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Assessing The Impact of Green Supply Chain Management, Competitive Advantage and Firm Performance in The Indonesia PROPER Companies

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ABSTRACT

The purpose of this study was to examine the effect of green supply chain management on firm performance with a competitive advantage as mediation. The population of this study was PROPER companies from 2010 to 2018. The sample was determined based on the purposive sampling method, yielding 516 companies. STATA 16 was used to test data obtained from the Indonesia Stock Exchange and OSIRIS software. Based on the research results, it was revealed that green supply chain management has a positive effect on competitive advantage, as well as a competitive advantage which also has a positive effect on firm performance, while green supply chain management does not affect firm performance. The relationship between green supply chain management and firm performance can be mediated by competitive advantage. The findings of the study showed the importance of implementing green supply chain management in gaining a competitive advantage and improving firm performance in the face of intense competition.

Keywords: *green supply chain management, competitive advantage, firm performance, proper companies, SDG's*

1. INTRODUCTION

In the 2020 World Economic Forum, the Indonesian government is committed to prioritizing a circular economy that aims to reduce environmental damage by re-use and re-fill (Greenpeace, 2020). Companies, in this case, are also responsible for reducing environmental impacts in product development, process design, logistics, company operations, marketing in addition to being obligated to comply with regulations and waste management (Srivastava, 2007). Thus, the company runs the production process by implementing green operations to reduce the negative impact on the environment due to the production process. This strategy is also intended

to face the company's competitive advantage from the green supply chain management process to improving company performance. Companies must have competitive capabilities to maintain and improve their company performance in the face of environmental impacts and increasingly fierce competition. Green supply chain management (GSCM) is a long-term company strategy for environmental development while also increasing profits and reducing environmental impacts in the face of market competition (Khaksar et al., 2016).

Green supply chain management considers the environmental impact of a company's supply chain, which includes suppliers as well as distributors. The conflict between economic growth and environmental impact occurs not only in academia but also in companies and society. Therefore, the selection of suppliers and distributors, especially those related to environmental capabilities, must be carried out strictly to realize competitive advantage through green supply chain management (Handayani et al., 2017; Kim et al., 2016). Green supply chain management is a company's strategic capabilities in practices and policies for managing environmental impacts in the supply chain (Kirchoff et al., 2016). There are two approaches in green supply chain management(Chu et al., 2017), namely the monitoring approach and the collaborative approach. The monitoring approach entails the company participating in data collection and supplier standards, whereas the collaborative approach entails the provision of training and education programs to assist management policies in implementing "green" policies and obtaining environmental certification. Green supply chain management, in this case, is a great opportunity to gain a competitive advantage and improve company performance.

Competitive advantage is formed when companies can combine and expand resources and capabilities efficiently. Competitive advantage is measured in terms of how well a company can meet production targets and how well its human resources, marketing, and financial objectives are met when it comes to improving company performance (Abeysekara et al., 2019). Competitive advantage is divided into 3 types, as follows 1) company policies in providing products and services at the lowest prices in the market, 2) differentiation of company services and products, and 3) ability to meet targets and be responsive to the needs of market segments and customers (Potjanajaruwit, 2018). Companies will be able to face market competition, create new products, increase productivity, sales, and company performance by gaining a competitive advantage.

Several studies have looked into green supply chain management and firm performance in the past (Ahmed et al., 2019; Samad et al., 2021). However, gaps in research results were found regarding the relationship between green supply chain management and firm performance (Abu Seman et al., 2019). In previous research, it was found that green supply chain management positively affects firm performance where an increase in the need for companies to implement green supply chain management in a broader perspective also occurs (Bu et al., 2020; Chu et al., 2017). Inconsistent results were found by (Younis et al., 2016; Zhu et al., 2007) which stated that the application of green supply chain management had no significant effect on firm performance. On the other hand, Jiang et al., (2020) explained that there are additional costs for companies to

purchase environmentally friendly materials in the production process when implementing green supply chain management. Green supply chain management has a significant effect on competitive advantage (Masoumik et al., 2014; Nanath & Pillai, 2017), considering that competitive pressure will urge companies to always increase their competitive advantage and firm performance. Competitive advantage and firm performance have a significant and positive relationship, with the company's competitive advantage consisting of two basic characteristics: the ability to increase profits in firm performance, and the inability of competing companies to imitate the company's strategy (Chen et al., 2017; Ferreira & Coelho, 2017). As a result, green supply chain management, competitive advantage, and firm performance are becoming increasingly important in Indonesian businesses. The goal of this research is to provide empirical evidence of the use of GSCM practices to improve firm performance and gain a competitive advantage. This study aids businesses in determining the most appropriate environmental strategy.

