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Crucial factors of green supply chain management on Indonesian SMEs business performance

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ABSTRACT

The COVID-19 pandemic has altered lifestyle and sparked a greater interest in GSCM. This study logically contributes to the branch of knowledge by demonstrating how resource-based attributes and integration can improve SME business performance while concurrently facilitating the successful transition from traditional to green supply chains. This study focused on batik SMEs that make their products using natural resources. The goal is to analyze SME performance models that affect GSCM, owner commitment, and supply chain connectivity. The data analyzed were gathered from a total of 163 experienced SME managers in the Special Region of Yogyakarta, Indonesia. PLS-SEM is the data analysis method used. The results validate that SME business performance is positively impacted by OC, SCC, and GSCM. The function of OC and SCC in SME business performance can also be mediated by GSCM.

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1. INTRODUCTION

Indonesia is a country that is known to have a variety of cultures. As a cultural heritage of the Archipelago, Batik has a high artistic value and blend, laden with philosophical meanings and symbols that show the way of thinking of the people who make it. The aim of this study is to analyze the performance of natural batik SMEs in Indonesia which GSCM influences. On October 2, 2009, UNESCO (United Nations Educational, Scientific and Cultural Organization) recognized Batik as Indonesia's cultural heritage. Batik cloth motifs cannot be separated from the coloring process, which gives a sweet touch. Natural dyes, aka traditional, are environmentally friendly compared to synthetic dyes. Making natural Batik is accompanied by precision and perseverance to get beautiful original Indonesian works with motifs with philosophical meaning. Some plants commonly used for natural batik dyes are avocado, guava, mahogany, mango, coffee, secang wood, and male manjel.

In tandem with the growing use of natural dyes in batik textiles, the batik industry in Indonesia has evolved into an environmentally friendly business sector. Consequently, Batik also becomes a high economic value product. The increase in consumers' desire for environmentally friendly products continues to occur in the fiercely competitive and dynamic global market. These issues can be resolved by the presence of natural color batik which is expected to expand current market opportunities. In accordance with data from the Ministry of Industry, small and medium-sized enterprises (SMEs) dispersed throughout 101 centers account for the majority of batik businesses in Indonesia. In batik IKM centers, the number of workers employed goes up to 15 thousand people. In 2016, the total value of batik products and cloth exported was USD 149.9 million, which were primarily marketed to Japan, the United States, and Europe. According to the data, the

batik industry plays a crucial role in propelling the country's economy by fostering the development of entrepreneurs, creating jobs, and contributing to the country's foreign exchange.

Growing awareness to poor environmental performance has made it imperative to implement the concept of sustainability, which is also known as GSCM (green supply chain management), into practice. Environmental considerations are integrated into the supply chain through green supply chain management. Product design, raw material selection, manufacturing processes, product delivery to consumers, and product management after its useful life are all encompassed in GSCM [1]. In order to cope with the uncertain dynamics of the global market, MSMEs are currently attempting to implement more effective business models [2]. One of the best business practices nowadays is GSCM, and have recognized its application as one of the ingenious business strategies that can aid businesses such as MSMEs to survive and succeed in operations. It is revealed that the presence of numerous hindrances, however, significantly complicates the adoption of the GSCM strategies by SMEs effectively. According to Akbar et al. [3], MSMEs encounter a number of challenges when attempting to take environmental issues into account during the production process, including a shortage of resources, time, money, abilities, skills, knowledge, flexibility, etc.

In the case of natural Batik in Indonesia, only a small number of natural color batik artisans in Indonesia demonstrate a dedication to implementing GSCM in the batik industry. One of the well-known reasons is the long time needed to create natural dyes due to their immense complexity. Aside from that, their ability to create natural color batik is limited by the availability of natural dye raw materials. The coloring process for natural batik is also more complex and time-consuming than that for synthetic colorants. Kitsis & Chen [4] claim that company performance is greatly influenced by top management commitment. The greater the commitment of top management, the more significant the improvement of the company's performance. Companies can increase market share, save more money, and meet customer demands on time by improving performance through top management commitments like allocating necessary resources and providing employee training. In its development, the external environment has a significant impact on the continuity of the Company's business.

