

MSME Credit as a Part of Sustainable Financing and Its Impact on the Performance of Indonesia's First Mover Sustainable Banks

Teti Chandrayanti¹, Rice Haryati², Listiana Sri Mulatsih³

^{1,2}Management Study Program, Faculty of Economics, Ekasakti University, Padang, Indonesia

³Management Study Program, Faculty of Economics and Business, Bung Hatta University, Padang Indonesia

Abstract: This study aims to examine how MSME credit, as part of sustainable finance, affects the performance of banks that were among the first to commit to sustainability practices in Indonesia. A quantitative approach was employed with a population of eight banks, using purposive sampling to select six banks as samples with data covering the period 2019–2024. Return on Assets (ROA) data were obtained from annual reports, while MSME credit and sustainable finance data were collected from sustainability reports. The data were processed using EViews. The findings reveal that MSME credit and green loan—two key components of sustainable finance—have a simultaneous effect on bank performance, although their partial effects are negative. This suggests that sustainable finance promotes new market opportunities and financial inclusion, but its effectiveness depends on regulatory initiatives, green credit diversification, growing demand for environmentally friendly products, and digital innovation. Access to financing remains constrained by collateral requirements, limited literacy on green finance, high transition costs, and inadequate policy incentives. The study concludes that sustainable finance represents both a strategic opportunity and a managerial challenge, providing valuable insights for policymakers and financial institutions in balancing sustainability and profitability goals.

Keywords: A Sustainable finance, MSMEs, Bank, Green economy, Indonesia

I. Introduction

Micro, Small, and Medium Enterprises (MSMEs) play a crucial role in Indonesia's economy. MSMEs contribute more than 60 percent to the national Gross Domestic Product (GDP) and absorb the majority of the labor force. To sustain growth and enhance competitiveness, MSMEs rely heavily on access to external financing, particularly through bank lending. Therefore, commercial banks hold a strategic position as financial intermediaries that channel funds to the MSME sector.

From the perspective of banking performance, MSME lending presents both opportunities and challenges. On one hand, MSME credit can expand the customer base, promote financial inclusion, and increase bank profitability through interest income and credit portfolio diversification. On the other hand, MSME loans are often associated with higher credit risk compared to corporate lending, which may affect bank stability if not properly managed. Lending decisions are influenced by factors such as interest rates, capital adequacy, asset quality, and liquidity (Minawi et al, 2025; Mentari, 2024). A substantial proportion of MSMEs remain "unbankable" due to collateral requirements, inadequate financial documentation, and a mismatch between their financing needs and conventional banking products. Although sustainable finance has been promoted through regulatory frameworks—such as OJK Regulation No. 51/PJOK.03/2017 and macroprudential incentives introduced by Bank Indonesia in 2019—its adoption remains limited.

In 2018, eight national banks representing 46% of Indonesia's total banking assets established the Indonesia Sustainable Finance Initiative (IKBI). These eight banks are therefore categorized as the first movers in sustainable banking, namely Bank Artha Graha Indonesia, BRI Syariah, Bank Central Asia, Bank Mandiri, Bank Muamalat, Bank Negara Indonesia, Bank Pembangunan Daerah Jawa Barat dan Banten (BJB), and Bank Rakyat Indonesia. These banks have begun transforming toward sustainable banking practices by integrating Environmental, Social, and Governance

(ESG) aspects and expanding their green financing portfolios. This transition creates a new dynamic: while MSME financing remains a key priority for promoting economic inclusion, banks must simultaneously balance profitability, risk management, and sustainability commitments.

Although sustainable finance has gained significant attention in Indonesia's banking sector, the integration of MSME credit into the sustainable finance framework remains insufficiently explored. Previous studies have largely emphasized environmental aspects such as green lending, ESG implementation, or carbon-related risk management, while the social and inclusive dimensions—represented by MSME financing—have received limited empirical attention. Consequently, the extent to which MSME credit contributes to bank performance, particularly among institutions recognized as first movers in sustainable banking, remains unclear. Furthermore, how MSME-based financing interacts with other components of sustainable finance, such as green lending, to influence profitability and operational efficiency has not been comprehensively analyzed.

In response to these gaps, this study aims to investigate the influence of MSME credit, as a key component of sustainable finance, on the performance of Indonesia's pioneer sustainable banks. Specifically, it seeks to examine both the individual and joint effects of MSME credit and green financing on bank performance, while also identifying the managerial and policy implications of implementing sustainability-oriented lending strategies. The findings are expected to provide empirical evidence that supports the integration of inclusive financing into sustainable banking practices. The novelty of this research lies in its focus on MSME credit as a central pillar of sustainable finance, bridging the gap between inclusive lending and sustainable banking performance. Unlike previous studies that predominantly concentrate on environmental sustainability, this research incorporates the social inclusion aspect of MSME financing within the sustainable finance framework. By analyzing Indonesia's first-mover banks, the study offers new insights into how inclusive and sustainable financial practices can be harmonized to achieve both profitability and long-term sustainability goals.