This research will look at the direct and indirect effects of green supply chain management on competitive advantage and firm performance. The mediating effect between green supply chain management and firm performance is investigated using a competitive advantage. In addition to improving market performance, Porter's strategy for implementing competitive advantage can also improve company performance (Anwar et al., 2018). Green supply chain management is a "green" concept in the supply chain that aims to integrate the manufacturing process and thus gain a competitive advantage (Martusa, 2013). Government pressure and other stakeholders together can encourage companies to comply with and implement green supply chain management in improving company performance (Ahmed, Najmi, & Khan, 2019). Because green supply chain management rarely improves firm performance, businesses must shift their focus to customer satisfaction (Laari et al., 2016). This research will be able to answer the following research questions:

1) Does green supply chain management have a positive effect on firm performance?
2) Does green supply chain management have a positive effect on competitive advantage?
3) Does competitive advantage mediate the relationship between green supply chain management and firm performance?

This research contributes by encouraging companies to pay more attention to the environmental impact of supply chains and market competition by recognizing the value of green supply chain management and competitive advantage in improving firm performance. The application of "green" from the purchase of supplier goods, including processing, to the distribution process to consumers, is known as green supply chain management. Meanwhile, the company can gain a competitive advantage by implementing its competitive strategy, which will enable it to compete in markets where competitors will be unable to imitate the strategy. It is hoped that as a result of this study, companies in Indonesia will be more aware of the importance of environmental protection to meet the demands of internal and external factors.

2. LITERATURE REVIEWS AND HYPOTHESIS DEVELOPMENT

Even though many previous studies have examined the correlation between green supply chain management and firm performance, the results of research into how green supply chain management affects firm performance are still unclear. According to previous research, green supply chain management has an impact on firm performance, with the application of green supply chain management practices resulting in more economic and social benefits for the company (Habib et al., 2021; Jiwa et al., 2021; Wang et al., 2020). This result is different from the research conducted by (Jia & Wang, 2019; Namagembe et al., 2019; Novitasari & Agustia, 2021) which found that green supply chain management did not affect firm performance while in the practice of green supply chain management, companies need motivation in reputation, revenue growth, and effectiveness. In light of the contradictory research findings, this study will conduct additional empirical testing to determine the relationship between green supply chain management and firm performance as mediated by competitive advantage. Green supply chain management practices have been shown to increase competitive advantage, putting the company in a more profitable position in a competitive environment. In the long run, sustainable green supply chain management practices will provide a competitive advantage and improve firm performance. In creating a competitive advantage, companies are required to have efficient resources and capabilities (Novitasari et al., 2021).

Pressure from stakeholders and institutional pressure are the main drivers of companies in implementing green supply chain management, namely implementing environmentally-friendly strategies to maintain competitive advantage and improve company performance (Vanalle et al., 2017). In business practice, customers crave health solutions in dealing with air pollution (Ha et al., 2021). Green supply chain management allows businesses to reduce pollution and environmental issues throughout their supply chain, from upstream to downstream (Govindan et al., 2014). By implementing green supply chain management, companies can gain competitive advantages, as well as open new market opportunities and lobby the government for legal protection for firm performance (Mitra & Datta, 2014).

Investor interest in companies that use the 6R concept (remanufacturing, redesign, recover, recycle, reuse, and reduce) as evolution and sustainable production will increase as green supply chain management is implemented. (Tundys & Wiśniewski, 2021; Vanalle & Santos, 2014). The relevance of “green” is very appropriate for corporate learning and human resource practices considering that these two things are very helpful in reducing barriers to adopting green supply chain management (Teixeira et al., 2016). Suppliers are critical partners in a company's supply chain because they are the primary source of support for the organization's environmental initiatives and participation in environmental performance improvement (Yu et al., 2014).

As stated by (Michael E. Porter & van der Linde, 1995), environmental must be included in the business which has a function to increase resources and competitive advantage. Competitive advantage is a company's strategy to obtain long-term benefits that cannot be defeated by its

competitors through product replication or imitation strategies (Ge et al., 2018). Competitive advantage in the long term must be able to develop, renew and increase the company's product portfolio by adjusting to customer desires, increasingly sophisticated technological changes, and increasingly fierce competition (Ohvanainen & Hietikko, 2012). Competitive advantage is defined as the ability to create and maintain competitiveness to increase company profits (Sinaga et al., 2019). To gain a competitive advantage, the company must effectively combine resources and capabilities.

Firm performance is an effort made to achieve the company's multi-dimensional goals based on conceptualization. There are three indicators, namely production, finance, and marketing, on the multidimensional goal of firm performance in addition to increasing profits (Schmidt et al., 2017; Tuan et al., 2016). Firm performance refers to a company's ability to complete work efficiently and profitably (Golicic & Smith, 2013). Firm performance is a picture of a company's success in achieving its economic objectives, such as gaining market share and increasing sales (Lirn et al., 2014). Companies must be fast and flexible in the operational practice of green supply chain management to ensure the flow of products to consumers (Khan & Wisner, 2019). Firm performance can provide stakeholders with information about the company's position in the market share competition.

