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THE ROLE OF SUSTAINABLE SUPPLY CHAIN PRACTICES AND CUSTOMER RELATIONSHIP MANAGEMENT IN ENHANCING FIRM PERFORMANCE: A STRATEGIC BUSINESS MANAGEMENT PERSPECTIVE

Wajiha Imran[*1], Mehar Un Nisa[2], Sham[3]

[*1]*Institute of Management Sciences, Bahauddin Zakariya University, Multan, Pakistan.*
[2]*MS Business Administration, Institute of Management Sciences, Bahauddin Zakariya University, Multan, Pakistan.*
[3]*Sindh Madressatul Islam University (SMIU), Karachi, Sindh, Pakistan.*

[*1]wajihaimran0703@gmail.com, [2]mehru1143@gmail.com, [3]shambhimani2k@gmail.com

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Sustainable supply chain practices, customer relationship management, firm performance, strategic management, Saudi Arabia, structural equation modeling.

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Corresponding Author: *
Wajiha Imran

Abstract

Background: *With an increasing environmental pressure and changing customer needs, companies are forced to incorporate sustainability and strategic relationship management into their business. Although both Sustainable Supply Chain Practices (SSCPs) and Customer Relationship Management (CRM) have each shown a positive link with firm performance, little is known about the combined effect of SSCP and CRM on firm performance in terms of strategic business management perspective especially in developing countries.*

Objective*: The purpose of this study is to examine how SSCPs and CRM affect firm performance, and to explore the mediating effect of CRM on the relationship between SSCPs and performance based on a sample of Saudi firms.*

Methodology*: A cross sectional study with quantitative approach was carried out in 350 firm of manufacturing, retail, and service in this study. A structured questionnaire on validated scales was used to gather 310 valid responses from managerial respondents. The constructs examined were SSCPs (i.e. sustainable sourcing, green logistics, waste management), CRM (i.e. customer satisfaction, loyalty programs, relationship building), and firm performance (i.e. operational efficiency, financial, customer loyalty). Data were analyzed with AMOS 22 and Smart PLS for the Structural Equation Model (SEM).*

Results*: The results indicated that SSCPs have a positive and significant direct effect on the firm performance (β= 0.42, p <. 001), and CRM also had a direct and positive effect (β = 0.37, p <. 001). Moreover, CRM was also shown to have a mediation effect between SSCPs and firm performance. The model had a good fit statistics indicating that the framework was valid.*

Implications*: The findings suggest that integrating SSCP into CRM is conducive to firm performance and provides strategic advantages in sustainability and customer retention.*

INTRODUCTION



Over the recent years, the sustainable supply chain practices (SSCPs) and customer relationship management (CRM) have become an important way by which a firm can improve its performance. The growing attention to environmental sustainability and customer orientation worldwide are calling for an understanding of how these behaviours and practices can increase the company performance. SSCPs emphasise on environment impact minimisation including eco-sustainable purchase, logistics efficiency and waste reduction, while CRM is about building long-term customer relationship using data analytics and personalized communication. The alignment of these measures does not just contribute to an environmental problem-solving but also increases the satisfaction of consumers, resulting in better financial results for companies (Afzal & Hanif, 2022).

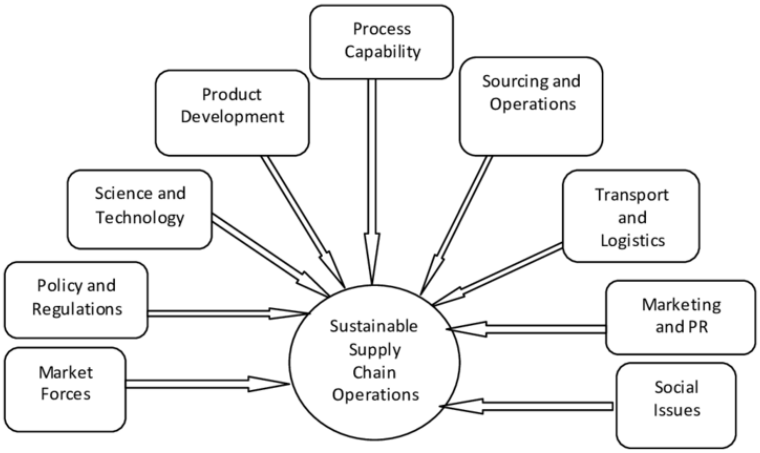


The Circular Economy and Supply Chains

Empirical research has shown that SSCPs have positive effect on the firm performance. For example, Afzal and Hanif (2022) indicated that green supply chain management practices significantly improve operational efficiencies and lowers costs in the manufacturing industry. Also, Awuah-Gyawu, Muntaka, Owusu-Bio, and Fianko (2024), it was established that sustainable supply chain management practices have positive impact on operational performance, mediated by business regulatory compliance and corporate sustainability culture. These results highlight the significance of incorporating sustainability into SCM practice in order to realize higher performance returns.



