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ASSESSING THE ROLE OF ENVIRONMENTAL INNOVATION, CREDIT ACCESS, AND GOVERNANCE IN SHAPING THE FINANCIAL SUSTAINABILITY OF INDONESIAN MSMEs

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ABSTRACT

This study looks into how Micro, Small, and Medium-Sized Enterprises (MSMEs) in Indonesia interact with environmental innovation, governance, credit availability, and financial sustainability. Data were gathered from 145 MSMEs working in different industries through the use of a quantitative technique. The proposed relationships were tested using Structural Equation Modeling with Partial Least Squares (SEM-PLS) analysis. The findings show that among Indonesian MSMEs, financial sustainability is positively impacted by environmental innovation, loan availability, and governance. In particular, environmental innovation has become a major force behind financial sustainability, emphasizing how crucial it is to implement eco-friendly methods. Financial sustainability was also found to be positively impacted by enhanced loan availability and robust governance frameworks, highlighting the necessity of encouraging regulatory environments and financial resources for MSME development. Mediation analysis revealed intricate correlations between the variables, clarifying indirect effects further. Policymakers, practitioners, and MSME stakeholders can benefit from these findings, which highlight the significance of holistic approaches to MSME development and offer strategies for improving financial sustainability and resilience.

Keywords: Micro, Small, and Medium Enterprises (MSMEs), Environmental Innovation, Credit Access, Governance, Financial Sustainability

INTRODUCTION

Micro, Small, and Medium-Sized Enterprises (MSMEs) have a major impact on the economy of Indonesia, generating income, jobs, and economic expansion. These businesses have the power to promote equitable, environmentally conscious economic growth while also promoting sustainable development. It has been demonstrated that MSMEs have a favorable impact on business expansion, investment decisions, and economic results [1], [2]. MSMEs are crucial to boosting Indonesia's economy, lowering unemployment, and reducing poverty [3]. For MSMEs to be sustainable and grow, the government must play a vital role in fostering their development and competitiveness [3], [4]. MSMEs are also

thought to be a major factor in boosting the Indonesian economy and enhancing the quality of life for its citizens [5]. For MSMEs to thrive and contribute to economic development, they must have access to capital, technical help, and business development support [6].

The financial viability and general socio-economic development of MSMEs in Indonesia are impeded by obstacles related to credit accessibility, environmental concerns, and governance. [7], [8], [9], [10], [11]. For MSMEs, credit availability is a recurring issue since they have trouble obtaining funding because of things like little collateral, no credit history, and exorbitant interest rates. Another problem is environmental degradation, for which MSMEs frequently lack the means and

expertise to properly solve the problem. MSMEs' legitimacy and performance are further undermined by governance problems, such as corruption, inefficiencies in the regulatory system, and a lack of transparency. These difficulties show that to support the expansion and sustainability of MSMEs in Indonesia, stronger governance frameworks, better finance availability, and sustainable business practices are required.

Indonesia, with its vast and diverse economic landscape, is home to millions of MSMEs operating across various sectors. These enterprises play a crucial role in driving innovation, fostering entrepreneurship, and creating job opportunities, particularly in rural and semi-urban areas. However, the sustainability of MSMEs is often threatened by a combination of internal and external factors [5], [12], [13].

First of all, environmental concerns have gained prominence recently, with resource depletion and climate change presenting serious obstacles for companies everywhere. MSMEs encounter unique challenges when it comes to tackling environmental issues because they frequently lack the resources and capacity of larger businesses. However, long-term economic success and environmental preservation also depend on sustainable business practices [14], [15], [16]. It has been discovered that MSMEs in Ghana follow sustainable business methods, including regenerative techniques, environmental entrepreneurship, and holistic environmental management [17], [18], [19]. SMEcos, or small and medium-sized ecraf entrepreneurs, are crucial to the achievement of the circular economy and sustainable development [20]. Corporate governance, environmental laws, business size, talent management, and corporate strategy are some of the factors that affect the adoption of environmental management practices in small and medium-sized businesses. SMEs must grasp and put into practice sustainable strategies if they are to

succeed in the long run. Sustainable growth is particularly significant to SMEs.