II. THEORETICAL REVIEW

MSME credit refers to loans granted to borrowers engaged in micro, small, and medium enterprises (MSMEs) that meet the definitions and criteria of Micro, Small, and Medium Enterprises. According to Law No. 20 of 2008 and Government Regulation No. 7 of 2021, MSMEs are classified based on net assets and annual turnover, as stipulated in. Micro enterprises are defined as having an annual turnover of less than IDR 300 million, small enterprises up to IDR 2.5 billion, and medium enterprises up to IDR 50 billion. This classification serves as a foundation for the targeted distribution of assistance, financing, incentives, and legal protection for MSME actors, ensuring government policies are appropriately aligned with business scale (Ardiansyah, 2019).

MSME credit is not merely viewed as a financial intermediation activity but also as a strategic mechanism to promote equitable development, financial inclusion, and economic sustainability. In the context of modern banking, MSME credit constitutes an integral part of sustainable finance, as it contributes to the achievement of the Sustainable Development Goals (SDGs) through enhancing community economic capacity, creating employment opportunities, and reducing social inequality.

Banks primarily function as financial intermediaries, mobilizing funds from the public in the form of deposits and redistributing them as loans to stimulate economic activity. Beyond intermediation, banks provide a wide range of financial services, manage payment systems, create demand deposits, and maintain financial system stability. Banks, together with other stakeholders, can serve as agents of change in the transition toward a green economy. In Indonesia, banks also fulfill social functions through MSME financing. By accumulating funds from society and distributing them in the form of credit or other financial instruments, banks contribute to improving the general standard of living. Acting as intermediary institutions, banks bridge parties with differing interests in saving and investing, while also providing services such as clearing. Small and medium enterprises play a critical role in credit distribution, demonstrating their significant contribution to economic development (Badriyah, 2009).

The concept of bank health is broad, encompassing the bank's capacity to perform all banking activities effectively. For sustainable financing performance, banks must extend credit efficiently, maintain asset quality by controlling non-performing loans (NPLs), diversify their portfolios, and prioritize productive sectors, such as MSMEs and the green economy. The Central Bank of Indonesia mandates that banks allocate a minimum proportion of their credit portfolio to MSMEs. Channeling funds to MSMEs not only supports economic development but also benefits banks' business performance in the Indonesian context. Innovation in financial products, adoption of digital technologies, and enhancement of lenders' capacities are critical to improving credit distribution effectiveness. Compliance with regulations

and transparent reporting are also essential to maintaining public and regulatory trust, reflecting strong and resilient financing performance.

In Indonesia, sustainable finance refers to the comprehensive support of the financial services industry for sustainable growth that harmonizes the economic, social, and environmental dimensions. In essence, financial institutions are encouraged to engage in activities that go beyond profit orientation, focusing instead on initiatives that generate long-term social and environmental benefits. The implementation of sustainable finance for financial institutions, issuers, and public companies is regulated by the Financial Services Authority Regulation (Otoritas Jasa Keuangan/OJK) No. 51/POJK.03/2017, which requires financial service institutions to publish an annual sustainability report.

According to OJK, sustainable finance in Indonesia is guided by several core principles, namely risk management, development of sustainable priority economic sectors, environmental and social governance and reporting, and capacity building through collaborative partnerships. Among these, the principle of developing sustainable priority economic sectors carries an inclusive character, emphasizing the importance of expanding financing for key sectors such as MSMEs, industry, energy, agriculture, and infrastructure, while maintaining a balance between economic, environmental, and social objectives. This principle also highlights the need to provide financial access to underserved or unbanked communities, aligning with the national agenda of financial inclusion.

Within this framework, MSME credit is recognized as an integral component of sustainable finance. MSMEs play a vital role in Indonesia's economic development, contributing significantly to GDP and employment generation. Nevertheless, MSMEs continue to face structural barriers, particularly limited capital and restricted access to financing from formal financial institutions. In response, many banks have incorporated MSME financing into their sustainable finance strategies. Several sustainability reports from Indonesian banks classify sustainable finance into two main categories: MSME loans and green project loans.

