

GREEN ENTREPRENEURIAL ORIENTATION AS A MODERATOR OF CIRCULAR ECONOMY IMPACT ON MICRO, SMALL AND MEDIUM ENTERPRISE PERFORMANCE

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Abstract

This study aims to examine the effect of the circular economy on the financial performance of Micro, Small and Medium Enterprises (MSMEs), and explore the role of green entrepreneurial orientation as a moderating variable. This study used a quantitative approach with a survey method of 250 carica fruit processing MSMEs in Wonosobo Regency. Data were collected through questionnaires and analyzed using linear regression and moderated regression analysis (MRA). The results showed that the circular economy has a positive and significant influence on the financial performance of MSMEs. This finding suggests that environmentally friendly practices such as resource efficiency, recycling, and waste reduction can improve business performance. In addition, the analysis also proved that green entrepreneurial orientation strengthens the relationship between circular economy and financial performance. MSMEs with high green entrepreneurial orientation are able to maximize the positive impact of circular economy implementation through green innovation and proactive attitude towards sustainability. This research provides practical contributions for MSME owners and policy makers in strategizing sustainable business development. The implications of the results emphasize the importance of strengthening green entrepreneurship capacity in supporting the transition to a more sustainable economic model.

Keywords: circular economy, financial performance, MSMEs, green entrepreneurial orientation.

INTRODUCTION

Circular economy is a system that aims to generate economic improvement by maintaining the value of products, materials and resources for a longer period of time so as to reduce social and environmental losses (Macarthur, 2015). This system utilizes available resources effectively and efficiently to produce zero waste. With the existence of a circular economy, it is expected to increase the competitive advantage of the industry by using resources appropriately, one of which is the performance of Small and Medium Enterprises (MSMEs). With a good implementation of the circular economy, it can reduce operational costs, optimize production, increase sustainable reputation and open up new job opportunities for MSMEs..

Primadhita et. al (2023) explained that MSMEs can have more value if they prioritize products and business processes that have a positive impact on the environment, one of which is the application of green innovation. Adopting green innovation in MSMEs can develop competitiveness and improve the image in the market which will have an impact on improving MSME business performance. Good waste utilization is also effective in reducing environmental pollution which has an impact on increasing sales (Dhiniati et al., 2023).

Green entrepreneurship can be defined as entrepreneurial activities that are environmentally friendly and can provide added value to environmental security. Innovation in entrepreneurship is needed to create new products that are environmentally friendly and can solve environmental and community problems (Luhglatno, et al., 2024). The main objectives of green entrepreneurship

include proper waste recycling, encouraging the use of renewable energy resources, and paying attention to environmentally friendly businesses (Rodrigues and Franco, 2023). Through the green entrepreneurship approach, it can provide business sustainability for entrepreneurs (Hamdan et al., 2024).

The potential of the circular economy and green entrepreneurship in MSMEs is actually very large, but there are several obstacles in implementing these practices. These challenges include limited access to green technology, lack of knowledge and awareness of sustainable practices, and lack of policy support and incentives from the government. In addition, many MSMEs still focus on the linear economy paradigm and are not willing to shift to a sustainable business model (Farhani, et al., 2025).

Previous research found different results related to the topic of circular economy and green innovation on MSME performance. For example, research by Farhani et. al (2025) and Ridha and Anisah (2024) found the results of the application of circular economy and green innovation in MSMEs. However, these studies have not discussed the role of green entrepreneurship that can improve performance and provide business sustainability for business owners. In addition, there is no collaboration between the government, academia, the private sector and the business community in creating an ecosystem that can support the transition to a green economy (Farhani, et al., 2025).

This study aims to fill the gap in previous research by exploring the application of circular economy and green entrepreneurship to improve the performance of environmentally friendly MSMEs. The implementation of green entrepreneurship in MSMEs is able to provide innovative solutions through the role of environmentally friendly entrepreneurship. Circular economy can also be a major consideration for the government and every business owner in making strategic decisions that can be relied upon for environmental sustainability and business owners.