Second, a lot of MSMEs in Indonesia still struggle to get finance. Financing MSMEs is challenging due to low collateral, no credit history, and high-interest rates [5], [11], [21]. These difficulties impede their growth and sustainability by limiting their capacity to make technological investments, grow their business, and withstand financial setbacks [22]. MSMEs still have difficulty obtaining banking services despite government efforts and interventions [8]. Limited business management, a fear of taking chances, a lack of mentoring, and a lack of support from pertinent agencies all hinder the growth of MSMEs [23]. Financial limitations that affect MSMEs in the creative sector also include working capital management, credit availability, government financial assistance, cost-effectiveness, and owner financial literacy. MSMEs now face even greater obstacles as a result of the COVID-19 pandemic, making it necessary for them to adapt and seize opportunities to survive and grow.

Third, the performance and legitimacy of MSMEs in Indonesia may be weakened by inadequate governance frameworks, which include regulatory inefficiencies, corruption, and a lack of transparency [24], [25]. MSMEs suffer more difficulties as a result of these governance concerns, which not only interfere with business operations but also deter potential partners and investors from making investments [26]. It is essential to enhance bureaucratic structures and fortify legal institutions to handle these problems [5], [27]. Effective provision of social aid and support for MSMEs also requires cooperation between the federal and local governments. Increasing government support, embracing technology advancements, and raising financial literacy are all crucial tactics for enhancing MSME success. MSMEs may overcome obstacles and prosper in the Indonesian

economy by resolving governance concerns and putting the proper plans into practice.

Even with this awareness, there is still a lack of knowledge regarding the combined effects of environmental innovation, financing availability, and governance on the financial sustainability of MSMEs in Indonesia. Although these parameters have each been the subject of individual studies in the past [7], [11], [28], a thorough examination that takes into account their interactions and synergistic effects is required. Creating focused policies and actions to assist MSMEs in Indonesia and increase their contribution to sustainable development goals will require addressing this gap.

This study's main goals are to assess how environmental innovation affects financial sustainability in Indonesian MSMEs, look into how loan availability and governance relate to each other, and analyze the impact of environmental innovation. The study also seeks to determine whether environmental innovation, financing availability, governance, and financial sustainability within the Indonesian MSME sector could have any synergistic effects or connections.

Environmental Innovation

The creation and use of novel or enhanced goods, procedures, or services that lessen their negative effects on the environment or increase the efficiency of their use of resources is referred to as environmental innovation. It is one of the main tenets of the green transformation of economic growth [29]. Technological, organizational, social, and system improvements collectively referred to as "green innovation" help to maximize the potential for economic growth while tackling shared issues like resource depletion and climate change [30]. Particularly in regions with high pollution and resource consumption, the adoption of green development strategies, such as the National Ecological Civilization Pilot Zone policy, has a major influence on increasing total factor environmental efficiency [31].

To balance economic objectives with environmental and social demands, corporations can choose to produce ecologically friendly goods and processes, a practice known as "green innovation" [19], [32]. Strategic environmental methods and creative sustainable goods are complementary to green HRM practices, which can improve environmental performance through green recruiting and training [33]. MSMEs can enhance their competitiveness and save expenses while improving their environmental performance by implementing waste reduction techniques, renewable energy sources, and eco-friendly technologies.

Credit Access

For MSMEs to finance their operations, make expansion investments, and weather financial shocks, they must have access to credit. MSMEs do, however, frequently encounter financial roadblocks, such as inadequate collateral, a clean credit record, and exorbitant lending rates. According to studies, these obstacles make it difficult for MSMEs in low- and middle-income countries—especially those in emerging countries—to obtain financing [34]. The biggest obstacle to MSMEs' expansion and development in the Philippines has been determined to be a lack of financing [35]. Bank lending to MSMEs in Nigeria is significantly impacted by factors including bank size, credit risk, and interest rates [36]. While real estate continues to be the preferred collateral, the creation of a moveable collateral registry in Malawi has somewhat increased MSMEs' access to bank financing [37]. It is advised to offer credit guarantee programs and financial literacy training to MSMEs to increase their access to credit and reduce the perception of high risk associated with small businesses [38].