Green supply chain management is a strategy for a company's sustainability resources and ability to gain a competitive advantage in terms of market share, competitors, and performance (Liu et al., 2012). Green supply chain management has a significant effect on competitive advantage (Khaksar et al., 2016) This influence shows that supply chain management that focuses on environmental impacts can increase industrial activities to increase competitive advantage. Companies that implement environmental management will be able to strengthen competitiveness and create competitive advantages (Arman & Iman, 2017). There needs to be cooperation with suppliers in supply chain management, including in compliance with environmental regulations, starting from purchasing materials from suppliers by companies, processing materials into ready-to-sell products to distributing these products to consumers. This kind of cooperation will build a competitive advantage in the global market. Thus, the researcher proposes the following hypothesis:

Hypothesis 1*: *Green supply chain management has a positive effect on competitive advantage

The ability of a company to make above-average investments is called a competitive advantage (Mee-Ngoen et al., 2020). The company's strategy for gaining a competitive advantage that competitors can't match is to reduce excessive costs to improve firm performance (Rauf et al., 2019). Companies that use a differentiation strategy must create unique and different products that can't be imitated by competitors, resulting in a competitive advantage and lower costs (S. Z. Khan et al., 2019). The company's profitability or performance will improve as a result of this cost

reduction (Michael Eugene Porter, 1985). Competitive advantage means that the company's products have unique characteristics that competitors can't match. Thus, the researcher comes up with the following hypothesis:

Hypothesis 2: *Competitive advantage has a positive effect on firm performance*

Green supply chain management will assist companies in managing and cooperating with suppliers as well as developing environmentally friendly products that reach consumers. This effort indirectly aids companies in lowering costs and improving their performance (Bu et al., 2020; Orenstein & Tang, 2021). Green supply chain management has a significant effect on firm performance (Jassim et al., 2020), which indicates that through green supply chain management, companies will find it easier to achieve sustainable business goals that can improve firm performance. The application of green supply chain management contributes to the reduction of environmental impacts such as pollution, waste, air emissions, and the use of toxic materials (M. A. Habib et al., 2020). In the process, green supply chain management involves the company's capacity and ability to carry out its operational activities(Bag et al., 2020). Green practice in supply chain management is a philosophy that is beneficial for companies in firm performance to generate maximum profit. Thus, the researcher proposes the following hypothesis:

Hypothesis 3: *Green supply chain management has a positive effect on firm performance*

Green supply chain management has been shown to have an impact on a company's performance in previous studies. However, when examining the impact of green supply chain management on firm performance, the mediating variable must be taken into account. In this case, green supply chain management has an impact on competitive advantage, and competitive advantage has an impact on firm performance. Since the company needs to increase its competitive advantage to maintain market share competitiveness, competitive advantage was added as a mediating variable (Wu et al., 2017). Green used by companies in supply chain management will form a competitive advantage that can improve firm performance (Lee et al., 2015). The company will benefit from a competitive advantage by reducing costs by preventing pollution, stakeholder monitoring of products that cannot be published to prevent competitors, and long-term synergistic development (Pålsson & Kovács, 2014). Besides, this will greatly assist the company in the improvement of firm performance. The researcher, therefore, proposes the following hypothesis:

Hypothesis 4*: Competitive advantage mediates the correlation between green supply chain management and firm performance*

This research focuses on the exploration of competitive advantage, green supply chain management, and firm performance. The goal of this research is to look into the direct and indirect correlation between competitive advantage, green supply chain management, and company performance. The following is the conceptual framework that can be derived from this research:

