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The Role of the Green Economy in The Correlation to The Circular Economy and Sustainable Business: A Case Study on The MSMEs of The GRI Community

Helin G. Yudawisastra[1]* | Siti Mardiana[2] | Suparjiman Suparjiman[3] | Abin Suarsa[4]

[1]*Universitas Muhammadiyah Bandung, Faculty of Economics and Business, Bandung, Indonesia*
[2]*Universitas Muhammadiyah Bandung, Faculty of Economics and Business, Bandung, Indonesia*
[3]*Universitas Muhammadiyah Bandung, Faculty of Economics and Business, Bandung, Indonesia*
[4]*Universitas Muhammadiyah Bandung, Faculty of Economics and Business, Bandung, Indonesia*

*Correspondence to: Helin G. Yudawisastra, Jl. Soekarno Hatta no 752 Cipadung Kidul, Bandung 40614, Jawa Barat, Indonesia
E-mail: yudawisastra.helin@umbandung.ac.id

Abstract: This study aims to explain the effect of the circular economy on implementing sustainable business through the green economy variable. The topic takes 3 (three) aspects, including economic, social, and environmental, by taking several indicators according to the variables used. In this study, the green economy variable will then be identified as a moderator or intervening variable, which will determine the relationship between the circular economy and sustainable business. This study uses primary data through the method of distributing questionnaires and secondary data as supporting data. The research object used is the sustainable business-based Micro, Small, and Medium Enterprises (MSMEs) of the Global Reporting Initiative (GRI) community. The research sample used was 300 obtained using a random sampling technique based on Isaac and Michael's Table. The method of analysis used multivariate data analysis including factor analysis with SEM-PLS covariance. The results show that the green economy is a moderating and intervening variable for the circular economy on sustainable business with a positive relationship. This research is recommended to the MSME of the GRI community, academics concerned with sustainability studies, and the general public who observe sustainability.

Keywords: sustainable business; circular economy, green economy, intervening and moderating variables.

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INTRODUCTION

Today, the world needs to shift to a sustainable concept in which meet the needs of the present is carried out without compromising future generations. John Elkington, an expert on sustainability from the UK initiated the concept of sustainable development in 1994 (a triple bottom line consisting of People, Planet, and Profit). There are 3 (three) sustainability objectives (Hart, 1995) The first objective is to prevent pollution by minimizing the level of emissions and waste. The second objective is production management which focuses on reducing pollution and minimizing the adverse environmental impacts associated with the life cycle of a product. The

third objective is the use of technologies that do not produce hazardous emissions or waste. Economic players try to do business based on the pillars of sustainability. Business players not only pay attention to economic aspects but also social and environmental aspects. Business players try to link sustainability principles with business strategies. They recognize that there is a primary responsibility to participate in solving critical global problems and demands of customers who expect the provision of environmentally friendly products and services. Based on this issue, sustainable business practices are required to face the global economy (Watson et al., 2008). Sustainable business practices are the hope for increasing the proportion of micro, small, and medium enterprises (MSMEs) with profitability, resilience, and positive social and environmental impacts to address the need for efficiency in production and waste reduction (Caldera et al., 2019). MSMEs currently dominate the world economy. It is estimated that around 70% pollute global industrial waste (Revell et al., 2010). These business players have the responsibility to address pollution prevention and align business strategies with sustainable business practices (Neto et al., 2017). Corporate sustainability is the result of triple bottom optimization where the foundation is three columns of ecological, social, and economic sustainability. Sustainable business operation means that eco-efficiency is carried out within the framework of ecological responsibility, while maintaining basic norms means social sustainability and economic sustainability which is clearly understood as the long-term profitability of the business (Tóth, 2019). The issue of environmentally friendly and sustainable business is currently quite important in the economy (Yudawisastra, 2021).