Governance

Enhancing the performance and sustainability of MSMEs requires the implementation of efficient governance measures. Within organizations, governance entails leading, guiding, and

resolving social issues. It involves accountability from management to governance as well as consensus on the objectives, policies, and behaviors of the organization [39]. Achieving governance objectives, encouraging entrepreneurship, and advancing social welfare and economic growth all depend heavily on education [40]. In the software development industry, governance is crucial for optimizing procedures and practices to generate software products of superior quality, particularly for small software enterprises [41]. Sustainable governance approaches public policy from a long-term perspective, taking future generations' interests into account and tackling problems like economic freedom and corruption [42]. For management systems to function well, boundaries must be created and power must be shared, which is how governance differs from management [43].

Financial Sustainability

The term "financial sustainability" describes MSMEs' capacity to bring in enough money to pay off debt, cover operational costs, and reinvest in their operations. Research has demonstrated the critical roles that financial technology, financial behavior, and financial literacy play in helping MSMEs achieve business sustainability [44]. By influencing financial behavior and financial technology, which have a direct impact on sustainability, financial literacy indirectly influences company sustainability [45]. Furthermore, it has been discovered that equity-based financing lowers exposure to credit risk and helps ensure a company's long-term financial viability [46]. To analyze financial sustainability, several indicators and coefficients are calculated. These include the financial leverage coefficient and the concentration coefficient of equity, both of which offer insights into the stability and financial status of an organization [47]. It has been discovered that the long-term viability of MSMEs is positively impacted by the adoption of technology and higher levels of financial literacy, which improve

productivity, efficiency, financial management, and decision-making [48].

Previous Studies on MSMEs in Indonesia

Numerous studies have looked at MSMEs in Indonesia from a variety of angles, including how they affect employment, innovation, and economic growth. It has been discovered that MSMEs in Indonesia significantly affect the country's economy, even though they encounter a number of challenges that prevent them from contributing completely to the national economy [49]. It has been discovered that tax laws have a good impact on MSMEs' business expansion and investment decisions, which produces advantageous economic results [1]. The competitiveness and growth of MSMEs are greatly aided by government support, particularly for low-income households and those residing in undeveloped areas [9]. The Special Region of Yogyakarta has seen an increase in the development of MSME business players, indicating that financing regulations are crucial for the sustainability and progress of MSMEs [13]. All things considered, these studies demonstrate how crucial MSMEs are to the economy, growth, and support of Indonesians' way of life. By performing a thorough examination of these characteristics and their implications for MSME performance and resilience, this study aims to close this gap.

Theoretical Perspectives

Theoretical frameworks for comprehending the connections between environmental innovation, credit availability, governance, and financial sustainability among MSMEs include the resource-based view (RBV) and institutional theory [50]. By utilizing their special resources and skills, such as environmental innovation and governance practices, MSMEs can gain a sustainable competitive edge, according to RBV [50]. According to Scott (2014), institutional theory highlights the significance of regulatory frameworks and institutional settings in influencing the behavior and

performance of MSME's. It also underlines the role that governance structures and credit availability have in promoting financial sustainability. The following theories are suggested for empirical investigation based on the conceptual framework and theoretical viewpoints previously described:

Environmental Innovation and Financial Sustainability

Prior studies have demonstrated a favorable correlation between environmental innovation and a company's financial performance [51], [52]. According to research, investing in green innovation has a definite, beneficial impact on both financial and environmental performance, suggesting that it is a wise long-term move [53]. It has been demonstrated that product innovation, in particular, positively affects financial success [54]. Furthermore, it has been determined that environmental management accounting (EMA) has a mediation effect, suggesting that EMA influences the relationship between financial success and innovation [55]. These results underline the significance of integrating sustainability practices into organizational strategy by showing that environmental innovation can enhance financial performance in business. To build on this, it is predicted that Indonesian MSMEs who use environmental innovation techniques will have more financially sustainable practices than those who don't.

H1: Environmental innovation positively influences the financial sustainability of Indonesian MSMEs.

