

The Role of Green Product Innovation and Market Advantage on Performance, Case of Transportation and Logistics Services

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Abstract

Sustainable development is constructed based on the understanding that conflicts between the economy and the environment can be overcome if it is organized in such a way that production activities would not cause adverse impacts on the environment. The objectives of this research are 1) to identify the relationship between green product innovation, environmental performance, market advantage, and financial performance, 2) to study whether green product innovation and environmental performance can improve financial performance through market advantage. This research was conducted by taking the case of the largest transportation and logistics company in Indonesia. Primary data were processed using SEM-PLS. The results of this research showed that the green product innovation policy could improve environmental performance, but could not improve financial performance simultaneously. Green product innovation could not significantly improve market advantage and financial performance. However, market advantage could significantly encourage the improvement of financial performance.

Keywords

Green Product Innovation, Environmental Performance, Market Advantage, Financial Performance, Transportation and Logistics, SEM-PLS.

Introduction

Various problems arising from traditional economic development have led to the need to reconsider the implementation of current development. The biodiversity, fuel, food, water and financial crises affecting the entire global economic system have prompted and accelerated the crystallization of a new economic development paradigm. One of the outcomes of the G20 in Bali emphasized on the importance of strengthening an inclusive and sustainable recovery while focusing on social protection and green economy. Restoration that invests sustainably in the green economy is believed to contribute to achieving Sustainable Development, stimulating decent and green-oriented job employment, and increasing people's resilience to climate shocks (Verma, 2024). The roles of companies are crucial, as

without their cooperation, it is difficult to make the world becomes cleaner. New technologies and well-designed policies must go hand-in-hand. The interests of governments, companies, and the environmental organizations lie in turning a cleaner environment into an opportunity for profit (Cairncross, n.d.).

Resource-Based Value (RBV) companies state that the competitive position determines the collection of resources owned by a company (Wernerfelt, 1984). The definition of resource review was expanded by Barney (1991) that organizational resources which are valuable, rare, inimitable, and irreplaceable can generate sustainable competitive advantages. Companies that are overly committed to certain resources will find it difficult to acquire new resources or capabilities. They must be able to respond to environmental changes through the development of new resources. Hart argues that, "one of the most important drivers of new resource and development capability for firms will be the constraints and challenges posed by the natural (biophysical) environment (Natural Resource-Based Value/NRBV). NRBV company is the adaptation of RBV company, which is needed due to natural environmental demands (Hart, 1995).

The companies should focus on their responses, such as waste and emissions reduction, solid waste reduction

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and recycling, conservation of energy and other natural resources, as well as reduction of business impacts on the ecosystem. In addition, company will have to develop their internal resources to compensate for the lack of available natural resources. Hart (1995) suggested that "on the next decade, business industry will be challenged to create new strategy concepts, and it is likely that the foundation for gaining competitive advantage in the coming years will increasingly be rooted in a set of emerging capabilities, such as waste minimization, environmentally friendly product design, and technological cooperation in developing countries." In the future, those companies will be able to secure resources and develop competencies to cope with the evolving challenges of natural environmental constraints.

Sustainable development is constructed based on the understanding that the conflict between economy and environment can be overcome if it is organized in such a way that production activities would not cause adverse impacts on the environment. Transition towards sustainable production and consumption can be conducted by improving resource efficiency, reducing fossil energy use, minimizing toxic waste towards a green economy approach. Green innovation generates processes and products which minimize consumption of resources and reduce waste and pollution (Abbas, J., & Sagsan, 2019). Eco-friendly product innovation aims to design and develop eco-friendly products while reducing negative impacts of its life cycle on the environment (Xie et al., 2019). In addition, green process innovation aims to systematically increase all operation and management processes to utilize resources and energy efficiently, promote design and production of green products, and set the foundation for green product innovation (Li et al., 2017).

