

Green Supply Chain Management and Sustainable Retail Business Performance

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Abstract: : The rapid growth of the retail sector has increased environmental pressure through energy consumption, packaging waste, and transportation emissions throughout the supply chain. Green Supply Chain Management (GSCM) has emerged as a strategic approach to integrate environmental considerations into purchasing, product design, distribution, and reverse logistics to drive sustainable business performance. This article aims to analyze how GSCM practices impact sustainable retail business performance through a qualitative approach based on a systematic literature review of reputable scientific publications from 2021-2026. Data were collected from reputable databases using keywords such as green supply chain management, sustainable performance, and retail, then analyzed thematically to identify practice dimensions, mediators, and their performance impacts. The study results show that green purchasing, eco-design, reverse logistics, green distribution, and green collaboration with suppliers consistently contribute to retailers' economic, environmental, operational, and social performance, with green innovation, digitalization, and big data capabilities playing important mediators. The novelty of this article lies in its cross-sector synthesis that specifically maps the gap in GSCM implementation in retail compared to manufacturing and proposes an integrative conceptual model for the context of sustainable retail. These findings provide practical implications for retail managers and policy makers in designing competitive green supply chain strategies.

Keywords: : green supply chain management; sustainable business performance; retail; green innovation; systematic literature review

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1. Introduction

The retail industry is one of the economic sectors with a significant environmental footprint, given its characteristics involving high transaction volumes, fast inventory turnover, extensive distribution networks, and the use of large amounts of packaging. Modern retail operations, from procurement and warehouse storage to store distribution and returns handling, generate significant energy consumption and carbon emissions. Amidst growing consumer awareness of environmental issues and government regulatory pressures regarding waste and emissions management, retailers are being challenged to transform

conventional business models toward more environmentally friendly practices without sacrificing competitiveness and profitability.

Green Supply Chain Management (GSCM) exists as a strategic framework that integrates environmental sustainability principles into every stage of the supply chain, encompassing green purchasing, product eco-design, clean production, green distribution, and reverse logistics for recycling and post-consumer waste management. Unlike conventional supply chain management, which focuses solely on cost efficiency and delivery speed, GSCM seeks to balance the three pillars of sustainability: economic performance, environmental performance, and social performance, enabling organizations to achieve long-term competitive advantage while simultaneously fulfilling their environmental responsibilities. Empirical studies have consistently demonstrated a positive association between GSCM implementation and improved organizational performance, both through operational efficiency, enhanced brand reputation, and supply chain risk mitigation.

However, much of the GSCM literature is still dominated by research in the manufacturing sector, particularly heavy industries such as automotive, textiles, and factory-based production, while studies in the retail sector are relatively underdeveloped. Yet, the characteristics of retail supply chains are fundamentally different from those in manufacturing: retailers generally do not produce goods directly, but rather act as intermediaries, managing multi-supplier procurement, omnichannel logistics, and direct interactions with end consumers. These structural differences mean that findings from the manufacturing context cannot always be easily generalized to the retail context, particularly regarding how green purchasing, green distribution, and reverse logistics practices are implemented within a distributed network of stores and rapidly changing consumption patterns, including the rapid growth of e-commerce and omnichannel business models.

Recent research developments have also shown a shift in focus from simply measuring the direct relationship between GSCM and organizational performance to exploring more complex mediating mechanisms. Recent studies have revealed that green innovation, digital transformation, big data analytics capabilities, and artificial intelligence act as connecting channels that strengthen the impact of GSCM on sustainable performance. Furthermore, contextual factors such as a company's strategic orientation, governance quality, and dynamic sustainability capabilities have also been reported to moderate the strength of this relationship. However, the integration of these findings into a conceptual framework specifically relevant to the retail context remains rare, leaving a conceptual gap that needs to be bridged.

Another identified gap is the lack of qualitative synthesis that explicitly maps the dimensions of GSCM practices comprehensively and links them to various indicators of sustainable business performance (economic, environmental, operational, and social) simultaneously within a single analytical framework. Many previous studies tend to be partial, focusing on only one or two dimensions of GSCM practices, or measuring only one type of performance, resulting in a fragmented picture of how the entire green value chain contributes to retail business sustainability. Furthermore, most studies use a quantitative, survey-based approach in a single country or sector, thus limiting cross-context generalization and accumulative synthesis of various global empirical findings.

Based on the above description, the novelty of this article lies in three main aspects. First, this article presents a cross-sector qualitative synthesis that explicitly maps the gap in GSCM implementation between the manufacturing and retail sectors, a comparison rarely made explicitly in previous literature. Second, this article integrates findings on

contemporary mediators, namely green innovation and digitalization/big data, into a conceptual framework specifically adapted for the retail operational context, including the characteristics of omnichannel and store networks. Third, this article proposes a comprehensive mapping between the five main dimensions of GSCM practices and the four dimensions of sustainable business performance (economic, environmental, operational, and social), resulting in an integrative conceptual model as a foundation for further empirical research in the retail sector.

