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THE EFFECT OF GREEN INNOVATION ON SUSTAINABLE PERFORMANCE: THE MODERATION ROLE OF MANAGERIAL ENVIRONMENTAL CONCERN

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Abstract

This study aims to determine the effect of green product innovation and green innovation processes on sustainable performance. In addition, to find out whether the presence of managerial environmental concerns moderates the relationship. This study uses quantitative data analysis methods with non-probability sampling. The sampling technique used purposive sampling. The results of this study indicate that green product innovation has no effect on sustainable performance, but the process of green innovation has an effect on sustainable performance. In addition, managerial environmental concerns do not moderate the effect of green product innovation on sustainable performance, and do not moderate the effect of green innovation processes on sustainable performance. This study has implications for additional related literature and also bring better business performance and can creating business continuity for the future.

Keywords: Green product innovation, green process innovation, managerial environmental concern, sustainable performance

IINTRODUCTION

In the economy of Indonesia, Micro, Small and Medium Enterprises (MSMEs) are a part that plays an important role in helping to increase the growth of the Indonesian economy. Based on data from the ministry of cooperatives and SMEs, MSMEs have contributed to employment.

From 2010 to 2018, MSMEs can absorb more than 95 million workers each year; even the highest absorption generated by MSMEs was in 2015, amounting to 123.2 million workers. In addition to employment, MSMEs contributed to the growth of Gross Domestic Product (GDP); from 2010 to 2019, MSMEs contributed more than 56% of GDP each year. However, the Covid-19 Pandemic that began in 2020 caused a decrease in MSMEs' contribution to The GDP is quite large, namely be 37.3%.MSME businesses are the backbone of the economic system to reduce poverty problems and their developers can make a significant contribution in improving the regional economy and national economic resilience (Ariani & Suresmiathi, 2013). MSMEs in Buleleng grow very fast. Based on Online Data System (ODS) data at the Ministry of Cooperatives and Small and Medium Enterprises (MSMEs) of the Republic of Indonesia, in 2019 the number of MSMEs was 81,575 for all types of MSMEs in Buleleng. The development of MSMEs in the districts of Buleleng is growing very rapidly every year and can make a major contribution to the economic development of the Buleleng.

Economic development in recent years cannot go hand in hand with sustainable resource management and reduction in generating pollution (Wang & Song, 2014) Environmental pollution has become a concern for human stability in the future because of the growing environmental damage and the occurrence of global warming (C. M. Chen & Delmas, 2012). To solve growth problems economy which resulting in excessive energy consumption and increased environmental damage is a challenge for all business people (Zhang, 2011). With that in mind, one of the challenges at the moment is what ways that business people can do to achieve an ecologically sustainable life Huber (2004) one way to protect the environment in which we live, business people need to adopt an approach to preventing environmental pollution (Y. S. Chen, 2008). Companies are encouraged to be able to identify activities to create economic value but also to be more environmentally friendly as a consideration for increasing environmentally friendly business practices (C. M. Chen & Delmas, 2012). Adopting green practices is an important consideration for companies (Shu et al., 2014; Tseng et al., 2013). Many industries are changing to adopt a green mindset (Shu et al., 2014). Furthermore, more and more companies are considering green innovation as a critical approach to reducing their Negative Impact on the Environment (Albort-Morant et al., 2018; Chang, 2011; Li et al., 2017; H. Lin et al., 2014; Tseng et al., 2013).

Green innovation is another solution to meet environmental requirements and sustainable corporate growth (Chiou et al., 2011; R. J. Lin et al., 2013). Green innovation will imply that innovation in products, processes or business models leads companies to a better level of environmental sustainability (Triguero et al., 2013). Green innovation consists of green product innovation and green process innovation designed to reduce energy use and pollution, recycle waste and utilize resources sustainably. Environmentally friendly products involve the creation of goods or services that do not have a negative impact and minimize waste or reduce the company's negative impact on the environment (Wong et al., 2012).