Traditional development concept stated that the improvement of environment performance can be seen as an economic burden for companies and it gave adverse impacts on economic performance and corporate competitiveness (Yook et al., 2018). On the other hand, in his research (Kam-Sing Wong, 2012) stated that green process innovation can help companies in producing green product by utilizing innovation advantage. Green economy development can improve the welfare of the people without causing negative effects on the environment, ecological scarcity, and social inequality. This idea then brings a greater awareness and commitment to the environmental and social pillars of economic development planning. The green economy can help improve product quality, expand new products, and thus increase the company's market share (Damanpour, 2010). Green Product Innovation (GPI) is defined as practice for new product development which "reduce negative impacts and risks toward en-

vironment, use less resources, and prevent waste" to generate products which give "higher environmental benefits than conventional products" (Lin et al., 2013). In contrast to the correlation between GPI and environmental performance, the relationship between GPI and corporate financial performance remains unclear. From the RBV, GPI can be seen as the realization of a set of resources and capabilities, explain why empirical studies on the relationship between GPI and overall firm performance produce varied results (Lin et al., 2013). This is still debatable and requires in-depth research. If green innovative activities are not successful in improving financial performance, there is no economic motivation that encourages companies to continue to carry out innovation activities in developing new green products. Based on this background, it is important to test how capable Green Product Innovation could improve environmental performance and financial performance simultaneously, by involving Market Advantage as an intervening variable.

Research problems are formulated as follows:

1. How is the correlation between green product innovation, environmental performance, financial performance, and market advantage in transportation and logistic companies in Indonesia?
2. Is green product innovation able to improve environmental performance and financial performance simultaneously through market advantage?

This research aims to study and analyze the impacts of:

1. Green product innovation on environmental performance
2. Green product innovation on market advantage
3. Environmental performance on market advantage.
4. Green product innovation on financial performance
5. Market advantage on financial performance
6. Environmental performance on financial performance

Literature review

Green Product Innovation (GPI)

Eco-friendly product is defined as product which use less resources, has lower impacts and risks of environmental damage, as well as prevent the generation of waste (Communities, 2001). Green product innovation is related to changing products to use non-polluting materials, making products from recycled materials, using environmentally friendly packaging, taking into account the end of service life and disposal. Green product innovation is the highest level of green technology innovation, as it provides methods to eliminate pollutant emissions at its source (Chen, J. & Liu, 2019; Tang et al., 2018; Wang et al., 2019).

Environmental Performance (EP)

Environmental performance can be seen through macro and micro dimension. Micro environment performance reflects environment legitimization from company operations, while macro performance evaluates long-term effort of company in pollution control, natural resource protection, and ecological restoration (Boons, F. & Wagner, 2009). A number of previous research has concluded that green technology innovation brings positive effects on environmental performance of the company (Du et al., 2019; Kraus et al., 2020; Mahto et al., 2020).

A research (Wang et al., 2021) concluded that green technology innovation can be divided into green process innovation and green product innovation, both can improve financial and environmental performance of companies. This research has built a theoretical model of economic performance transmission for green technology innovation and upgrades, and conducted an empirical analysis based on data from 642 industrial enterprises in China. Environmental performance is a mediating variable between green technology innovation and economic performance.

Market Advantage (MA)

Green technology innovation help companies win over consumers, enhance brand reputation, and create premium eco-friendly products (Tu & Wu, 2021; Zameer et al., 2020). Green technology innovation can fulfill the growing demand for green consumption. Companies can reach cost efficiency, differentiate their products from competitors' products, be competitive, and create a green brand image in order to gain consumer trust and finally obtain higher market competitiveness (Sellitto et al., 2020; Sueyoshi & Wang, 2014).

