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Assessing The Role Of Competitive Advantage Between Green Supply Chain Management, Green Innovation And Firm Performance

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Abstract

Concern for the environment by using green technology will produce environmentally friendly products that can create competitive advantages and improve firm performance. This study examines the mediating role of competitive advantage between the effect of green supply chain management and green innovation on firm performance. This type of research is quantitative research. The population in this study is the Company Performance Rating Program (PROPER) companies listed on the Indonesia Stock Exchange for the 2015-2020 period. The sample in this study was obtained through the purposive sampling method. Namely, there are annual reports and financial reports, so 255 companies were obtained. This study uses STATA 16 to test the data of this research. The results of this study prove that green supply chain management has no effect on firm performance, green innovation has no effect on firm performance, green supply chain management has no effect on competitive advantage, green innovation has no effect on competitive advantage, a competitive advantage does not mediate the effect of green supply chain management on firm performance, and competitive advantage mediates the effect of green innovation on firm performance. The implications of this study guide for companies to be able to apply green technology based industry to be able to create competitive advantage and improve firm performance.

Keywords: Green supply chain management, Green innovation, Firm performance, Competitive advantage, Path Analysis.

1. Introduction

The environment is the unity of space with all objects, forces, conditions, and living things, including humans and their behavior, that affect nature, the survival of life, and the welfare of humans and other living things [1]. Environmental problems are a major factor in increasing corporate responsibility in line with the development of the business sector. One of the environmental problems is pollution. Pollution is a problem that is an important factor that hinders social and economic development and company performance [2]. The government's participation in overcoming problems that impact the environment through the Company Performance Rating Program in Environmental Management (PROPER) will increase company awareness in identifying existing environmental impacts [3]. Based on the Decree of the Director General of Pollution and Environmental Damage Control, there is an increase in companies designated as participants in the Company Performance Rating Program in Environmental Management (PROPER). Thus, companies can overcome environmental impacts by protecting and managing the environment. Environmental protection and management is a systematic and integrated effort carried out to preserve environmental functions and prevent environmental pollution and/or damage which includes planning, utilization, control, maintenance, supervision, and law enforcement [1].

Green supply chain management is an innovation in supply chain implementation that includes activities such as recycling and replacing hazardous materials with environmentally friendly materials. Green supply chain management integrates environmental thinking into all ongoing phases of the management operations chain from raw material acquisition, product design, production processes to delivery to customers [4]. Therefore, green supply chain management practices can be described as green design initiatives, procurement, and delivery of product recovery to reduce environmental impacts [5].

Green innovation is one of the plans to achieve the company's strategic targets by using new techniques, systems, practices, production processes, and business methods to reduce environmental damage. Currently, green innovation is getting much international attention due to the increasing overall concern related to the degradation of natural resources and environmental pollution [6]. Green innovation is a strategy to mitigate environmental effects by reducing resource use and anticipating negative effects [7]. Green innovation is the main success factor in economic and social development at the national level, as well as gaining competitive advantage and business success for the company [8]. Competitive

advantage is a condition that allows companies to operate more productively and efficiently than their competitors [9]. Companies can gain a competitive advantage using two main strategies: differentiation and cost leadership. The differentiation strategy can be done by offering customers the company's unique products. In contrast, cost leadership can be done by reducing the costs used for product development, marketing costs, operations, suppliers, wages, and management [10].

Various studies have examined the relationship between green supply chain management and green innovation on firm performance, but previous literature has shown different results [11]–[14]. [15] show that green supply chain management can affect firm performance and that implementing green supply chain management practices in a company can improve firm performance. However, green supply chain management has no effect on firm performance. This happens due to a company's need for incentives to implement green supply chain management [11], [16]. There is a significant positive effect between green innovation and firm performance, that green innovation is the main contributor for a company to improve firm performance [3], [17]. However, green innovation also shows no significant relationship to firm performance because of the high coordination and follow-up costs [18]. The gap in the results of previous studies identified an indirect relationship. There is a mediating variable in the effect of green supply chain management on firm performance and the effect of green innovation on firm performance.

