

## ENABLERS OF GREEN SUPPLY CHAIN MANAGEMENT AND SUSTAINABILITY PERFORMANCE

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### **Abstract**

*This study investigates the enabling factors of Green Supply Chain Management (GSCM) practices and their impact on sustainability performance, with a particular focus on economic performance among furniture Micro, Small, and Medium Enterprises (MSMEs) in Yogyakarta. The urgency of this research lies in the inconsistent findings of previous studies regarding GSCM's effectiveness in improving firm performance and the limited exploration of its enabling factors. Using a quantitative approach, the study surveyed 75 export-oriented furniture MSMEs, selected through purposive sampling, and analyzed the data using SmartPLS 4.0. The results show that consumer behavior and organizational strategy significantly influence GSCM adoption, while institutional pressures and economic advantages do not. GSCM practices positively influence environmental and social performance, but do not directly or indirectly improve economic performance. This study contributes to the literature by integrating both the drivers and the outcomes of GSCM in a single empirical framework specific to the MSMEs context.*

**Keywords:** *green supply chain management; environmental performance; social performance; economic performance; sustainability performance*

### **INTRODUCTION**

MSMEs play a strategic role in Indonesia's economy due to their significant number and contribution (Syaakir, 2017). In 2019, around 65.4 million MSMEs supported national economic growth. According to data from the Ministry of Cooperatives and MSMEs, MSMEs contributed 60.5% to Indonesia's Gross Domestic Product (GDP), and this figure has continued to grow annually (Tambunan, 2023). One of the most prominent MSME sectors is the wooden furniture industry, which contributes significantly to both domestic and international markets. Indonesia ranks among the top five furniture-exporting countries globally, along with China, Italy, Vietnam, and Malaysia (Djunaidi et al., 2018). However, with the increasing global awareness of environmental issues and intensified competition due to globalization, the furniture industry faces critical challenges. Companies are now required to not only strengthen their internal capabilities but also enhance their supply chain competitiveness through sustainability (Kusmantini & Untoro, 2019).

In this context, GSCM implementation is increasingly seen as a strategic necessity. In Indonesia, companies using wood as their primary raw material are mandated to comply with environmental standards through certifications such as the Timber Legality Assurance System (Sistem Verifikasi Legalitas Kayu, or SVLK), Sustainable Production Forest Management

(Sertifikasi Pengelolaan Hutan Produksi Lestari, or SPHPL), and Timber Tracking System (Sistem Lacak, atau SLC) (Subulas Salam & Suherman, 2013). GSCM is a multidimensional concept that integrates both internal and external environmental practices throughout the supply chain (Feng et al., 2018; Kalyar et al., 2020). The GSCM adoption is driven not only by regulatory requirements but also by increasing societal expectations regarding corporate environmental and social responsibility. Government pressure, along with growing public scrutiny over ecological degradation, has pushed organizations to embrace greener business strategies (Huang, 2022).

Numerous studies have found that GSCM positively impacts environmental, social, and economic performance (Dian et al., 2022; Yalviolita & Hendayani, 2022). However, the empirical findings remain inconsistent. Several studies suggest that not all GSCM practices significantly influence firm performance, indicating the need for deeper and more contextual analysis (Jassim et al., 2020; Holling & Backhaus, 2023). In the Yogyakarta region, furniture MSMEs hold great potential, contributing USD 2.8 billion in export value during the 2021–2023 period (*Kementerian Koperasi Dan UKM Indonesia*, 2024). Despite this, the sector has yet to reach its full potential. A 28% decline in exports from January to September 2023 indicates weakening competitiveness. Compared to culinary and fashion subsectors, furniture MSMEs have consistently underperformed.

Key challenges include limited availability of raw materials and high logistics costs (Kompas.com, 2024). These challenges reflect suboptimal sustainable supply chain practices, highlighting the urgent need for effective GSCM implementation to improve economic outcomes and ensure long-term viability. GSCM adoption is influenced by various enablers such as environmentally conscious consumer behavior, sustainability-oriented organizational strategies, government regulations, and financial motivations (Asif et al., 2020; Tjahjadi et al., 2022). This aligns with stakeholder theory, which emphasizes value creation for all parties that influence or are influenced by an organization (Freeman, 1984). GSCM serves as a critical tool to meet the expectations of diverse stakeholders across environmental, social, and economic dimensions (Mahajan et al., 2023).