Based on the Resource-Based View (RBV), Natural Resource-Based View (NRBV), and Stakeholder Theory, this article argues that green capabilities built through GSCM practices constitute a strategic resource that is difficult for competitors to imitate (VRIN), while also being a legitimate response to stakeholder demands for environmental sustainability. Thus, the objectives of this study are: (1) to identify dimensions of GSCM practices relevant to the retail context; (2) to analyze mechanisms and mediators that bridge the relationship between GSCM and sustainable business performance; and (3) to formulate an integrative conceptual framework as a theoretical and practical contribution to the development of green supply chain strategies in the retail sector.

2. Method

This study employed a qualitative approach with an interpretive-thematic systematic literature review (SLR) design. The qualitative approach was chosen because the research aimed to build a deep conceptual understanding of the relationship between GSCM practices and sustainable retail business performance, rather than to statistically test hypotheses. The research process followed four main stages: identification, screening, eligibility assessment, and thematic synthesis, adapted from the PRISMA principles for qualitative studies.

In the identification stage, a literature search was conducted through reputable academic databases, including Scopus, Web of Science, ScienceDirect, SAGE Journals, MDPI, Emerald Insight, and the academic search engines Google Scholar and Consensus, using a combination of the keywords "green supply chain management", "sustainable performance", "sustainability performance", and "retail". Inclusion criteria included: (1) indexed journal articles with an active, accessible DOI; (2) published within the last five years (2021-2026) to maintain the recency of the findings; (3) explicitly discussing GSCM practices and their relationship to organizational/business/sustainability performance; and (4) written in English or Indonesian. Exclusion criteria included non-peer-reviewed articles, proceedings without a DOI, short editorials, and articles with inaccessible full text.

In the screening and eligibility assessment stage, the titles and abstracts of identified articles were screened to ensure thematic relevance, and then the selected articles were thoroughly read to assess their methodological quality and conceptual contribution. A total of 25 articles were ultimately used as the primary data corpus in this synthesis, encompassing studies in manufacturing, service, and retail contexts from various countries, to enable cross-sector comparisons as mentioned in the novelty section.

Data analysis was conducted thematically following the stages of data familiarization, initial coding (open coding), grouping themes (axial coding), and compiling core themes (selective coding) that represent the dimensions of GSCM practices, mediators, and dimensions of sustainable business performance. The coding process was carried out manually with the help of a concept matrix to ensure consistency of interpretation between articles. The results of this thematic synthesis were then visualized in the form of a conceptual framework as presented in Figure 1, which illustrates the flow of relationships between the five dimensions of GSCM practices, two main groups of mediators (green

innovation and digitalization/big data), and four dimensions of sustainable retail business performance (economic, environmental, operational, and social), which is based on the perspectives of RBV, NRBV, and Stakeholder Theory.

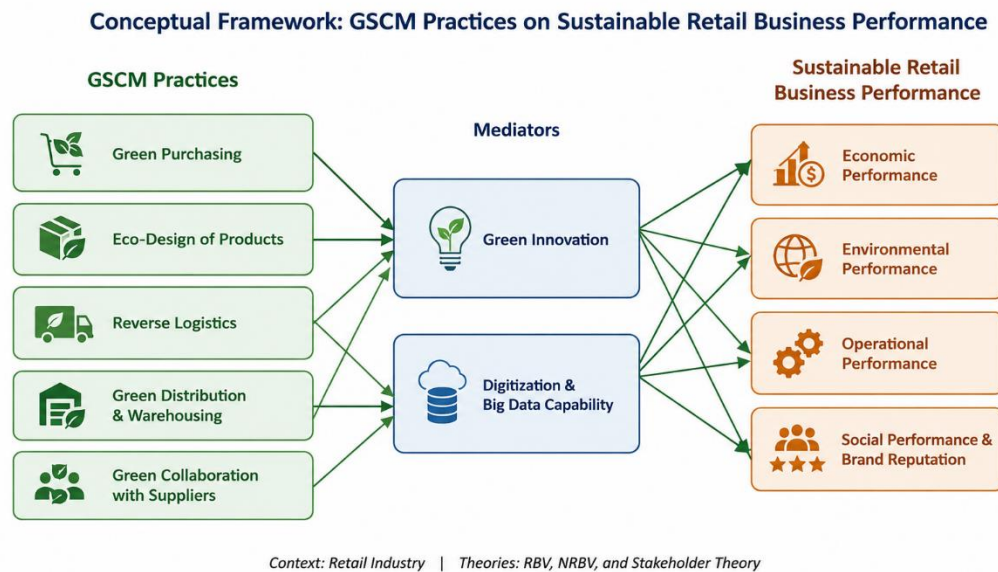


Figure 1. Conceptual Framework of the Thematic Synthesis Results of GSCM and Sustainable Retail Business Performance

The trustworthiness of this qualitative synthesis was ensured through source triangulation, which involved comparing findings from various publication types (empirical studies, meta-analyses, and literature reviews) and diverse country contexts, ensuring that the resulting themes were not derived from a single perspective. Furthermore, a consistency check (audit trail) was conducted on the citations and interpretations of each source article to minimize the researcher's interpretive bias.