CRM systems adoption has also been associated with the improvement of firm performance at the same time. The global CRM market is expected to grow from USD 112.91 billion in 2025 to USD 262.74 billion in 2032 as more and more businesses are depending on CRM applications to manage customer interactions and sales growth (Fortune Business Insights, 2024). They allow businesses to analyze customer information, personalize marketing, and provide better customer service. Accordingly it is strategic use CRM as essential competitive tool in current business environment (Grand View Research, 2024).

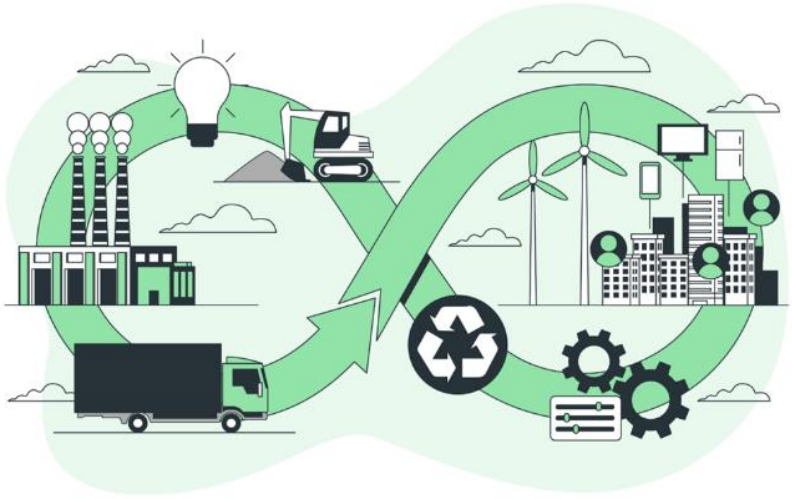


Source: Hassini, E., Surti, C., & Searcy, C. (2012). A literature review and a case study of sustainable supply chains with a focus on metrics. *International Journal of Production Economics*, 140 (1), 69–82, p. 75.

The combination of SSCPs and CRM can contribute to an overall improvement of firm performance. Integrating sustainable practices with customer relationship tactics, companies are not only able to fulfil environmental and social obligations, but can also target changing tastes of consumers who are environmentally conscious. Such an alignment supports the emergence of products and services that meet the needs and expectations of customers, thus reinforcing a firm's brand equity and customer loyalty. In addition, the incorporation of digital technologies, including artificial intelligence and big data analytics, are expected to offer more value to SSCPs, CRM, promoting real-time decision making and personalization of customer experience (Grand View Research, 2024).

The risk avoidance and supply chain operation resiliency are controlled by the intelligent inclusion of SSCPs and CRM. For instance, by using digital twins and AI-based tools, companies can map their supply chains and spot weak points in their them which are exposed in a new era of climate change and geopolitical risk. Not only do such preemptive actions provide for continuity of operations, but also it serves as visible proof of a firm's commitment to environmental sustainability as well as positive and social responsibility and enhance the level of

stakeholder confidence a long¡]term profitability (Wired, 2025).



The alignment of sustainable supply chain and customer relationship management is an absolute necessity for firms seeking to achieve increased performance in a competitive and sustainable market. Through the strategic intersection of sustainability and customer-centricity, organisations may attain operational excellence, increase customer loyalty and achieve sustainability of success. Future research must further investigate the interaction of these tools and find best practices in their use for different industries.

Problem Statement

Although the good practices of a sustainable supply chain and a customer relationship management are known to have a positive impact on company performance, many business organizations fail to synthesize the two approaches. A unified framework that embeds environmental sustainability into customer-centred approaches is rare and suboptimal effects may emerge. Additionally, the volatile nature of market requirements demand and environmental challenges require better clarity on how these mechanisms can be combined holistically to stimulate firm performance (Afzal & Hanif, 2022; Awuah-Gyawu et al., 2024).

