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Green Innovation on the Business Performance of Halal-Certified Micro, Small, and Medium Enterprises in South Sulawesi

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Abstract

This study aims to analyse the effect of green innovation on the business performance of micro and small enterprises in South Sulawesi, particularly those that have obtained halal certification. Green innovation is a new strategy that has emerged among business actors, involving the creation of environmentally friendly innovations in the production process and the products produced. The research method used is explanatory research with a quantitative approach, with a population of 1,025 MSEs and a sample of 124 MSEs with halal certification. The data collection techniques used were observation, interviews and questionnaires with a 1-7 Likert scale, while the data analysis techniques used were descriptive statistical analysis and inferential analysis, namely inner model and outer model analysis, as well as hypothesis testing. The results of the study indicate that green innovation has a positive and significant effect on the business performance of micro and small enterprises in South Sulawesi -, amounting to 45.1%. This implies that the implementation of green innovation in SMEs that already have halal certification can improve business performance while promoting economic, social, and environmental sustainability.

Keywords:
Green Innovation; Business Performance; Micro and Small Enterprises.

1. INTRODUCTION

Business in general is an entrepreneurial activity carried out by individuals or groups with the aim of obtaining profit or gain. In Islam, business is not only about worldly aspects in terms of obtaining profit, but also considers the hereafter. One type of business that is growing rapidly in society today is micro and small enterprises (MSEs).

Micro and small enterprises (MSEs) can be defined as productive businesses run by individuals or groups in the form of business entities as defined by law. In Indonesia, micro and small enterprises are seen as one of the businesses that absorb a lot of labour. Based on data from the Ministry of Cooperatives and SMEs, in 2019 there were 65.4 million MSMEs in Indonesia. With 65.4 million business units, they were able to absorb 123.3 thousand workers. This proves that MSMEs have a significant impact and contribute to reducing the unemployment rate in Indonesia. MSMEs contribute 60.5% to the national GDP. This shows that MSMEs have great potential to be developed so that they can contribute even more to the economy (DJPb, 2023).

The success of a business is inseparable from the good performance of its operators. When a company has good performance, is unique compared to its competitors, and is difficult to imitate, then that company can be said to have good performance. Penrose argues that management experience develops, knowledge is

possessed by resources, and potential is used in different ways so that the company is able to create opportunities for further growth (Lau & Michie, 2024).

Business performance is key to an enterprise's survival in the era of globalisation. Many factors determine the business performance of an organisation, one of which is innovation. Rapid technological advances and high levels of competition demand continuous innovation, which will ultimately improve the business performance of an organisation or company (Hartini, 2012). This is in line with research stating that corporate innovation has an impact on company performance (Meisya & Surjasa, 2022). This statement is also consistent with research findings, which indicate that increased innovation will be followed by improved business performance, assuming that other factors influencing the scale of business strategies are considered constant (Awaluddin, 2017).

One of the current trends in innovation is environmentally friendly product innovation, often referred to as green innovation. With the increasing number of businesses developing today, companies and organisations are required to practise environmentally friendly business practices in accordance with applicable laws. The way for companies to compete healthily is through innovation. Good innovation is innovation that can create all company activities that are environmentally friendly, often referred to as green innovation.

Along with the development of MSMEs in South Sulawesi, especially those with halal certification, there must also be product innovation, particularly environmentally friendly product innovation, both in terms of the production process and the products produced. Green innovation refers to innovation that can mitigate environmental impacts in line with the achievement of the organisation's environmental goals and generate benefits for the surrounding environment. Furthermore, environmentally friendly efforts can provide benefits and creative ideas for environmentally friendly products or processes that can create a favourable business climate. Green innovation has certainly opened up opportunities for businesses to gain a positive reputation through the green products they produce. This can certainly help develop consumer awareness of the company, allowing them to see the contributions made by businesses in helping with ecological issues and increasing awareness of environmental (Erdhwarni, 2024). This is what drives SME players to be more creative in running their businesses.

In South Sulawesi province, based on data from the South Sulawesi Central Statistics Agency, the number of micro, small and medium enterprises (MSMEs) have fluctuated throughout 2020 to 2023. In 2020, the number of MSMEs reached 129,823, in 2021 it decreased to 126,519, and in 2022 it decreased again to 122,880. However, in 2023 it increased again to 129,679 MSMEs (BPS, 2024). Meanwhile, in 2024, there were 1,025 MSMEs with halal certificates, consisting of 1,011 micro enterprises and 14 small enterprises, with a total of 10,424 halal-certified.