This study will examine the direct relationship and indirect relationship. The indirect relationship in this study will empirically test competitive advantage as a mediation between the effect of green supply chain management and green innovation on firm performance. In its application, green supply chain management has a significant relationship to competitive advantage, which is one of the main environmental factors to increase competitive advantage [19]. Green innovation positively influences competitive advantage, and implementing green innovation can increase a company's competitive advantage [20]. Competitive advantage also has a significant positive relationship with firm performance, and focusing on a competitive strategy can achieve superior performance [10]. From the results of this study, competitive advantage can act as a mediating variable. This research will be able to answer the questions: 1) Does green supply chain management effect firm performance?, 2) Is green innovation able to affect firm performance?, 3) Does green supply chain management affect competitive advantage, 4) Is green innovation able to affect competitive advantage?, 5) Is competitive advantage able to influence firm performance?, 6) Does competitive advantage mediate the effect of green supply chain management on firm performance?, 7) Does competitive advantage mediate the effect of green innovation on firm performance?. This study aims to improve firm performance by implementing green supply chain management, green innovation, and competitive advantage in several companies in Indonesia

This research contributes to companies increasing environmental awareness by using new technologies or processes to produce environmentally friendly products (goods and services) to improve firm performance. With the increasing number of companies in Indonesia, green supply chain management will help in dealing with the company's environmental impact. The implementation of green supply chain management can be seen in how companies obtain raw materials from suppliers, process them into finished goods, and distribute products to customers by considering the negative environmental impacts. In addition, green innovation positively impacts the environment by creating new products, production processes, practices, and business methods using environmentally friendly materials to reduce environmental damage. Both will also be the same as competitive advantages that can improve firm performance. Competitive advantage can be utilized to improve a company's ability to create innovative products by using its resources. Therefore, this research is expected to influence companies to pay attention to environmental impacts.

Green supply chain management shows an integration of environmental thinking in supply chain management in the form of product design, material sourcing and selection, manufacturing processes, final product delivery to consumers, and final product management after being useful in life [21]. This integration of environmental thinking can be identified in all of the ongoing supply phases of chain management operations, from raw material acquisition, raw material selection and purchasing processes, and product design production to delivery of the final product to the customer and the final management of the product after its useful life ends [4]. Green supply chain management emerged as a collaborative strategy between supply chain management to improve environmental performance [21]. Based on this, supply chain management activities must be redesigned to simultaneously achieve business goals and environmental sustainability, such as pollution prevention strategies, sustainable development, and product strengthening [5]. Therefore, green supply chain management is a form of strategic integration in achieving the company's social environment and systematic business coordination in supply chain processes between key organizations to improve the long-term economic performance of each company

[22].

Green supply chain management has objectives vary from monitoring company activities to sustainability practices [21]. The green supply chain management system is redesigned, keeping environmental objectives that lead to waste materials, contributing to the subsequent manufacturing process, and producing final items that effectively support remanufacturing principles [23]. The practice of green supply chain management can be described as a direct initiative from design, procurement, delivery, and product recovery to the essence of reduction and reuse to reduce environmental impact [5]. Green supply chain management practices are also related to economic performance costs, such as waste management, the use of cheaper raw material recycling, efficient energy consumption, minimization of environmental accidents, and several other components in preventing pollution and products that limit the costs of compliance with environmental regulations and costs. Operational performance of the green economy [22]. [24] Their research stated that green supply chain management practices could improve company performance. However, green supply chain management also shows no effect on firm performance [11].

Green innovation is creating and using goods or services, marketing practices, new organizations, and new processes that have added value with the main objective of reducing negative environmental impacts [25]. Green innovation can also be said as environmental responsibility, which is the formulation of new processes and products by offering clear benefits, but still respecting the environment, such as reducing pollution, eliminating waste, and better managing resources by involving the use of environmental technologies, strategies, and enterprise management systems [26], [27]. Green innovation is also one of the main factors for success in economic and social development and gaining a competitive advantage for the success of a company's business [25]. Thus, green innovation plays a major role in sustainable development and is an important factor in company management performance [17].