Financial Performance (FP)

Green technology innovation is related to environmental management agenda, and is believed to improve environmental performance of companies (Adegbile et al., 2017). Green process and green product innovation do not only minimize the negative impacts, but also reduce the waste of resources by minimizing costs, thereby effectively improve companies' social and financial performance (Weng et al., 2015). At the same time, recycling waste can generate additional revenue (Wang et al., 2019),

Another research (Aivazidou et al., 2018) concluded that a strong green corporate image is important to influence financial performance of companies. Consumers who perceive the brand favorably will trust the company and its products more (Lee & Chen, 2019). Other research also suggested about the importance

of green innovation in gaining competitive advantage (Chang, 2018); Chu et al., 2019; Takalo et al. 2021), and to achieve better company performance (Weng et al., 2015; Xie et al., 2019). Moreover, other study (Lin et al., 2013) found that environmental performance has positive effects on improving financial performance of motorcycle companies in Vietnam. A research also (Nishitani et al., 2017) concluded that the company's attitude towards environmental management can improve its financial performance by improving its environmental performance. Various researches conclude that green product innovation has positive effects on improving company performance (Weng et al., 2015; Zhou et al., 2018; Baah et al., 2020; Mohsin et al., 2020; Rehman, 2020; Ma et al., 2021).

Empirical research conducted by Andersén (2021) on 305 small industries in Sweden, revealed that there is a positive relationship between Green Product Innovation and company performance through differentiation advantages. Wang et al. (2021) proposed that green product innovation has an indirect effect on financial performance, but it is directly influenced by market competition, environmental performance and green process innovation. Green product innovation is believed to help develop company image to new business opportunities and competitive advantages (Yook et al., 2018). The development of sustainable development concept has encouraged researchers to conduct qualitative and quantitative analyses and concluded that there is a close relationship between environmental performance and company economic performance (Ma et al., 2021; Sharma et al., 2021). However, so far the researcher have not found similar research on this subject in the Indonesian context, so this research is necessary to conduct. This research established a research model as follows:

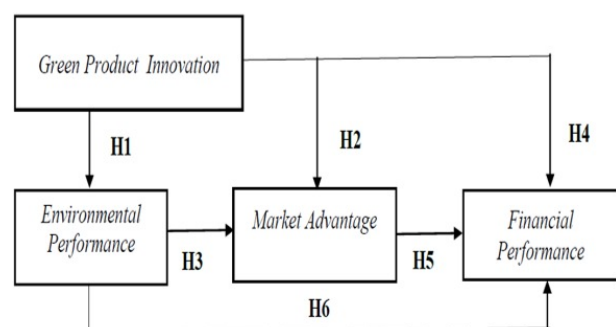


Fig. 1. Research Model Framework

Figure 1 shows that the implementation of eco-friendly strategies (green product innovation) is expected to bring positive effects on improving envi-

ronmental performance, and financial performance through Market Advantage, so the hypotheses were formulated as listed below:

H1 = Green product innovation has positive effects on environmental performance

H2 = Green product innovation has positive effects on market advantage

H3 = Environmental performance has positive effects on market advantage

H4 = Green product innovation has positive effects on financial performance

H5 = Market advantage has positive effects on financial performance

H6 = Environmental performance has positive effects on financial performance.

Materials & Methods

Research Location, Research Type and Data Source

The research location was conducted at the largest transportation and logistics service company in Indonesia. Until 2020, the company had branch offices in 26 cities in Indonesia, to support its business activities and had developed into a leading company in vehicle rental services. The type of this research based on its explanation is categorized a casual associative research. The data measurement scale used the semantic differential scale. The population is the company's leaders and employees, all branches in Indonesia that are directly involved in the implementation of the green economy. This study uses primary data, collected in April 2024, with a sample size of 100 respondents. This figure fulfilled the requirements (Hair et al., 2017a).

Variable Operationalization

Table 1, 2, 3 and 4 show the variable operationalization, consisting of the green product innovation variable, market advantage, environmental performance and financial performance.

Data Collection

The research used primary data in the form of a Google form. Sampling was included in the non-probability sampling category with purposive sampling technique. Determination of respondents who were included as samples was based on certain criteria and researcher's judgment.