LITERATURE REVIEW AND HYPOTHESIS

Research (Yahaya & Nadarajah, 2023) explored the research map related to the complex topic of MSME performance by conducting a literature review study of 469 articles, then filtering the data until 16 related articles were found that had similar concepts and relevance, and found the keyword strategic orientation as one of the factors that could support MSME performance. MSME performance is not only influenced by the existence of tangible assets but also by the existence of intangible assets, so strategic orientation can be a key factor in improving MSME performance. The dimensions of strategic orientation include entrepreneurial orientation, market orientation, learning orientation, and the ability to innovate are intangible assets which according to some experts or researchers can be a key factor in the success of MSME performance (Yahaya & Nadarajah, 2023). The complexity of research related to MSME performance still remains an interesting topic for discussion, where currently performance is not only measured by financial indicators, but non-financial indicators are also a measure of the success of the performance of a company including MSMEs.

The discussion about the performance of MSMEs is never separated from the obstacles that are also faced by MSMEs in their business processes. (Sarma & Mehdi, 2022) compiled research on a systematic literature review based on article data collected from 1990 to 2020 or within a span of 30 years to be analyzed to answer three fundamental questions that often arise regarding the condition of MSMEs. Three questions about how developments in terms of driving the growth of MSMEs, what obstacles MSMEs face, what factors affect the performance of MSMEs. The three questions were answered by reviewing 78 articles obtained from Google Scholar, thus obtaining a conclusion in the form of a significant framework, namely that MSME performance is influenced by managerial characteristics, MSME characteristics, external factors and internal factors, these four factors as drivers of MSME growth and have an impact on MSME performance. These various factors

will answer questions about performance in MSMEs but may have different responses depending on the scale of the business, the type of industry and the geography where the MSME is located..

MSMEs are currently filled with challenges in their business processes, so MSMEs need to have a dynamic ability to read the situation around the business organization where the MSME is located. Industrial organization theory is a theory that can explain what the business environment in which these MSMEs operate is like. Market structure and conditions are the most relevant keywords in industrial organization theory. These keywords contain several aspects that have an impact on company decisions and behavior, due to the assumption that behavior depends on the context in which it occurs (Brown, 2002). The approach used in industrial organization theory is the SCP approach or paradigm, namely Structural, Conduct, and Performance, The logical assumption of the SCP paradigm is that there is a causal linear relationship between structure and performance, the behavior and performance of the company has no impact on market structure. The feedback effect in the SCP paradigm of an industry, causes the causal relationship between structure and performance to disappear, because it is possible for companies to influence market conditions through the behavior or strategy of business actors in responding to the market (Raible, 2013).

According to (Carlton, 2015) there are two approaches in industrial organization theory, namely the first structure-behavior-performance (SCP) approach which provides an overview of industrial organization. The second approach is price theory which uses microeconomic models to explain firm behavior and market structure. According to the structure-behavior-performance approach, an industry's performance depends on the behavior of its firms, which in turn depends on its structure (factors that determine market competitiveness). The structure of an industry depends on basic conditions, such as technology and demand for a product. Market structure-performance determines a firm's ability to adapt to the environment in which it operates. Industrial organization theory through the SCP approach will lead organizations to implement the concept of circular economy in their business processes.

Corporate sustainability is one of the main objectives for a company in terms of business to be able to continue to perform or show its achievements, the circular economy is believed to facilitate the sustainability of a company's business. The findings are in line with research conducted by (Rodríguez-Espíndola et al., 2022) which revealed that government support and customer pressure facilitate the implementation of the circular economy, the circular economy supports the implementation of sustainability-oriented innovations and drives positive impacts on financial, environmental and social performance. (Dey et al., 2022) found that circular economy practices have the potential to improve sustainability and organizational performance, the implementation of circular economy can result in superior environmental performance through energy and resource efficiency and waste reduction, the design function contributes the most to circular economy deployment in SMEs while the recovery function contributes the least. The description provides the following hypothesis concept, namely :

H1 : there is a positive relationship between circular economy and MSME performance.