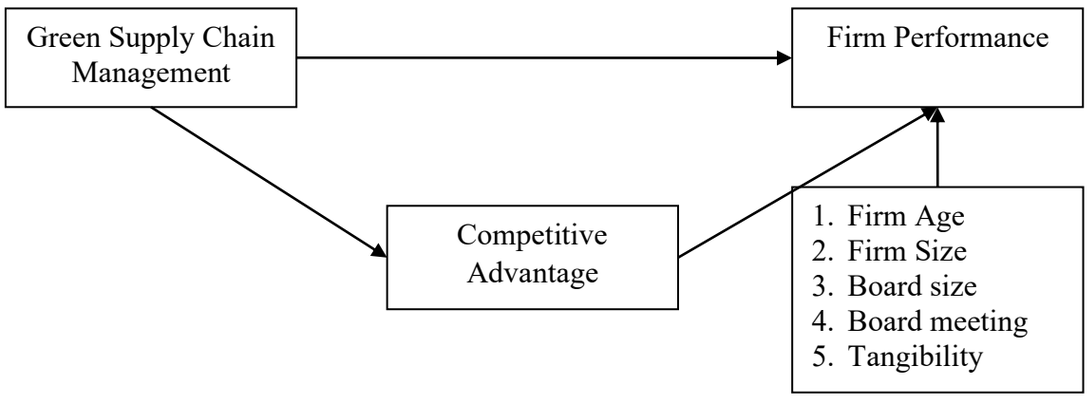

Figure 1. Conceptual Framework

3. RESEARCH METHODOLOGY

3.1. Research Design

The study's main goal is to examine the competitive advantage as a mediating factor in the effect of green supply chain management on firm performance. This study includes several control variables, including firm age, the board size, board meeting, and tangibility. Previous research has suggested that these variables have an impact on firm performance (Eluyela et al., 2018; Mallinguh et al., 2020; Mubeen et al., 2020; Pucheta-Martínez & Gallego-Álvarez, 2020; Vu et al., 2019). However, these variables are still limited by research on competitive advantage (Jeong & Chung, 2022; Lu et al., 2021; Nkundabanyanga et al., 2018; Nyuur et al., 2019; Whitler & Puto, 2020). This research is included in quantitative research where secondary data is used. The population of this study is companies registered in the PROPER program in 2012-2018. The data sample was selected based on the purposive sampling technique and obtained as many as 516 companies. The data in this study were taken from the Indonesia Stock Exchange and OSIRIS software. The variables were tested using STATA 16 to test the direct relationship and the Sobel calculator (www.quantspsy.org) to test the indirect relationship. The tests in this study consisted of descriptive statistical tests, correlation tests, regression tests, and mediation tests. There are two regression equations in this study as follows:

$$CA = \alpha_2 + \beta_8 GSCM + e \quad (1)$$

$$FirmPerformance = \alpha_1 + \beta_1 GSCM + \beta_2 CA + \beta_3 FirmAge + \beta_4 FirmSize + \beta_5 BoardSize + \beta_6 BoardMeeting + \beta_7 Tangibility + e \quad (2)$$

3.2. Definition of The Operational Variables

3.2.1. Firm Performance

Firm performance is the result of a stakeholder's effort to manage the company to increase resources and create products that cannot be duplicated or published (King & Zeithaml, 2001). The firm performance will be beneficial for the company because it can increase profits, competitive advantage, target market share, increase sales, and customer satisfaction. According to (Vithessonthi & Racela, 2016), the firm performance ratio used is as follows:

$$\text{ROA} = \frac{EBIT}{TA}$$

where

EBIT: Earning Before Interest and Tax

TA: Total Asset

3.2.2. Green Supply Chain Management

Green supply chain management is "green" which is combined with supply chain management while paying attention to the environmental impacts that may occur, starting from the selection and purchase of materials from suppliers, materials, and product designs, to the distribution of ready-to-sell products to consumers (Srivastava, 2007). Five indicators are used to assess green supply chain management. Green supply chain management is calculated using indicators in the company's annual report and measured in ratios. Following up on previous studies, (Sharma et al., 2017; M. L. Tseng & Chiu, 2013; Wibowo, 2018) The following are the indicators used in this analysis: (1) Have an ISO 9000 or ISO 14000 certificate, (2) Green distribution and marketing, (3) Reverse logistics or packaging made from recycled materials, (4) Supplier relationship closeness, which aims to determine purchasing criteria and material quality from suppliers, and (5) Product quality that meets customer needs

In the research conducted by (Novitasari & Agustia, 2021), it was found that each indicator item disclosed in the annual report was given a score. The scoring provisions are a score of "1" indicating the presence of a disclosure indicator item in the annual report and a score of "0" indicating the absence of a disclosure indicator item in the annual report.

Competitive Advantage

The company's efforts to create product differentiation so that competitors cannot duplicate it and can reduce costs to improve firm performance are referred to as competitive advantage (Q. Tan & Sousa, 2015). The competitive advantage arises because of the advantages that come from asset turnover (Dehning dan Stratopoulos, 2002). The greater the company's competitive advantage, the more product sales it will make. Competitive advantage is a company's ability that is assessed based on characteristics and resources so that it can be determined that the company's performance is better than other companies in the same industry or market share and involves top

management which allows substantial increases and asset utilization (M. A. Porter, 1998). Asset utilization can be measured by asset turnover (Curtis et al, 2015):

$$ATO = \frac{Sales}{NOA(t) - NOA(t-1)}$$

where

NOA: Net Operating Asset

Variabel Control

In this study, the control variables used consisted of firm age, firm size, the board size, board meeting, and tangibility. Firm age is measured by the natural logarithm of the number of years the company was founded (Ellouze & Mnasri, 2020) while the firm size is measured using the natural logarithm of total assets (Zhang et al., 2016). Board size can be measured based on the number of commissioners in the company (Hardika et al., 2018). The aspect to measure board meetings is to use the number of meetings held by the company in the current year ((Hanh et al., 2018). Tangibility, meanwhile, can be measured by the ratio of net fixed assets to total assets (Vithessonthi & Tongurai, 2015).

Results and Empirical Discussion

Descriptive Statistics and Correlation

Table 1 shows descriptive statistics. As shown in table 1, the minimum and maximum values for firm performance are -0.260 and 0.872, respectively, and for green supply chain management are 0.000 and 1,000, respectively. In competitive advantage, the minimum and maximum values are -266,469 and 620,363, respectively.

Table 1. Descriptive Statistics

	Mean	Median	Std	Minimum	Maximum
Firm Performance	0.108	0.088	0.127	-0.260	0.872
GSCM	0.535	0.600	0.200	0.000	1.000
CA	22.542	12.183	68.604	-266.469	620.363
Firm Age	3.546	3.638	0.545	0.000	4.762
Firm Size	12.991	14.581	4.211	4.151	18.335
Board Size	8.411	5.000	16.057	2.000	11.000
Board Meeting	14.052	10.000	17.711	0.000	200.000
Tangibility	0.419	0.421	0.192	0.008	0.843

Notes: This table presents descriptive statistics for the dependent, independent, and control variables. The sample consists of PROPER companies listed on the Indonesia Stock Exchange (IDX) in the 2010-2018 periods.