Although GSCM is theoretically linked to sustainable performance, few studies have simultaneously examined the relationship between its enabling factors, implementation, and impacts on environmental, social, and economic performance particularly in the context of furniture MSMEs in Indonesia. This research gap underscores the importance of an empirical investigation into how these enablers drive GSCM practices and contribute to business sustainability. Therefore, this study focuses on identifying and analyzing the enabling factors that influence GSCM adoption and assessing how such practices affect the sustainability outcomes of furniture MSMEs in Yogyakarta.

## METHODS

This study employed a quantitative research design grounded in previous empirical findings, theoretical frameworks, and the researcher's understanding of field conditions. The approach was explanatory, aiming to examine causal relationships between variables based on formulated hypotheses. A conceptual framework was developed to guide the research, with hypotheses derived from a synthesis of the literature and the research context. A purposive sampling technique was employed to ensure that the sample reflected the population characteristics relevant to the study objectives. Two inclusion criteria were applied in selecting respondents: (1) furniture businesses that were export-oriented; (2) businesses that considered environmental sustainability in supplier selection. Based on these criteria, a sampling frame of 75 eligible companies was identified. Out of these, 64 respondents agreed to participate, resulting in a response rate considered acceptable for ensuring representativeness in this context.

Data were collected over a two-month period, from March to April 2024, using structured questionnaires distributed to qualified respondents. To enrich and validate the quantitative data, follow-up in-depth interviews were conducted with selected participants. This step enabled a deeper understanding of the contextual nuances behind their answers and decisions related to GSCM adoption. After distributing the questionnaire and collecting the data, we conducted follow-up

interviews to further explore the findings. In data analysis, convergent validity was considered acceptable if the outer loading value exceeded 0.6, the average variance extracted (AVE) exceeded 0.5, and composite reliability exceeded 0.7. In addition, Cronbach's alpha had to exceed 0.7 for each variable, indicating reliable and appropriate items for each construct. The data were examined using structural equation modeling (SEM) with partial least squares (PLS) in the SmartPLS 4.0 software. Figure 1 presents the conceptual framework of this research.

Based on the conceptual framework and literature review, the following hypotheses were tested: (1) H1a: Consumer behavior positively influences GSCM practices; (2) H1b: Organizational strategy positively influences GSCM practices; (3) H1c: Government regulations positively influence GSCM practices; (4) H1d: Financial benefits positively influence GSCM practices; (5) H2: GSCM practices positively influence environmental performance; (6) H3: GSCM practices positively influence social performance; (7) H4: Environmental performance positively influences economic performance; (8) H5: Social performance positively influences economic performance; (9) H6: GSCM practices positively influence economic performance directly; (10) H7a: Environmental performance mediates the effect of GSCM on economic performance; (11) H7b: Social performance mediates the effect of GSCM on economic performance.