Data Analysis Method

Data analysis tools used in this research was structural equation modelling (SEM-PLS). The analysis steps are as follow:

1. Referring to the research framework in Figure 1, the structural equation model is formulated as follows:

$$EP = \beta_1 GPI + e_1 \dots \dots \dots (1)$$

$$MA = \beta_2 GPI + 3EP + e_2 \dots \dots \dots (2)$$

$$FP = \beta_4 GPI + 5MA + 6EP + e_3 \dots \dots (3)$$

Expected signs $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6 > 0$

where:

GPI = Green product innovation

EP = Environmental performance

MA = Market advantage

FP = Financial performance

2. Data analysis tools used PLS applications, by conducting: Validity Test, Reliability Test, Goodness of Fit Test, and Hypothesis Test. SEM-PLS was

Table 1
Variable Operationalization of Green Product Innovation

Variable	Indicator	Code
Green Product Innovation	Have a definition, identification, and purpose of green products	GPI1
	Developing service processes that take into account environmental health and energy efficiency	GPI2
	Measurement of the achievement of sustainable programs from green products	GPI3
	Services offered using eco-friendly goods/materials	GPI4
	Information to customers about products/services that emphasize green and sustainable approach	GPI5
	Information on products/services related to occupational health and safety impacts and how its handling	GPI6

Source: (Ar, 2012; Chen & Liu, 2019; Lin et al., 2013; Ma et al., 2018; Xie et al., 2019).

Table 2
Variable operationalization of Market Advantage

Variable	Indicator	Code
Market Advantage	Company's eco-friendly image is higher than its competitors	MA1
	Company's overall market competitive advantage is greater than its competitors	MA2
	Market share of company's products is increasing faster than its competitors	MA3
	Proportion of company's R&D investment is higher than its competitors	MA4
	Customer satisfaction with the product is higher than its competitors	MA5

Source: (Dong et al., 2014; Huang et al., 2016; Sellitto et al., 2020)

Table 3
Variable Operationalization of Environmental Performance

Variable	Indicator	Code
Environmental Performance	Reducing the quantity of domestic solid waste disposal in the production/operational processes	EP1
	Meeting regulations and strengthen environmental management standards	EP2
	Proportion of qualified waste disposal reaching top level in the industry / Reduction in quantity of waste (liquid, solid, gas) that is untreated/does not meet quality standards	EP3
	Reducing environmental pollution by adhering to environmental quality standards	EP4
	Reduction in energy and water consumption per unit of product (efficiency achieved in the past 1 year)	EP5
	Achieving greenhouse gas reduction target	EP6
	Owning and using 3R products in operational processes	EP7

Source: (Chan et al., 2016; Long et al., 2017; Yook et al., 2018)

Table 4
Variable Operationalization of Financial Performance

Variable	Indicator	Code
Financial Performance	Profitability of new product reaches top level in the industry	FP1
	New product sales increases as a percentage of total sales	FP2
	Company profitability is increasing faster than its competitors	FP3
	Company's return on assets is increasing faster than its competitors	FP4
	Company productivity is increasing faster than its competitors	FP5

Source: (Dong et al., 2014; Huang & Li, 2017; Ma et al., 2021; Yook et al., 2018)

chosen because of its application in exploratory and confirmative research and its ability to analyze complex topics with limited data. This research framework was developed using several pre-existing theories. SEM-PLS was conducted through data testing with several stages of outer and inner model tests.

Results

Respondent Characteristics

The respondents in this research were leaders and employees of the largest transportation and logistics company in Indonesia. As many as 100 respondents

from various regions of Indonesia were involved, and this figure fulfilled the requirements needed for analysis with the Structural Equation Model (Hair et al., 2017a). The questionnaires were distributed with the following respondent characteristics (Table 5).

Table 5
Respondent Characteristics

Gender	Total
Male	73
Female	27
Total	100
Age	Total
20 – <25 Years-old	6
25 – <30 Years-old	14
30 – <35 Years-old	28
35 – 40 Years-old	26
>40 Years-old	26
Total	100
Period of Employment	Total
<5 Years	24
5 – <10 Years	7
10 – <15 Years	29
15 – <20 Years	16
≥ 20 Years	24
Total	100
Sub-Business Unit (SBU)	Total
Head Office	53
TRAC	34
SLI	6
HMU	3
UAS	2
IBID	2
Total	100
Department	Total
GA	49
CSR	2
HSSE	35
CSR, HSSE	2
GA, HSSE	2
GA, CSR	1
GA, CSR, HSSE	9
Total	100
Position	Total
Staff	34
Officer	40
Analyst	22
Total	100

Note: Health Safety Security Environment (HSSE), General Affairs (GA), and Corporate Social Responsibility (CSR)

Outer model test: Convergent Validity

The convergent validity value was identified from the loading factor value on the latent variable with its indicators. The loading factor value of each indicator on the latent variable, all of which have a value above 0.7, as presented in Table 6.