Source: Data processed by researchers

The Pearson correlation test is described in Table 2. The correlation between green supply chain management and competitive advantage is positive with a significance level of 5%., while the correlation between competitive advantage and firm performance is also positive with a significance of 1%. Furthermore, the correlation between green supply chain management and firm performance is found to be positive as well.

Table 2. Pearson Correlation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Firm Performance	1.000							
(2) GSCM	0.037	1.000						
	(0.404)							
(3) CA	0.135***	0.088**	1.000					
	(0.002)	(0.046)						
(4) Firm Age	0.108**	0.058	0.103**	1.000				
	(0.014)	(0.188)	(0.019)					
(5) Firm Size	0.305***	-0.003	-0.110**	0.091**	1.000			
	(0.000)	(0.948)	(0.012)	(0.039)				
(6) Board Size	0.107**	0.040	-0.021	0.013	0.037	1.000		
	(0.015)	(0.369)	(0.632)	(0.764)	(0.396)			
(7) Board Meeting	0.140***	0.139***	-0.015	0.044	0.036	0.833***	1.000	
	(0.001)	(0.002)	(0.733)	(0.316)	(0.409)	(0.000)		
(8) Tangibility	-0.137***	0.057	0.015	0.141***	-0.075*	-0.066	-0.079*	1.000
	(0.002)	(0.194)	(0.729)	(0.001)	(0.090)	(0.132)	(0.073)	

Source: Data processed by researchers

Model 1

Model 1 investigates the impact of green supply chain management on competitive advantage using simple linear regression. The results of this test are shown in tables 3 and 6. The t value for the green supply chain management variable on competitive advantage is 2.00 based on the result obtained in the t-test, with a significance value of 0.046 (sig 5%). This finding suggests that green supply chain management improves competitive advantage, or in other words, H1 is accepted.

Model 2

In model 2, multiple linear regression was used to test the effect of green supply chain management, competitive advantage, firm age, firm size, board size, board meeting, and tangibility on firm performance. The results obtained are presented in table 3 and table 5. Competitive advantage on firm performance has a t-value of 3.94 and a significance value of 0.000 (sig 1%), indicating that competitive advantage has a positive effect on firm performance, or H2 is accepted. The effect of green supply chain management on firm performance has a t value of 0.18 and a significance value of 0.858 (sig > 10%). As a result, H3 is rejected because green supply chain management does not affect firm performance. The firm age control variable has a t value of 1.76 and a significance value of 0.078 (sig 10%). This finding suggests that firm age has a positive impact on firm performance. Firm size has a t value of 7.33 and a significance value of 0.000 (sig 5%), implying that it has a positive impact on firm performance. The t value for board size is -0.37, with a significance value of 0.712 (sig > 10%), indicating that board size does not affect firm performance. At the board meeting, the t value is 1.87, with a significance value of 0.062 (sig 10%). This indicates that the board meeting has an impact on the company's performance. The t value for tangibility is found to be -2.84 with a significance value of 0.005 (sig 1%), indicating that tangibility has a negative impact on firm performance.

Table 3. The Results of Firm Performance Regression and Competitive Advantage

	(1) CA	(2) Firm Performance
GSCM	30.070**	0.005
	(2.00)	(0.18)
CA		0.000***
		(3.94)
Firm Age		0.017*
		(1.76)
Firm Size		0.009***
		(7.33)
Board Size		-0.000
		(-0.37)
Board Meeting		0.001*
		(1.87)
Tangibility		-0.078***
		(-2.84)
_cons	6.446	-0.062
	(0.75)	(-1.57)
r2	0.008	0.156
r2_a	0.006	0.144
N	516	516

Source: Data processed by researchers

Mediation Effect

The results of the mediation test using Sobel are presented in table 4 and table 5. In the indirect relationship, it was found that the t value was 1.811 with a significance value of 0.070 (sig < 10%). These results indicate that competitive advantage mediates the relationship between green supply chain management and firm performance so that H4 is accepted.

Table 4. Mediation Test Results

	Input	Statistical Test	Std. Error	P-value
a	30.07	1.8115747	0.00597965	0.07005194*
b	0.0003			
Sa	15.043			
Sb	0.00007			

Source: Data processed by researchers

Table 5. Summary of Hypotheses Testing

Hypothesis		Regression Coefficient	t-value	p-value	Status
H1	GSCM->CA	30.07	2.00	0.046**	Significantly Positive
H2	CA->FP	0.0003	3.94	0.000***	Significantly Positive
H3	GSCM->FP	0.0047	0.18	0.858	Not significant
H4	GSCM->CA->FP	0.009021	1.811	0.07*	Significantly Positive

Source: Data processed by researchers

Discussion

The findings of this study show that green supply chain management has a direct relationship with a competitive advantage and that competitive advantage has a direct relationship with firm performance. Green supply chain management, on the other hand, did not affect firm

performance. Furthermore, green supply chain management has an indirect relationship with firm performance in PROPER companies in Indonesia mediated by competitive advantage. Green supply chain management practices were found to have a significant impact on firm performance and the creation of competitive advantage.