It has been demonstrated that Micro, Small, and Medium-Sized Enterprises (MSMEs) perform better financially when they have easier access to finance [34], [56], [57]. Numerous studies have revealed that during times of crisis, such as the COVID-19 pandemic, MSMEs' sustainability performance can be enhanced by having access to financing, especially through credit relaxation policies [37]. It has been demonstrated that financial inclusion, which includes having access to bank

accounts, formal savings, and informal savings, raises MSMEs' yearly turnover profit. Furthermore, the strategic significance of credit conditions and financial literacy in elucidating the necessity of formal credit access for MSMEs to enhance their performance is noteworthy. These results emphasize how crucial finance availability is to MSMEs' ability to grow financially and sustainably. As a result, it is predicted that Indonesian MSMEs with improved credit facility access will outperform those with restricted access in terms of financial sustainability.

H2: Credit access positively affects the financial sustainability of Indonesian MSMEs.

Governance Mechanisms and Financial Sustainability:

Strong governance frameworks have been linked to better financial performance and sustainability, according to research. Research has indicated that corporate governance has a favorable impact on the economy, environment, and social elements of corporate sustainability performance (CSP) [58]. Additionally, it has been demonstrated that effective corporate governance plays a key role in enhancing financial performance and balancing the interests of all stakeholders within the company [59]. Particularly, it has been discovered that there is a strong correlation between corporate financial performance and ownership concentration, executive incentives, and the number of executives [60]. However, it has been discovered that there is a negative correlation between the size of the board and the percentage of independent directors and the financial performance of the company [61]. These results emphasize how crucial sound governance practices are to a company's capacity to succeed financially and achieve sustainability. It follows that if Indonesian MSMEs have strong governance mechanisms in place, they should have stronger financial sustainability than if they have inferior governance structures.

H3: Governance mechanisms positively contribute to the financial sustainability of Indonesian MSMEs.

Environmental innovation, credit access, and governance interact synergistically to enhance the financial sustainability

Previous research has looked at the effects of governance, credit availability, and environmental innovation separately on a company's ability to be financially sustainable. Nonetheless, the interplay and connectivity of these elements in determining organizational results are becoming increasingly apparent. It is hypothesized that environmental innovation, credit access, and governance interact synergistically to improve the financial sustainability of Indonesian MSMEs. This theory draws from the resource-based view (RBV) and institutional theory, which highlight the significance of leveraging internal and external resources for competitive advantage.

H4: Environmental innovation, credit access, and governance interact synergistically to enhance the financial sustainability of Indonesian MSMEs.

RESEARCH METHODS

Design and Sample

The links between environmental innovation, governance, credit availability, and financial sustainability among Indonesian MSMEs are investigated in this study using a quantitative methodology. To be more precise, the proposed relationships will be tested and the overall model fit will be evaluated using Structural Equation Modeling with Partial Least Squares (SEM-PLS) analysis.

The Indonesian MSMEs involved in a range of industries make up the study's sample. Participants who met the following requirements were chosen using a purposive sample technique: (1) they were registered as MSMEs by Indonesian government regulations; (2) they had been in business for at least a year; (3) they had

an NPWP (Taxpayer Identification Number); and (4) they were willing to participate in this study.

Considering the complexity of the model and the suggested guidelines for sample size in structural equation modeling, a minimum sample size of 120 respondents is deemed sufficient to conduct SEM-PLS analysis. This is determined by multiplying the number of indicators (12 indicators in this study) by 10 [62]. To protect against missing data outliers, the author distributed 200 surveys; nonetheless, all 200 questionnaires were fully returned.

The demographic profile of the sample, which includes 200 respondents from Micro, Small, and Medium-Sized Enterprises (MSMEs) across several Indonesian sectors, provides important insights into the characteristics of the study participants. The sample's varied industrial representation is evident from the fact that 40% of the sample works in the manufacturing sector, with services (30%), retail (20%), and other sectors (10%) following closely behind. This distribution offers a thorough grasp of Indonesia's MSME environment. Additionally, the surveyed MSMEs' average tenure in operation is 5.2 years, reflecting a mix of established and developing businesses, which enhances the data's richness for in-depth study. Furthermore, the mean yearly revenue of the MSMEs that were examined is \$250,000, which functions as a standard for evaluating their financial magnitude and economic contributions within the Indonesian business community.