Table 6
Convergent Validity

Green Product Innovation	Loading Factor	Environmental Performance	Loading Factor
GPI1	0.877	EP1	0.869
GPI2	0.891	EP2	0.862
GPI3	0.919	EP3	0.834
GPI4	0.880	EP4	0.842
GPI5	0.910	EP5	0.724
GPI6	0.869	EP6	0.856
GPI7	0.824	EP7	0.880
Market Advantage	Loading Factor	Financial Performance	Loading Factor
MA1	0.778	FP1	0.879
MA2	0.747	FP2	0.894
MA3	0.812	FP3	0.893
MA4	0.769	FP4	0.854
MA5	0.789	FP5	0.851

Source: Data processing results

Table 6 indicates that all indicators in the construct are valid (Hair et al., 2017b). These results confirm that all indicators of Green Product Innovation, Environmental Performance Market Advantage, and Financial Performance are worth using as good indicators. In addition to identifying from the value of factor loading, validity can also be seen from the Average Variance Extracted (AVE) value as follows (Table 7).

Table 7
Average Variance Extracted

Variable	Average Variance Extracted (AVE)
Green Product Innovation	0.778
Environmental Performance	0.705
Market Advantage	0.607
Financial Performance	0.764

Source: Data processing results

Table 7 shows that all latent variables have an Average Variance Extracted (AVE) value above 0.5 so that it can be said that the data is convergent and valid, and can be tested further.

Discriminant Validity

Discriminant Validity is a cross loading factor value that is useful for knowing whether the construct has adequate discriminant. It can be carried out by comparing the loading value on the intended construct which must be greater than the loading value with other constructs (Tab. 8).

From the results of Table 8, it can be seen that the largest cross loading value of each indicator corresponds to the latent variable.

Fornell and Larcker Test

Another method for assessing discriminant validity is to compare the square root value of average variance

extracted (AVE) of each construct with the correlation between constructs in the model, known as Fornell and Larcker testing (Tab. 9).

Table 9 shows that the root value of AVE (main diagonal value) is greater than each correlation between latent variables (value below the main diagonal), so it is stated that all data is valid.

Reliability Test

The construct reliability test was measured using the composite reliability and Cronbach's alpha of the indicator block that measures the construct. Constructs are declared reliable if they have a composite reliability value above 0.70 and Cronbach's alpha above 0.70, as shown in Table 10.

Table 10 states that all construct have composite reliability and Cronbach's alpha values above 0.70, so it can be concluded that the construct have good reliability.

Table 8
Discriminant Validity

Cross Loadings	Green Product Innovation	Environmental Performance	Market Advantage	Financial Performance
GPI1	0.877	0.669	-0.050	-0.008
GPI2	0.891	0.779	-0.024	-0.013
GPI3	0.919	0.745	0.114	0.086
GPI4	0.880	0.698	0.014	0.005
GPI5	0.910	0.668	0.085	0.109
GPI6	0.869	0.744	0.034	-0.003
GPI7	0.824	0.752	0.007	0.066
EP1	0.699	0.869	0.021	0.043
EP2	0.730	0.862	0.109	0.126
EP3	0.651	0.834	0.102	0.074
EP4	0.757	0.842	0.003	0.009
EP5	0.549	0.724	-0.059	0.037
EP6	0.683	0.856	-0.073	-0.065
EP7	0.734	0.880	-0.033	-0.000
MA1	-0.024	-0.038	0.778	0.654
MA2	0.044	0.033	0.747	0.527
MA3	0.027	0.005	0.812	0.596
MA4	0.051	0.057	0.769	0.563
MA5	0.025	0.009	0.789	0.660
FP1	0.038	0.079	0.688	0.879
FP2	-0.005	0.043	0.661	0.894
FP3	0.087	0.079	0.680	0.893
FP4	-0.004	-0.033	0.677	0.854
FP5	0.053	-0.001	0.681	0.851