The supplier is an example of an external environment for the company. Without suppliers, companies cannot run their business, and proper management of the company's supply chain is essential to maintaining smooth production. In this regard, businesses and suppliers collaborate not only on purchasing and providing, but also on the necessity of communication for both parties to maximize and satisfy consumers. Exchange of information becomes a means of communication between suppliers and companies. The only way to conceptualize connectivity is as a process of decision-making involving interconnected parties at different levels of the supply chain, where the responsibility for decisions and results is shared collectively. Research findings on the correlation between manager commitment in GSCM and business performance yield diverse findings.

In addition to SCM and OC connectivity, owner commitment (OC) is another aspect that contributes to the successful implementation of GSCM. Demand from internal and external stakeholders leads to the increasing urgency and expectation for business owners to develop greener operations [5]. This study seeks to close a knowledge gap by creating a model to investigate the role of OC in green practices and its effetcs on firm economic performance. This research focuses on the role of humans as an area studied in SCM [6], specifically the ability to persuade people to commit to owners. This research also examines the function of OC as a precursor to GSCM, which leads to green operating performance. This study also contributes to the clarification of the ongoing debate about the practical impact of GSCM on economic performance.

The study carried out by Govindan et al. [7] revealed that GSCM and business performance have a positive correlation. Supply chain connectivity enables SMEs to share resources that affect the supply chain and business performance [8]. Mofokeng & Chinomona [8], however, discovered that SME performance was not discernibly impacted by supply chain connectivity. GSCM is a topic that has drawn a lot of interest [7, 9, 10]. Nevertheless, it is asserted that there is a dearth of research on GSCM in the field [11, 12]. This research focuses on the literature gap with regard to the role of GSCM in improving performance. There are two GSCM predictors analyzed in this study, namely supply chain connectivity and SME owner commitment to green production.

2. MATERIALS AND METHODS

This is a quantitative study in which the owners or managers of SMEs that produce Batik with natural dyes in the Special Region of Yogyakarta become respondents. There were 163 respondents from natural dye batik SMEs. A purposive sampling method was the non-probability sampling method utilized in the sampling of this study. The sampling criteria in this study include naturally colored hand-drawn batik that are committed to implementing green supply chain management in their business operations. The data in this study was gathered using a questionnaire. The data in this study is analyzed using the PLS model analysis in Smart PLS version 4.0. Each variable is measured by adopting the items from research result by Sharma et al, Zhai et al, and Khan et al. [13, 14, 15].

Initially, validity and reliability tests will be performed on these items. SME business performance variables are measured namely (1) SMEs have the capability of utilizing their assets effectively, (2) SMEs have a strong competitive position compared to other SMEs, and (3) SMEs have overall positive profitability parameters. Meanwhile, the items used to measure GSCM include all processes that incorporate environmental concerns into supply chains and ecosystem protection. Among the GSCM measurements are (1) green purchase, (2) active cooperation with suppliers and customers, (3) environmentally friendly design practices, (4) designing sustainable product and service offerings, and (5) performing green production processes. SCC refers to an organizational capacity to collect and exchange supply chain-related information through the use of IS. These items are used to measure SCC: (1) SMEs can maintain SCC between suppliers, (2) SMEs collaborate during disruptions, (3) SMEs can organize information collection quickly, (4) SMEs use information systems to exchange supply chain information, (5) SMEs are adopting digital business, (6) SMEs can quickly overcome disruptions, and (7) SMEs can quickly improve supply chain connectivity. The following indicators to measure OI, namely: (1) Top management recognizes sustainability as a crucial component of the company's strategy, (2) Top management encourages endeavors to enhance sustainability initiatives, and (3) Employees are qualified to solve sustainability issues.

3. RESULTS

3.1. Characteristics of Respondents

This study used data from 163 respondents from batik SMEs with natural dyes in the Special Region of Yogyakarta. The characteristics of the respondents can be observed in Table 1.

Table 1. Characteristics of respondents

Characteristics	(%)	Characteristics	(%)
Gender		**Education**	
Male	22	Elementary School	7
Female	78	Junior High School	18
Age		Senior High School	33
21 - 30 years	17	Bachelor	42
31 - 40 years	28	**Length of Business**	
41 - 50 years	24	Less than five years	42
51 - 60 years	29	5 - 10 years	33
> 60 years	3	11 - 15 years	15
Target Market		16 - 20 years	8
Domestic	77	21 - 30 years	2
Overseas	23		

3.2. Measurement models

Convergent validity, discriminant validity, composite reliability, and Cronbach alpha were tested in order to implement the measurement model. Convergent validity indicates that a set of indicators corresponds to a single latent variable. Single-dimensionality, which is expressed using the average value of the extracted variance (AVE), can be used to illustrate this kind of representation. The results of convergent

validity and reliability tests can be viewed in Table 2. The AVE criterion value must be higher than 0.5, the composite reliability is ≥ 0.6, and the Cronbach's Alpha which reflects a reliability is at least 0.7.