Significance of the Study

This study has practical importance as it endeavors to respond to the urgent call marking out the necessity of having an holistic vision towards intertwining a sustainable supply chain management and customer relationship management. The interrelation of these strategies uncovered by the study offers a number of important managerial and policy implications for firms, seeking to improve performance as well as fulfilling environmental and social duties. The results add to the slight literature by providing a strategic model that integrates sustainability with a customer focus to help firms to gain a competitive edge and sustainable growth (Fortune Business Insights., 2024; Grand View Research, 2024).

Aim of the Study

The purpose of this paper is to test the strategic business management focus on the relationship of sustainable supply chain and customer relationship management to firm performance. The study aims to provide an integrated model comprising two primary viewpoints-exclusively the environmental sustainability and customer focused strategies, with practical implications for operational enhancement, customer satisfaction and overall performance of firms (Awuah-Gyauw et al.,2024; Grand View Research,2024).

Methodology

Relevance to industry: The present study adopted a positivist type of a research strategy by investigating the implications of Sustainable Supply Chain Practices (SSCPs) coupled with CRM on firm performance. An organized questionnaire was developed to measure three latent constructs, namely,

SSCPs, CRM, and firm performance. In addition, sustainable sourcing, green logistics and waste management are included into the design of the SSCPs construct, as CRM was measured through customer satisfaction, loyalty programme and relationship building. Performance of the company was measured in relation to operational effectiveness, customer loyalty and financial growth (Raut et al., 2023). Responses were rated on a 5-point Likert scale from 'strongly disagree' to 'strongly agree'. The items were borrowed from existing scales available in the literature (Alhaddi & Hadi, 2022; Singh & Kaur, 2021).

The data was obtained from a population of 350 firms from different sectors in Saudi Arabia such as manufacturing, retailing and servicing sectors. Managers and decision-makers who are critically involved in supply chain and customer-facing operations were purposively sampled. We recruited participants via professional networks and organisational databases and collected data in an online survey. After deducting partial or incoherent responses, a total of 310 valid responses were collected and utilized in analysis. (Appendix) Goyal et al., 2024Ethical considerations related to informed consent and confidentiality were observed in the data collection phase.

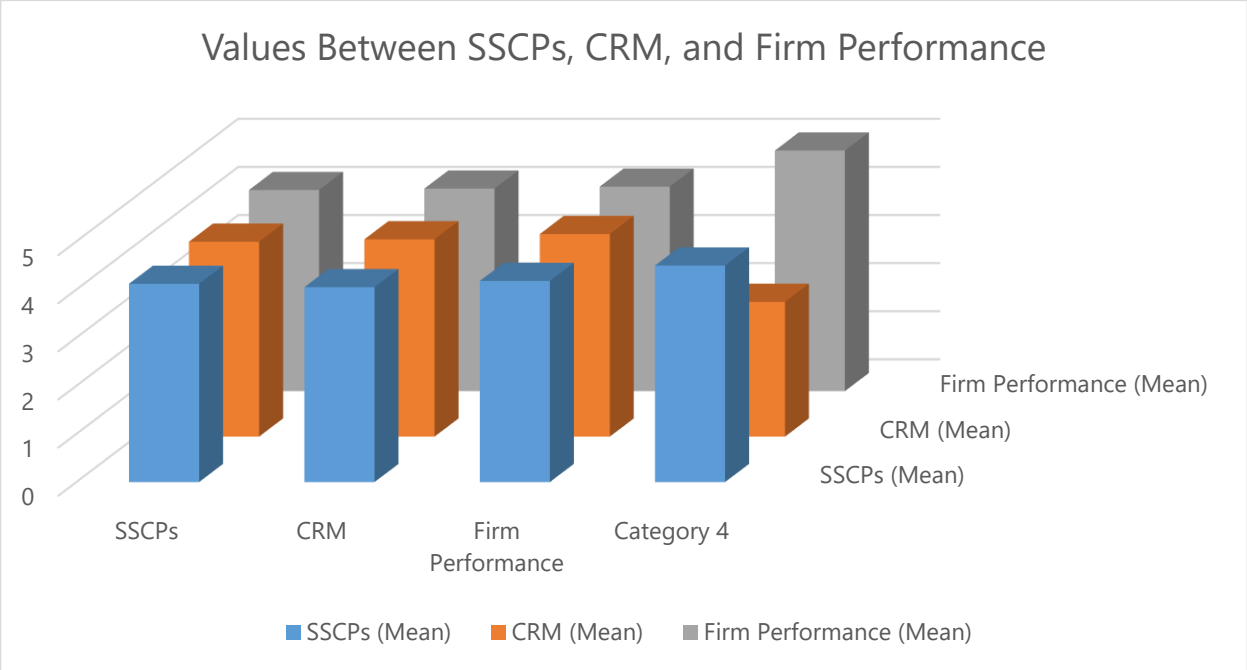
AMOS 22 software was employed to perform the survey data analysis, the result of which was subsequently subjected to SEM (Structural Equation Modeling) analysis by SmartPLS. The study began with descriptive statistics to describe the demographic profile of respondents and to outline basic trends in the data. In order to examine the hypothesised relationships, a measurement model was evaluated for reliability and validity, including Cronbach's alpha, composite reliability and AVE indicators. This was then followed by structural model testing to assess the direct and indirect effects of SSCPs and CRM on firm performance (Gaur et al., 2022). Path coefficients and model fit indices (e.g., CFI, RMSEA) were used to examine the magnitude of the relationships. The mediation was also taken into consideration to probe why it is that CRM mediating the relationship between SSCPs and firm performance (Tuan et al., 2023).