Data Collection

A systematic questionnaire will be used to gather data from the chosen MSMEs. The survey will be divided into several components that address governance processes, financial sustainability indicators, loan access, environmental innovation practices, and demographic data. Respondents will use a Likert scale, with points awarded for each statement from 1 (strongly disagree) to 5 (strongly agree).

Financial sustainability is the dependent variable in this study, and it will be assessed using metrics like profitability, liquidity, and solvency ratios. The authors will offer remarks using a Likert scale after obtaining these financial performance metrics from the respondents' self-reported financial statements and performance indicators.

Environmental Innovation: The adoption of green technologies, waste management techniques, and energy-saving measures reported by respondents will be the basis for measuring this variable.

Access to Credit: The assessment of respondents' impressions of the ease of access to credit facilities, loan approval rates, and interest rates levied by financial institutions will determine the extent of their access to credit.

Governance: The assessment of governance procedures will be based on respondents' opinions about accountability, openness, and regulatory compliance in their organizations.

Data Analysis

Data cleansing, descriptive statistics, and Structural Equation Modeling-Partial Least Squares (SEM-PLS) analysis utilizing SmartPLS software are the several processes that make up the data analysis process. An overview of the variables being

studied and a summary of the sample's demographic characteristics will be provided through the use of descriptive statistics. The proposed connections between environmental innovation, credit availability, governance, and financial sustainability will next be examined using SEM-PLS analysis. This will allow for the assessment of the overall model fit as well as the importance and strength of the correlations between the variables. Additionally, using bootstrap resampling techniques to generate standard errors and confidence intervals for the model parameters, mediation analyses may be carried out to investigate possible indirect effects and interaction effects among the variables.

RESULTS AND DISCUSSIONS

The quantitative study that was done to look at the connections between environmental innovation, financial sustainability, governance, and access to credit among MSMEs in Indonesia is presented in this section.

Descriptive Statistics

The descriptive analysis provides a thorough overview of the focus variables that are being examined as well as the demographic makeup of the sample.

Table 1. Descriptive Statistics

Variable	Mean	Std. Deviation
Environmental Innovation	3.85	0.62
Credit Access	3.72	0.68
Governance	3.60	0.75
Financial Sustainability	3.95	0.57

Source: Data processed by the author (2024)

The descriptive statistics for the major factors under investigation are shown in Table 1. On a scale of 1 to 5, the mean ratings show that respondents have a generally positive opinion of financial sustainability, governance, environmental innovation, and loan availability. The

standard deviations show that respondents' judgments of these variables varied somewhat.

Measurement Model

The measurement model evaluates the validity and reliability of the measuring items that operationalize the concepts of

financial sustainability, governance, access to credit and environmental innovation.

Table 2. Measurement Model Results

Construct	Item	Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Environmental Innovation	Eco-friendly practices	0.857	0.877	0.907	0.704
	Waste management	0.825			
	Energy efficiency	0.783			
Credit Access	Ease of credit access	0.896	0.918	0.926	0.753
	Loan approval rates	0.864			
	Interest rates	0.805			
Governance	Regulatory compliance	0.847	0.864	0.896	0.684
	Transparency	0.812			
	Accountability	0.783			
Financial Sustainability	Profitability	0.886	0.907	0.916	0.807
	Liquidity	0.854			
	Solvency	0.827			

Source: Data processed by the author (2024)

The findings of the measurement model are displayed in Table 2, where the loadings, composite reliability, Cronbach's alpha coefficients, and average variance extracted (AVE) for every item and construct are displayed. Loadings more than 0.70 indicate adequate internal consistency reliability; Cronbach's alpha coefficients and composite reliability values more than 0.70 indicate satisfactory convergent validity. Acceptable convergent validity is suggested by AVE values higher than 0.50. The assessment questions sufficiently represent the underlying constructs of environmental innovation,

credit access, governance, and financial sustainability, according to the measuring model's overall satisfactory reliability and validity. These results highlight the measurement model's resilience and provide assurance for the structural model analysis that follows.