Many factors can influence the relationship between the circular economy and its impact on MSME performance, various factors have certainly been explored to assess the relationship or impact of the circular economy on MSME performance. This study attempts to re-explore the factors that could influence the impact of the circular economy on MSME performance by using green entrepreneurial orientation as a moderating variable that might strengthen the influence of the circular economy on MSME performance. Entrepreneurial orientation is a topic that is quite interesting to discuss, especially in the realm of management, because a company's establishment is of course preceded by the orientation of the owner or entrepreneur to be able to behave in accordance with its dimensions in an effort to improve and maintain the sustainability of their business. The MSME sector as a small industrial sector within the scope of large industries experiences many challenges in its business processes. The MSME sector is very vulnerable to

unsustainability in its business, so a strong orientation is needed from MSME business actors, so that MSMEs can continue to develop amid very complex economic conditions..

Variations in research results regarding the impact of entrepreneurial orientation and performance on MSMEs are found. Research (Nguyen et al., 2022) found an insignificant relationship between entrepreneurial orientation and performance, this could occur because SMEs with a high entrepreneurial orientation can create industrial configurations and form new market conditions by focusing on risk activities while SME resources are limited. Research results are in line with (Karami & Tang, 2019) and (Al-Dhobee et al., 2025). Differences in research results are found in research belonging to (Said et al., 2024), the results of his research analyze the dimensions of entrepreneurial orientation, namely risk taking, innovation, proactive attitude, owner autonomy and competitive aggressiveness, where all dimensions of entrepreneurial orientation can positively affect firm performance. The moderating effect of entrepreneurial orientation has not been widely explored, especially to assess the relationship between the circular economy impact on MSME performance..

(Baquero, 2024) investigated the mediating role of green innovation and the moderating effect of natural resource orchestration capabilities in the relationship between green entrepreneurship and performance, the results showed that green performance is influenced by green entrepreneurial orientation, green innovation mediates the relationship between green entrepreneurial orientation and green performance, and natural resource orchestration strengthens the relationship between green entrepreneurial orientation and green performance. This study explores the moderating effect of the relationship between circular economy and MSME performance based on the explanation, by expressing the following hypotheses, namely:

H2 : Green entrepreneurial orientation strengthens the relationship between circular economy and MSME performance.

The figure below shows the proposed research model to answer the hypothesis outlined.

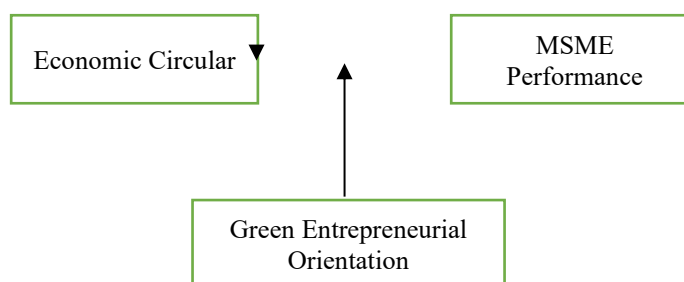


Figure 1. Research Model

RESEARCH METHODS

This research is a type of quantitative research, data collected from SMEs in Central Java Indonesia with a focus on SMEs Manufacturing or producing Carica products in the Wonosobo area. The sample selection is based on the large number of carica fruit processing producers in the region, because it is believed that carica fruit only exists in the Wonosobo district which is precisely located in the Dieng plateau area. Waste from carica is very profitable to be reprocessed into other processed products but many are also just thrown away as environmental waste or garbage. Data were collected from carica processing SMEs registered at the Wonosobo district cooperative and MSME office totaling 250 questionnaires. The unit of analysis for this study includes owners, CEOs or managing directors, senior managers and those who represent the organization or SME. Data were collected by means of a survey using a questionnaire analysis tool that has been prepared based on existing theoretical studies and based on considerations from academics and related experts. Data were collected at one time or cross sectionally for approximately two months.

