

The Effect of Green Innovation on Business Sustainability Through Green Supply Chain Management as a Mediating Variable in Furniture SMEs in Yogyakarta Special Region

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ABSTRACT

This study shows how business sustainability (SB) is affected by Green Innovation (GI) and uses the mediating role of Green Supply Chain Management (GSCM) to explain the relationship. Quantitative descriptive method was used in this study. The population of this study is all owners and managers of furniture SMEs in the Special Region of Yogyakarta. The data analysis method used in this research is SmartPLS 3. The results showed that: 1) GI has an influence on Business Sustainability; 2) GI has an influence on GSCM; 3) GSCM has an influence on Business Sustainability; 4) GSCM mediates the influence of GI on the Sustainability of furniture SMEs in the Special Region of Yogyakarta.

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1. INTRODUCTION

Increased business competition, the emergence of social problems and unpredictable environmental changes make it difficult for companies today to achieve business sustainability in the long term [1]. This has also happened in various types of businesses such as SMEs which are facing various pressures to adjust their business strategies to achieve business sustainability, market awareness of increasing environmental damage forces SMEs to face challenges to adapt to become more environmentally friendly. In addition, it must also be able to reduce production costs to remain competitive in increasingly fierce business competition while continuing to

maintain the safety of the surrounding environment [26].

Given these limitations, in recent years, research has highlighted the importance of business sustainability for manufacturing industries, particularly in developing countries, as manufacturing industries still tend to overlook the negative impacts on society and the environment during the production process. Their main focus is how to produce production costs as cheaply as possible, although the excessive extraction excessive of natural raw materials and the use of environmentally hazardous raw materials are still quite high, which will eventually make environmental pollution increase and will threaten public health [8]. So with the business sustainability approach, companies will be able to create strategies that

can balance economic, social and environmental aspects that not only increase financial performance but also strengthen corporate social responsibility to preserve the environment [25].

Indonesia as a developing country whose economy grows from the contribution of SMEs, this is a challenge for SMEs in how to manage the production process by adopting environmentally friendly practices to achieve business sustainability. Moreover, the conditions in the Indonesian industry still have considerable potential in overexploiting natural raw materials and generating high residual production waste, this happens because SMEs pay little attention to environmental aspects and only focus on reducing production costs [12]. Given that sustainability has become an important part of all businesses today, companies need a management approach that is able to combine the three dimensions of business sustainability, this is important in order to have a resilient supply chain and be able to adapt well in the long term [11].

Furniture SMEs in Yogyakarta is currently still one of the industries that has the potential to continue to grow, but the furniture industry is still considered as one of the industries that produces high production waste without further processing, finally just burned so that it becomes the main cause of air pollution for local residents. In addition, furniture SMEs also still consume significant tree wood raw materials due to the lack of knowledge of SMEs to optimize the use of existing wood and if left unchecked, it will interfere with natural conditions when exploited excessively and illegally. So to achieve business sustainability, the furniture industry continues to try to carry out various strategies in order to survive economic competition and environmental changes so as to create a balance between production, social and environmental.

With increasing business competition, environmental issues and limited resources have become research topics that focus on utilizing Green innovation to achieve sustainability [16]. When companies

will practice environmentally friendly to achieve business sustainability is strongly influenced by Green innovation [27]. Where according to [23] Green innovation is described as an activity to adopt the latest technology, eliminate waste of raw materials, compliance with regulations, cost savings and development of capabilities that will improve internal and external operating processes, ultimately resulting in products with minimal environmental pollution.

Evidence from previous research shows that Green Innovation is important for businesses because it can have a significant impact on the progress of the production process with technology that is able to maximize the use of raw materials and for residual raw materials to be put to good use, so as to achieve business sustainability quickly. [24], but the findings between Green Innovation and business sustainability show that it is still not consistent, especially in developing countries because to implement Green Innovation is not easy, there are aspects that need to be considered, ranging from the high cost of research and development of green products to the difficulty of changing the ecosystem of organizational performance suddenly [16],[22]. So with Green Innovation will create new product innovations or product improvements that are able to reduce various environmental impacts, reduce energy use, reduce pollution and the amount of waste which in turn will create a good environmental management system to achieve business sustainability [19].