MSME credit, when integrated into the framework of sustainable finance, plays a significant role in shaping the overall performance of banks. According Dinutistomo & Lubis (2021) stated that there is a significant and positive impact of the proportion of MSMEs lending on bank efficiency. The higher the lending ratio, the higher the efficiency of banks. It means that from those lending, bank will take benefit in terms of efficiency. Wibowo, & Aumeboonsuke, (2020). investigated that most of the banks are still capable and comply with supply lending to MSMEs as mandated by the regulation in the short term. However, in the long term, the intention is moving slowly and tends to decrease - possibly due to the dynamics of economic growth and the development of financial technology companies. It meant loan to MSMEs have to give benefit to the bank both in short term and long term, because of lending to MSMEs riskier rather than lending to big corporations. Norman et al (2015) added that the credit risk effects profitability analysis finds that credit risk effects profitability of the commercial banks negatively. Therefore, banks need to use prudent credit risk management procedure in order to ensure profitability and safe the bank form loss and crisis. Some banks further describe MSME financing as a social loan, complementing green loans within their sustainability portfolio. Despite these variations in terminology, the essence remains the same—MSME credit represents a crucial form of sustainable financing, as it supports inclusive economic growth while fostering long-term social and environmental benefits. Consequently, MSME loans are consistently reported as part of sustainability financing activities in Indonesian banks' sustainability reports.

Hasan et al (2025). that green finance exhibits an insignificant impact on bank performance. The results indicate that implementation costs may initially exceed benefits. In Bangladesh itself, sustainable finance can be divided into three sustainable finance factors: green finance, corporate social responsibility (CSR) and digitalization. While in Indonesia in general based on some sustainability Report of bank consist of MSMEs Social Financing dan Green Loan. Mirza, et al (2023) also stated that there is a positive relationship between green SME lending and net interest margin. According to Pangarso (2022) empirical evidence indicates that green finance investments, total output, energy consumption, political stability, and institutional quality collectively affect environmental and financial outcomes. Mirza et al. (2023) found a negative link between sustainable lending to small businesses and banks' default risk. This means that when banks increase sustainable loans to SMEs, they can benefit from higher net interest margins and lower default risks. Therefore, providing sustainable credit to SMEs offers financial benefits for banks while also supporting sustainability goals. The same opinion was stated by Zhen et al (2025) that green lending standard improve profitability but not directly affect solvency. It is suggested that was needed the strategic value of sustainable finance for banks while reinforcing the need for tailored risk frameworks to support green SME lending. Some researchers stated that green credit does not affect bank performance significantly due to the proportion of green credit is relatively small compared to the bank's overall loan.

Therefore the government have to encourage banks greater in lending green loan such as provide tax incentives to make bans more profitable when allocating to green credit portfolio.

Bachtiar & Nainggolan (2023) stated there is a significant relationship between sustainability financing and financial performance of banks which measured by net interest margins and the capital adequacy ratio, but significant negative impact on the nonperforming loans ratio. In other words, by the disbursement of sustainable financing, bank will get a positive impact on financial performance and can attract investors.

H1: MSME credit has a significant positive effect on bank performance.

H2: Green loan has a positive impact on bank performance

H3: MSME credit and Green loan has a positive impact on bank performance

III. Methodology

Research question three was addressed using quantitative methods. This analysis relied on secondary data obtained from banks with complete and reliable records. The study utilizes panel data from some Indonesian banks, covering the period 2019–2024. The population consists of eight banks that were the first movers toward sustainable banking. The sample was selected based on several criteria, including the completeness of the required data. Bank Muamalat and Bank Syariah Indonesia were excluded from the sample due to incomplete data for the desired observation period. To ensure robustness, the estimation was conducted using Eviews 12. The use of EViews version 12 in this study is justified by the nature of the data, which are panel data. Panel data combine cross-sectional data with time-series data, representing observations across entities over specific time periods. EViews is particularly suitable for analyzing panel data because it is capable of generating both Fixed Effect Models (FEM) and Random Effect Models (REM), as well as determining the most appropriate model through the Hausman Test and the Chow Test. Moreover, EViews provides powerful statistical tools for various time-series analyses, making it highly efficient and reliable for processing panel data.

The study focused on three main variables. Sustainability financing was defined through two dimensions: the MSME Loan Ratio (X_1), measured as the proportion of loans to Micro, Small, and Medium Enterprises relative to total sustainable financing, and the Green loan Ratio (X_2), defined as the share of credit allocated to environmentally friendly and low-carbon activities to sustainable financing. Bank performance was measured using Return on Assets (ROA) (Y), calculated as net income divided by total assets, which reflects the efficiency of banks in generating profitability. The empirical model is specified as:

$$ROA_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \varepsilon_{it} \quad (1)$$

where i represents the bank, t the year, α the intercept, β_1 and β_2 the coefficients to be estimated, and ε_{it} the error term. This specification allows the study to assess whether MSME financing and green financing contribute significantly to bank profitability, thereby addressing the research question on the implications of sustainable finance for banking performance in Indonesia.