Many empirical studies have examined the relationship between green innovation and performance, but still do not provide a clear explanation whether companies that adopt green innovation practices or do not adopt green innovation practices tend to be more profitable for their companies. In this case it is ambiguous as several empirical studies have found a positive relationship between green innovation and performance (Cheng et al., 2014; Hojnik & Ruzzier, 2016; Huang & Li, 2017; Shu et al., 2014) said that an increase in the prospects for green innovation organizations led to an increase in company performance as well as Charlo et al., (2015) shows that companies that are socially responsible, companies will earn higher profits for the same level of risk. However, there are several studies that also find a negative relationship between green innovation and performance which states that arguments in green innovation lead to reduced company financial performance (Driessen et al., 2013). Likewise Circuit (2011) that the application of green innovation can increase organizational costs. On the other hand (Aguilera-Caracuel & Ortiz-de-Mandojana, 2013) concluded that application of innovative companies green no significant effect on the increase in the company's financial performance. So is (Sinaga et al., 2019) shows the results found no relationship between managerial environmental concern for green process innovation with economic performance and green product innovation with firm economic performance. Many researchers have highlighted the extent to which green innovations can eventually be transformed into corporate performance which management is likely to shape (Przychodzen et al., 2016). Further empirical studies were carried out (Zheng et al., 2021) show that the dimensions of green finance which include social, economic and environmental aspects have a strong positive influence on a bank's sustainability performance. Therefore, the extent to which a company manager cares about

environmental conditions is very important in determining the success of the company in practice, sustainable development and improving company performance. Based on the supporting data and previous supporting research above, the authors are interested in continuing and re-examining this research.

The author wants to examine whether the role of variable moderator concern environment managerial (MEC) is influential in the relationship of green innovation (GPD, GPR) to the sustainable performance of MSMEs in Buleleng. The uniqueness of this study is to identify the moderating effect of MEC on green innovation and sustainable performance by using two forms of green innovation. This study examines the contribution of GPD and GPR in influencing company performance. Previous research has only examined contributions singly green product innovation (Albino et al., 2012; Driessen et al., 2013) or green process innovation (Tseng et al., 2013) or in general only green innovation Lee & Min (2015), besides that, this research focuses on SMEs.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

According to Chang (2011) green innovation is an important strategic catalyst for obtaining sustainable development, including technological innovations involved in energy saving, pollution prevention and waste recycling. Green innovation is also defined as all actions that can be taken by any person or organization to promote the development and implementation of improved processes, products, techniques and management systems that contribute to negative environmental impacts and achieve specific ecological objectives. The results of the study Tonay & Murwaningsari (2022) found that green intellectual capital and green innovation have a positive effect on firm value.

Environmentally friendly product innovation involves creating goods or services that do not have a negative impact and minimize waste or reduce the company's negative impact on the environment (Wong et al., 2012), stated that green process innovation is a production process with the use of environmentally friendly technology to produce goods and services reducing the negative impact on the environment.

- Concern Environment managerial

A number of studies highlight the extent to which green innovation can ultimately be transformed into corporate performance that management is likely to shape (Przychodzen et al., 2016). Managers' concern in directing the company on the path of sustainability is considered very important to drive green growth and performance(Lee & Min, 2015). Therefore, the extent to which company managers care about environmental conditions determines success in development practices sustainable and improve company performance. The success of an organization or company is related to its green relational capital in increasing their managerial capacity and technical skills, knowledge and to produce new goods faster and more efficiently (Tonay & Murwaningsari, 2022).

- Sustainable Performance

The results of the study Ospanova et al., (2022) concluded that both theoretically, petodologically and the development of a practical conceptual approach to green economy as a vector of sustainable development. Luciana Spica Almalia dan Dwi Wijayanto (2007) stated that economic performance is the performance of companies that relatively changes from year to year in the same industry which is marked byreturns company annual.

- Conceptual Framework

Based on KemenKOPUKM data (2018) which is still in use until 2020, the number of MSMEs has reached 64.2 million with a contribution to GDP reaching IDR 8,573.89 trillion (61.07%) (Kemenkop UKM, 2020). MSMEs are one part that plays an important role in helping economic growth in Indonesia. So that it can spur on the direction towards better MSMEs in terms of economy and empowerment. Currently, businesses are facing difficulties and fear of stability in the future due to increasing environmental damage due to industrial activities. Even though MSMEs have an important role in driving the national economy, adopting Green practices are an important consideration for companies now. Consumer demands, regulatory policies drive the need towards a more balanced balance for economic growth and environmental sustainability. The MSME industry is expected to pay attention to the products produced and industrial activities carried out in exploiting natural resources and disposing of waste as part of the production process so as not to result in damage to the environment.