The categories of green innovation include green product innovation and green process innovation. Green product innovation is applying innovative ideas that allow the creation of new designs, production, and marketing that are environmentally friendly because of product renewal so that it is more efficient and increases durability. Raw materials are safer from hazardous materials, while green innovation processes refer more to all regulations or changes that contribute to reducing environmental damage in the production stage with the target of being environmentally friendly products whose processes and systems meet environmental goals such as reducing pollution and energy use and recycling waste [26]. Internal and external pressures, corporate culture, and values impact the competitive advantage of green innovation products and processes [28]. In addition to these two categories, green innovation has a positive relationship with company performance, including environmental performance [6]. The driving factor in applying green innovation and its competitive advantage is the company's environmental ethics, which is the main element of the company's organizational structure [28]. Meanwhile, the main obstacles are the lack of environmental education by the company, long-term return on investment, difficulty finding relevant resources, stagnant environmental regulation system, difficulties in networking between partners and teams, and inefficient internal communication [26].

Competitive advantage shows the organization's ability to compete in the market with competitors. Companies can gain a competitive advantage using two main strategies: differentiation and cost leadership. With a competitive advantage, the company's innovation will not be easily imitated by competitors [29]. A differentiation strategy allows a company to gain differential-based profits by offering customers unique products. A cost leadership strategy enables companies to achieve cost-based advantages by reducing costs associated with materials, product development, marketing, operational, supplier, wage, and management costs [10]. However, there are two trends in the literature to identify two main sources of competitive advantage, namely (1) differentiation: creating more value for customers than the company, and (2) cost leadership: achieving lower costs than competitors [30].

Firm performance is a multidimensional concept, such as environmental performance, social performance, and economic performance [11], [31]. Firm performance measurement is divided into two, namely, financial performance and market performance. The company determines the measurement of financial performance to consider the return on investment, excess, market share, and revenue growth at a more competitive rate and is carried out in monthly, quarterly, semester, and annual periods. Meanwhile, the criteria for measuring market performance are sales growth, market share growth, and other competitiveness improvements [15]. In addition, firm performance can show customer satisfaction, company reputation, company success, company development, and cultural and social connections [32]. Firm performance measurement is very important because it provides an overview of how well the company's goals have been achieved [33].

The results of firm performance are obtained from the company's management activities and are used to be a benchmark parameter in assessing the success of company management [15].

Green supply chain management is the best way for a company to minimize the negative impact caused by the company's operations on the environment. One of the world's newest issues is the increasing pollution and environmental damage caused by company activities [15]. Implementing green supply chain management in companies will also have a good impact by increasing sustainable firm performance [5]. The use of green supply chain management is a positive factor for managers' trust in companies in adopting to improve firm performance [34]. Improved firm performance can be achieved with support from suppliers and consumers [35]. Companies implementing green supply chain management in every activity will ensure an increase in profitability, reduce environmental impacts and increase corporate social responsibility [36].

[15] and [37] concluded that green supply chain management could improve firm performance. This shows that green supply chain management has succeeded in dealing with environmental problems that create new opportunities in the competitive world and can increase company profits. Therefore, the importance of using green supply chain management practices is a consideration and guideline for entrepreneurs and managers in adopting green supply chain management practices to achieve a competitive advantage and develop an ecologically sustainable society [5], [38]. Thus, the researcher proposes the following hypothesis:

H1: Green supply chain management has a positive effect on firm performance

The relationship between green innovation and firm performance is a novelty of the production process and the output of environmentally friendly products that can improve firm performance. With the ongoing threat to the environment, companies must implement green innovation practices that can carry out company operations and produce environmentally friendly products amidst competitive competition in the global market [3]. Support from a manager to implement green innovation practices is highly expected. This can improve firm performance because the practice of green innovation uses raw materials that are easily available and cheaper [39]. The research results by [3] also state that green innovation is the main contributor to improving firm performance. Environmental accounting is considered important to identify the company's influence on the environment, which has the potential to increase firm performance [3]. Green innovation allows companies to develop higher-level companies and get more economic benefits. Based on this description, the research hypothesis is formulated as follows:

H2: Green innovation has a positive effect on firm performance

In a dynamic market, competitive advantage has received sufficient attention from companies because it significantly affects financial performance and the company's market [40]. Competitive advantage occurs when a company can operate at a lower cost than its competitors' operations [41]. In addition, stakeholder involvement and the importance of resources as a driver of competitive advantage to improve firm performance [42]. Companies that focus on competitive strategies such as differentiation-based and cost-based can improve superior performance [10]. The company must adopt strategic steps among its competitors to gain a competitive advantage. Competitive advantage proposes the importance of understanding the consequences of competition in understanding corporate growth [43]. Competitive advantage occurs when a company can operate at a lower cost than its competitors' operations [41]. In addition, stakeholder involvement and the importance of resources as a driver of competitive advantage improve firm performance [42]. Companies that focus on competitive strategies such as differentiation-based and cost-based can improve superior performance [44]. [42] and [45] explain that competitive advantage can affect firm performance. Companies with competitive advantages are very effective in producing higher productivity. Based on this description, the research hypothesis is formulated as follows:

H3: Competitive advantage has a positive effect on firm performance

Green supply chain management is an initiative aimed at reducing the environmental impact of the company's operations [46]. Implementing green supply chain management will impact the company's competitive operational capabilities regarding cost reduction, quality improvement, and flexibility [47]. In addition, senior management commitment is the main criterion for green supply chain management that monitors and evaluates the effectiveness of environmentally friendly practices and their impact on company performance [48]. Thus, green supply chain management is an important element in increasing the company's competitive advantage [49]. Therefore, green supply chain management positively influences competitive advantage, whereas green supply chain management also contributes to developing the company's competitiveness and achieving internal

and external cooperation [50]. Based on this description, the research hypothesis is formulated as follows:

H4: Green supply chain management has a positive effect on competitive advantage

The relationship between green innovation and competitive advantage is the adoption of new environmentally friendly processes and products to gain a competitive advantage in the global market. Companies can gain a competitive advantage based on environmental strategies and relationships with the natural environment. Company management must provide training to company employees to focus on green innovation practices that can reduce pollution, prevent hazardous and toxic waste, and improve environmental compliance so that they can gain the company's competitive advantage and improve product quality [51], [52]. In addition to overcoming the environmental impact, green innovation can also reduce costs used during the production process. Companies that can adopt the concept of eco-efficiency by reducing the number of resources used for the production of goods and which can reduce environmental impacts while at the same time gaining a competitive advantage are successful [53]. Therefore, green innovation can affect competitive advantage, where green innovation can make companies provide environmentally friendly products and facilitate businesses in achieving competitive advantages [20], [54], [55]. Based on the description above, the research hypothesis is formulated as follows:

H5: Green innovation has a positive effect on competitive advantage

The practice of green supply chain management in a company aims to reduce the consumption of raw materials and waste to reduce product costs, improve product quality, and prevent environmental risks, allowing companies to gain a competitive advantage [56]. A sustainable competitive advantage can be the main innovation strategy affecting the company's competitiveness. Therefore, companies must focus on managing green supply chain management to increase sustainable competitive advantage [57]. There is an influence between green supply chain and competitive advantage, which shows the quality of supply chain relationships that can increase the company's competitiveness potential [58], [59]. In today's developing countries, green supply chain management practices are urgently needed to improve firm performance through a sustainable competitive advantage [60].

Competitive advantage is important for improving firm performance by building a sustainable business model [61]. Competitive advantage can be realized when a company implements unique and different operational strategies and products from competitors [45]. Although competitive advantage is important, the mediating effect of competitive advantage on the relationship between green supply chain management and firm performance has yet to be studied extensively [5], [11]. [38] and [62] confirmed the ability to practice green supply chain management as a driver of sustainable competitive advantage to improve firm performance. In addition, [31] stated that firm performance produces sustainable superior products. [42] and [63] prove that competitive advantage affects firm performance. This shows that competitive advantage can be reflected in several dimensions, such as unique products, collaboration with partners, controlling market share, focus on high-value customers, and supply chain leadership. From the discussion above, competitive advantage can mediate the relationship between green supply chain management and firm performance to increase overall revenue. Based on this description, the research hypothesis is formulated as follows:

H6: Competitive advantage can mediate the influence of green supply chain management on firm performance

Environmental sustainability plays a role in the company's innovation in sustainable product development [64]. Therefore, a sustainable competitive advantage becomes a green innovation strategy that can affect the company's competitiveness. [65] and [66] show that green innovation influences competitive advantage, where the contribution of green innovation to building competitive advantage also has a high percentage in the company's contemporary important strategy. Competitive advantage is the pioneer of green innovation strategy in improving firm performance by applying the concept of resource-based capabilities.