Observing the development and contribution of MSMEs shows that they play a crucial role in improving business performance, thereby serving as a benchmark for MSME development. Additionally, the presence of green innovation can be one strategy to enhance the business performance of micro and small enterprises in South Sulawesi, particularly in terms of financial and non-financial performance. Green innovation not only encompasses the use of environmentally friendly technology, but also business practices that focus on sustainability, resource efficiency, and reducing negative impacts on the environment, such as the use of recyclable product packaging, natural raw materials, environmentally friendly production tools, and the provision of production waste disposal sites.

The direction of green innovation for MSMEs in South Sulawesi in the future will increasingly focus on environmentally friendly production process efficiency, the use of sustainable raw materials, and the integration of halal standards as added value to products. The application of green innovation is important because it can reduce production costs, improve quality, and strengthen the competitiveness of MSMEs in facing market changes and regulatory demands. In addition, the digitization of business processes and product traceability will promote transparency and expand market access. With the support of the government, educational institutions, and technological assistance, green innovation will be a crucial strategy to ensure the sustainability, reputation, and long-term growth of MSMEs in South Sulawesi.

Based on the above studies, there has been no integration between business performance and green innovation in home-based micro and small enterprises; in general, integration has only been done for manufacturing companies or large companies. This has prompted researchers to analyse the effect of green innovation on the business performance of micro and small enterprises in South Sulawesi.

2. RESEARCH METHOD

This research uses a type of research categorised as explanatory research with a quantitative approach, conducted in South Sulawesi Province, specifically targeting MSME actors who have halal certificates, with a population of 1,025 MSMEs and a sample of 124 MSMEs. with a sample of 124 SMEs using probability sampling techniques with simple random sampling, considered because this technique provides equal selection opportunities for each unit, resulting in a representative sample. The main characteristic of respondent selection is SMEs that have halal certificates. The data collection techniques used were

observation, interviews, and questionnaires using a 1-7 Likert scale (Budiaji, 2013). The variable indicators in this study for the green innovation variable were green process innovation and green product innovation, while for the business performance variable, they were financial performance and non-financial performance.

The data analysis techniques used are descriptive statistical analysis, inferential statistical analysis, and hypothesis testing. Inferential statistical analysis consists of inner model and outer model analysis. Inner model analysis consists of convergent validity, discriminant validity, and construct reliability. Outer model analysis looks at the R-Square value. Meanwhile, hypotheses are tested using Bootstrapping for direct effects.

3. RESULTS AND DISCUSSION

3.1. Results

This study was conducted in South Sulawesi with a sample of 124 micro and small enterprises (MSEs) that have obtained halal certification. The data analysis results are as follows.

3.1.1. Descriptive Statistical Analysis

Descriptive statistical analysis was used to provide an overview of the research data before conducting an in-depth analysis, such as inferential analysis. The results of the descriptive statistical test are as Table 1.

Table 1. Descriptive Statistical Data Processing Results

Variable	Mean	Median	Standard Deviation	Note
Green Innovation	6,479	6,833	0.648	
Business Performance	6,411	6,500	0.680	

Source: (Data analysis results, 2025)

Based on the data above, the standard deviation values for green innovation and business performance vary.

3.1.2. Inferential Statistical Analysis

This analysis was conducted using SmartPLS version 4, applying the Partial Least Squares (PLS) method and Structural Equation Modelling (SEM) on various variances.

3.1.2.1. Inner Model Analysis

The outer model focuses on the relationship between latent variables and indicators or statements.

3.1.2.1.1. Convergent Validity

The value criterion evaluated in assessing convergent validity in this study is the average variance extracted (AVE) value (Table 2).

Table 2. AVE Results of Convergent Validity Test

Variable	Average variance extracted (AVE)	Description
Green Innovation	0.667	Valid
Business Performance	0.644	Valid

Source: (Data processing results, 2025)

The AVE values of the variables Islamic Business Ethics 0.640, Islamic Environmental Ethics 0.663, Green Innovation 0.667, and business performance 0.644. This indicates that the value of each variable is ≥ 0.50, which means that the variables can be considered valid.

3.1.2.1.2. Discriminant Validity

The discriminant validity value can be seen from the cross-loading value. An indicator/statement can be said to be valid when the relationship between the indicator/statement and its indicator construct (cross loading) is greater than its relationship with other constructs.