Sustainable goals and circular economy have so far become quite popular topics in the business sustainability arena. The principle of a circular economy is different from a linear economy that involves activities (take-make-dispose). In a circular economy, economic activities are carried out with sustainable principles and reduce negative impacts on nature. Circular Economy is a means to achieve sustainability, but with a narrower focus on the economic and environmental dimensions (Geissdoerfer et al., 2016). This concept encourages the use of circular resources to achieve sustainable development. By applying the circular economy concept, businesses can implement strategies to save on product functions, material components, and other factors (Suwignyo et al., 2021). When the circular economy and sustainability get greater attention from the government, industry and academia, innovation in the circular business model makes sustainability fundamental to maintaining the company's competitive advantage (Pieroni et al., 2019). Circular Economy aims to optimize production with minimum resource consumption and side effects coupled with recycling of waste originating from the production process (Moriguchi, 2007). The circular economy is basically a change in the environment in response to the global need for an ecological economy, which must be carried out consistently with 3 (three) principles, including Reduce, Reuse, and Recycle (Ying & Li-jun, 2012). The application of these principles is critical to improving resource use, security, and competitiveness while reducing the associated environmental impacts. Reduction and Reuse are preferred over Recycle for economic reasons (Nasr & Thurston, 2006). In the circular economy, materials that can be recycled are then processed and released back into the economy as new raw materials (Melece, 2016).

MSMEs are businesses that globally provide the highest potential for the transition to a circular economy and cleaner production (OECD, 2021). Indonesia is currently adopting the circular economy concept in its development vision and strategy. Through the circular economy, economic benefits can be obtained. Likewise, environmental and social aspects that are very meaningful in 2030 can be maintained. This has the potential to generate additional GDP of IDR 593 trillion - IDR 638 trillion in 2030, reduce waste by 18% - 52% in 2030, and create 4.4 million new jobs in 2030 (Nandi et al., 2021). This is in line with the basic principles of a circular economy.

However, the contribution of MSMEs is limited due to economic and organizational barriers as explained by Caldera et al (2019), such as business scale, scarcity of economic resources, as well as human or technical resources (Bartolacci et al., 2020). Against this backdrop, the circular economy in the context of its impact on business is designed to create and capture value by helping to achieve an ideal state of resource use. Thus, the business objective shifts not only to generate profits from product sales through the flow of resources and products by reusing and recycling resources. This implies that companies can reduce their negative impact on the environment by delivering and capturing value through alternative value propositions (Lahti et al., 2018).

Besides the circular economy, a green economy is an approach that aims to achieve several goals towards sustainable development where there is value in natural capital, increasing resilience, building an inclusive and equitable local economy, and taking into account the reduction of greenhouse gas emissions (Bappenas, 2022). Green economy growth is designed to increase national income and living standards in a sustainable and equitably distributed manner. This is carried out by maintaining environmental sustainability through reducing pollution, building environmentally friendly and sustainable infrastructure, using resources more efficiently, as well as creating value in natural assets that have been supporting economic success and supporting human welfare. A green economy serves as a pathway to improve the quality of life, eradicate poverty, and build sustainable development (UNEP, 2012). Implementing a green economy will overcome environmental problems, reduction of limited natural resources, and prosperity. Nowadays, the concept and framework of the green economy influence policies in various countries, including Indonesia.

Sustainability creates a balanced integration between economic performance, social inclusivity, and environmental resilience, for the benefit of present and future generations (Geissdoerfer et al., 2016). In the concept of sustainable business, green economy and circular economy have the same goal of developing a sustainable economy and attracting huge political, academic, social, and business interests (Gregorio et al., 2018). In this article, we try to analyze the effects of circular economy, green economy, and sustainable business all of which aim to promote sustainable development. Despite various suggestions and recommendations for bridging production and consumption activities through sustainable-based businesses, research on this topic remains limited. This research was created to bridge the gap by connecting the concepts of circular economy, green economy, and sustainable business.