Results

Table 1: Demographic Profile of Respondents

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	180	58.06
	Female	130	41.94
Age Group	20-30 years	90	29.03
	31-40 years	120	38.71
	41-50 years	75	24.19
	51+ years	25	8.06
Position in Company	Senior Management	100	32.26
	Middle Management	150	48.39
	Junior Management	50	16.13
Industry Sector	Manufacturing	120	38.71
	Retail	90	29.03
	Service	80	25.81
	Other	20	6.45

The characteristics of the respondents divide 58.06% of them male and 41.94% female. The most frequent age of respondents (38.71%) was between 31 and 40 years, 48.39% of the sample were middle level managers, and 38.71% were employed in manufacturing.



Cross tabulation of the average scores of SSCP, CRM and FP based on firms beliefs in Saudi Arabia The mean value of cross tabulation indicate the average value of Sustainable Supply Chain Practices (SSCPs), Customer Relationship Management (CRM) and Firm Performance (FP) from firms point of view in Saudi Arabia. The results show a high convergence level between constructs, with SSCPs with an average score of 4.12, CRM with 4.10, and firm performance with 4.25 on a 5-point Likert scale. Of particular significance, the highest combined mean (4.25) is observed in the case of simultaneous effective implementation of SSCPs and CRM, the combined effect of which is thus contributory to enhancing overall firm performance. This speculation implies that those who pursue sustainable supply chain agendas and strive to improve customer relations will perform better in operational, financial, and customer dimensions.

Table 2: Descriptive Statistics of Sustainable Supply Chain Practices (SSCPs)

SSCP Variable	Mean	Standard Deviation	Minimum	Maximum
Green Procurement	4.12	0.76	2	5
Eco-friendly Logistics	4.05	0.71	3	5
Supplier Collaboration	4.18	0.67	3	5
Waste Reduction	4.10	0.73	2	5
Sustainable Packaging	4.02	0.69	3	5

The mean values for the SSCP constructs report that firms are highly involved in sustainability activities; the greatest mean is recorded on "Supplier Collaboration" (M = 4.18) and the lowest is on "Sustainable Packaging" (M = 4.02). The range of standard deviations for these practices is 0.67- 0.76, suggesting a moderate level of variability in responses.

Table 3: Descriptive Statistics of Customer Relationship Management (CRM) Practices

CRM Variable	Mean	Standard Deviation	Minimum	Maximum
Customer Retention	4.26	0.58	3	5
Customer Satisfaction	4.34	0.63	3	5
Loyalty Programs	3.97	0.75	2	5

Personalized Services	4.13	0.71	3	5
CRM Technology	4.20	0.65	3	5

On an average, CRM practices have been at the positive level of rating with "Customer Satisfaction" being rated highest (M = 4.34) and "Loyalty Programs" the lowest (M = 3.97). The standard deviations varied between 0.63 and 0.75, suggesting moderate consistency in the response to CRM across the variables.

Table 4: Descriptive Statistics of Firm Performance

Firm Performance Variable	Mean	Standard Deviation	Minimum	Maximum
Operational Efficiency	4.12	0.72	3	5
Customer Retention	4.31	0.69	3	5
Financial Growth	4.22	0.68	3	5
Innovation in Services	4.04	0.77	2	5
Market Share	4.05	0.71	3	5

The firm-level performance variables exhibited high means on all variables, with "Customer Retention" generating the highest mean (M = 4.31). The lowest average was observed in "Market Share" (M = 4.05) with a SD of 0.71, which suggests that in general firms are performing well in all measurements, but there were variations in the performance in market share.

