–652. <https://doi.org/10.1108/JFRA-10-2021-0336>
- Jiang, W., & Liu, B. (2025). Registration reform: A game-changer for corporate financial discipline? *Finance Research Letters*, 85, 108254. <https://doi.org/10.1016/j.frl.2025.108254>
- Kharabsheh, B. (2026). The impact of bank-specific, industry-specific and macroeconomic variables on the profitability of Jordanian commercial banks. *Cogent Business & Management*, 13(1). <https://doi.org/10.1080/23311975.2026.2614786>
- Muhammad, N., & Lubis, A. W. (2025). MSME Loan Composition, Financial Stability, and Government Ownership: Evidence from Indonesia's Banking Sector. *Gadjah Mada International Journal of Business*, 27(3), 321. <https://doi.org/10.22146/gamaijb.110637>
- Nhleko, R., & Adelowotan, M. (2025). Bank-Specific Credit Risk Factors and Long-Term Financial Sustainability: Evidence from a Panel Error Correction Model. *Sustainability*, 17(14), 6442. <https://doi.org/10.3390/su17146442>
- Piuaru, B.-A., Tescașiu, B., Epuran, G., Mosora, M. H., & Ivasciuc, I. S. (2024). Information Asymmetry in the European Funds Market: Impact on Resource Allocation and Sustainable Development. *Sustainability*, 16(24), 11101. <https://doi.org/10.3390/su162411101>
- Respati, H., Triatmanto, B., Natsir, M., & Hanantijo, D. (2024). A role of corporate image as a successful determinant of human resource management strategy and marketing strategy in the

- firm performance of hospitality industry In Indonesia. *Cogent Business & Management*, 11(1). <https://doi.org/10.1080/23311975.2024.2433163>
- Rita, M. R., Hidayat, R., & Kristanto, A. B. (2022). Competitive Advantage and Firm Performance: Debt Financing as a Moderating Variable. *Jurnal Dinamika Manajemen*, 13(1), 1–18. <https://doi.org/10.15294/jdm.v13i1.32937>
- Singh, S., Raj, R., Dash, B. M., Kumar, V., Paliwal, M., & Chauhan, S. (2025). Access to finance and its impact on operational efficiency of MSMEs: mediating role of entrepreneurial personality and self-efficacy. *Journal of Small Business and Enterprise Development*, 32(3), 596–619. <https://doi.org/10.1108/JSBED-01-2024-0053>
- Smith, H., Discetti, R., Bellucci, M., & Acuti, D. (2022). SMEs engagement with the Sustainable Development Goals: A power perspective. *Journal of Business Research*, 149, 112–122. <https://doi.org/10.1016/j.jbusres.2022.05.021>
- Spence, M. (1973). Job Market Signaling. *The Quarterly Journal of Economics*, 87(3), 355. <https://doi.org/10.2307/1882010>
- Utami, R., & Setiawan, D. (2023). Banking and trust-based SMEs toward credit access. *Corporate Governance and Organizational Behavior Review*, 7(2, special issue), 385–391. <https://doi.org/10.22495/cgobrv7i2sip16>
- Vo, N. N. T., Nguyen, T. V. H., & Phan, D. H. T. (2022). Earnings management and bank risk-taking behavior in Asia-Pacific region. *Research in International Business and Finance*, 63, 101785. <https://doi.org/10.1016/j.ribaf.2022.101785>
- Xue, Q., Zhan, P., Jin, Y., & He, H. (2024). Reputation, commitment, and financial market regulation. *International Review of Financial Analysis*, 96, 103667. <https://doi.org/10.1016/j.irfa.2024.103667>