Several articles agree that Pearce & Turner in 1990 introduced the concept of a circular economy, which refers to its desire to replace the prevailing traditional linear economy with a circular economy (Andersen, 2007). The main objective of this concept is to maintain the value of products, materials, and resources in the economy as long as possible by minimizing the wastage and consumption of resources and predicting that goods generate value through their use at the end of their lives (Gregorio et al., 2018). Based on the definition mentioned by Merli et al. (2018), the circular economy aims to overcome the take-make-dispose linear pattern of production and consumption, proposing a circular system in which the value of products, material resources, and resources managed in the economy as long as possible. The circular economy concerns the production, consumption of goods and services, and the supply of money based on the principles of designing waste and pollution, keeping products and materials in use, and regenerating natural systems (Murray et al., 2017). According to Macarthur (2022), the circular economy is a restorative or regenerative industrial system by intention and design. It replaces the end-of-life concept with restoration, shifts to the use of renewable energy, eliminates the use of toxic chemicals, interferes with reuse, and aims to eliminate waste through the excellent design of materials, products, systems, and businesses. The circular economy is an alternative to the traditional linear economy in which economic actors keep resources in use as long as possible, extract maximum value

from use, and then recover and regenerate products and materials at the end of each service life. The concept of circular economy in the industrial sector can be applied using the 5R approach (Reduce, Reuse, Recycle, Recovery, and Repair) (Marpaung, 2021).

The economy and environment are interdependent concepts and cannot be separated (D'Amato & Korhonen, 2021). The concept of the green economy is an operational policy agenda for achieving measurable progress in the environmental economy (Schmalensee, 2012), which is used as a pillar of the implementation of sustainable development for the transition process to a low-carbon and green economy. In general, the green economy has some definitions, including an economy that is sustainable in society by consuming all renewable resources naturally and without containing carbon emissions (Kristianto, 2020). A system of economic activities related to the production, distribution, and consumption of goods and services aimed at improving human well-being in the long term, without compromising future generations significantly from environmental risks or ecological scarcity (Ivanova, 2010). UNEP defines a green economy as an economy that results in increased human well-being and social equity, while significantly reducing environmental risks and ecological scarcities (UNEP, 2012). The green economy is a place to grow and increase people's welfare and work due to state and social investment followed by reduced emissions and environmental pollution to stimulate the effective use of energy and resources and prevent damage to biodiversity and ecosystems (Diyar et al., 2014). The green economy is a form of economy that not only focuses on meeting the needs of the community but also emphasizes its impact on the environment (Wu et al., 2020). This concept has different implications for the economy in general because it prioritizes the future of natural resources, environmental welfare, and reducing the risk of using natural resources (Loiseau et al., 2016). The green economy is considered to be an economic practice that emphasizes long-term plans because, with this economic practice, it can reduce poverty, carbon dioxide emissions, and ecosystem degradation (Musango et al., 2014). In its simplest terms, a green economy is low-carbon, resource-efficient, and socially inclusive. In a green economy, income and employment growth are driven by public and private investments that reduce carbon emissions and pollution, increase energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services (OECD, 2021).

Business sustainability has become a shared concern and responsibility. It is an integrated approach to address issues related to several environmental and socio-economic issues. Sustainable business is a concept that describes organizational activities that support business success in terms of various dimensions, both socio-economic and their relationship to the environment. In a more specific context, business sustainability can be defined as a dynamic activity capable of generating value. This ability stems from innovation and opportunity (Larson, 2000). Nwabueze (2019) emphasizes that a sustainable business can provide a competitive advantage for the company. The sustainable business describes value creation activities as sustainable economic activities. A sustainable business model can be defined as a business model that creates, delivers, and captures value for all its stakeholders without depleting natural, economic, and social resources (Dyllick & Hockerts, 2002). Rudnicka (2016) defines a sustainable business as open to changes covering culture, structure, business processes, as well as products and services offered.

Sustainability is aimed at addressing the environmental and socio-economic problems of our and future generations. The circular economy is the most reliable approach to achieving sustainable development, where the circular economy has a direct or indirect impact on most of the 17 sustainable development goals that have been approved by the United Nations in 2015. Based on this issue, the circular economy has been recommended as an approach to achieve economic growth in line with sustainable environmental and social development (Marpaung, 2021). The circular economy has been proposed to address environmental problems by turning waste into resources, and bridging production and consumption activities, including business and stakeholder

collaboration (Witjes & Lozano, 2016) The contingency and importance of environmental suitability create market opportunities stemming from the sustainability-based business of a circular economy (Lahti et al., 2018). The transition from a linear economy to a circular economy implies the creation of a sustainable ecosystem characterized by a sustainable business model that leads to circularity (Bocken et al., 2018). The relationship between the circular economy and MSMEs is increasingly emphasising how important they are in the global economy (OECD, 2021).