Table 3. Cross Loading Results of Discriminant Validity Test

Instrument	Green Innovation	Business Performance	Note
GI 2	0.920	0.666	Valid
GI 3	0.792	0.567	Valid
GI 4	0.837	0.552	Valid
GI 5	0.717	0.419	Valid
GI 6	0.806	0.459	Valid
KB 1	0.504	0.835	Valid

KB 2	0.429	0.800	Valid
KB 3	0.433	0.866	Valid
KB 5	0.500	0.742	Valid
KB 7	0.559	0.796	Valid
KB 8	0.494	0.770	Valid

Source: (Data processing results, 2025)

The cross-loading values for the green innovation and business performance variables have a correlation value between the indicators (instruments) and their constructs (variables) > compared to the indicator values in other constructs. This indicates that the model used has good fit and is able to effectively distinguish between different constructs. Therefore, it can be concluded that the measurement tools used in this study are valid.

3.1.2.1.3. Construct Reliability

Construct reliability can be analysed by examining the Cronbach's alpha value.

Table 4. Cronbach's Alpha Values from the Construct Reliability Test

Variable	Cronbach's alpha	Description
Green Innovation	0.873	Reliable
Business Performance	0.889	Reliable

Source (Data analysis results, 2025)

Based on the Cronbach's alpha values in the table above for the constructs/variables Green Innovation 0.873 and Business Performance 0.889. This indicates that the Cronbach's alpha values are > 0.70, meaning that all variables have good reliability values.

3.1.2.2. Outer Model Analysis

The outer model values in this study were evaluated by examining the R-Square values.

Table 5. R-Square Test Results

Dependent Variable	R-Square Adjectived
Business Performance	0.451

Source: (Data Processing Results, 2025)

Based on the table above, the R Square Adjectived value for the business performance variable is 0.451, indicating that 45.1% of the variation in this variable can be explained by the independent variables in the model. Meanwhile, the remaining 54.9% is influenced by external factors such as competition between business actors, human resource quality, marketing strategies, and business digitalisation. This value is classified as moderate, which means that this model is still quite good at explaining variations in business performance, even though there are other factors that also have an influence.

3.1.3. Hypothesis Testing

Bootstrapping the direct effect is one of the statistical methods used in SEM (Structural Equation Modelling) to test the significance of the relationship between independent and dependent variables directly without going through mediating or intervening variables.

Table 6. Results of Direct Effect Bootstrapping Test

Path Coefficients	Original sample (O)	T Statistics	P values	Notes
Green Innovation -> Business Performance	0.462	4.852	0.000	Significant

Source: (Data Processing Results, 2025)

3.2. Discussion

The results of this study indicate that green innovation has a positive and significant effect on business performance. The coefficient value indicates that the better the level of green innovation implementation in a business, the better the business performance. This is in line with the resource-based view (RBV) which states that long-term competitive advantage can be obtained if an organisation has unique, rare, and difficult-to-imitate resources and capabilities (Barney, 1991). Green innovation is a form of strategic capability that not only improves operational efficiency but also creates added value for consumers through environmentally friendly products and sustainable business practices.

Descriptive statistical results show that the green innovation score indicates that the implementation of green innovation by MSME actors in South Sulawesi is high and consistent across respondents. This shows that most MSME actors have realised the importance of implementing environmentally-based innovation in improving competitive and sustainable business performance. The measurement indicators are green process

innovation and green product innovation. Meanwhile, the business performance variable shows that the overall business performance of MSMEs is in the high category, with little variation in responses between respondents, as measured by financial and non-financial performance.

Green process innovation describes the extent to which MSMEs have implemented environmentally friendly production processes by improving the efficiency of raw material use, waste management, and the use of clean technology in the production process. The results of this analysis show that the majority of MSME players have adopted more energy-efficient production processes, reduced waste, and utilised environmentally friendly materials.

As stated by Nurbaya:

"In running my beppa laiya business, I use natural raw materials without any additional chemicals.

This is in line with what Nurainul, a Rangginang SME operator, stated:

“In producing rangginang, I use natural ingredients and dry the product directly under sunlight.”

Lisna, a small and medium-sized enterprise (SME) operator in the cake industry, also stated that:

“We have made several innovations, such as processing kitchen waste into compost and using energy-efficient equipment in the production process.”

Green product innovation reflects the ability of SMEs to develop products with a lower environmental impact, in terms of materials, packaging, and product function. In South Sulawesi, many SMEs have made efforts to modify their products to align with sustainability principles, such as using natural ingredients, reducing single-use plastics, or highlighting ecological values in product design.