The financial performance variable is an assessment of the financial performance of SMEs and contains three questions or indicators, namely the amount of production, production costs and net profit. SMEs do not publish financial reports to the public, so the owners, or managers of SMEs assess their business performance over the past three years and compare it to the performance of major competitors. The questionnaire was adapted from previous research (Cantele & Zardini, 2018) and used a five-point Likert scale ranging from strongly disagree to strongly agree. Circular economy variables are measured using nine indicators, namely refuse, rethink, reduce, reuse, repair, refurbish, remanufacture, repurpose, recycle, recover. Question items are presented by choosing five answers presented on a Likert scale ranging from strongly disagree to strongly agree. The questionnaire based on the indicator items was adopted from research (Kirchherr et al., 2017) and (Potting et al., 2017). Green entrepreneurial orientation variables are measured based on indicators adopted from research (Lumpkin & Dess, 1996, Covin & Wales, 2012, Fatoki, 2019).

Green entrepreneurial orientation is a development of the concept of entrepreneurial orientation which is then expanded by incorporating the concept of sustainability in the structure of the concept of entrepreneurial orientation. Green entrepreneurial orientation is measured using eight question items, namely (1) the company has introduced many new green products and services (2) changes in our green product or service line are quite complex (3) in general, my company favors a strong emphasis on green practices such as research and development, technology leadership, and innovation (4) in general, my company tends to be more advanced than others in introducing green products or services (5) in competition, my company often tries to initiate green actions that are responded to by critics (5) my company often tries to initiate green actions that are responded to by critics. (6) We believe that due to the nature of the environment, bold action is required to achieve the Company's green goals (7) My company takes a posture to maximize the possibility of exploring potential green opportunities (8) My company strongly favors high-risk green projects with high return opportunities. All question items are based on a five-point Likert scale with responses of strongly disagree to strongly agree.

Statistical analysis using linear regression analysis tools to test the first hypothesis, in this study testing was carried out to test the dependent variable, namely SME financial performance and independent variable circular economy. Testing the liner regression model to test the first hypothesis is shown as follows:

$$\text{Perform Finc} = a + \beta_1 \text{CE} \dots \dots \dots (1)$$

Testing the second hypothesis using moderate regression analysis (MRA), testing with this method is carried out in two steps, in the first step is interacting the green entrepreneurial orientation variable with the independent variable circular economy. The second step is to regress the dependent variable on the financial performance of MSMEs. Testing green entrepreneurial orientation as a moderator of the circular economy's influence on financial performance is modeled with the following equation:

$$\text{Perform Finc} = a + \beta_1 \text{CE} + \beta_2 \text{CE} * \text{GEO} + e2 \dots \dots \dots (2)$$

RESULTS AND DISCUSSION

This study employed the Corrected Item–Total Correlation and Cronbach's Alpha if Item Deleted to assess the validity of the measurement indicators. An indicator is considered valid if it demonstrates a significance value greater than 0.5. Reliability testing in this research was conducted using Cronbach's Alpha analysis. A variable is deemed reliable if its internal consistency yields a Cronbach's Alpha coefficient of at least 0.7, while for exploratory purposes, a coefficient between 0.6 and 0.7 is considered acceptable. The results of the validity and reliability tests are presented in Table 1.

Table 1.
Uji Validitas

Variabel	Kisara Korelasi	Signifikan	Keterangan	Cronbach's Alpha
(Perform Finc)	0,936** - 0,971**	0,000	Valid	0,955
(CE)	0,858** - 0,961**	0,000	Valid	0,944
(GEO)	0,944** - 0,972**	0,000	Valid	0,979

The results of the regression analysis used to test the first hypothesis, which examines the effect of the circular economy on the financial performance of MSMEs, are presented in the table below.

Table 2.
Hasil Uji Regresi Linier
Coefficients^a

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	1.473	.170		2.782	.615
	Circular Economy	.283	.033	.699	8.687	.000

a. Dependent Variable: Financial Performance

The linear regression test for the first hypothesis, as modeled in the proposed research framework, aimed to assess the influence of the circular economy on the financial performance of MSMEs. The results, as presented in Table 2, indicate that the coefficient of determination (R^2) for the effect of the circular economy on financial performance is 0.283, or 28.3%. The significance level was 0.000, which is below the 0.05 threshold, indicating that the circular economy has a positive and statistically significant effect on the financial performance of MSMEs.