For the sustainability of the furniture industry is currently still dependent on raw materials, mainly wood that comes from nature but sometimes obtained by force and illegally which can damage natural conditions, so there needs to be an appropriate supplier strategy to manage so that the furniture industry can achieve sustainability. Furniture SMEs need to see social demands to be more environmentally friendly as a very important part of their business, starting with the selection of safe suppliers, then conducting efficient and environmentally friendly production, as well

as thinking about management approaches that are able to jointly combine economic, social and environmental when designing supply chains.

So the sustainability process has become an important part of the supply chain, in order to care more about environmental conditions and society. In a deteriorating environmental situation, unpredictable climate change and natural disasters make supply chains very unstable [21], so the idea of Green supply chain is the answer to the sustainable process. Green supply chain is based on good management of the environment and manufacturing [13]. Green supply chain management is a strategy that involves the entire supply chain to ensure the course of the supply chain will be safe for the environment and reduce adverse impacts on public health [15].

In Green Supply Chain it is important to create innovative environmentally friendly products that are designed to be environmentally friendly by utilizing the knowledge that the company has, then pass on this environmentally friendly philosophy to the entire supply chain, which will ensure that it will further strengthen the entire supply chain to follow an environmentally friendly orientation and in the process will encourage relevant stakeholders to participate in greening nature which can ultimately strengthen business sustainability in the company [2]. There are already many businesses that have used Green supply chain management resulting in environmentally friendly products and services that contribute to environmental sustainability so companies such as furniture SMEs also need to align the Green supply chain approach as a sustainability strategy which will ultimately strengthen the performance of SMEs to achieve sustainability [15].

This is in line with Institutional theory where the high demands of the community to be more environmentally friendly and demands from related agencies put pressure on organizations to change their business models or operational processes. Institutional pressure from the government

through regulations or legislation can also force organizations to force changes in their business activities [9], so this theory in organizations can help understand how influences from the external environment can shape behavior or practices to match the expectations of the surrounding environment, which in turn the organization is able to meet all stakeholder desires by getting great support from customers.

So that in this study includes Green supply chain variables as mediation between Green Innovation and Business sustainability because the role of the Green supply chain will make environmentally friendly processes run throughout the supply chain both from the beginning of the process to the production process which will ultimately improve company performance. Green supply chain as a bridge and encouragement for companies to move towards sustainability and spread throughout the supply chain which will strengthen the implementation of environmentally friendly practices [3],[7]. With the green supply chain, it can facilitate changes in corporate culture to increase green innovation to be spread throughout the supply chain, which will strengthen and accelerate the green implementation process which in turn the company can quickly realize business sustainability.

2. LITERATURE REVIEW

2.1 Green Innovation

Green innovation according to [19], the process of creating new product innovations or improving products that reduce environmental impacts by reducing energy use, reducing pollution and the use of product waste that can be recycled through a good environmental management system with environmentally friendly product design and by adopting green technology. Indicators of green innovation [6]:

- 1) Green product innovation
- 2) Green process innovation

2.2 Green Supply Chain Management

Green supply chain management, according [14] is an activity that uses environmentally friendly processes and

converts them into environmentally friendly results so that under certain conditions they can be reused in their life cycle, ultimately creating a sustainable supply chain. This process will create efficiency and cooperation between business partners to help reduce environmental impacts and ultimately reduce production costs. Indicators for Environmentally Friendly Supply Chain Management are [5]:

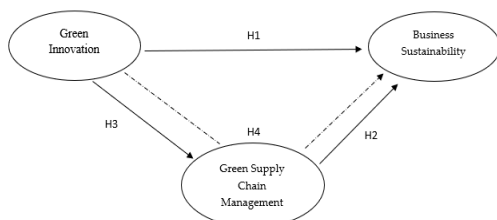
1. Eco-Design
2. Investment recovery
3. Green purchasing
4. Internal environmental

2.3 Business Sustainability

Business Sustainability according to [20] is a company action to maintain, build and protect resources in order to meet the needs of available resources based on current economic conditions or situations. current economic conditions or situation. Business Sustainability Indicators [25]:

- 1) Economic Performance
- 2) Social Performance
- 3) Environmental Performance

2.4 Hypothesis



H1: Green Innovation has a positive and significant effect on Business Sustainability.