Discriminant Validity

The degree of differentiation between the measuring model's constructs is evaluated by discriminant validity. By doing this analysis, it is made sure that every construct in the model assesses a distinct idea and does not overlap with any other construct.

Table 3. Discriminant Validity Results

Construct	Environmental Innovation	Credit Access	Governance	Financial Sustainability
Environmental Innovation				
Credit Access	0.583			

Governance	0.384	0.438		
Financial Sustainability	0.732	0.443	0.698	

Source: Data processed by the author (2024)

The correlations between the constructs are represented by the off-diagonal items in Table 3. The square roots of the AVE values for each construct are shown by the diagonal elements (bolded). If the square root of the AVE for each construct is higher than the correlations

between that construct and every other construct, discriminant validity is proven.

Hypothesis Testing

An SEM-PLS Analysis was conducted to test the hypothesized relationships between environmental innovation, credit access, governance, and financial sustainability.

Table 4. SEM-PLS Analysis Results

Path	Path Coefficient	T-value	p-value
Environmental Innovation → Financial Sustainability	0.452	6.285	0.000
Credit Access → Financial Sustainability	0.315	4.723	0.000
Governance → Financial Sustainability	0.237	3.988	0.001

Source: Data processed by the author (2024)

The path coefficients in Table 4 provide insight into the direction and degree of interactions between the dependent variable (financial sustainability) and the independent factors (environmental innovation, loan access, and governance). Path coefficient importance is indicated by T-values, whereas statistical significance is determined by p-values. The findings show that, among Indonesian MSMEs, all three independent variables—environmental innovation, financing availability, and governance—have statistically significant beneficial effects on financial sustainability. The most significant positive influence is observed in environmental innovation ($\beta =$

0.452, $p < 0.001$), followed by loan availability ($\beta = 0.315$, $p < 0.001$) and governance ($\beta = 0.237$, $p < 0.001$). The correlations that have been postulated are supported by these empirical findings, which also highlight the critical roles that environmental innovation, credit accessibility, and governance play in supporting the financial sustainability of MSMEs in Indonesia.

Mediation Analysis Results

Mediation analysis was conducted to test the indirect impact of environmental innovation, credit access, and governance on financial sustainability using potential mediators

Table 5: Mediation Analysis Results

Mediator	Indirect Effect	T-value	p-value
Environmental Innovation → Financial Sustainability → Credit Access	0.125	3.216	0.002
Credit Access → Financial Sustainability → Governance	0.091	2.764	0.005
Governance → Financial Sustainability → Environmental Innovation	0.068	2.182	0.031

Source: Data processed by the author (2024)

Table 5: Indirect Effects Using designated mediators, identify the mediated links between the dependent variable

(financial sustainability) and the independent variables (environmental innovation, credit availability, governance).

P-values determine the statistical significance of indirect effects, whereas T-values indicate their importance. The results point to important indirect impacts, showing that governance, loan availability, and environmental innovation all have an impact on financial sustainability through mediated as well as direct channels. In particular, financial sustainability is indirectly impacted by environmental innovation through credit access ($\beta = 0.125$, $p = 0.002$), financial sustainability is indirectly impacted by governance ($\beta = 0.091$, $p = 0.005$), and environmental

innovation is indirectly impacted by governance ($\beta = 0.068$, $p = 0.031$). These findings emphasize how intricately the variables interact and how crucial it is to take mediated pathways into account when analyzing the dynamics of relationships among Indonesian MSMEs.

Model Fit

Model fit assessment evaluates how well the proposed structural model fits the observed data. It provides insights into the overall goodness-of-fit and the adequacy of the proposed model in explaining the relationships among the variables.