Source: Data processing results

Table 9
 Discriminant Validity

Fornell-Larcker Criterion	Environmental Performance	Financial Performance	Green Product Innovation	Market Advantage
Environmental Performance	0.840			
Financial Performance	0.038	0.874		
Green Product Innovation	0.822	0.039	0.882	
Market Advantage	0.014	0.775	0.030	0.779

Source: Data processing results

 Table 10
 Composite Reliability Test and Composite Reliability Test

Variabel	Cronbach's Alpha	Composite Reliability
Green Product Innovation	0.952	0.961
Environmental Performance	0.930	0.943
Market Advantage	0.838	0.885
Financial Performance	0.923	0.942

Source: Data processing results

Inner Model Test:

R Square Test

Determination coefficient (R Square) is a method to assess how much the endogenous construct can be explained by the exogenous construct, as presented in Table 11.

 Table 11
 R Square Test

Variabel Dependen	R Square
Environmental Performance	0.676
Market Advantage	0.001
Financial Performance	0.601

Source: Data processing results

Table 11 specifies that the environmental performance and financial performance equations can be moderately explained by their exogenous variables, while the market advantage equation shows that the influence of exogenous variables on endogenous variable is weak (Hair et al., 2017b).

F Square Test

The size F square was utilized to examine whether the effect of exogenous latent variables on endogenous latent variables has a substantive effect, as illustrated in Table 12.

 Table 12
 F Square Test

F Square	Environmental Performance	Market Advantage	Financial Performance
Green Product Innovation	2.084	0.001	0.000
Environmental Performance		0.000	0.002
Market Advantage			1.505

Source: Data processing results

Table 12 exhibits that GPI has a strong effect on environmental performance, as well as market advantage on financial performance. However, green product innovation and environmental performance have a minimum effect on market advantage and financial performance, or their effects are negligible (Hair et al., 2017b).

Discussion

After going through various data testing processes and goodness of fit, the results of the complete research model can be seen in Figure 2.

Figure 2 explains that green product innovation has a direct effect on environmental performance. Similarly, market advantage has a direct effect in improving financial performance. However, green product innovation and environmental performance cannot encourage an

increase in market advantage and financial performance. Details about this explanation can be seen in Table 13.

The regression test results show that hypothesis 1 (H1) is accepted, meaning that green product innovation has a positive and significant effect on environmen-