3. Results and Discussion

3.1 Dimensions of GSCM Practices and Their Contribution to Performance

A thematic synthesis of 25 articles yielded five key dimensions of GSCM practices consistently reported to contribute to sustainable business performance: green purchasing, eco-design/product innovation, reverse logistics, green distribution and warehousing, and green collaboration with suppliers. A summary of key findings from each dimension, along with representative reference studies, is presented in Table 1.

Table 1. Summary of GSCM Practice Dimensions and Their Contribution to Sustainable Business Performance

Dimensions of GSCM Practices	Study Example (Author, Year)	Key Findings on Sustainable Business Performance
Green Purchasing	Habib et al. (2021); Hejazi et al. (2023)	Purchasing based on environmental criteria lowers long-term raw material costs and improves a company's environmental performance.

Eco-Design & Product Innovation	Le et al. (2022); Liu et al. (2026)	Eco-friendly product design drives green innovation that mediates improvements in economic and operational performance.
Reverse Logistics	Rupa & Saif (2021); Nureen et al. (2022)	Product reuse and recycling management reduces waste and improves retail operational cost efficiency.
Green Distribution & Warehousing	Asnawi (2024); Tsikada et al. (2024)	Optimizing distribution routes and green warehousing in retail reduces transportation emissions and improves operational efficiency.
Green Collaboration with Suppliers	Sharma et al. (2023); Ngo et al. (2023)	Supply chain resource integration and supplier collaboration strengthen supply chain resilience to sustainability risks.
Digitalization & Big Data	Le et al. (2024); Liu et al. (2026)	Digital capabilities and data analytics significantly mediate the relationship between GSCM and corporate performance.
Dynamic Governance & Capabilities	Essuman et al. (2025); Galdos-Urbizu (2024)	The quality of governance and sustainable dynamic capabilities strengthen the effect of GSCM on corporate environmental performance.

Source: Processed from a thematic synthesis of 25 articles (2021-2026).

The findings in Table 1 confirm that green purchasing is the most common entry point for GSCM implementation. Habib et al. (2021) and Hejazi et al. (2023) report that establishing environmental criteria in the procurement process not only reduces regulatory risk but also reduces long-term raw material costs through efficient resource use. For retailers, this practice is relevant in the form of curating environmentally friendly products from suppliers and implementing green certification standards in multi-vendor procurement contracts, a challenge that is more complex than in manufacturing due to the significantly more diverse number of suppliers.

The eco-design and product innovation dimensions also showed significant influence, as found by Le et al. (2022) and Liu et al. (2026), who emphasized that green innovation acts as a bridge between green business strategy and corporate performance. In the retail context, this dimension manifests itself in minimalist packaging, private label products made from sustainable materials, and energy-efficient store designs. Meanwhile, reverse logistics, which encompasses product returns management and recycling, was reported by Rupa and Saif (2021) and Nureen et al. (2022) as a practice that directly impacts operational cost efficiency and waste reduction, a crucial issue given the high return rate in online retail.

The green distribution and warehousing dimension is one of the most specific areas in the retail context, as demonstrated by Asnawi's (2024) study, which specifically examined GSCM strategies in retail companies. Optimizing delivery routes, consolidating loads, and using renewable energy in distribution warehouses have been shown to reduce transportation emissions while increasing the operational efficiency of the store network. Similarly, Tsikada et al. (2024) found that improved operational performance resulting from green practices also strengthens a company's sustainable competitive advantage. Finally, the green collaboration dimension with suppliers, emphasized by Sharma et al. (2023) and Ngo et al. (2023), demonstrates that integrating supply chain resources across partners strengthens an organization's resilience to sustainability risks, such as supply disruptions due to increasingly stringent environmental regulations.

3.2 The Role of Mediators: Green Innovation and Digitalization

One important finding of this synthesis is the shift in research focus from a direct GSCM-performance relationship to exploring mediating mechanisms. Le et al. (2024) found that digitalization drives sustainable corporate performance through the dual mediation of green innovation and GSCM, indicating that digital transformation enhances, rather than replaces, the role of conventional green practices. Similar findings were reported by Liu et al. (2026), who demonstrated that artificial intelligence capabilities and knowledge integration mediate the relationship between green business strategy, GSCM, and sustainable performance at the organizational level.