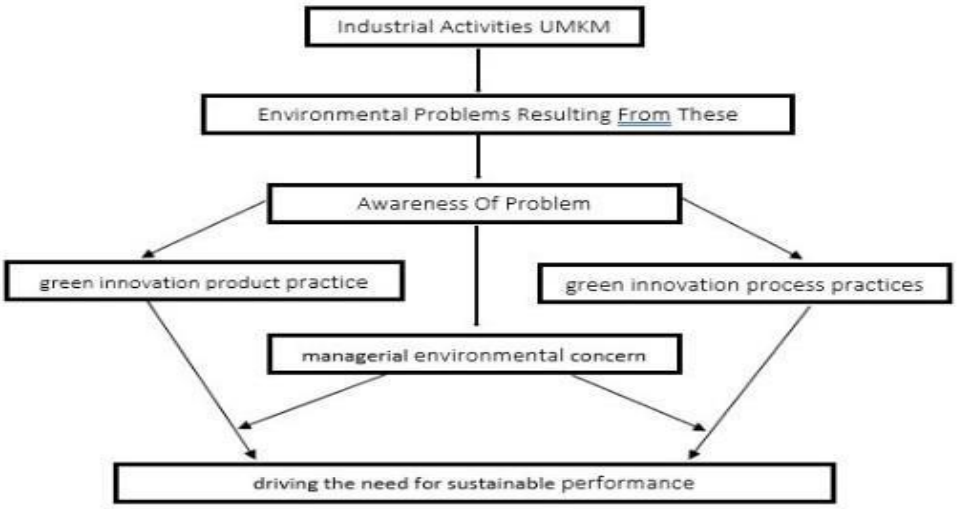

Figure 2.1 Conceptual Framework

- Green Innovation and Sustainability Performance

The results of a study Kasayanond et al., (2019) in Malaysia reveal that increasing green economy awareness among companies will encourage an increase in the level of environmental sustainability. Green innovation itself consists of green product innovation and green process innovation designed to reduce energy use and pollution, recycle waste and utilize sustainable resources. Environmentally friendly product innovation involves the creation of goods or services that do not have a negative impact and minimize waste or reduce the company's negative impact on the environment (Wong et al., 2012). Green process innovation is a production process using environmentally friendly technology to produce goods and services that reduce the negative impact on the environment (Wong et al., 2012) . Empirical research exploring the relationship between environmental performance and firm performance mixed findings(Lee & Min, 2015). Several empirical studies have found that there is a positive relationship between green innovation and performance (Cheng et al., 2014; Hojnik & Ruzzier, 2016; Huang & Li, 2017; R. J. Lin et al., 2013) it says that the increase in the prospects of green innovation organizations leads to an increase in company performance. As well Charlo et al., (2015) shows that companies that are socially responsible, companies will earn higher profits for the same level of risk. The analysis of the results of the research above led this researcher to the formation of the research hypothesis as follows:

H_1a: Green product innovation has an impact significant impact on sustainability performance.

- Green Innovation, Sustainability Performance, and Concern for the Managerial Environment

Support from the organization is essential to achieve successful innovation implementation. In addition, C.-Y. Lin et al., (2009) shows that the more support for innovation by management, the more willingness of companies to implement green innovation. Other empirical research has also found that managerial concern is the most motivating important for the adoption of green practices (Qi et al., 2010). The role of management in implementing green innovation can ultimately be transformed into company performance which cannot be ignored (Przychodzen et al., 2016). Furthermore, Dangelico (2015) argues that considering environmental aspects from the start is a factor determinant success green product development. In the case from women entrepreneurs on soth Africa, it was found that there were four driving factors for the transition to a green economy, namely green entrepreneurship education, the need for financial resources, a network program for green women entrepreneurs and the implementation of new green policies (Maziriri et al., 2019)

The intended managerial environmental concern is the awareness and responsibility of a manager in developing environmental sustainability which is currently very important for the sustainability of a business. Managers need to consider cheap product materials to decompose, recycling, ways to reduce costs such as: saving water, electricity and fuel oil. With these considerations can begin to improve environmental sustainability. The development of this green innovation product and process can have a positive impact not only for MSMEs but also for society improve health and environmental resource sustainability, reduce damage environment and maintain sustainability. This it is not only the reasons that managerial concern may be important in determining whether a firm will be implementing green innovation practices, but also that the level of attention can shape the combination of green innovation and sustainable performance of the company.