Companies implementing green innovation practices will lead to superior competitive advantages [67] and achieve sustainable firm performance [68]. The effectiveness of green innovation in improving firm performance can consider situations and conditions that affect its effectiveness in maintaining a competitive advantage in an uncertain market [69]. [42], [70] and [71] show that competitive advantage can affect a firm performance, this shows that the company's competitive advantage will result in product differentiation, achieving wider market share, gaining more customers and be able to increase the firm. From this statement, it can be shown that green innovation can create a competitive advantage that can promote profit

growth and firm performance [42]. Based on this description, the hypothesis of this research is formulated as follows:

H7: Competitive advantage can mediate the effect of green innovation on firm performance

2. Research Methods

This type of research is quantitative research that focuses on empirical testing of green supply chain management, green innovation, competitive advantage, and firm performance. This study aimed to examine the direct and indirect relationship using STATA 16 on the variables in this study. Although the type of data used in this study is secondary data, the samples in this study were selected using the purposive sampling method. The population in this study are PROPER companies listed on the Indonesia Stock Exchange for the 2015-2020 period, as many as 255 companies. The data in this study were taken from the Indonesia Stock Exchange website and OSIRIS software. There are two similarities in this study, namely as follows:

$FP = \alpha_2 + \beta_3 GSCM + \beta_4 GI + \beta_5 CA + \beta_6 FA + \beta_7 FS + \beta_8 Big4 + e1$.....(1)
$CA = \alpha_1 + \beta_1 GSCM + \beta_2 GI + e$.....(2)

Firm performance is a multidimensional concept, such as environmental performance, social performance, and economic performance, that can increase the company's profit growth rate [11], [31]. According to [72], firm performance can be measured using Return On Assets (ROA), namely earnings before interest and tax (EBIT) on total assets.

Green supply chain management can be defined as purchasing and supply chain management innovation that considers the environmental context [73]. Green supply chain management can be measured using several indicators. In this study, the indicators used to measure green supply chain management are as follows: (1) Having ISO 9000 or ISO 14000 certificates, (2) Environmentally friendly marketing and distribution, (3) Recycling materials as product packaging, (4) Close relationships with suppliers to find out the quality of materials from suppliers, and (5) Product quality can meet customer needs and demands.

Green innovation is the creation or use of new products, processes, practices, and business methods that combine green product innovation and green process innovation by using environmentally friendly materials to reduce negative environmental impacts [8], [28]. Green innovation can be measured using several indicators, some of which are: (1) the use of new technology to create a product that can reduce harmful pollutants, (2) the creation of products using environmentally friendly materials, (3) using environmentally friendly products, and (4) the basic material of the product can be recycled [11].

This study uses control variables, including firm age, size, and big 4. Firm age is measured by the natural logarithm of the company's age since the registration date [74]. Firm size is measured by the natural logarithm of the total assets at the end of the year in the listed companies [75]. KAP Big 4 is measured by a variable indicator worth 1 if the company is audited by KAP Big 4 and is worth 0 otherwise [74].

3. Results and Discussions

Table 1 shows descriptive statistics for the independent variable and the dependent variable. The sample in this study consisted of PROPER companies listed on the Indonesia Stock Exchange for the 2015-2019 period. The descriptive statistical table below shows that each firm's minimum and maximum performance is -0.093 and 0.235, competitive advantage is 0.100 and 2.010, green innovation is 0.000 and 1,000, green supply chain management is 0.200 and 0.800, firm size is 4.151 and 18,195. , firm age is 2.833 and 4.277, and big four is 0.000 and 1.000

Table 1. Descriptive statistics

	N	Mean	Median	Std	Min	Max
FP	255	0.065	0.061	0.065	-0.093	0.235
CA	255	0.847	0.780	0.420	0.100	2.010
GI	255	0.540	0.500	0.300	0.000	1.000
GSCM	255	0.580	0.600	0.157	0.200	0.800
FS	255	13.207	14.923	4.290	4.151	18.195
FA	255	3.601	3.689	0.298	2.833	4.277
Big4	255	0.416	0.000	0.494	0.000	1.000

Source : data processing STATA 16

Table 2 shows the Pearson correlation test. There is no correlation between green supply chain management and firm performance. There is no correlation between green innovation and firm performance. There is no correlation between green supply chain management and competitive advantage. There is a correlation between green innovation and competitive advantage with a significance level of 5%. There is a correlation between competitive advantage and firm performance, with a significant level of 1%.