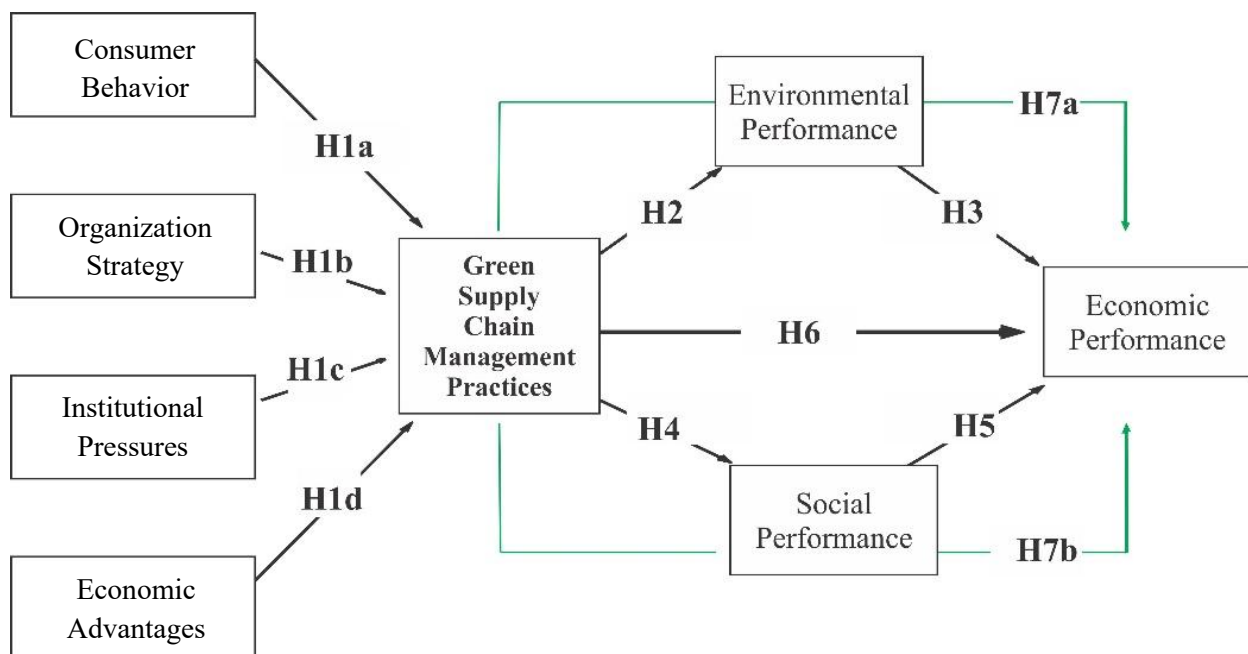


Figure 1. Conceptual Framework

## RESULTS

This section presents the results of the outer model evaluation. The initial analysis showed that five indicators (OS4, EA3, GSCMP5, GSCMP6, and GSCMP7) were invalid in the convergent validity evaluation, as their loading factor values were below 0.70. Therefore, these indicators were excluded from further analysis. After removing the invalid indicators, all remaining indicators had loading factor values above 0.70, confirming their validity. Furthermore, reliability testing, which assessed internal consistency, construct reliability, and extracted variance, revealed that all variables exhibited Cronbach's alpha values greater than 0.7, indicating adequate reliability: CB = 0.925, EA = 0.755, IP = 0.822, OS = 0.772, GSCMP = 0.863, EP = 0.778, SP = 0.769, and ECP = 0.774. Hypothesis testing was conducted using bootstrap PLS, with the results presented in Figure 2. More detailed findings are shown in Table 1.