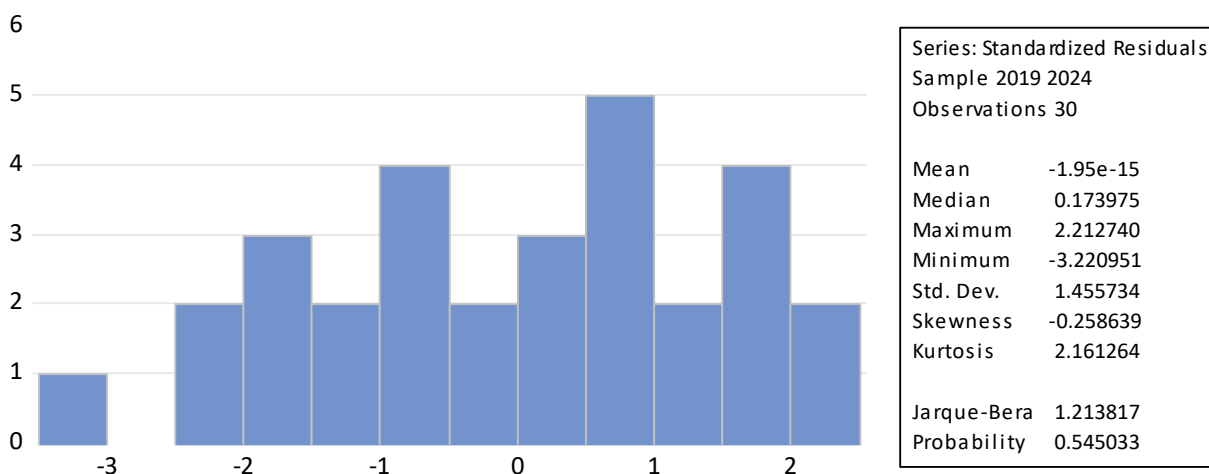
IV. RESULTS

Table 1. Description Analysis

	X1	X2	Y
Mean	68.84267	30.89000	2.384333
Median	62.77000	37.23000	2.625000
Maximum	97.75000	48.86000	4.860000
Minimum	49.15000	2.250000	-0.730000
Std. Dev.	15.09402	14.91072	1.520013
Skewness	0.439798	-0.449374	-0.396237
Kurtosis	1.654443	1.660775	2.054616
Jarque-Bera	3.230268	3.251587	1.902209
Probability	0.198864	0.196755	0.386314
Sum	2065.280	926.7000	71.53000
Sum Sq. Dev.	6607.055	6447.555	67.00274
Observations	30	30	30

Based on the descriptive analysis table 1, it can be stated that there are 30 observations in this study. The lowest ROA value is -0.73, while the highest ROA value is 4.8. The average ROA is 2.38, with a standard deviation of 1.2. Since the mean value is greater than the standard deviation, it indicates that the variation in performance among banks is not too high. Therefore, it can be concluded that the ROA of the companies in the research sample tends to be homogeneous or consistent across the banks. All variables are normally distributed, as shown by skewness values close to zero, kurtosis around two, and Jarque-Bera probabilities above 0.05. Variable X1 has the highest mean (68.84) with moderate variation, while X2 (30.89) and Y (2.38) show lower dispersion. These results suggest that the data meet the normality assumption, providing a sound basis for regression analysis.

Table 2. Normality Test



Based on the figure above, it can be seen that the Jarque-Bera probability value is 0.545033, which is greater than 0.05. Therefore, it can be concluded that the data in this study are normally distributed since $0.545033 > 0.05$.

Table 3. Multicollinearity Test

	X1	X2
X1	1.000000	-0.997681
X2	-0.997681	1.000000

Based on the results of the multicollinearity test in Table 3, it can be seen that the correlation coefficient between X1 and X2 is -0.997681, which is less than 0.90. Therefore, it can be concluded that the model is free from multicollinearity or has passed the multicollinearity test.

Table 4. Heteroskedasticity Test

Cross Section

Panel Cross-section Heteroskedasticity LR Test

Equation: UNTITLED

Specification: Y C X1 X2

Null hypothesis: Residuals are homoskedastic

	Value	df	Probability
Likelihood ratio	11.80126	5	0.0376

Based on the table above, the probability value is $0.0376 < 0.05$, which indicates that the data analyzed in this study, based on the Cross-Section Heteroskedasticity LR Test, exhibit heteroskedasticity problems. Therefore, the analysis was continued using the Panel Period Heteroskedasticity LR Test.

Period

Panel Period Heteroskedasticity LR Test

Equation: UNTITLED

Specification: Y C X1 X2

Null hypothesis: Residuals are homoskedastic

	Value	df	Probability
Likelihood ratio	3.032822	5	0.6949

Based on the table above, the probability value is $0.6949 > 0.05$, which indicates that the data analyzed in this research, based on the Period Heteroskedasticity LR Test, do not exhibit heteroskedasticity problems

Table 5. Chow Test

The Chow Test is conducted to determine the most appropriate model between the Common Effect Model (CEM) and the Fixed Effect Model (FEM). The decision criterion in the Chow Test is based on the probability value. If the significance value (probability) is less than 0.05, the suitable model is the panel data regression using the Fixed Effect Model (FEM). Conversely, if the significance value (probability) is greater than 0.05, the appropriate model is the panel data regression using the Common Effect Model (CEM). The results of the Chow Test in this study are as follows

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	25.481451	(4,23)	0.0000
Cross-section Chi-square	50.766774	4	0.0000

Based on Table above, the Chi-Square probability value is 0.000, which is less than 0.05. When the Chi-Square probability value is smaller than 0.05, the selected model is the Fixed Effect Model (FEM). Therefore, further testing using the Hausman Test is required.