The results shown in the first hypothesis explain that green supply chain management has a positive effect on competitive advantage. Companies that implement green supply chain management will have a higher competitive advantage. Supply chain management that implements "green" while paying attention to environmental impacts is emphasized to use the 3R (reuse, reduce and recycle) which will help companies to reduce direct material costs and total product costs. Efforts from green supply chain management will encourage companies to develop more efficient products, increasing their competitive advantage. For companies in Indonesia, increasing competitive advantage requires the application of green supply chain management. Our findings are supported by the research of (C. L. Tan et al., 2016). (C. L. Tan et al., 2016).

Competitive advantage has a positive effect on firm performance, as evidenced by the results of the second hypothesis. This shows that gaining a competitive advantage can improve a company's performance. These findings are in line with previous research (Rauf et al., 2019). Companies in Indonesia are currently facing a high level of competition. Companies that implement non-replicable products are better able to strengthen their competitive advantage, which in turn strengthens or improves company performance.

According to the third hypothesis, reen supply chain management does not affect firm performance. This explains why there are cost constraints in the application of green supply chain management in terms of environmental sustainability. The high cost of practicing green supply chain management is an effort that the company is still making to improve its performance. These findings are supported by (Ahmed, 2020; Novitasari & Agustia, 2021) research.

The results in the fourth hypothesis suggest that competitive advantage can provide evidence that it can mediate the relationship between green supply chain management and firm performance. Environmental issues may encourage businesses to use "green" in supply chain management, starting from the selection and purchase of materials from suppliers, processing of finished goods, and distribution of goods to consumers. Green supply chain management can also help businesses gain a competitive advantage by lowering operational costs and creating products that are difficult to duplicate, resulting in increased sales. Furthermore, such efforts will boost the firm's performance. Indonesian businesses must implement green supply chain management to improve their competitiveness and firm performance. This result is supported by the research of (Abednico, 2016; Jiang et al., 2020; Munsung & Stephens, 2020). In other words, implementing green supply chain management in Indonesian businesses will strengthen competitiveness and create a competitive advantage, allowing businesses to increase sales, profits, and overall performance.

Conclusion

This study concludes that green supply chain management can help businesses gain a competitive advantage. The company will be able to strengthen increasingly stringent competitiveness and create a competitive advantage by reducing the environmental impact of implementing "green" in supply chain management. With the creation of this competitive advantage, the company will be able to increase market share and achieve maximum sales targets, resulting in increased profits and firm performance. Given the numerous competitors in the same industry, a competitive advantage is required, which aims to create products that cannot be imitated to boost sales and firm performance.

The finding of increasingly high environmental problems and pressure from stakeholders, with the use of green supply chain management being offered as a solution to these environmental problems, is the implication of this research. Green supply chain management will reduce environmental impacts, allowing for increased competitive advantage and firm performance. By implementing green supply chain management in companies, this program will assist the Indonesian government in reducing the risk of environmental impacts.

This research also contributes to efforts to reduce the environmental impact of the company's manufacturing process in Indonesia. Green supply chain management is critical for businesses to ensure that the processes of selecting raw materials from suppliers, brand creation, product manufacturing processes, and product distribution do not have a negative impact on the

environment until the product reaches the customer's hands. According to research (Tseng et al., 2019), the practice of green supply chain management has been steadily improving. This study shows, in particular, that companies can gain a competitive advantage by implementing green supply chain management in their operations. From this strategy, firm performance will be created. Theoretically, this study adds to the literature on the direct relationship between green supply chain management and firm performance, as well as the indirect relationship between green supply chain management and firm performance mediated by competitive advantage. Green supply chain management will help businesses gain a competitive advantage and improve their performance.

The limitation of this study lies in the population used which only takes from the companies listed in PROPER and only implements green supply chain management, competitive advantage, and firm performance. For this reason, it is recommended for further studies to consider the performance and application of other green management.