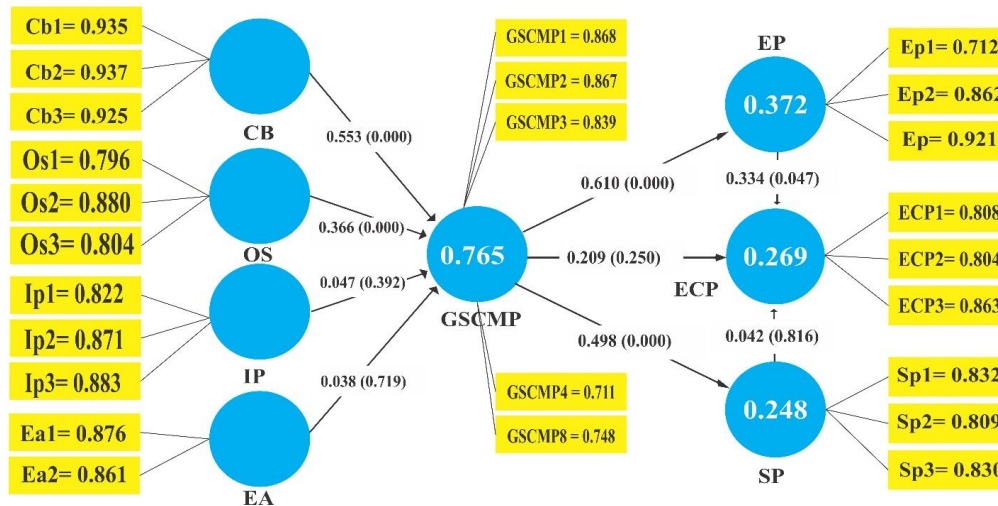


Figure 2. Bootstrap PLS

Table 1. Hypothesis Testing Results

	Hypothesis	Original Sample (O)	T Statistic ( O /STDEV)	p-value	f-square	Description
H1a	Consumer behavior (CB) → green supply chain management practices (GSCMP)	0.553	6.738	0.000	0.683	Accepted
H1b	Organization strategy (OS) → green supply chain management practices (GSCMP)	0.366	4.585	0.000	0.298	Accepted
H1c	Institutional pressures (IP) → green supply chain management practices (GSCMP)	0.047	0.857	0.392	0.006	Rejected
H1d	Economic advantages (EA) → green supply chain management practices (GSCMP)	0.038	0.360	0.719	0.003	Rejected
H2	Green supply chain management practices (GSCMP) → Environmental performance (EP)	0.610	8.788	0.000	0.591	Accepted
H3	green supply chain management practices (GSCMP) → Social performance (SP)	0.498	6.492	0.000	0.329	Accepted
H4	Environmental performance (EP) → Economic performance (ECP)	0.334	1.984	0.047	0.076	Accepted
H5	Social performance (SP) → Economic performance (ECP)	0.042	0.233	0.816	0.001	Rejected
H6	green supply chain management practices (GSCMP) → Economic performance (ECP)	0.209	1.151	0.250	0.036	Rejected
H7a	green supply chain management practices (GSCMP) → Economic performance (EP) → Economic performance (ECP)	0.205	1.865	0.062	0.374	Rejected
H7b	green supply chain management practices (GSCMP) → Social performance (SP) → Economic performance (ECP)	0.021	0.221	0.825	0.250	Rejected

## DISCUSSION

The results of this study show that several enabling factors positively affect GSCM practices, namely consumer behavior (H1a,  $p = 0.000$ ) and organizational strategy (H1b,  $p = 0.000$ ). This result aligns with previous studies (Onsrud Hazel & Simon, 2013; Olson, 2008) that emphasize the importance of environmentally aware consumers and proactive internal strategies in driving green supply chain initiatives. In the context of Yogyakarta's furniture MSMEs, which mostly cater to export markets, consumer pressure appeared to be a strong external driver. Buyers from international markets often demand proof of sustainability compliance, which compels MSMEs to adjust their practices accordingly. Furthermore, organizational strategy, despite being constrained by scale and resources, proves to be an essential internal enabler when leadership prioritizes long-term competitiveness and market access through green initiatives.

In contrast, institutional pressures (H1c,  $p = 0.392$ ) and economic advantages (H1d,  $p = 0.719$ ) did not significantly influence GSCM practices. This may reflect weak regulatory enforcement and limited incentives government authorities and industry regulators. Although certifications such as SVLK are required, many MSMEs perceive compliance as a formality rather than a genuine commitment to sustainability. Respondents reported that regulatory bodies rarely offer support or training and sometimes impose costly certification requirements without adequate assistance. This discourages small businesses from viewing regulation as a constructive enabler of GSCM (Djunaidi et al., 2018; Wongthongchai & Saenchaiyathon, 2019; Kalyar et al., 2020). Similarly, the lack of significant influence from economic benefits suggests that MSMEs have yet to perceive clear financial returns from GSCM implementation. In fact, many respondents noted increased operational costs associated with green practices such as eco-friendly materials, staff training, and certification expenses without corresponding short-term economic gains. These findings are consistent with Wongthongchai & Saenchaiyathon (2019), who argue that the perceived cost burden often inhibits SMEs from pursuing environmentally responsible supply chain practices.

GSCM practices positively affect environmental performance (H2 accepted,  $p = 0.000$ ), supporting previous studies (Dian et al., 2022; Huang, 2022; Shafira et al., 2021; Siregar & Pinagara, 2022; Yalviolita & Hendayani, 2022). Implementing GSCM practices enables companies to better manage the environment, thereby improving environmental performance. MSMEs in Yogyakarta's furniture sector that adopt GSCM practices can minimize environmental harm by reducing production waste and air pollution and by preserving forests through the use of certified (legal) wood. The third hypothesis, which states that GSCM practices positively affect corporate social performance, is supported. The results highlight the importance of environmentally friendly practices by MSMEs in generating strong social performance, ultimately contributing to overall sustainability (Rosati & Faria, 2019). This study supports the findings of Yildiz Çankaya and Sezen (2019).