The analysis of the results of the research above led this researcher to the formation of the research hypothesis as follows:

H_2a: environmental management concern significant effect of moderating the relationship between green product innovation and sustainability performance.

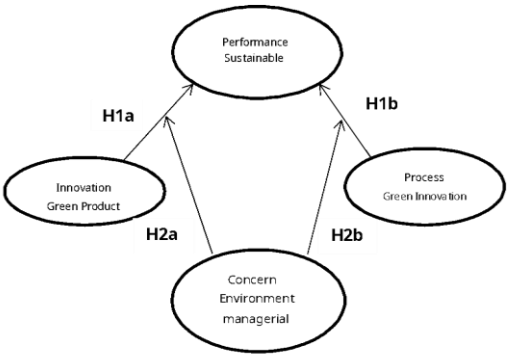

Figure 2.2 Research Model

RESEARCH METHOD

The type of research is Quantitative, the data used is primary data by distributing questionnaires online to MSME respondents. This study uses an approach to non-probability sampling by means of sampling technique purposive. The sample in this study is MSME owners in the districts of Buleleng who are engaged in the food and beverage production sector. The number of samples to be taken in this study is based on the Slovin formula as follows:

$$n = \frac{N}{1 + n\ (e)^2}$$

Information:

N = population size/population size

n = sample size/sample size

E = error tolerance limit (error tolerance)

Buleleng MSME population (N) = 81,575 assuming an error rate (e) = 10%, then the number of samples that must be used in this study is as much rounded to = 100 SMEs. So based on the calculation results above, to find out the sample size with an error rate of 10% is as many as 100 MSMEs in Buleleng. The variables in this study were measured using a Likert scale with a score scale of 1 – 4 = strongly disagree to totally agree. In this study a 4- point score scale was used to avoid respondents filling in with doubtful or neutral answers and being able to capture more accurate research data

The measurement model used is Variance Based Structural Equation Modeling (VB-SEM) with using smartPLS via Internal Consistency Reliability, Convergent validity, discrimanant validity,

and outer loading. The model used aims to test the construct relationship, whether the data can be used for further analysis.

RESULTS AND DISCUSSION

- Measurement Models

The measurement model is an analysis used to examine the relationship of a latent variable with its indicators. In the testing Measurement model there are 3 criteria in the use of data analysis techniques with SmartPLS consisting of convergent validity, internal consistency reliability and discriminant validity.

Table 2. Measurement Model of the application *Smart PLS*

Factors and Variabels	Loading	AVE	√AVE	Composite reliability	Cronbach's Alpha
Green Product Innovation					
My company slects product materials that consume the least amount of energy and resources	0.739				
My company saves on raw materials.	0.736	0.565	0.751	0.796	0.625
My company is scrupulous consider wich products are easy to recycle, reuse, and decompose	0.779				
Green Innovation Process					
My company effectively reduces emissions of hazardous materials or waste	0.797				
My company recycles waste and emissions allowing them to be treated and reused	0.768	0.575	0.758	0.802	0.634
my company conserves water, electricity, or oil usage	0.707				
Concern for their Managerial Environment					
For my company environmental innovation is an important component of the strategy	0.899				
The environmental innovation that my company has implemented has benefits for all parties	0.904	0.792	0.89	0.919	0.868

For my company environmental innovation is an effective strategy	0.866				
Sustainable Performance					
My company is doing environmental situation improvement	0.884	0.651	0.807	0.848	0.738
My company reduces waste (water/solid)	0.726				
My Company is getting more efficient in terms of waste management cost	0.803				

Source: Results of Data Processing (2022)