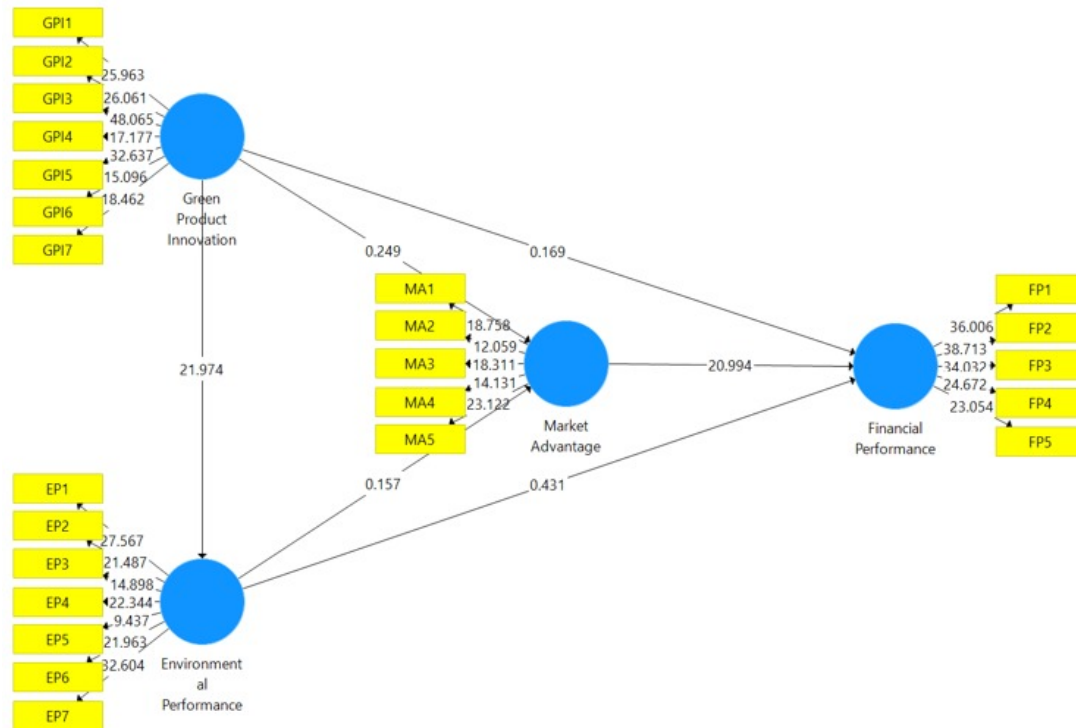


Fig. 2. Influence Model of Green Product Innovation on Environmental Performance, Financial Performance and Market Advantage

Table 13
Hypothesis Test Results

Patch Coefficients	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Green Product Innovation → Environmental Performance	0.822	0.831	0.037	21.974	0.000
Green Product Innovation → Market Advantage	0.055	0.045	0.222	0.249	0.803
Environmental Performance → Market Advantage	-0.031	-0.018	0.199	0.157	0.875
Green Product Innovation → Financial Performance	-0.020	-0.007	0.118	0.169	0.866
Market Advantage → Financial Performance	0.775	0.781	0.037	20.994	0.000
Environmental Performance → Financial Performance	0.043	0.034	0.101	0.431	0.667

Source: Data processing results

tal performance with a parameter coefficient of 0.822. These results stated that green product innovation (GPI) could directly improve environmental performance, as supported by the research (Du et al., 2019; Kraus et al., 2020; Mahto et al., 2020 and Wang et al., 2021) for the case of industrial companies in China.

The results of research on hypothesis 2 and hypothesis 3 stated that green product innovation and environmental performance have no effect in increasing market advantage. GPI and environmental performance (for the case in developing countries) have not been able to take consumers' hearts, so they have not been able to encourage market advantage (Tu & Wu, 2021; Zameer et al., 2020). This could happen because according to the RBV-based view, a product would have a competitive advantage if the basic requirements were met, that were valuable and non-substitutable (Hart, 1995). As long as these two basic requirements were not met, it would be difficult for a product to have a competitive advantage. In the case of the transportation services industry in Indonesia, it contained valuable elements, but was substitutable with fossil-based vehicles. This results in the case of the transportation services industry where GPI did not have a significant effect on market competitiveness. The role and intervention of the government through policies could be done by limiting the use of fossil energy sources and replacing them with environmentally friendly energy.

The results of hypothesis 4 research concluded that green product innovation has no effect in improving financial performance. It is in line with research conducted by Andersén (2021) and Wang et al. (2021). This finding makes a perfect sense, because according to Dangelico (2016), all green products have high or very high production costs. Consequently, there will be no company which can successfully develop green products without incurring additional costs. The respondents consisting of marketers stated that green products would not be successful. As a result, green products were developed with low priority. The case in the food industry (coffee) was initially targeted at fancy restaurants and high-end hotels. After establishing relationships with these customers, the company expected that its new eco-friendly product sales would be relatively easy, however, the existing customers seemed to be more interested in the quality of the coffee. The organization eventually realized that the product would be more suitable for coffee user groups that demonstrated high environmental and social commitment, such as local governments and pioneers in corporate social responsibility. The findings showed that green approach and industry type influenced green targeting. Green products were likely to be targeted at green niches, if those green niches existed or were