Table 6. HAUSMAN Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.041190	2	0.9796

The best model REM due to > 0.05

The Lagrange Multiplier (LM) Test is conducted to determine whether the Random Effect Model (REM) is more appropriate than the Common Effect Model (CEM). The decision is made by observing the cross-section probability (p-value) of the Breusch-Pagan test. If the p-value is greater than 0.05, the selected model is the Common Effect Model. However, if the p-value is less than 0.05, the appropriate model is the Random Effect Model.

Table 7 LAGRANGE MULTIPLIER

Lagrange Multiplier Tests for Random Effects

Null hypotheses: No effects

Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	45.08995 (0.0000)	1.515644 (0.2183)	46.60559 (0.0000)
Honda	6.714905 (0.0000)	-1.231115 (0.8909)	3.877625 (0.0001)
King-Wu	6.714905 (0.0000)	-1.231115 (0.8909)	4.184251 (0.0000)
Standardized Honda	8.753303 (0.0000)	-1.057625 (0.8549)	2.225577 (0.0130)
Standardized King-Wu	8.753303 (0.0000)	-1.057625 (0.8549)	2.649676 (0.0040)
Gourieroux, et al.	--	--	45.08995 (0.0000)

Based on the results of the Lagrange Multiplier (LM) Test, the Breusch-Pagan probability value is $0.000 < 0.05$, indicating that the most appropriate model for this study is the Random Effect Model

In this research the selected model is the Random Effect Model, determined through three stages of testing: the Chow Test, the Hausman Test, and the Lagrange Multiplier Test.

Table 8. The Best Panel Data Estimation Model

Dependent Variable: Y
 Method: Panel Least Squares
 Date: 09/14/25 Time: 08:22
 Sample: 2019 2024
 Periods included: 6
 Cross-sections included: 5
 Total panel (balanced) observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.85545	14.32004	0.827892	0.4162
X1	-0.100691	0.144248	-0.698042	0.4921
X2	-0.082203	0.142611	-0.576414	0.5699

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.831133	Mean dependent var	2.384333
Adjusted R-squared	0.787081	S.D. dependent var	1.520013
S.E. of regression	0.701382	Akaike info criterion	2.329437
Sum squared resid	11.31456	Schwarz criterion	2.656383
Log likelihood	-27.94155	Hannan-Quinn criter.	2.434030
F-statistic	18.86696	Durbin-Watson stat	1.459540
Prob(F-statistic)	0.000000		

The fixed effect regression model shows that both X1 and X2 have negative but insignificant effects on Y, as indicated by probability values above 0.05. However, the model has strong explanatory power with an adjusted R-squared of 0.79, while the F-statistic (18.87, $p < 0.01$) confirms that the overall model is statistically significant.

The regression equation can be written as:

$$Y = 11.8554 - 0.1069X_1 - 0.0822X_2 + e$$

The findings reveal that MSME loans and green loans negatively affect ROA when tested individually, yet jointly they exert a positive and significant impact on bank performance. This condition can be happened according to Nguyen (2023) because of substantial initial expenditure and delayed returns associated with green projects place downward pressure on short-term profitability. In Indonesia, the implementation of sustainable finance under POJK No. 51/2017 remains relatively new and is still in the early stages of adoption. Consequently, the costs of socialization, transition, operations, and the implementation to green business practices remain high, while public awareness of environmentally friendly enterprises is still relatively low. In the longer term, however, these initiatives are expected to provide a more significant and positive contribution. The same result was stated Hasan et al (2025). that green finance exhibits an insignificant impact on bank performance. The results indicate that implementation costs may initially exceed benefits. Moreover, default rate and bank size negatively and significantly affect performance, reflecting higher credit risk and inefficiencies in larger institutions due to agency costs and organizational complexities. In Bangladesh itself, sustainable finance can be divided into three sustainable finance factors: green finance, corporate social responsibility (CSR) and digitalization. While in Indonesia in general based on some sustainability Report of bank consist of MSMEs Social Financing dan Green Loan. The green loan is a loan designed for environmental projects related to agriculture, renewable energy sources, environmentally friendly industry (Miroshnichenko & Mostovaya, 2019). Norman et al (2015) added that the credit risk effects profitability analysis finds that credit risk effects profitability of the commercial banks negatively. Therefore, banks need to use prudent credit risk management procedure in order to ensure profitability and safe the bank form loss and crisis