From table 2, the results in the table above show that the AVE root value is greater than the correlation between variables or AVE values. The AVE root value is 0.751 – 0.890. Comparison between the AVE value and the AVE root: first, green product innovation, namely from the AVE value of 0.565 to 0.751 on the AVE root value. The two processes of green innovation are from the AVE value of 0.575 to 0.758 at the AVE root value. Third, managerial environmental concern, namely from the AVE value of 0.792 to 0.890 at the AVE root value. Fourth, the sustainability performance, from the AVE value of 0.651 to 0.807 at the AVE root value, it can be concluded that the AVE root value of the 4 variables is greater than the AVE value and is acceptable.

- Structural Models

Tests on the structural model are carried out to examine the relationship between latent constructs. In testing the structural model or inner model it can be evaluated with several evaluation provisions (Hair et al., 2017).

First, Collinearity Test (VIF) is acceptable if it does not occur multicollinearity when the VIF value is greater > 0.20 and more <5. The VIF value is 1.876 – 2.334, so from these results it can be concluded that the VIF results are stated Valid and no multicollinearity occurs.

Second, R Square is the coefficient of determination on the endogenous construct. Score R square of 0.75 (good), 0.50 (moderate), and 0.25 (poor). Predictive level analyzed with R 2for the construct of sustainability performance is worth 0.621. This shows that the exogenous variables produce a good value to explain the endogenous variables.

Third, F Square can measure the effect of latent variables on other variables. According to Hair et al. (2017) Value f square Effects are divided into 3 categories, namely value f square effect

0.35 (large), 0.15 (medium), and 0.02 (small). size f2 shows that the green innovation process variable has a moderate effect on the sustainable performance variable with a value of 0.193, followed by managerial environmental concern which has a small effect on sustainable performance with a value of 0.077 and green product innovation has the smallest effect on sustainable performance with a value of 0.009. The effect of managerial environmental concern acting as a moderator on green product innovation and sustainability performance has a small effect with a value of 0.002 and managerial environmental concern acting as a moderator on green innovation processes and sustainability performance has a small effect with a value of 0.015.

Fourth, path coefficients According to Hair et al., (2017) said that path coefficients to show how important exogenous variables influence endogenous variables. The test results show that variable the green innovation process plays an important role in the sustainability performance variable with a value of 0.413, then followed by the managerial environmental concern variable which plays an important role in the sustainability performance variable with a value of 0.259 and finally the green product innovation variable which plays an important role in the sustainability performance variable with a value of 0.078.

Fifth, total effect According to Hair et al., (2017)said that the results total effect to evaluate how strong exogenous variables influence endogenous variables. The test results show that the green innovation process variable has a strong influence on the sustainability performance variable with a value of 0.413, followed by the managerial environmental concern variable that has a strong influence on the sustainability performance variable with a value of 0.259 and finally the green product innovation variable has a strong influence on sustainability performance variable with a value of 0.078.

Sixth, outer weights to determine which indicators are most important in one variable Hair et al., (2017) The test results show that the green product innovation variable on the indicators for considering recycled, reused and elaborated products has the most important value with a value of 0.542 compared to other indicators which only have a value of 0.420 and 0.363. From the green innovation process variable to the indicator of reducing emissions of hazardous materials or waste, the indicator has the most important value with a value of 0.519 compared to other indicators which only have a value of 0.417 and 0.376. From the managerial environmental

awareness variable to environmental innovation indicators, it is an important component of a strategy that has value the most important with a value of 0.542 compared to other indicators which only have a value of 0.332 and 0.349. From the sustainability performance variable on the company indicator improving the environmental situation has the most important value with a value of 0.884 compared to other indicators which only have a value of 0.726 and 0.803.

- Hypothesis Testing

The results of hypothesis testing can be seen in table 3 using values p- values below 0.05 and t-values above 1.96. In testing the first hypothesis, it shows that the effect of green product innovation on sustainability performance is value t-values of 0.876 below 1.96 and value p valuesof 0.381 above 0.05. This shows that green product innovation has no significant effect on sustainability performance. This is due to the lack of awareness and concern for MSMEs for environmental sustainability in the districts of Buleleng, such as: using raw materials that are not environmentally friendly, products that are difficult to decompose and not easily recycled. These things will have a negative impact on environmental public health and the sustainability of natural resources and it will be difficult to create a sustainable business in their business.