For the retail sector undergoing a massive omnichannel transformation, these findings are highly relevant. Big data-based inventory management systems enable retailers to more accurately predict demand, thereby reducing excess stock and product waste, particularly in perishable goods. Furthermore, digital platforms facilitate greater supply chain transparency, simplifying the tracking of a product's carbon footprint from supplier to end consumer, while strengthening consumer confidence in retailers' sustainability claims (green claims).

3.3 Contextual Factors: Governance and Dynamic Capabilities

In addition to innovation and digitalization mediators, this synthesis also identifies the role of contextual factors such as governance and dynamic sustainability capabilities. Essuman et al. (2025) found that governance quality strengthens the effects of GSCM and green innovation on corporate environmental performance in a developing country context, while a meta-analysis by Galdos-Urbizu (2024) of 166 articles published between 2001 and 2023 confirmed that the strength of the GSCM-environmental performance relationship varies depending on specific moderating practices, such as Environmental Management System (EMS) certification and the level of collaboration with customers.

The findings of Kumar et al. (2023) in a comprehensive literature review on measuring sustainable supply chain performance further confirm that organizations need a multidimensional performance measurement system, beyond just financial indicators, to capture the full impact of green practices. This is relevant for retailers, who need to develop specific key performance indicators (KPIs), such as packaging reduction ratio, in-store renewable energy usage, and customer satisfaction indexes for sustainability initiatives, to complement conventional financial indicators.

3.4 Retail Sector Gap and Novelty Contribution

A systematic comparison between studies in manufacturing contexts (e.g., Feng et al., 2024; Mokadem & Khalaf, 2024; Ning et al., 2025) and retail contexts (Asnawi, 2024; Alzoubi et al., 2024) shows that while the underlying logic of GSCM is relatively similar, the emphasis of its practices differs significantly. In manufacturing, greater emphasis is placed on clean production processes and factory emissions management, while in retail, the emphasis shifts toward green distribution, returns management, and direct interaction with increasingly environmentally conscious end-consumer preferences. Alzoubi et al.'s (2024) study in the e-retailing industry even shows that organizational innovation orientation strengthens the relationship between GSCM and performance in the digital retail context, a nuance rarely seen in conventional manufacturing studies.

Based on this synthesis, the conceptual framework in Figure 1 offers a novel contribution by integrating five practice dimensions, two groups of contemporary mediators, and four performance dimensions into a single model that explicitly considers the unique characteristics of retail: a dispersed store network, omnichannel patterns, and direct interactions with end consumers. This model fills a gap in previous literature that

tends to test partial relationships and serves as a basis for developing empirical measurement instruments for further quantitative research in the retail sector.

Overall, these findings provide practical implications that retail managers need to adopt a holistic GSCM approach, not just focusing on a single practice such as packaging reduction, but integrating all dimensions of the green supply chain simultaneously and supported by investments in digital capabilities and strong sustainability governance, so that its impact on business performance can be optimized sustainably.

4. Conclusion (Times New Roman, 12 pt, bold)

This qualitative study based on a systematic literature review concludes that Green Supply Chain Management (GSCM) plays a crucial role in driving sustainable retail business performance through five key practice dimensions: green purchasing, product eco-design, reverse logistics, green distribution and warehousing, and green collaboration with suppliers. The relationship between these practices and business performance is strengthened by contemporary mediators, namely green innovation, digitalization, and big data capabilities, and moderated by the quality of governance and the organization's dynamic sustainability capabilities. Unlike the majority of literature that focuses on the manufacturing sector, this article emphasizes that the retail context has unique characteristics, particularly in the areas of distribution, returns management, and customer interaction, which require specific adaptations of the GSCM framework.

The novelty of this research lies in its cross-sector synthesis that maps the gap in GSCM implementation between manufacturing and retail, the integration of contemporary mediators into a conceptual framework relevant to the retail context, and the comprehensive mapping of the dimensions of sustainable business practices and performance (economic, environmental, operational, and social). Practically, these findings recommend that retail managers develop an integrated green supply chain strategy, support it with digitalization investments, and strengthen internal sustainability governance.

This study has limitations in that it is purely qualitative and based on a synthesis of secondary literature, so it has not yet tested the proposed conceptual framework empirically. Therefore, future research is recommended to conduct quantitative validation, for example through surveys or structural equation modeling, on a sample of retail companies in various countries, to test the strength of the relationships between the dimensions in the proposed conceptual framework and explore additional contextual variables, such as company size, retail format (offline, online, omnichannel), and the organization's level of digital maturity.

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