Table 8 . T Test

Dependent Variable: Y
Method: Panel Least Squares
Date: 09/14/25 Time: 08:22
Sample: 2019 2024
Periods included: 6
Cross-sections included: 5
Total panel (balanced) observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.85545	14.32004	0.827892	0.4162
X1	-0.100691	0.144248	-0.698042	0.4921
X2	-0.082203	0.142611	-0.576414	0.5699

Table 9. F Test

Cross-section fixed (dummy variables)

R-squared	0.831133	Mean dependent var	2.384333
Adjusted R-squared	0.787081	S.D. dependent var	1.520013
S.E. of regression	0.701382	Akaike info criterion	2.329437
Sum squared resid	11.31456	Schwarz criterion	2.656383
Log likelihood	-27.94155	Hannan-Quinn criter.	2.434030
F-statistic	18.86696	Durbin-Watson stat	1.459540
Prob(F-statistic)	0.000000		

The F-test is conducted to determine whether the relationship between all independent variables and the dependent variable is statistically significant simultaneously. In this study, the F-test uses a significance level of 0.05 or 5%. If the significance value of F is less than 0.05, the regression coefficients are considered valid for use. Based on the results shown in the table, Prob (F-statistic) value is 0.000. Therefore, it can be concluded that the independent variables have a simultaneous effect on the dependent variable

V. DISCUSSION

According to Pangarso (2022) empirical evidence indicates that green finance investments, total output, energy consumption, political stability, and institutional quality collectively affect environmental and financial outcomes. Barriers to accessing financing originate from multiple sources: MSMEs must improve bankability through proper documentation, collateral, financial reporting, and certifications demonstrating eco-friendly operations. Digitalization, GE-based innovation, and organizational readiness are crucial for MSMEs to adopt sustainable business practices effectively. Also Hidayat et al. (2024) added that those barriers can be solved by Capacity-building initiatives, including green financing literacy and training, enhance understanding, motivation, and adoption of sustainable practices among MSME actors. The government and financial regulators, including Bank Indonesia and OJK, have introduced policies such as the Green MSME Development Guideline and incentives for ESG-compliant activities to support this transition (Kinanti, 2024; Handajani et al, 2019). According to Citil et al. (2023) indicates that green credit still represents a small fraction of total bank lending and has so far had a limited impact on bank performance.

Sustainable financing from banks is relating with the green banking practices encompass four domains: green products, green operations, green customers, and green policies. These areas collectively encourage environmentally conscious banking operations and customer engagement while promoting sustainable business practices. Policy measures, including risk-weighted asset adjustments and tax incentives, further support bank participation in green credit programs (Andaiyani et al. 2023). Other opinion added by Wati and Fasa (2024) that in the future green finance will be

have big opportunity be chosen by business due to greater awareness of business environmentally, and Government develop regulatory instruments and incentives to support the transition to a greener economy.

The Quintuple Helix framework emphasizes collaboration among higher education, government, business, society, and the natural environment, supported by digitalization, to drive sustainable innovation. Strong synergy among central banks, financial regulators, technical ministries, financing institutions, and business actors is essential for building a robust green finance ecosystem (Pangarso, 2021; Kinanti 2024). In summary, multi-stakeholder collaboration, transparent reporting, technical assistance, and risk-sharing incentives form the foundation of an ideal MSME green financing ecosystem, enabling businesses to adopt sustainable practices while remaining profitable and competitive globally.

MSMEs often face significant challenges in accessing financing. To become eligible, MSMEs must transition from “unbankable” to “bankable” by preparing necessary documentation, such as financial reports, collateral, and certifications demonstrating environmentally friendly operations. This process requires improving internal business performance to align with banks’ credit assessment criteria. Sustainability financing has both direct and indirect effects on sustainable business performance, particularly in industrial sectors in Indonesia (Ye & Dela, 2023). For MSMEs, access to green financing is further constrained by collateral requirements, complex documentation, and in some cases the need for green certification, which discourages many owners from applying for sustainability-linked loans (Arjuna et al, 2023).

According to Pangarso (2022) three key elements for MSMEs to achieve Green Economy (GE) performance: GE-based innovation, organizational readiness for GE implementation, and digitalization. Digitalization is crucial for developing GE-based business strategies and innovations. Once prepared, MSMEs require commitment, strategic planning, and collaboration to successfully innovate. Hidayat et al (2024) emphasizes that green financing literacy and training enhance MSME understanding and motivation, supporting adoption of sustainable business practices. These programs increase awareness and interest in green financing, opening pathways for future development and improving overall business sustainability.