In testing the second hypothesis, it shows that the effect of the green innovation process on sustainability performance is value t-values of 3.365 above 1.96 and p values of 0.001 below 0.05. This shows that the green innovation process has a significant effect on sustainability performance. In the results of the study it can be seen that SMEs in the districts of Buleleng are starting to carry out green innovation processes such as not littering, saving electricity and water consumption so that MSMEs can save, reduce costs and start repairing environmental damage, by implementing this green innovation process it can bring a sustainable business for the future.

In testing the third hypothesis, it shows that managerial concern is moderate. The relationship between green product innovation and sustainability performance is with a t-value of 0.421 below 1.96 and a p-value of 0.674 above 0.05. This shows that managerial environmental awareness has no significant moderating effect on the relationship between green product innovation and sustainability performance. This is due to the lack of awareness and responsibility for the environment by managers that environmental sustainability is so important nowadays for the sustainability of a business.

Environmental issues have become one of the important factors that determine the sustainability of a business. Managers do not consider that running a business is not only a matter of profit but must also consider that directing business towards green product innovation is also very important for the environment, economy and business.

In testing the fourth hypothesis, it shows that managerial concern moderates the relationship between the green innovation process and sustainability performance with a t-value of 1.031 below 1.96 and a p-value of 0.303 above 0.05. This shows that managerial environmental awareness has no significant moderating effect on the relationship between green innovation processes and sustainability performance. The results of the research above show that the green innovation process with sustainability performance has no relationship to managerial environmental concern which acts as a moderator.

Table 3.Hypothesis testing

	Original Sample (O)	Sample Means (M)	Standard Deviation (STDEV)	T Statistic (O/STDEV)	P Value
Green product innovation -> Sustainability performance	0.078	0.085	0.089	0.879	0.381
Green innovation process -> Sustainability performance	0.413	0.406	0.123	3.365	0.001
Green product innovation -> Sustainability performance*Managerial environmental concern	-0.039	-0.048	0.093	0.421	0.674
Green innovation process -> Sustainability performance*Managerial environmental concern	-0.094	-0.082	0.091	1.031	0.303

Source: Results of Data Processing (2022)

DISCUSSION AND CONCLUSION

This study examined a sample of SMEs engaged in production in the districts of Buleleng. The variables are green product innovation, process of green innovation, concern for managerial environment, and sustainability performance. In this study, managerial environmental concern which acts as a moderator does not play a role in the process of green innovation and green

product innovation in sustainable environmental and economic performance in MSMEs in Buleleng districts. MSMEs do not have the awareness and concern to improve and develop their business to be better.

The limitations contained in the implementation of this research are as follows Researchers only examined a sample of SMEs engaged in production in the districts of Buleleng. The limitations of the variables used so that it is hoped that further research will need to add several other variables to enrich a more comprehensive analysis in the research model and also due to time constraints, the research was only carried out in the area of Buleleng districts.

Sustainable performance can be measured by two types, namely: environmental performance and economic performance. Where with these two performances MSME actors can create performance related to the environment and can improve the economy better so that the business being run can last longer. In order for green innovation and sustainable performance to be carried out properly, the role of a manager is needed in directing MSMEs to the path of sustainability to encourage green growth and performance, so that managerial environmental awareness is very important for every MSMEs.

This study shows the first test, green product innovation has no significant effect on sustainability performance. The second test, the process of green innovation has a significant effect on sustainability performance. the third test, Concern for the managerial environment has no significant effect in moderating the relationship between green product innovation and sustainability performance. fourth test, Concern for managerial environment has no effect significant in moderate the relationship between green innovation processes and sustainability performance. For future study expected to add more other variables in researching the research model, such as green management, green innovation strategy. MSMEs and managers are expected to start considering the application of green product innovation and green innovation processes in running their business. For study next expected to add more other variables in researching the research model, such as green management, green innovation strategy. MSMEs and managers are expected to start considering the application of green product innovation and green innovation processes in running their business.

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