Pieroni et al. (2019) state that the circular economy affects sustainable business. This means that when a company implements a circular economy, the company has automatically implemented some of the sustainable business concepts. For example, a restaurant that uses waste from its kitchen to make eco-enzymes, then uses those eco-enzymes as fertilizer for their gardens where the vegetable products are used as raw materials in the restaurant is an example of a circular economy. The restaurant does not need to buy fertilizer and can use vegetables from the garden as raw materials for the restaurant, thus saving operational costs. Using eco-enzyme as a fertilizer will reduce the use of chemicals as fertilizer. This is an implementation of the concept of sustainable business because it is more environmentally friendly. If many companies implement a circular economy, there will be certainly less waste produced and disposed of into the environment. In this connection, the role of the green economy concept appears to be an accelerator (or vice versa, which can be an obstacle) in the process of the relationship between the circular economy and sustainable business. This means that if a company has a low green economy spirit (meaning that the company does not implement the green economy concept to its full potential), this will weaken the relationship between the circular economy and sustainable business, and vice versa.

The circular economy and green economy are popular narratives in macro-level sustainability discussions in policy, scientific research, and business. These narratives offer different recipes for addressing economic, social, and ecological goals, thus promoting different pathways for sustainable transformation (D'Amato & Korhonen, 2021). This conceptualization has been recognized in various literature. There is a strong technical orientation (engineering, environmental science) in the research environment, with little emphasis on achieving a common understanding or comparing definitions (Toppinen et al., 2020). Consequently, in the literature on circular economy and green economy, a 'more comprehensive and holistic approach' must be taken (Geissdoerfer et al., 2016). Communities that use and contribute to the development of a circular economy and a green economy result in a growing diversity of interpretations and internal understanding (Merino-Saum et al., 2020). The breadth of the circular economy and green economy concepts is the basis for informing the operationalization of strategies, actions, and tools in public and private decision-making at national or regional levels around the world. Various governance principles and actions, including public financing, play an important role in achieving circular and green economy targets, particularly in the areas of productivity and resource efficiency, waste management (food waste), and eco-innovation. The transition to a circular economy will require qualified human resources with specialized and sometimes new skills. Skills development and other measures to support job creation in a green economy will be one of the priorities (Melece, 2016).

Sustainable growth and a green economy can only be achieved by cultivating adequate fundamental changes in people's mindsets and attitudes towards unexpected fluctuations that hinder the implementation of green practices, especially in business activities. To overcome basic environmental problems, an umbrella in the form of a green concept is required for the survival and prosperity of each business (Baker & Sinkula, 2005). Green practices often focus on reducing negative environmental impacts as stated by Rusinko (2007), whereas sustainable business practices have a holistic focus on business behavior that has a net impact on environmental, human, social, and productive capital (Moser, 2001).

METHODS

This analysis method was carried out by first, looking at the characteristics of the data through descriptive statistics. Then, multivariate data analysis was done, including factor analysis using SEM-PLS covariance. The study used primary data obtained by filling out a questionnaire. The population of MSME of the GRI community is 750 business players. The sample used was 300 with a random sample technique. This research was conducted in early August-September 2022. This type of research is a descriptive survey and a verification survey.

Conceptual Model

In this study, two conceptual models called Model 1 and Model 2 are proposed, each of which has its background why it is included in this study. Model 1 is designed to examine the role of the green economy as a moderating variable in the relationship between circular economy and sustainable business (D'Amato & Korhonen, 2021). This is significant to gain insight into the role of the green economy in supporting sustainable business for companies that want to implement a circular economy. In this model, there is one concept to be tested, which is the existence of a green economy as a moderating variable between a circular economy and sustainable business. This is important to gain insight into the role of the green economy in supporting sustainable business for companies that want to implement a circular economy.