The government has introduced several initiatives to support sustainable MSME practices, including the Green MSME Development Guideline issued by Bank Indonesia, which categorizes MSMEs according to their adoption of green practices (Kinanti, 2024). Effective policy measures include: Incentives for MSMEs that comply with GE principles. Simplified regulatory procedures for green financing. Support for digitalization to facilitate business transformation (Pangarso, 2022; Miroshnichenck, 2019). Tax incentives and risk-sharing mechanisms to encourage banks to allocate credit to green MSMEs (Andaiyani, 2023).

Sustainable financing for MSMEs requires coordinated efforts across five elements of the Quintuple Helix: higher education, business, government, society, and the natural environment. Each actor generates knowledge, which in turn drives innovation and contributes to sustainable development (Pangarso, 2022). Digitalization further accelerates these processes, enabling faster adoption of innovative, environmentally friendly business practices.

Successful MSME sustainability financing ecosystems connect entrepreneurs, financial institutions, government agencies, and other stakeholders. Such systems provide affordable, tailored credit, technical assistance, risk-sharing mechanisms, and recognition through clear green standards and certifications. Multi-stakeholder collaboration and transparent reporting ensure that green financing functions as both a financial instrument and a driver of MSME transformation toward an inclusive, green, and globally competitive economy.

For MSMEs, practical implications include upgrading internal capabilities, adopting digitalization, and pursuing GE-compliant innovations. For banks, implications involve incorporating ESG criteria in lending, providing flexible loan requirements, and supporting capacity-building programs. Policymakers should establish clear regulations, incentives, and tax benefits to encourage MSME adoption of sustainable practices, ensuring the effectiveness of green financing programs in promoting both environmental and economic objectives.

VI. CONCLUSION

The sustainable finance provides both significant opportunities and notable barriers for banks and MSMEs in Indonesia. On the opportunity side, the steady growth of MSMEs and the transition toward a green economy create strong potential for market expansion, portfolio diversification, and alignment with environmental, social, and governance (ESG) reforms. For banks, this development opens the way to expand sustainability-oriented lending, strengthen long-term resilience, and support the green economic transition.

Several barriers were faced by MSMEs in accessing loan from the bank. Collateral requirements, limited financial literacy regarding sustainable finance, and high transition costs hinder MSMEs from accessing sustainable credit effectively. These constraints not only slow the pace of green adoption but also increase banks' exposure to credit risk, particularly in the absence of adequate support mechanisms. Prudent risk management practices and innovative financing schemes are required to balance profitability with sustainability objectives. Sustainable finance consists of MSME loans and green loans. Individually, MSME loans and green loans have a negative effect on bank profitability. However, when considered simultaneously, MSME loans and green loans show a positive and statistically significant impact on bank performance. Overall, this study concludes that although the short-term financial impact of sustainable finance may appear unfavorable, the long-term benefits are substantial. Integrated efforts involving inclusive credit schemes, capacity-building initiatives, and strong government policy support are essential to overcome structural challenges and ensure that MSMEs not only sustain their growth but also play a pivotal role in Indonesia's transition toward an environmentally responsible and resilient economy.

References

- [1] Minawi, A., Tayachi, T., & Antar, M. (2025). Determinants of Commercial Bank Lending: Evidence in United Arab Emirates. *Finance: Theory and Practice*. 29(3), 72-82. DOI: 10.26794/2587-5671-2025-29-3-72-82
- [2] Mentari P. (2024). Mar 7 [cited 2025 Sep 5]. Rasio kredit UMKM RI rendah, Menkop UKM buka penyebabnya [Internet]. CNBC Indonesia. . Available from: <https://www.cnbcindonesia.com/market/20240307110414-17-520373/rasio-kredit-umkm-ri-rendah-menkop-ukm-buka-penyebabnya>
- [3] Ardiansyah T. (2019). Model financial dan teknologi (FinTech) membantu permasalahan modal wirausaha UMKM di Indonesia. *Majalah Ilmiah Bijak*.16(2):158-66. doi:10.31334/bijak.v16i2.518
- [4] Badriyah, N. (2009). Peran Intermediasi Perbankan Terhadap Usaha Mikro Kecil dan Menengah (UMKM). *Jurnal Ekonomi Pembangunan*, 7(2), 183–208. <https://doi.org/10.22219/jep.v7i2.3615>
- [5] Dinutistomo, I. A., & Lubis, A. W. (2021). MSME lending and bank efficiency: Evidence from Indonesia. *Banks and Bank Systems*, 16(3), [http://dx.doi.org/10.21511/bbs.16\(3\).2021.09](http://dx.doi.org/10.21511/bbs.16(3).2021.09)
- [6] Wibowo, M., & Aumeboonsuke, V. . (2020). Bank Financial Capability on MSME Lending Amid Economic Change and The Growth of Fin-Tech Companies in Indonesia. *Thailand and The World Economy*, 38(2), 63–87. retrieved from <https://so05.tci-thaijo.org/index.php/TER/article/view/237384>
- [7] Noman, A. H. M., Pervin, S., Chowdhury, M. M., & Banna, H. (2015). The effect of credit risk on the Banking profitability: A case on Bangladesh. *Global journal of management and business research*. 15(3), 41-48.
- [8] Hasan, S. M., Islam, K. A., Tawfiq, T. T., & Saha, P. (2025); Triple pillars of sustainable finance: The role of green finance, CSR, and digitalization in bank performance in Bangladesh. *Banks and Bank Systems*. 20(1), 38-50. doi:10.21511/bbs.20(1).2025.04]
- [9] Mirza, N., Afzal, A., Umar, M., & Skare, M. (2023). The impact of green lending on banking performance: Evidence from SME credit portfolios in the BRIC. *Economic Analysis and Policy*, 77, 843-850. <https://doi.org/10.1016/j.eap.2022.12.024>
- [9] Pangarso, A., Sisilia, K., Setyorini, R., Peranginangin, Y., & Awirya, A. A. (2023). The long path to achieving green economy performance for micro small medium enterprise. *Journal of Innovation and Entrepreneurship*.2023; 11(1), 1-19.<https://doi.org/10.1186/s13731-022-00209-4>
- [10] Zheng, L., Mirza, N., Umar, M., & Su, C. W. (2025). Sustainable Lending to European SMEs: Implications for Bank Performance. *International Review of Economics & Finance*, 104283.<https://doi.org/10.1016/j.iref.2025.104283>