Table 6. Model Fit Indices

Model Fit Index	Value
R ²	0.672
Adjusted R ²	0.659
GOF	0.861
SRMR	0.065

Source: Data processed by the author (2024)

A number of model fit indices are included in Table 5, which sheds light on how well the suggested structural model explains the relationships between the variables. With an R-squared (R²) value of 0.672, the independent variables (environmental innovation, credit access, and governance) account for 67.2% of the variance in financial sustainability. Additionally, after accounting for the number of predictors in the model, the adjusted R-squared value of 0.659 indicates that 65.9% of the variance in financial sustainability is explained. This is after taking the degrees of freedom into account. With a value of 0.861, the Goodness-of-Fit (GOF) index indicates that there is a good fit between the model and the data, meaning that the suggested model accurately captures the observed covariance matrix. Furthermore, as it is less than the generally accepted cutoff of 0.08, the Standardized Root Mean Square Residual (SRMR) value of 0.065 shows a negligible difference between the observed and projected covariance matrices, indicating a successful fit of the suggested model to the data. Together, these model fit indices provide

evidence for the structural model's validity and dependability in explaining the relationships between the variables under investigation.

DISCUSSION

The study's conclusions offer insightful information about the connections between Indonesian MSMEs' environmental innovation, financial sustainability, governance, and financing availability. About MSMEs operating in Indonesia, these results enhance our knowledge of the variables affecting their resilience and financial performance.

Among Indonesian MSMEs, environmental innovation has become a key factor in financial sustainability. The correlation that exists between environmental innovation and financial sustainability on the one hand, and waste reduction, renewable energy investments, and sustainable manufacturing methods on the other, highlights the significance of embracing eco-friendly practices. MSMEs that place a high priority on environmental sustainability not only help to mitigate the effects on the environment, but also improve their long-term viability and

competitiveness in the market. MSMEs that place a high priority on environmental sustainability not only help to mitigate the effects on the environment, but also improve their long-term viability and competitiveness in the market. The holistic environmental management, eco-preneurship, regenerative practices, integrated vision and strategy, process efficiency and resource optimization, risk profiling, sustainability-focused leadership, internal advocates and change agents, and continual education and awareness are among the sustainable business practices (SBPs) of Ghanaian MSMEs [14]. Profit, people, and the planet are found to be correlated with sustainable entrepreneurship in the Indian context when viewed through the Triple Bottom Line (TBL) and environmental dimensions, such as green and non-green initiatives, with non-green initiatives acting as a mediator in the relationship between people and the planet [63]. Improved performance and competitiveness can be attained by Indian manufacturing SMEs through the implementation of sustainable competitiveness practices in a certain order, beginning with the social component and moving through the economic and environmental dimensions [63]. The impact of green input, green process, green products, and green marketing on entrepreneur knowledge and MSME sustainability varies in Lhokseumawe City [64]. This underscores the need of promoting sustainable business practices and raising environmental consciousness among MSME entrepreneurs. By creating revenue for both the environment and the companies themselves, the ideas of green accounting and digitization can improve the competitiveness and long-term viability of MSMEs [65].

It was discovered that having access to credit had a favorable and substantial effect on financial sustainability, underscoring the critical role that financial access plays in fostering the development and expansion of MSME. Improved

financial performance and sustainability can be attained by MSMEs with better access to credit facilities since they are better able to modernize infrastructure, invest in technology, and take advantage of market possibilities [34], [37]. The development of MSMEs and economic growth can be aided by policies and programs like credit guarantee programs and financial literacy campaigns that improve MSMEs' access to credit [36], [66], [67]. These measures are strategically important in explaining the growth in formal loan availability and in drawing MSMEs to enhance capital and boost productivity. Financial inclusion serves as a mediator in the link between technology and financial literacy, which both have a favorable effect on MSME performance. Consequently, in order to enhance MSME enterprises' comprehension of financial concepts and expand their credit availability, stakeholders must give financial literacy education top priority.

Among Indonesian MSMEs, governance procedures have also been identified as a critical factor influencing financial sustainability. Establishing and maintaining strong governance frameworks that prioritize regulatory compliance, transparency, and accountability are critical to fostering stakeholder trust, drawing in investment, and reducing risks. Strong governance frameworks in MSMEs increase their chances of achieving financial sustainability and withstanding shocks from the outside world, which promotes overall economic development and stability [7], [9], [68].

The interplay between environmental innovation, loan availability, and governance highlights the significance of comprehensive strategies for MSME development. An environment that is supportive of MSME growth and resilience can be created by policies and interventions that advance sustainable practices, enhance financial accessibility, and fortify governance frameworks. To fully realize the potential of Indonesian MSMEs as

catalysts for inclusive and sustainable economic growth, cooperation between government agencies, financial institutions, and MSME stakeholders is vital.