Model 1 contains two assumptions (Figure 1), including 1) circular economy affects sustainable business through a green economy (D'Amato & Korhonen, 2021; Gregorio et al., 2018), 2) circular economy can directly affect sustainable business (Pieroni et al., 2019). In the first model, there is one concept to be tested, which is the existence of a green economy as an intervening variable between the circular economy and sustainable business. This is important to gain insight into the role of the green economy in supporting sustainable business for companies that want to implement a circular economy.

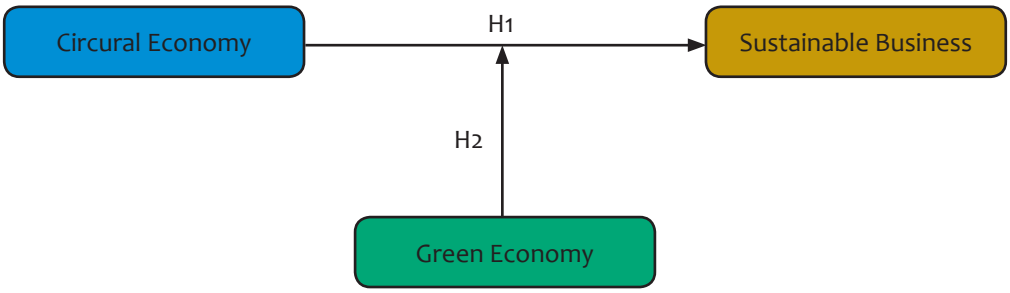

Figure 1 First Model. The green economy as a moderating variable in the relationship between circular economy and sustainable business

Model 2 has three hypotheses (Figure 2): H1, H2, and H3. Hypothesis H1 has been explained in the description of Model 1 because Model 1 and Model 2 have similarities in the hypothesis H1 section. Then, the next explanation is given to describe the background of hypotheses H3 and H4.

The steps that will be carried out in the analysis process in this study are as follows:

1. Comparing the first model and the second model through Partial Least Square (PLS) analysis with parameters using the SmartPLS tool

2. If the results obtained in the first model have better parameters than the second model, it means that the green economy function is a moderating variable. If the second model has better parameters, then the green economy is an intervening variable.
3. Based on the results of the comparison, the hypothesis will be answered whether the circular economy will affect business through the green economy or directly.

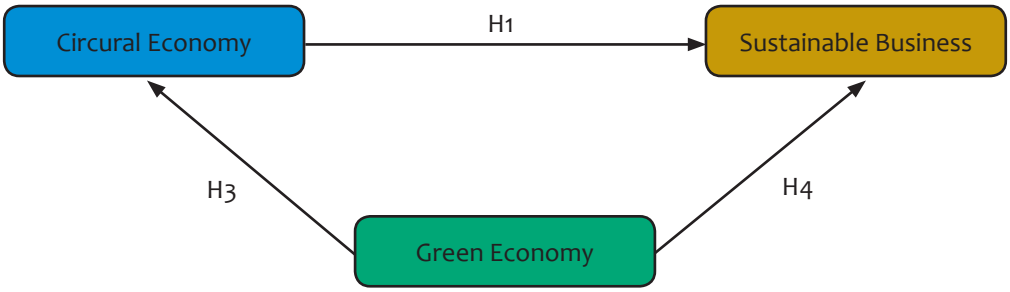

Figure 2 The second model. The green economy as an intervening variable in the relationship between circular economy and sustainable business

The constructs were adapted from previous studies and used a five-point Likert-type scale. Table 1 presents the measurement model in English, although the questionnaire was presented in Spanish.