- [11] Bachtiar, A., & Nainggolan, Y. A. (2023). Financing for sustainability and bank performance: Case of G-20 countries. *International Journal of Current Science Research and Review*, 6(05).DOI: 10.47191/ijcsrr/V6-i5-30, Impact Factor: 6.789
- [12] Miroshnichenko OS, Mostovaya NA. (2019) Green loan as a tool for green financing. *Finance Theory Pract.* 23(2):31-43.<https://doi.org/10.26794/2587-5671-2019-23-2-31-43>
- [13] Hidayat, A., Liliana, L., Pertiwi, R., Yunisvita, Y., Andaiyani, S., Nida, R.,(2024). THE Role Of Green Financing In Supporting Sustainable Business For Msmes In Tunas Aur Village, Indralaya District, Ogan Ilir Regency. *Martabe: Jurnal Pengabdian Kepada Masyarakat.* 7(2), 642- 653.DOI : 10.31604/jpm.v7i2.642-653
- [14] Kinanti AN. .(2024) [cited 2025 Sep 5].Advancing green MSMEs: Insights from the talk on FinTech's role in supporting green MSMEs in Indonesia [Internet] Available from: https://www.microsave.net/wp-content/uploads/2024/12/Advancing-green-MSMEs_Insights-from-the-talk-on-FinTechs-role-in-supporting-green-MSMEs-in-Indonesia.pdf
- [15] Handajani, L., Rifai, A., & Husnan, L. H. (2019) Kajian Tentang Inisiasi Praktik Green Banking Pada Bank BUMN. *Jurnal Economica.* 15 (1), 1–16.Website: <https://journal.uny.ac.id/index.php/economia>
- [16] Çitil M, İlbasmış M, Olanrewaju VO, Barut A, Karaoglan S, Ali M. (2023) Does green finance and institutional quality play an important role in air quality? *Environ Sci Pollut Res.* ;30:53962-76. doi:10.1007/s11356-023-26016-2
- [16] Andaiyani S, Muthia F, Novriansa A. (2023). Green credit and bank performance in Indonesia. *Diponegoro Int J Bus.* 69(1):50-6. DOI: <https://doi.org/10.55657/iefj.v3i2.208>
- [17] Wati, D. I., & Fasa, M. I. (2024). Analisis Pentingnya Meningkatkan Strategi Pemasaran Syariah Di Era Digital Analysis Of The Importance Of Improving Syariah Marketing Strategies In The Digital Era. *Jurnal Ilmiah Ekonomi, Manajemen Dan Syariah*, 3(2), 233–244. <https://doi.org/10.55883/jiemas.v3i2.68>
- [18] Ye J, & Dela E. (2023). The effect of green investment and green financing on sustainable business performance of foreign chemical industries operating in Indonesia: The mediating role of corporate social responsibility. *Sustainability.* 15(14):11218. Available from: <https://www.mdpi.com/2071-1050/15/14/11218>
- [19] Arjuna, L. H., Ansir, V. R., Nur, M., Kude, N., & Dehi, T. (2023). The Implementation of Green Financing as an Alternative Sustainable Financing for MSMEs in Gorontalo. *International Journal of Economics, Business and Accounting Research (IJEBAR).* ; 7(1). DOI: <https://doi.org/10.29040/ijebar.v7i1.8735>