Table 2. Convergent validity test results

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Business Performance	0.840	0.904	0.758
Green SCM	0.769	0.850	0.587
Owner Commitment	0.787	0.811	0.590
Supply Chain Connectivity	0.893	0.916	0.609

Table 2 shows that the convergent validity and reliability criteria are met so that all the items proposed in this study can be used further to justify discriminant validity using the criteria suggested by Fornell-Larcker and cross-loadings. The Fornell-Larcker postulate mentions that a latent variable with the underlying indicator shares more variance than that with other latent variables. Therefore, according to statistical interpretation, each latent variable definitely has AVE value that is greater than the highest *r2* value with the other latent variable values. Table 3 shows a good Fornell-Larcker value so that the discriminant validity criterion can be exceeded.

Table 3. Fornell-Larcker

	Business Performance	Green SCM	Owner Commitment	Supply Chain Connectivity
Business Performance	**0.871**			
Green SCM	0.797	**0.766**		
Owner Commitment	0.789	0.721	**0.768**	
Supply Chain Connectivity	0.870	0.677	0.658	**0.881**

3.3. Structural models

After the construct is confirmed reliable and valid, analysis of the structural model must be carried out. The structural model assessment examines the correlation between constructs and predictive ability models [16]. Model testing is carried out by observing the R^2 value and predictive relevance. The resulting R^2 is classified into weak (0.25), moderate (0.50), or substantial (0.75) categories [16]. Based on these standards, R^2 Business Performance (0.848) can be considered substantial, and Green SCM (0.806) can be considered substantial.

Table 4. R Square

	R Square	R Square Adjusted
Business Performance	0.848	0.843
Green SCM	0.806	0.802

The next test uses the f^2 effect criterion. f^2 is examined from each predictor construct to assess its effect on each endogenous construct. Table 5 displays the results of the f^2 test.

Table 5. *F* Square

	Business Performance	Green SCM
Business Performance		
Green SCM	0.617	
Owner Commitment	0.519	0.288
Supply Chain Connectivity	0.763	0.477

The effect of the size of GSCM, Owner Commitment, and Supply Chain Connectivity on SME business performance is 0.617, 0.519, and 0.763, respectively. This effect is considered significant according to the criteria of Cohen (1988). Likewise, the effect sizes for OC and SCC on GSCM were 0.288, considered moderate, and 0.477, considered significant. Another model fit test also performed was Q^2 to evaluate the predictive relevance of endogenous latent constructs. The following shows the calculation of the Q^2 value:

$$Q^2 = 1 - (1 - R_1^2)(1 - R_2^2) \quad (1)$$

$$Q^2 = 0.901584$$

A Q^2 value of 0.901584 resulted from the Q^2 test means that it shows the predictive relevance of each exogenous latent construct that forms endogenous latent is large [16].