Table 1 Research variables and dimensions

Factor	Dimension
Circular economy (European Commission, 2019)	Self-sufficiency in raw materials for production, Green public procurement*, Heaps of waste, Food waste, Recycling, Specific waste flows, Contribution of recycled materials to demand raw materials, Trade of recyclable raw materials between countries, Private investments, Jobs, Gross value added, Patents related to recycling (innovation)
Green economy (UNEP, 2012)	Green GDP, Cleaner Production*, Eco-efficiency*, Green Investment*, Sustainable Production and Consumption*, Green Life Style
Sustainable business (Laurell et al., 2019)	Business Network, Organizational Support, Corporate culture, Company reputation, Commitment and dedication, Sustainability reporting

Source: researcher's elaboration

RESULTS AND DISCUSSION

The PLS technique used is suitable for this study for various reasons. First, covariance-based structural equation modeling requires much higher sample sizes. Since PLS-SEM is based on OLS regression, it has minimum requirements regarding sample size (Hair et al., 2012). The findings of model reliability and convergent validity are presented in Table 2. In Table 2, all presented CR and AVE exceed the 0.70 recommendation (Sürücü & Maslakçi, 2020). In general, a minimum composite reliability of 0.60 is estimated accordingly (Bagozzi & Yi, 1988). Next, the average variance extracted (AVE) was estimated for each construct, thus ensuring the AVE was higher than 0.50 (Sürücü & Maslakçi, 2020). Therefore, it is concluded that the proposed model offers appropriate evidence of reliability, convergence, and discriminant.

Table 2 Reliability of the measurement model and convergent validity

Factor	Item	Loading Factor	CR	AVE
Circular economy	CE1	0.727	0.932	0.556
	CE3	0.779		
	CE4	0.724		
	CE5	0.733		
	CE6	0.720		
	CE7	0.809		
	CE8	0.725		
	CE9	0.706		
	CE10	0.734		
	CE11	0.769		
	CE12	0.767		
Green economy	GE1	0.867	0.837	0.720
	GE6	0.830		
Sustainable business	SB1	0.734	0.909	0.589
	SB2	0.837		
	SB3	0.819		
	SB4	0.704		
	SB5	0.816		
	SB6	0.740		
	SB7	0.710		

Notes: CR Composite Reliability; AVE Average Variance Extracted. *p < 0.05.

In Table 3, discriminant validity is checked. The joint variance between pairs of constructs is lower than the associated AVE (Fornell & Larcker, 1981). It is concluded that the proposed model offers appropriate discriminant evidence.

Table 3 Measurement of the validity of the discriminant model

	circular economy	green economy	sustainable business
CE1	0.727	0.298	0.491
CE3	0.779	0.359	0.551
CE4	0.724	0.335	0.449
CE5	0.733	0.416	0.422
CE6	0.720	0.378	0.413
CE7	0.809	0.423	0.486
CE8	0.725	0.329	0.423

CE9	0.706	0.371	0.448
CE10	0.734	0.719	0.506
CE11	0.769	0.741	0.583
CE12	0.767	0.701	0.542
GE1	0.616	0.867	0.558
GE6	0.503	0.830	0.548
SB1	0.519	0.657	0.734
SB2	0.541	0.543	0.837
SB3	0.546	0.478	0.819
SB4	0.411	0.399	0.704
SB5	0.540	0.526	0.816
SB6	0.555	0.443	0.740
SB7	0.381	0.386	0.710

This study used bootstrap (5000 re-samples) to propose standard errors and allowable t-value for individual sign changes (Hair et al., 2014).

R square for all dependent variables is above the 10% threshold level (Latan et al., 2017), thus revealing the predictive importance of the model (Henseler et al., 2015). By comparing the amount of R square in the first model and the second model (Table 4), it can be concluded that the first model has better parameters than the second one.

Table 4 Contribution of variables

	First model		Second model	
	R Square	**R Square Adjusted**	**R Square**	**R Square Adjusted**
Green economy	0.439	0.437	0.439	0.437
Sustainable business	0.530	0.525	0.516	0.513

The findings (Table 5) show that circular economy support has a positive and significant effect on sustainable business through a green economy (H1; b 0.31; t 21.308; p 0.001, b 0.042; t 13,355; p 0.000). GE, CE are intertwined in the science and practice of sustainability, and are used to frame sustainability challenges and to operationalize solutions by individuals, organizations, and authorities at local, national, and international levels. Taken together, the circular economy, green economy, and bioeconomy demonstrate the need for a new global society and economy that is based on renewable/reproductive processes, based on biodiversity and biodiversity-friendly, providing material and immaterial benefits that meet economic needs, and everyone's social requirements today and in the future (D'Amato & Korhonen, 2021).