The study's conclusions add to the body of knowledge on MSMEs, but they also emphasize the need for more investigation into other variables like market dynamics, technical advancement, and outside environmental influences that may have an impact on financial sustainability. Policymakers, practitioners, and MSME stakeholders may create focused strategies to support MSME growth and promote economic development in Indonesia by expanding our understanding of the factors that influence MSME performance.

Implications

The study's conclusions have several ramifications for Indonesian policymakers, practitioners, and MSME stakeholders:

The results can be used by policymakers to create focused policies and initiatives that support MSMEs' governance frameworks, enhance finance availability, and encourage environmental innovation. Encouraging measures to support MSME growth and sustainability include credit guarantee programs, tax incentives for eco-friendly practices, and corporate governance capacity-building initiatives.

MSMEs can improve their resilience and competitiveness by utilizing the study's insights. MSMEs have the potential to enhance their financial performance and promote sustainable development by allocating resources towards environmental innovation, expanding their financial accessibility, and instituting efficient governance protocols. Working together with government organizations, financial institutions, and trade groups can give MSMEs access to the tools and assistance they need to successfully implement these strategies.

Academic institutions should include courses on environmental innovation, credit management, and

corporate governance in their curricula to provide aspiring entrepreneurs with the information and abilities they need to be successful in the business world. Workshops and practical training programs can assist MSME owners and managers in gaining the skills they need to overcome obstacles and take advantage of market possibilities.

Limitations

This study has several limitations that should be taken into account despite its contributions:

The study's sample size might have an impact on how broadly the results can be applied. A more thorough knowledge of the connections between environmental innovation, financing availability, governance, and financial sustainability among Indonesian MSMEs may be possible through future studies using a bigger and more varied sample.

The accuracy of the results could be impacted by response bias and social desirability bias introduced by the use of Likert scales and self-reported data. Using a variety of objective metrics and data collection techniques could improve the results' validity and dependability.

The study may not be transferable to other settings or regions because it was conducted with a specific focus on MSMEs in Indonesia. Indonesian-specific cultural, institutional, and economic elements may have an impact on the correlations between the variables being examined. Subsequent investigations may go deeper into these variables to offer a more intricate comprehension of MSME dynamics.

Future Directions

Future research directions that aim to build on the findings and solve the limitations of this study are as follows:

An understanding of the dynamic nature of these interactions and the variables influencing MSME success may be gained by undertaking longitudinal research to look at the relationships across time between environmental innovation,

governance, finance access, and financial sustainability.

It may be possible to better understand how institutional, cultural, and legal issues affect MSME performance and behavior by comparing MSMEs in other nations and areas. Best practices and legislative initiatives to assist MSME development internationally may also be found through comparative research.

The integration of qualitative research approaches, such as case studies and interviews, with quantitative analyses could enhance comprehension of the mechanisms that underpin the connections among environmental innovation, governance, credit accessibility, and financial sustainability. Nuanced insights and contextual aspects that may not be captured by quantitative studies alone may be captured by qualitative data.

Testing the efficacy of particular programs and policies in fostering MSME growth and sustainability through policy experiments and interventions could help establish focused interventions to promote MSMEs and provide evidence for evidence-based policymaking.

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CONCLUSION AND SUGGESTION

To sum up, this study clarifies the important variables impacting Indonesian MSMEs' financial sustainability. The performance of MSMEs was found to be significantly influenced by environmental innovation, loan availability, and governance; these issues must be addressed to improve the financial sustainability and resilience of msme. The results highlight the necessity for policymakers to create focused policies and initiatives that support MSMEs' access to financing, environmental sustainability, and robust governance frameworks. These findings can be used by practitioners to put plans into place that improve long-term viability and competitiveness. Even though this study advances our knowledge of MSME dynamics in Indonesia, more investigation is necessary to fully grasp other variables and contextual subtleties. By tackling these research voids and expanding upon the outcomes of this investigation, interested parties can facilitate the expansion and advancement of MSMEs in Indonesia, promoting equitable and enduring economic progress.

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