Hypotheses H3, which explore the impact of GSCM on social performance ( $p = 0.000$ ), is supported. This indicates that GSCM practices, when implemented, enhance companies' ability to manage environmental impacts (e.g., waste reduction, use of certified wood, pollution control) and improve social outcomes such as worker health and community relations. These findings are in line with prior research (Dian et al., 2022; Yalviolita & Hendayani, 2022; Rosati & Faria, 2019), and demonstrate that MSMEs in Yogyakarta are capable of achieving non economic sustainability targets when they prioritize green supply chain management.

Environmental performance (H4) had a modest but statistically significant effect on economic performance ( $p = 0.047$ ), consistent with findings by Manrique & Martí-Ballester (2017) and Mann & Kaur (2020). In some cases, MSMEs have repurposed wood waste into marketable products, reduced pollution-related fines, or attracted environmentally conscious buyers. However, these benefits appear limited and vary significantly across firms.

On the other hand, the insignificant effect of social performance on economic outcomes (H5 rejected,  $p = 0.816$ ) may reflect a lack of structured corporate social responsibility (CSR) systems among MSMEs. This finding contradicts theoretical expectations and previous results reported by (Margolis & Walsh, 2003). It may even have a negative impact. Most furniture MSMEs in Yogyakarta remain medium-sized and lack dedicated CSR or social activity divisions. Business actors should enhance social performance to improve company reputation, which may lead to stronger economic outcomes.

Although this study confirms that GSCM practices positively affect environmental and social performance, they have no direct impact on economic performance (H6 rejected). This finding contradicts previous studies (Dian et al., 2022; Feng et al., 2018; Holling & Backhaus, 2023; Huang, 2022; Jermisittiparsert et al., 2019; Kalyar et al., 2020; Taj Hejazi et al., 2023). GSCM practices in furniture MSMEs do not directly influence economic performance, likely due to the involvement of multiple moderating factors.

The hypothesis proposing a mediating role of environmental and social performance is not supported (H7a and H7b are rejected). These findings do not corroborate the results by (Ahmad

Amjad et al., 2022; Sarminah Samad et al., 2021). Efforts such as reusing obsolete equipment, repairing damaged tools, and converting waste into value-added products fail to offset the costs incurred by the company to implement GSCM practices. These costs include employee training, non-chemical materials, environmental maintenance, social activities, and certification of legally sourced raw materials by furniture MSMEs in Yogyakarta. This situation illustrates that sustainable performance through GSCM has not yet been achieved, as no significant improvements were observed in environmental, social, and economic performance. This contradicts the triple bottom line framework, a key reference for sustainable performance (Rosati & Faria, 2019).

## CONCLUSIONS

This study investigated the enabling factors of Green Supply Chain Management (GSCM) practices and their effects on environmental, social, and economic dimensions of sustainability performance among furniture micro, small, and medium enterprises (MSMEs) in Yogyakarta Province, Indonesia. Eleven hypotheses were tested to examine these relationships. The findings confirm that only two enabling factors, namely consumer behavior (H1a) and organizational strategy (H1b), significantly influence the adoption of GSCM practices. Meanwhile, institutional pressure (H1c) and perceived economic advantages (H1d) do not show significant effects. These results suggest that formal external pressures (e.g., regulations) and perceived financial benefits are insufficient motivators for MSMEs, especially when regulatory support and cost efficiency remain underdeveloped.

In terms of outcomes, GSCM practices have a significant positive impact on both environmental (H2) and social performance (H3). However, GSCM practices do not directly affect economic performance (H6). Furthermore, environmental performance has a positive influence on economic performance (H4), but social performance shows no such effect (H5). The mediating effects of environmental and social performance in linking GSCM to economic performance (H7a and H7b) are also not supported. These findings indicate that while GSCM improves environmental and social dimensions of sustainability, such improvements have not yet translated into measurable economic gains for most furniture MSMEs. Barriers such as high implementation costs, limited sustainability management, and weak institutional support may hinder the economic realization of green practices.

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