The circular economy has a positive and significant effect on sustainable business (H2; b 0.068; t 5.583; p 0.000, b 0.055; t 7.95; p 0.000). It is interesting that it has been concluded that the circular economy affects the green economy more significantly than a sustainable business. The results are consistent with previous research which revealed that the circular economy affects sustainable business (D'Amato & Korhonen, 2021).

Sustainability is aimed at addressing the environmental and socio-economic problems of our and future generations. The circular economy is expected to overcome environmental problems by turning waste into resources, and bridging production and consumption activities, including business and stakeholder collaboration (Witjes & Lozano, 2016). In line with research conducted by Scheyvens et al. (2016), it underscores the enabling role of sustainable business, discussing the need to evolve from a static to a dynamic approach to sustainable practices. However, this phenomenon is influenced by the existence of cultural, organizational, and financial barriers that have a negative impact on SMEs' attitudes towards sustainable practices (Bartolacci et al., 2020). Within this context, our insight extends the existing knowledge about the circular economy business model in MSMEs by analyzing one of the main enabling factors identified by practitioners and policymakers (Blakstad & Allen, 2018).

Other findings also show that the green economy has a positive effect on sustainable business (H3; b 0.066; t 5.753; p 0.000, b 0.050; t 7.98; p 0.000).

Table 5 Hypothesis testing

	First model			Second model		
	standardize beta	T values	P Values	standardize beta	T values	P Values
Moderating Effect 1 → sustainable business	0.032	3.289	0.001			
H1: circular economy → green economy	0.031	21.308	0.000	0.042	13.355	0.000
H2: circular economy → sustainable business	0.068	5.583	0.000	0.055	7.950	0.000
H3: green economy → sustainable business	0.066	5.753	0.000	0.050	7.980	0.000

The results of this study show that community involvement affects the triple bottom line program process, where all lines of business lead to three aspects, including economic achievement, paying attention to the social sector, and maintaining environmental sustainability. Research on this topic contributes to academia and management. From an academic point of view, there are two main contributions. First, this study fills the gap in studies related to the circular economy that incorporates the concept of a green economy by conceptualizing a sustainable business. In addition, this study contributes to the literature regarding the green variable and sustainable business, for example, the role and contribution of stakeholders. Second, the findings reveal that the relationship between circular economists and sustainable business is perceived to be highly important through the role of the green economy. The challenge now faced by MSMEs based on sustainability is the development of environmentally friendly and sustainable businesses. Thereby, in terms of industrial practice, the findings of this study are relevant for stakeholders in policy-making and product innovation development.

CONCLUSION

Based on the findings of this study, it can be concluded that the green economy serves as both a moderating and mediating variable that strengthens the relationship between the circular economy and sustainable business. The circular economy has a positive and significant effect on sustainable business, both directly and indirectly through the green economy. This demonstrates that the adoption of green economy principles not only enhances the effectiveness of circular economy practices in creating sustainable value but also acts as a critical driver for business transformation toward sustainability. The contribution of this research to science

lies in providing a deeper conceptual understanding of the dual role of the green economy as a moderator and mediator within the sustainability framework, which has been rarely explored in the context of GRI-based MSMEs. However, this study is limited to a sample of MSMEs within the GRI community in Indonesia and relies on self-reported survey data, which may introduce potential subjective bias. Therefore, future research should broaden the scope to include other industrial sectors, employ longitudinal or mixed-method approaches, and consider additional variables such as technological innovation and regulatory support to provide a more comprehensive understanding of the interplay between the circular economy, green economy, and sustainable business development.

ORCID

Helin G. Yudawisastra https://orcid.org/0000-0002-4126-8025

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