growing. In three out of four green products, only the green niche market was believed to be more open to green products. This was a direct consequence of the inability of most companies to align green traits with other product characteristics such as cost. The companies that have developed green products, to some extent, felt compelled to target a niche market that valued green practices more. Even though the product was eco-friendly and eco-niche, it was not targeted at the eco-niche market because the managers thought that the eco-benefits would attract more consumers. However, in this case, the appropriateness of targeting is still debatable. Based on financial and customer performance, the three non-green products were the most successful. A possible explanation for this observation was that although green niches were emerging in some markets, demand for green products was still low, as exemplified in the case of chemical and food industries in Rome, Italy. Therefore, industry type is as important to explain the performance results.

The research conducted by Wang et al. (2021) concluded that market competitiveness is an important mediating variable in improving economic performance. Therefore, it could be said that as long as the GPI has not been able to contribute positively to improving market competitiveness, it would be difficult to improve environmental performance and financial performance simultaneously. On the other hand, a research (Verma, 2024) concluded that the implementation of green logistics practices could significantly improve sustainable development outcomes. Environmental sustainability and economic benefits could be achieved simultaneously through resource efficiency and innovation. It means that as long as the implementation of GPI cannot reach the level of resource efficiency and innovation, it will be difficult for companies to improve their environmental performance and economic performance simultaneously.

The results of research on hypothesis 5 testing were accepted, suggesting that Market Advantage has a direct and significant effect on Financial Performance with a coefficient of 0.775. These results are in line with the previous research (Sulistyowati & Purnomo, 2020; Firmansyah & Sulistyowati, 2021; Emir & Sulistyowati, 2024; Wang et al., 2021; Andersén, 2021) that competitive advantage has a positive effect in improving company performance.

The regression test results showed that hypothesis 6 was rejected, indicating that Environmental Performance has no direct effect on Financial Performance. Similar to GPI which has no effect on financial performance, environmental performance also has no effect on financial performance. This happens because in developing countries, public awareness of the green

concept is still low. People still think that the cost factor is a consideration to buy a good or service (Mustafa et al., 2022). In the transportation sector, infrastructure is not ready and technology is expensive, making people prefer to use vehicles with fossil fuels.

In order to create a green product, environmental awareness needs to be improved, which can be realized by providing knowledge about the environment. Environmental awareness is the mediator between environmental knowledge and green products. According to Candrianto, Aimon, & Sentosa (2023), managers' awareness of the environment should be implemented by sharing knowledge about the importance of protecting the environment as this will affect the production of green products. High organizational commitment is needed in order to improve the performance of sustainable companies (Surip et al., 2021).

Conclusion

This research has provided an understanding and assertion that green product innovation can significantly contribute to environmental performance. However, in developing countries, green product innovation has not been able to encourage the improvement of market competitive and financial performance. As long as the GPI has not been able to contribute positively to improve market competitive, it will not be able to encourage the improvement of environmental performance and financial performance simultaneously. This is a challenge for developing countries to provide awareness about the importance of preserving the environment, to create green consumers. The role of the government, private sector, and the society is needed to promote the benefits of green practices in all the activities. For developing countries, improving this awareness is still quite a task, given the barriers and resistance. Another obstacle is the expensive cost of the technology to be used and inadequate infrastructure, making the GPI unable to drive market advantage and financial performance.

Theoretically, this research enriches the existing literature by providing empirical evidence on how green product innovation affects environmental performance, market advantage, and financial performance. The results of this research conclude that as long as the implementation of the GPI has not been able to reach the level of innovation and resource efficiency, it will be difficult for companies to improve their environmental performance and economic performance simultaneously.

This research provides fundamental insights, but future research should be conducted by involving other

sectors to increase generalizability by combining objective data sources or broader sectoral studies. Further research can also expand the model by adding social performance, in addition to environmental performance and financial performance. Therefore, it will open up broader studies for future research to build on new findings, potentially leading to strategies that can be adopted globally to achieve sustainability and economic growth.

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