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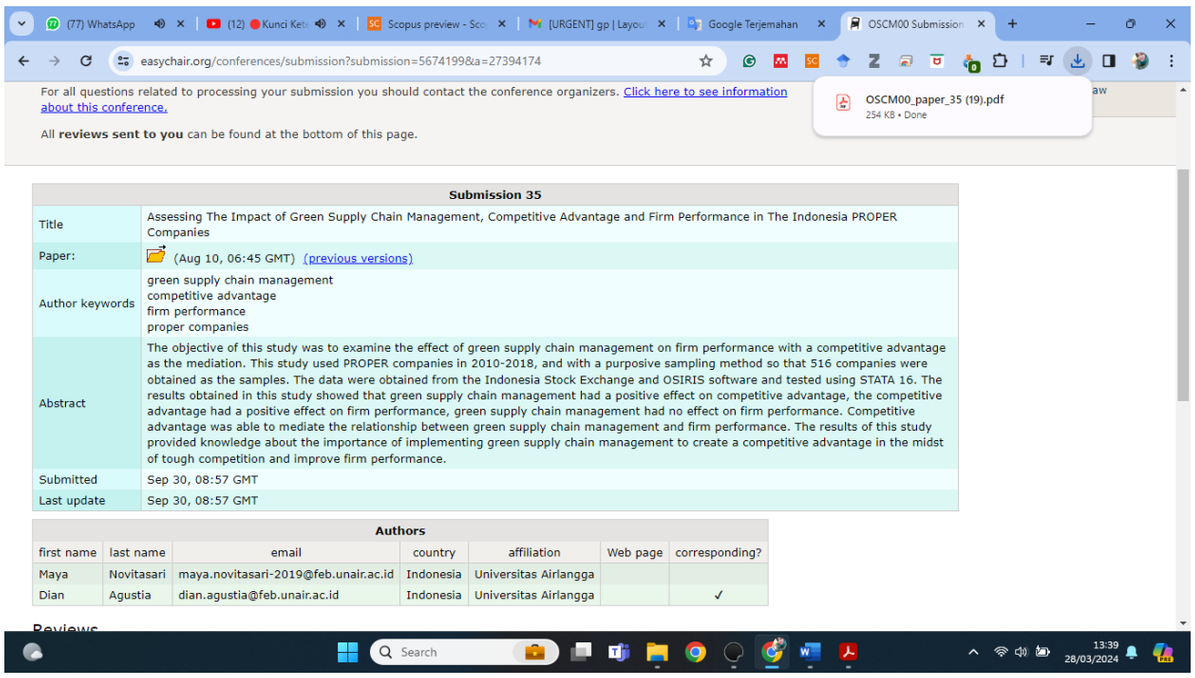

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Submission 35	
Title	Assessing The Impact of Green Supply Chain Management, Competitive Advantage and Firm Performance in The Indonesia PROPER Companies
Paper:	(Aug 10, 06:45 GMT) (previous versions)
Author keywords	green supply chain management competitive advantage firm performance proper companies
Abstract	The objective of this study was to examine the effect of green supply chain management on firm performance with a competitive advantage as the mediation. This study used PROPER companies in 2010-2018, and with a purposive sampling method so that 516 companies were obtained as the samples. The data were obtained from the Indonesia Stock Exchange and OSIRIS software and tested using STATA 16. The results obtained in this study showed that green supply chain management had a positive effect on competitive advantage, the competitive advantage had a positive effect on firm performance, green supply chain management had no effect on firm performance. Competitive advantage was able to mediate the relationship between green supply chain management and firm performance. The results of this study provided knowledge about the importance of implementing green supply chain management to create a competitive advantage in the midst of tough competition and improve firm performance.
Submitted	Sep 30, 08:57 GMT
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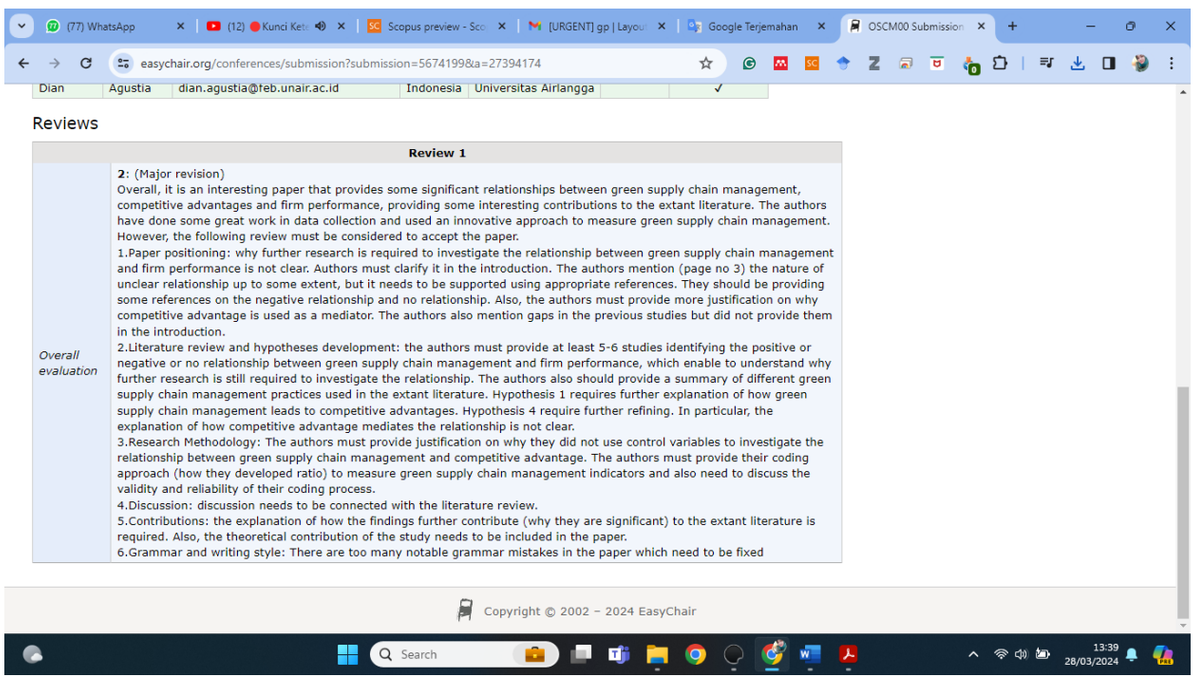