These results are consistent with the study by Rodríguez-Espíndola et al. (2022), which found that the implementation of circular economy practices is supported by customer pressure and government policy, ultimately contributing positively to a company's environmental, social, and financial performance. This study also reinforces the conclusions of Dey et al. (2022), who reported that circular economy practices significantly improve resource efficiency, reduce waste, and enhance the sustainability of MSME operations. Furthermore, the present findings align with the arguments of Primadhita et al. (2023) and Dhiniati et al. (2023), who emphasized that MSMEs adopting environmentally friendly practices through innovation and effective waste utilization can increase their competitiveness and business performance.

The results of the Moderated Regression Analysis to examine the moderating effect of green entrepreneurial orientation on the relationship between the circular economy and the financial performance of MSMEs are presented in the table below.

Table 3
Hasil Uji MRA
Coefficients^a

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	1.675	24.679		2.468	.015

CE	.668	.088	.930	7.563	.412
GEO	.312	.046	.545	6.727	.760
CE*GEO	.009	.003	.487	3.551	.022

a. Dependent Variable: Financial Performance

The results of the Moderated Regression Analysis (MRA) indicate that the interaction between the circular economy and green entrepreneurial orientation has a positive and significant effect on the financial performance of MSMEs. This implies that green entrepreneurial orientation strengthens the influence of the circular economy on financial performance. This finding is supported by the significance value of the interaction term, which is 0.022—less than the 0.05 threshold—along with a coefficient of determination (R^2) of 0.009 or 9 percent.

These results are consistent with the study by Baquero (2024), which demonstrated that green entrepreneurial orientation significantly contributes to the enhancement of green performance through the mediation of innovation and the orchestration of natural resources. In addition, this evidence supports the conclusions of Said et al. (2024), who found that the dimensions of entrepreneurial orientation—such as innovation, risk-taking, and proactiveness—positively influence firm performance.

However, this outcome contrasts with the results of Nguyen et al. (2022) and Karami & Tang (2019), who reported that entrepreneurial orientation does not always have a significant correlation with performance, particularly among MSMEs with limited resources. This divergence can be attributed to the local context of the current study, in which MSME actors engaged in carica fruit processing in Wonosobo are beginning to show heightened awareness of environmentally friendly practices and the potential of sustainability as a competitive advantage.

Additionally, this research affirms the relevance of the industrial organization theory and the Structure-Conduct-Performance (SCP) paradigm (Carlton, 2015; Raible, 2013), which posits that market structure and firm behavior—in this case, green entrepreneurial orientation and circular economy practices—directly influence performance. The structure and external environment that demand sustainability help shape strategic behavior among MSMEs in adopting more environmentally conscious business models, ultimately enhancing their financial performance. Consequently, this study supports the proposed hypotheses and contributes to the literature by providing empirical evidence on the critical role of green entrepreneurial orientation in strengthening the positive impact of circular economy implementation on the financial performance of MSMEs in the local agro-industrial sector.

CONCLUSION

The results of this study indicate that the circular economy has a positive and significant effect on the financial performance of MSMEs. Furthermore, green entrepreneurial orientation has been proven to strengthen the influence of the circular economy on financial performance. This suggests that the higher the level of green entrepreneurial orientation possessed by MSME actors, the greater the positive impact of circular economy implementation on their financial performance. The practical implication of these results is the importance of increasing awareness and capacity among MSME actors in adopting circular economy principles and developing a green entrepreneurial orientation. Local governments, cooperative and MSME agencies, as well as business development institutions, are encouraged to provide training and incentives to strengthen environmentally friendly innovations within the MSME sector. Such practices not only support environmental sustainability but also have the potential to improve business financial performance.

This study is limited by its geographical scope, as it focuses on MSMEs involved in carica fruit processing in Wonosobo, which limits the generalizability of the findings to other sectors or regions.

In addition, the research employed a cross-sectional approach, which does not allow for the observation of changes or dynamics in the relationships between variables over time.

Future studies are recommended to use a longitudinal approach to observe long-term changes in the implementation of circular economy and green entrepreneurship practices on MSME performance. Moreover, future research could expand the sectoral and geographical scope, as well as incorporate additional variables such as government policy support or digitalization factors to provide a more comprehensive understanding.

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