Tabel 2. Pearson's correlation

	FP	CA	GI	GSCM	FS	FA	BIG4
FP	1.000						
CA	0.209***	1.000					

	(0.001)						
GI	0.004	-0.134**	1.000				
	(0.949)	(0.033)					
GSCM	-0.061	-0.065	0.351***	1.000			
	(0.333)	(0.300)	(0.000)				
FS	0.435***	-0.102	0.012	-0.048	1.000		
	(0.000)	(0.105)	(0.847)	(0.446)			
FA	0.103	0.035	0.117*	-0.004	0.175***	1.000	
	(0.101)	(0.582)	(0.062)	(0.955)	(0.005)		
Big4	-0.062	-0.014	0.020	-0,002	-0.014	-0.008	1.000
	(0.324)	(0.821)	(0.755)	(0.975)	(0.820)	(0.900)	

*,**,*** *show significance levels at the 10,5,1 percent levels, respectively*
Source : data processing STATA 16

Table 3 shows the normality test. Testing for normality in this study used the One-sample Kolmogorov-Smirnov. The K-S normality test shows a significant value of 0.559 (sig >5%). This can indicate that the data in this study are normally distributed.

Tabel 3. One-sample Kolmogorov Smirnov

	P-Value
Combined K-S	0.166

Source : data processing STATA 16

Model 1 is shown by simple linear regression to test the effect of green supply chain management and green innovation on firm performance, as shown in table 4 and table 6. Based on the results of the t-test, the t-value for the effect of green supply chain management on firm performance is -0.66, with a significance value of 0.510 (sig > 10%). This indicates that green supply chain management does not affect firm performance, so H1 is rejected. The t value for the effect of green innovation on firm performance is 0.79, with a significance value of 0.432 (sig > 10%). This indicates that green innovation has no effect on firm performance, so H2 is rejected. The t value for the effect of competitive advantage on firm performance is 4.65 with a significance value of 0.000 (sig < 1%), this indicates that competitive advantage has a positive effect on firm performance, so H3 is accepted. The t value for the effect of firm size on firm performance is 8.16 with a significance value of 0.000 (sig < 1%), this indicates that firm size has a positive effect on firm performance. The t-value for the effect of firm age on firm performance is 0.14, with a significance value of 0.888 (sig > 10%). This indicates that firm age does not affect firm performance. Finally, the t value for the influence of the big four on firm performance is -0.96 with a significance value of 0.336 (sig > 10%). This indicates that the big four do not affect firm performance.

Model 2 is shown by simple linear regression to test the effect of green supply chain management and green innovation on competitive advantage, which is shown in table 4 and table 6. Based on the results of the t-test, the t-value for the effect of green supply chain management on competitive advantage is -1.90 with a value significance of 0.755 (sig > 10%). This indicates that green supply chain management has no effect on competitive advantage, so H4 is rejected. On the other hand, based on the results of the t-test, the t-value for the effect of green innovation on competitive advantage is -0.31 with a significance value of 0.059 (sig < 10%), this indicates that green innovation has a positive effect on competitive advantage, so H5 is accepted.

Tabel 4. Regression Results of *Competitive advantage* and *Firm performance*

	(1) *Competitive advantage*	(2) *Firm performance*
GSCM	0.177	-0.016
	(-1.90)	(-0.66)
GI	0.56*	0.010
	(-0.31)	(0.79)
CA		0.039***
		(4.65)
FirmSize		0.007***
		(8.16)
FirmAge		0.002
		(0.14)
Big4		-0.007
		(-0.96)
_cons	0.975	-0.058
	(9.65)	(-1.29)
R^2	0,018	0.259
Ajd R^2	0,010	0.241
N	255	255

*,**,*** *show significance levels at the 10,5,1 percent levels, respectively*
Source : data processing STATA 16

Table 5 shows the results of the path analysis. Path analysis of competitive advantage mediating green supply chain management is -0.31 with a significance value of 0.754 (sig > 10%), this means that competitive advantage cannot mediate the relationship between green supply chain management and firm performance, so H6 is rejected. Path analysis of competitive advantage mediating green innovation is -1.77 with a significance value of 0.077 (sig <10%), this means that competitive advantage can mediate the relationship of green innovation to firm performance, then H7 is accepted.