H2: Green Supply Chain Management has a positive and significant effect on Business Sustainability.

H3: Green Innovation has a positive and significant effect on Green Supply Chain Management.

H4: Green Innovation has a positive and significant effect on Business Sustainability through the mediating role of green supply chain.

3. METHODS

Quantitative descriptive methods were used in this research. The population used is all furniture SMEs in the Special Region of Yogyakarta. so the number of samples in this study was 50 SMEs. The sampling technique for this research uses saturated sampling with a questionnaire. Primary data is used in this research. The data analysis tool used for hypothesis testing is the SmartPLS 3 software application.

4. RESULTS AND DISCUSSION

4.1 Descriptive Analysis of Respondents

The results of the study provide findings that respondents as managers are more dominant than owners, namely 38 respondents or equivalent to 76% of the total respondents. The respondents' educational background is dominated by undergraduates as many as 39 respondents or equivalent to 78% of the total respondents. For the length of business sesponden dominated 11-15 years as many as 21 respondents or equivalent to 42%. Furthermore, the number of employees in SMEs is dominantly in the range of 5 people to 25 people as many as 45 respondents 90% and this finding shows that the most dominant income of respondents is in the range of Rp200,000,000 to Rp600,000,000 as many as 24 respondents 48%. Respondent characteristics are presented in Table 1.

Table 1. Respondents Characteristics

Respondent Identity	Category	Frequency	Percentage
Position	Owner	38	76 %
	Manager	12	24 %
	Total	50	100 %
Education	SMA/SMK	11	22 %
	Sarjana	39	78 %

	Total	50	100 %
Length of Business	1 – 5 years	4	8 %
	6 – 10 years	20	40 %
	11 – 15 years	21	42 %
	16 – 20 years	5	10 %
	Total	50	100 %
Employees	5 – 25 Employees	45	90 %
	26 – 50 Employees	5	10 %
	Total	50	100 %
Annual Income	Rp. 300Jt – Rp. 600Jt	24	48 %
	Rp. 60t1 – Rp. 900Jt	21	42 %
	Rp. 901Jt– Rp. 1,2 M	5	10 %
	Total	50	100 %

Source: Processed primary data, 2024

4.2 Measurement Model Analysis

After assessing the characteristics of respondents, it can be seen that all variables show reliability and validity as seen in Table 2. Outer loading of each item has exceeded the threshold of 0.5. Furthermore, the Average Variance Extracted (AVE), Cronbach Alpha

and Composite Reliability values have exceeded the threshold of 0.50, 0.60 and 0.70 respectively. To assess discriminant validation, the Fornell-Larcker Criterion and Heterotrait-Monotrait Ratio (HTMT) were used as shown in Table 3.

Tabel 2. Reliability and Validity

Variable	Items	Outer Loadings	Cronbach Alpha	Composite Reliability	AVE
Green Innovation	X1.1	0.697	0.856	0.890	0.505
	X1.2	0.763			
	X1.3	0.776			
	X1.4	0.622			
	X1.5	0.638			
	X1.6	0.732			
	X1.7	0.774			
	X1.8	0.661			
Green Supply Chain Management	Z1.1	0.654	0.943	0.950	0.544
	Z1.2	0.629			
	Z1.3	0.623			
	Z1.4	0.603			
	Z2.5	0.624			
	Z2.6	0.689			
	Z2.7	0.814			
	8	0.851			
	9	0.796			
	10	0.801			
	11	0.786			
	12	0.708			
	13	0.793			
	14	0.753			
15	0.764				
16	0.843				