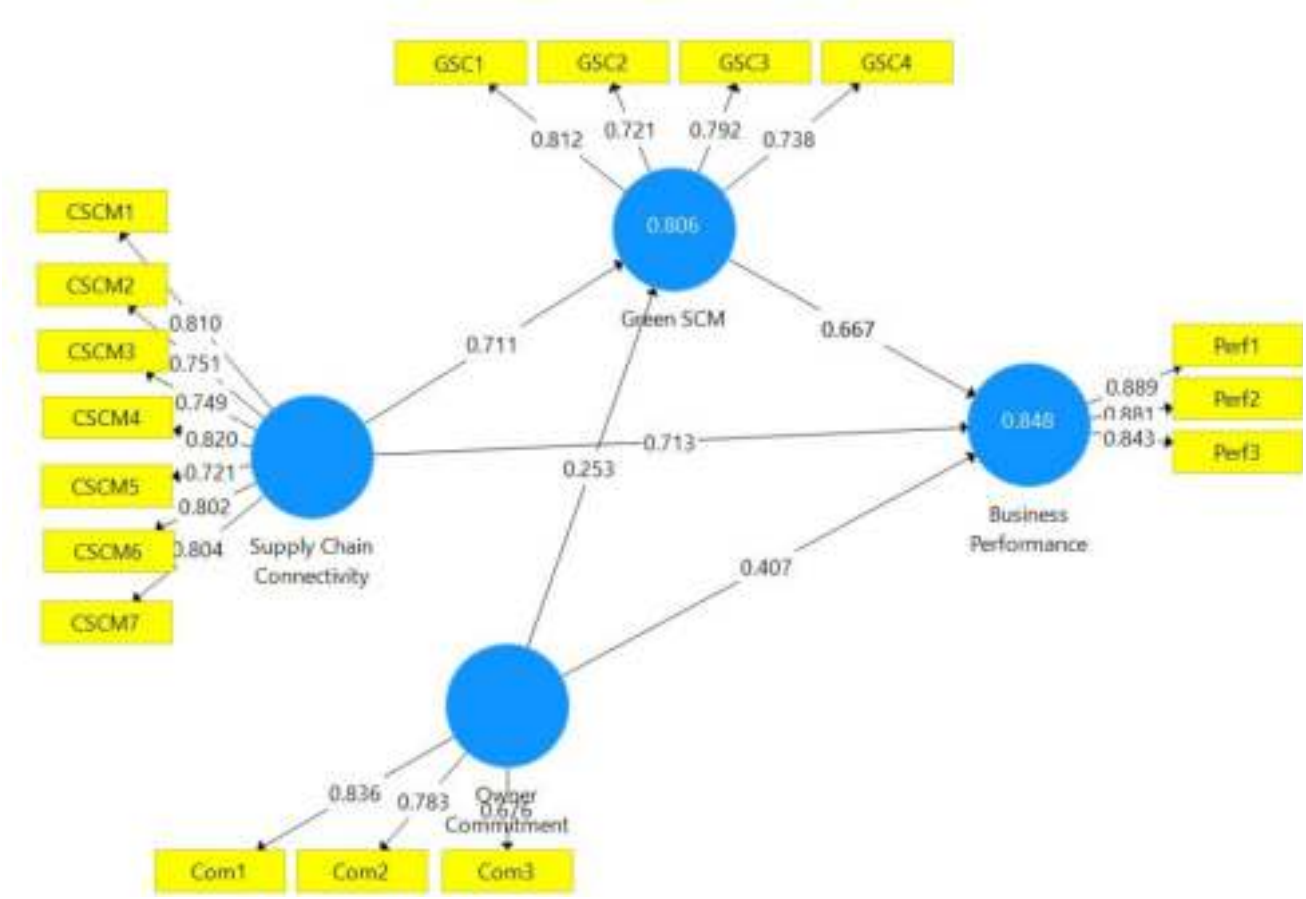

Figure 1. Structural Model of Business Performance

Figure 1 and Table 6 present the path coefficient, significance level, and the results of hypothesis testing. The structural path coefficient analysis results suggest that all the proposed hypotheses are accepted because all p-values are significant at the 0.05 level.

Table 6. Structural path coefficients and results of hypotheses tests

Structural relationship	Path coefficient	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Hypotheses (Accept/ Reject)
Green SCM →Business Performance	0.667	0.083	4.482	0.039	H1 Accept

Table 6. Structural path coefficients and results of hypotheses tests (Continued)

Structural relationship	Path coefficient	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Hypotheses (Accept/ Reject)
Supply Chain Connectivity → Green SCM	0.711	0.045	15.693	0.000	H2 Accept
Supply Chain Connectivity → Business Performance	0.713	0.081	8.810	0.000	H3 Accept
Owner Commitment → Green SCM	0.253	0.060	4.259	0.000	H4 Accept
Owner Commitment → Business Performance	0.407	0.048	8.406	0.000	H5 Accept

4. DISCUSSION

This study scrutinizes the quantitative relationship between SSC, OC, GSCM, and business performance of batik SMEs with natural dyes. In order to obtain data for this study, questionnaires were distributed to batik SMEs that produce their Batik with natural dyes in the Special Region of Yogyakarta, Indonesia. Structural equation processing of the data results in a good SME performance fit model. The pathways and effects of SSC and OC on GSCM and business performance resulted from this study are all proven significant. The following three aspects will be the criteria to examine the results of this study. First, GSCM is positively affected by business performance.