Tabel 5. Path Analysis

	Coef.	z	P>|z|
GSCM- CA- FP	-0.002	-0.31	0.754
GI- CA- FP	-0.007	-1.77	0.077

*,**,*** *show significance levels at the 10,5,1 percent levels, respectively*
Source : data processing STATA 16

Table 6. Hypothesis Test Results

		Coef	t	p	Description
H1	GSCM -> FP	-0.016	0.66	0.510	Not significant
H2	GI -> FP	0.010	0.79	0.432	Not

					significant
H3	CA -> FP	0.039	4.65	0.000***	Significantly Positive
H4	GSCM -> CA	0.177	-1.90	0.755	Not significant
H5	GI -> CA	0.56	-0.31	0.059*	Significantly Positive
H6	GSCM -> CA -> FP	-0.002	-0.31	0.754	Not mediated
H7	GI -> CA -> FP	-0.007	-1.77	0.077*	Mediated

,,*** show significance levels at the 10,5,1 percent levels, respectively*
Source : data processing STATA 16

The hypothesis in this study is the effect of green supply chain management on firm performance. The hypothesis test results show that partially green supply chain management does not affect firm performance. With the company's supply chain management from raw material acquisition to distribution to customers that focus on environmental friendliness through the application of green supply chain management in companies, it cannot improve firm performance. This study's results align with research conducted by [11] and [16] that applying green supply chain management practices requires motivation and costs a lot to improve the reputation, competence and income of a company. Applying green supply chain management practices requires investment in every management activity, such as recycling and the ISO 14000 system [76]. In addition, there must be a strict policy to support the procurement of environmentally friendly materials in terms of tax exemptions [77].

The hypothesis in this study is the effect of green innovation on firm performance. The hypothesis test results show that partially green innovation has no effect on firm performance. The latest technology in product creation cannot improve firm performance by reducing negative environmental impacts such as using environmentally friendly materials, reducing pollution during the production process and recycling waste through green innovation practices. This study is in line with research conducted by [18] which states that green innovation does not affect firm performance due to the high cost of maintaining investment in the form of coordination costs and follow-up costs. This is also supported by research [27] which states that green innovation practices require greater costs and failures can occur to obtain product differentiation effects. Green innovation also requires investment because changes occur in processes and services in the short term [78].

The hypothesis in this study is the effect of green supply chain management on competitive advantage. However, the hypothesis test results show that partially green supply chain management does not affect firm performance. Therefore, green supply chain management with the main objective of reducing the environmental impact of raw material acquisition, marketing and distribution to customers using environmentally friendly materials cannot increase competitive advantage. This research is in line with [25], which state that adopting green supply chain management as a form of company concern for the environment is an expensive activity and requires special allocation of funds to be the attention of suppliers. However, implementing green supply chain management practices can strengthen the value of a company's business [79]. In addition, it can be used for pollution prevention and product stewardship in sustainable development to enable companies to gain public and environmental competitive advantages [56], [80].

The hypothesis in this study is the effect of green innovation on competitive advantage. The hypothesis test results show that partially green innovation has a positive and significant effect on competitive advantage. New technology's role in creating environmentally friendly products through green innovation, which aims to reduce pollution and company waste, cannot improve firm performance. This research is in line with [20], which states that green innovation focusing on new processes and operations can impact product quality, customer quality, and company market share. Applying green innovation practices can help companies save short-term costs, develop new market opportunities, increase productivity, and gain a competitive advantage [81]. Although the application of green innovation is risky, an effective green innovation formulation cannot be ignored. It can increase a product's potential value, brand effect, and corporate ethics [82]. In addition, green innovation is a high percentage contribution to building a company's competitive advantage [65].