Business Sustainability	Y1.1	0.646	0.926	0.937	0.578
	Y1.2	0.828			
	Y1.3	0.767			
	Y1.4	0.868			
	Y1.5	0.761			
	Y1.6	0.689			
	Y2.7	0.708			
	Y2.8	0.753			
	Y2.9	0.810			
	Y2.10	0.752			
	Y2.11	0.754			

Source: Processed primary data, 2024

Tabel 3. Fornell-Lacker Criteria

	Green Innovation	Green Supply Chain Management	Business Sustainability
Green Innovation	0.710		
Green Supply Chain Management	0.755	0.738	
Business Sustainability	0.660	0.684	0.760

Source: Processed primary data, 2024

Tabel 4. Heterotrait-Monotrait Ratio (HTMT)

	Green Innovation	Green Supply Chain Management	Business Sustainability
Green Innovation			
Green supply chain management	0.826		
Business Sustainability	0.719	0.715	

Source: Processed primary data, 2024

4.3 Structural Model Analysis

The next step is the structural model. Predictive relevance (Q2) and coefficient of determination (R2) were used to evaluate the structural model. The research model was distinguished and assessed using the R2 value. Table 5 displays the R-square value for the Business Sustainability variable, which is 0.515. This indicates that 51.5% of the variation in the Business Sustainability variable can be explained by the model based

on the Green Innovation and Green Supply Chain Management variables, and the remaining 48.5% can be explained by other variables. The ability of the model to explain the Green supply chain variable is 57.0%, with the remaining 43.0% explained by other factors, according to the R-square value of 0.570 for the Green Supply Chain Management variable.

Tabel 5. R-Square (R²)

Variable	R ²
Green supply chain management	0.570
Business Sustainability	0.515

Source: Processed primary data, 2024

4.4 Hypothesis Testing

Based on the results obtained through the bootstrapping process presented in Table 6, it can be seen that Green Supply Chain Management (GSCM) shows a significant positive influence on Business Sustainability (BS) ($\beta = 0.431$, $p < 0.009$). In addition, GI also shows a significant positive influence on

GSCM ($\beta = 0.775$, $p < 0.000$). Green Innovation (GI) has a significant positive effect on Business Sustainability (BS) ($\beta = 0.334$, $p < 0.029$). On the other hand, it should be noted that GI shows a positive and significant influence on Business Sustainability through GSCM ($\beta = 0.326$, $p < 0.012$).

Table 6. Path Coefficients Test Results

Path	Original Sample	T-Statistic	p-Value	Decision
GI -> GSCM	0,775	1,014	0.000	Accepted
GI-> SB	0.334	2.187	0.029	Accepted
GSCM -> SB	0.431	2.614	0.009	Accepted
GI -> GSCM -> SB	0.326	2.512	0.012	Accepted

Source: Processed primary data, 2024

DISCUSSION

Based on the results of hypothesis testing, GI significantly and positively affects BS, supporting hypothesis H1. Previous research showing a positive effect of GI on BS also corroborates this conclusion [4].

Based on the results of hypothesis testing, GSCM significantly and positively affects BS, supporting hypothesis H2. Supporting evidence for this conclusion is previous research showing the positive potential of GSCM on BS [1] [27].

Based on the results of hypothesis testing, GI significantly and positively affects GSCM, supporting hypothesis H3. In addition, previous research has shown that GI can positively influence GSCM [10].

Hypothesis H4 is confirmed by the hypothesis testing results, which show that GI

significantly and positively influences BS through GSCM. Previous research showing that GI can positively influence BS through GSCM [17] also supports this conclusion.

5. CONCLUSION

This study shows several findings, namely GI has an influence on BS. GSCM has an influence on BS. GI has an influence on GSCM. GI has an influence on BS through GSCM. Based on the results of this study, it is known that all variables are good, but the company still maintains and develops green supply chain management and green innovation strategies so that the production process can run well and be able to achieve long-term business sustainability.

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