The results of this study corroborate and are in harmony with the results of studies performed by Gonzales et al., Tseng et al., & Li et al. [1, 17, 18]. Environmental degradation is deteriorating under new normal conditions and the world's rapid economic development, both in Indonesia and globally. Companies are increasingly confronted with the need to conduct green operations. In addition, Gonzales et al. [1] demonstrate that GSCM can be a green operation endeavor to achieve optimal economic and environmental performance. Research regarding batik SMEs with natural dyes that they conducted included obtaining and purchasing environmentally friendly materials for batik SMEs with natural dyes and carrying out environmentally friendly production processes. The financial performance of these SMEs may improve as a result of this green production pattern. This increase in financial performance is evidenced by an increase in natural batik sales and consumer satisfaction with natural Batik.

Second, GSCM and performance are positively impacted by SCC. The results of this study affirm [14,18-20] A good SCC can maintain good relationships with suppliers, consumers, and with the entire Company's supply chain from upstream to downstream [15, 28, 32, 35]. The findings of this research imply that batik SMEs with natural dyes can integrate all supply chain lines, which facilitates their ability to overcome challenges and barriers in each production process. The interconnectivity between SMEs is also relatively good for fostering connectivity between SMEs, suppliers, and consumers. GSCM facilitates the supply chain connectivity made by natural batik SMEs that improves the implementation of green supply chains and assists SMEs in maintaining a green production process [20]. The majority of batik SMEs with natural dyes already use information technology to manage relationships with customers and suppliers. Good connectivity achieved by batik SMEs with natural dyes can increase sales growth and profits.

Third, OC affects GSCM and performance positively. This study affirms [21, 22, 23, 31], in numerous SMEs, top management support is typically linked to owner commitment. The majority of SME leaders in Indonesia are also the owners. Hardly ever do SMEs hire particular leaders for their SMEs. Hence, the owner

also administers SME management. The owner's commitment to natural batik SMEs can improve GSCM and SMEs' performance. This is evident from the commitment of the owner, who already believes that the Company's sustainability is an essential component of the business strategy that this natural Batik SMEs must have. In addition, the owner is committed to enhancing green operation initiatives that are sustainable and environmentally friendly in every production process. The owner is also committed to providing the employees with continuous training on green operation to protect the environment. According to studies by [21,22, 37, 38] owner commitment is crucial to the successful application of GSCM practices. This OC has the potential to impact the performance of natural batik SMEs in the future and is the key to achieving consumer satisfaction and business performance.

Nevertheless, owner commitment is also typically affected by pressure from the government [33, 34, 36] and the moral obligations of SME owners. Moreover, implied that moral demands and government regulations also foster the emergence of SME entrepreneurs' commitment to green production and environmental preservation. Among other things, the government supports naturally dyed Batik through a decree requiring SMEs to operate environmentally sound operations. The government of the Special Region of Yogyakarta is supporting initiatives to preserve Batik with natural dyes through various training programs and encouraging several regions to become centers of naturally dyed batik crafts. The government has provided substantial support and funding to a number of naturally dyed batik centers in order to maintain the naturally dyed batik production process. The government also facilitates natural batik SMEs with national and international exhibitions, bridging natural dye batik SMEs to attract international consumers.

5. CONCLUSION

This study investigates the precursors and consequences of GSCM on business performance. Two GSCM precursors were noted from SCC and OC. According to the proposed hypothesis, the SCC-GSCM-Business performance framework produces positive results. Moreover, the OC-GSCM-Business performance relationship is also positive. This study examines the effects of owner commitment as a critical factor in human aspects on GSCM and business performance and the effects of OC on the process of green operations in natural batik SMEs. The results indicate that OC affects the performance by 40.7%. This value is worth to take into account by SMEs when aiming for better business performance. OC and SCC are also essential in increasing GSCM practices in craft SMEs.

The GSCM practice by natural batik SMEs promotes a green environment and culture throughout the entire company, from the raw material procurement to the packaging and delivery of products to consumers. The green environment created by SMEs can improve customer satisfaction and sales turnover of natural Batik. This study only discovered two GSCM precursors, namely SCC and OC. It is would be preferable if future research on green operations can include other variables such as supplier collaboration, government pressure on pro-environmental businesses, and consumer pressure so that they could learn more about the benefits of GSCM on business performance from the perspective of businesses, consumers, organizations, and governments. Moreover, it is also necessary to perform a thorough analysis of the green performance of SME operations in the green sustainability-oriented craft industry.

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