The hypothesis in this study is the effect of competitive advantage on firm performance. The results of hypothesis testing show that partially competitive advantage has a positive and significant effect on firm performance. Innovations in products by utilizing environmentally friendly materials to minimize environmental damage and save costs on acquiring raw materials for production can improve firm performance. This study is in line with research conducted by [83] which states that the alignment of sustainable competitive advantage strategies can improve sustainable company performance. Competitive advantage improves a company's financial performance and significantly impacts the market and operational performance [44]. Companies must improve production processes and new ideas in modifying products and marketing [84]. Companies with a greater competitive advantage can reduce total costs and take advantage of different strategies from competitors to improve firm performance [85].

The hypothesis in this study is the mediation of competitive advantage between green supply chain management on firm performance. The results of the mediation test show that competitive advantage cannot mediate the relationship between green supply chain management and firm performance. This indicates that competitive advantage cannot increase the company's operational efficiency because choosing environmentally friendly raw materials and marketing to reduce environmental impacts requires a lot of motivation and expenditure to improve the reputation, competence and income of a company [16]. According to [76] and [77], green supply chain management practices require investment in every management and strict policies to support the procurement of environmentally friendly materials in terms of tax exemptions.

The hypothesis in this study is the mediation of competitive advantage between green innovation and firm performance. The results of the mediation test show that competitive advantage can mediate the relationship between green innovation and firm performance. By prioritizing innovations to produce environmentally friendly products, it can save costs in the production process to improve firm performance, and the company also gains a competitive advantage. This research is in line with [86], who state that with green innovation, companies can expand product ranges, attracting new environmentally conscious customers and investors. In addition, it can increase the company's profitability so that the practice of green innovation can improve the firm performance. With the application of green innovation practices, companies can consume as little material and energy as possible during the production process, reducing pollutant emissions and minimizing costs; this can strengthen the company's ability to participate in market competition [87]. In addition, companies must also focus on differentiation-based and cost-based competitive strategies to improve firm performance [44].

4. Conclusion

The direct relationship examines the relationship between green supply chain management and green innovation on firm performance. At the same time, the indirect relationship examines competitive advantage as a mediating variable for the relationship between green supply chain management and green innovation on firm performance. Based on several cases regarding the company's lack of attention to the impact of environmental damage, this research was conducted by applying green supply chain management and green innovation practices using environmentally friendly raw materials and technology that focuses on protecting and managing the company's environment.

Companies implementing green supply chain management practices will be more selective in choosing suppliers to produce environmentally friendly products to reach customers [49], [88]. With this, a competitive advantage will be created where the company has competitiveness over competitors. Competitive advantage can help green supply chain management in improving firm performance. In addition, green supply chain management can increase the trust of suppliers and customers, allowing the company to expand its market share and have a competitive advantage to improve firm performance [11], [89].
Technology in green innovation can make companies carrying out operations not pollute the environment. For example, where the company will use environmentally friendly product materials. Green innovation can answer stakeholder pressure in reducing environmental impacts [90]. In addition, by running green innovation, companies will be able to create competitive advantage because it produces product differentiation that is not owned by competitors [20]. With this, it will be an opportunity for the company to have high competitiveness. And the product will be more attractive to customers because it has environmentally friendly materials. This will create high selling power and increase firm performance [42].

This study has two important theoretical implications. First, the results of this study provide answers to research questions and expand the literature on green supply chain management, green innovation, competitive advantage and firm performance. Our results advance the literature that competitive advantage mediates the effect of green supply chain management and green innovation on firm performance. Where green supply chain management and green innovation can respond to stakeholder pressure in operations and produce products that do not impact the environment, this will create a competitive advantage. The results of this study add to the theory that green supply chain management and green innovation can help companies in environmentally friendly innovation technology to improve firm performance. The results of this study also show that to improve the company's performance, "green solutions" in the environmental strategy are needed to generate economic benefits. The managerial implication in this study shows that implementing green supply chain management and green innovation can create a profitable competitive advantage for the company. In addition, companies can understand that green supply chain management and green innovation can be a tool to improve the company's reputation with customers. This can support companies in environmental management to carry

out green supply chain management and green innovation practices to achieve customer satisfaction. Therefore, managers must understand that green supply chain management and green innovation are very important in achieving the goal of competitive advantage to improve firm performance.

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