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Reviews

Review 1	
Overall evaluation	**2**: (Major revision) Overall, it is an interesting paper that provides some significant relationships between green supply chain management, competitive advantages and firm performance, providing some interesting contributions to the extant literature. The authors have done some great work in data collection and used an innovative approach to measure green supply chain management. However, the following review must be considered to accept the paper. 1.Paper positioning: why further research is required to investigate the relationship between green supply chain management and firm performance is not clear. Authors must clarify it in the introduction. The authors mention (page no 3) the nature of unclear relationship up to some extent, but it needs to be supported using appropriate references. They should be providing some references on the negative relationship and no relationship. Also, the authors must provide more justification on why competitive advantage is used as a mediator. The authors also mention gaps in the previous studies but did not provide them in the introduction. 2.Literature review and hypotheses development: the authors must provide at least 5-6 studies identifying the positive or negative or no relationship between green supply chain management and firm performance, which enable to understand why further research is still required to investigate the relationship. The authors also should provide a summary of different green supply chain management practices used in the extant literature. Hypothesis 1 requires further explanation of how green supply chain management leads to competitive advantages. Hypothesis 4 require further refining. In particular, the explanation of how competitive advantage mediates the relationship is not clear. 3.Research Methodology: The authors must provide justification on why they did not use control variables to investigate the relationship between green supply chain management and competitive advantage. The authors must provide their coding approach (how they developed ratio) to measure green supply chain management indicators and also need to discuss the validity and reliability of their coding process. 4.Discussion: discussion needs to be connected with the literature review. 5.Contributions: the explanation of how the findings further contribute (why they are significant) to the extant literature is required. Also, the theoretical contribution of the study needs to be included in the paper. 6.Grammar and writing style: There are too many notable grammar mistakes in the paper which need to be fixed

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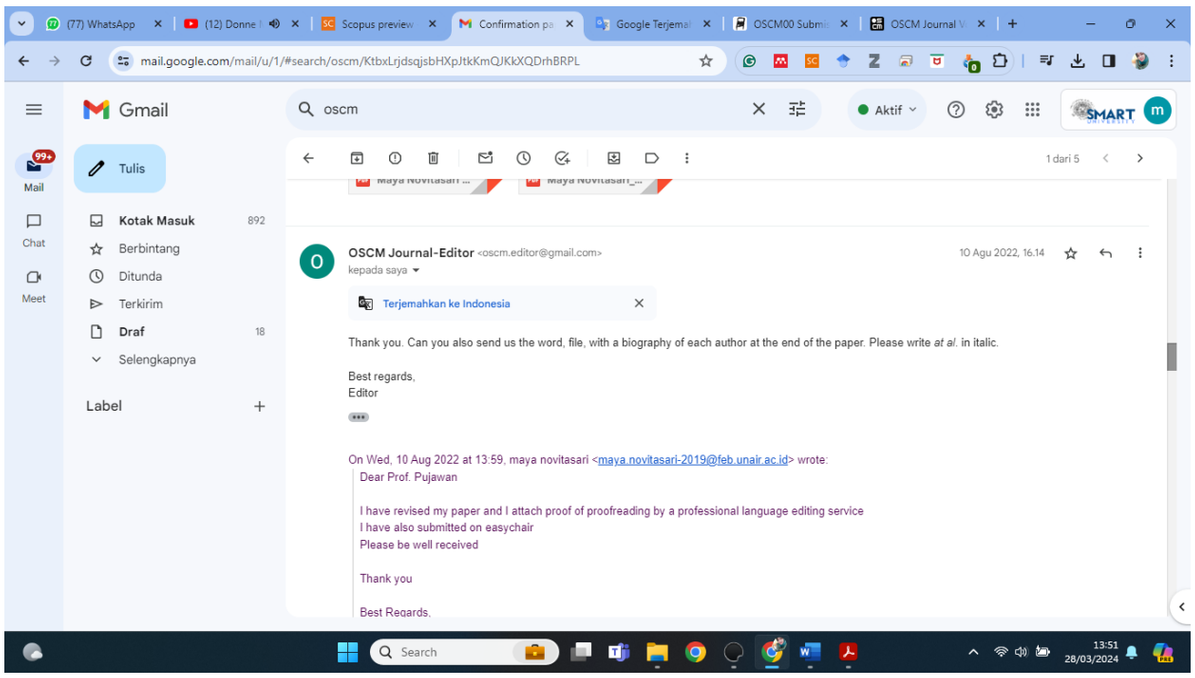

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