As stated by Nurbaya:

"The plastic we use for beppa laiya packaging also uses paper-based packaging that is easily biodegradable. With the use of these natural raw materials, demand for beppa laiya orders continues to increase, and customers feel proud to purchase local products that care about the environment."

This is also in line with Nurainul’s statement:

"I use biodegradable paper packaging and have created a mini product innovation that is easy to carry anywhere. With this innovation, my sales have increased because customers find the rengginang I sell easy to carry around."

Based on the above interview, it can be concluded that MSME actors in South Sulawesi have implemented green innovations in the sustainability of their businesses. The implementation of environmentally friendly innovations, such as the use of natural materials, waste management, and environmentally friendly packaging, will not only save costs but also increase consumer confidence and the image of superior product brands. The SMEs that have implemented green innovation are micro and small home industries, which are businesses run directly from home by entrepreneurs using simple equipment.

The higher the level of green innovation implemented by MSME entrepreneurs, the better the business performance that can be achieved, both financially and non-financially. From a management perspective, MSME entrepreneurs who can integrate sustainability principles and innovation strategies are not only complying with global environmental issues but also implementing a profitable business strategy. Green innovation is not merely a technical activity, but a strategy that enables MSMEs to survive amid increasing consumer awareness of the environment and increasingly fierce market competition. In addition, the results of this study can also provide benefits that encourage economic growth while preserving the environment. In other words, green innovation will become a bridge between business interests and ecological responsibility. SMEs that adopt a green-based approach will not only reap economic benefits.

From the Triple Bottom Line perspective, all businesses must help society achieve three interrelated goals, namely economic prosperity, environmental protection, and social justice, issues that have become priorities on a company's agenda (John Elkington, 1999). Building information modelling (BIM) is one of the most effective technological innovations that plays a key role in short- and long-term economic, social, and environmental sustainability (Soltani, 2016). These findings also support the notion that business performance should not only be viewed from a profit perspective, but also from a social and environmental perspective. Green innovation must be able to balance these three dimensions by increasing customer satisfaction through healthier and safer products, maintaining environmental sustainability through waste management and energy efficiency, and being able to provide long-term economic benefits. Therefore, the application of green innovation is an important strategy for halal-certified MSMEs to strengthen the sustainability of their businesses.

The implementation of green innovation will not only be a trend in modern business management, but will also contribute significantly to improving the financial and non-financial performance of MSMEs. Green innovation can also include the development of environmentally friendly products, waste management, and

the use of sustainable technologies that have been proven to improve operational efficiency, strengthen competitiveness, and enhance the image of the business in the eyes of consumers.

Company data registered in China from 2010 to 2021 shows that substantive green innovation (green innovation in processes and products) significantly improves company financial performance (X. Liu et al., 2024). Green innovation positively drives ESG performance of companies in China (X. Zhang et al., 2024). Green innovation has a tangible and positive impact on future company performance (X. Furthermore, green innovation not only increases company value and performance, but can also reduce risks, including volatility and credit risk.

Green innovation has a positive impact on business sustainability in energy-intensive industries in Chinese companies in terms of environmental performance, environmental performance and social performance (Li et al., 2020). Green innovation has a positive relationship with the performance of manufacturing companies in China (D. Zhang et al., 2019). However, this disagrees with the statement that the application of green innovation in the manufacturing industry in China is still at a relatively low level and has great potential for improvement, unlike countries in the West (Yang & Zhu, 2022).

Thus, the results of this study confirm that green innovation can strengthen the business performance of MSMEs in terms of both financial and non-financial performance, which can support business sustainability in the long term. This also shows that for MSMEs that have halal certification, the integration of green innovation is not only a market requirement or regulation, but also a core strategy to survive amid competition and be able to develop in the long term. Furthermore, among previous research findings, there has been no study specifically focused on micro, small, and medium enterprises (MSMEs) in the home industry sector; generally, green innovation has been applied to larger companies.

4. CONCLUSION

Based on the research question, this study shows that green innovation has a positive and significant effect on the business performance of micro and small enterprises (MSEs) in South Sulawesi. The higher the implementation of green innovation, the better the financial and non-financial performance achieved by business actors. The results show that sustainability-oriented business practices not only increase efficiency and competitiveness but also strengthen reputation and consumer trust because the raw materials used are natural, and the packaging is recyclable. Thus, green innovation can be a new strategy for MSME actors in realising business sustainability while contributing to economic development and environmental preservation.

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