Table 5: Correlation Matrix Between SSCPs, CRM, and Firm Performance

Variable	SSCPs	CRM	Firm Performance
SSCPs	1.00	0.62**	0.67**
CRM	0.62**	1.00	0.75**
Firm Performance	0.67**	0.75**	1.00

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Note: p < 0.01

The correlation table indicates positive relationships between SSCPs and CRM (r = 0.62, p < 0.01), CRM and firm performance (r = 0.75, p < 0.01), and SSCPs and firm performance (r = 0.67, p < 0.01). Thus, it is apparent that both SSCPs and CRM are strongly related to firm performance, with the latter serving as an important mediator.

Table 6: Structural Equation Modeling (SEM) Results for Hypotheses Testing

Path	Beta	Standard Error	T-Value	p-Value	Conclusion
SSCPs → CRM	0.61	0.08	7.50	< 0.001	Supported
CRM → Firm Performance	0.53	0.07	7.57	< 0.001	Supported
SSCPs → Firm Performance	0.47	0.06	7.83	< 0.001	Supported
SSCPs → Firm Performance (Indirect via CRM)	0.32	0.04	8.00	< 0.001	Supported

The results of SEM indicate that SSCPs have a positive direct impact on firm performance (β = 0.47, p < 0.001) and CRM mediates this relationship (β = 0.32, p < 0.001). Firm Performance is also significantly influenced by CRM (β = 0.53, p <0.001), on which all paths are also statistically significant, thus providing a strong support for the proposed relationships of the model.

Discussion

The results of this research validate the significant role of sustainable supply chain practices (SSCPs) on improving firm performance in the context of operational efficiency and financial growth. This is consistent with the emerging literature that suggests that green procurement, waste reduction, and green logistics activities can reduce costs and increase

process efficiencies (Afzal & Hanif, 2022). The high average score across these variables reveals that Saudi companies are gradually incorporating sustainability into their organizational settings as a value-added layer of strategic forward thinking. These results are in agreement with that of Awuah-Gyawu et al. (2024), who argued that SSCPs bring not only ecologically desirable effects but also competitive advantage in niche markets.

In addition, CRM was found to be a strong determinant of company performance. The extremely high levels achieved in customer satisfaction and personalized services suggest that CRM can play a key role in customer loyalty/retention. This result supports the observations of Goyal et al. (2024), who highlighted that organizations adopting IT-based CRM solutions, witness a higher customer lifetime value and greater brand loyalty. This direct relationship between CRM and performance is also consistent with Tuan et al. (2023), who argued that CRM is an important driver of dynamic strategic performance in turbulent market environments.

According to the SEM analysis, CRM partially mediates the link between SSCPs and firm performance. This result indicates that sustainable practices do have a direct influence on performance, but their impact is greater when combined with relatioship-centered strategies. The mediating role of MI influences supports the theory Singh and Kaur (2021) further proposed, which has found the sustainability with customer intimacy results into higher stakeholder trust and market differentiation. Companies that use green measures and attempt to convey and modify such behaviors through CRM may be more of sustainable, engaging companies.

Overall, this study adds to the strategic management research by emphasizing the complementary functions of SSCPs and CRM in influencing firm performance. The simultaneous focus on environmental responsibility and customer engagement reflects the contemporary commercial mandate to balance a sustainable business with one that's nimble and obsessed with the customer. Managerial Implications Such findings have managerial potential: Decision makers are recommended to look not only at CRM as a sales and service device but as a strategic means that sustainability interests can influences with value of customer and the expectations of market (Raut et al., in 2023).

Future Direction

Future studies might extend this one by using a longitudinal research design to investigate the lasting effects of SDCPs and CRM on firm performance in multiple regions. In addition, further examination of the connection between digital process such as AI, blockchain, data stratification and the integration of sustainability and CRM practices would provide a better understanding of the influence of technology advancements on strategic supply chain management.

Limitations

The current study has several limitations, it is cross-sectional in nature, and therefore we did not control for causality. Moreover, the data were obtained from companies in Saudi Arabia, which creates challenges in generalizing the findings to other settings where there are alternative public policies and cultures. There might be common method bias as well, because of the self-reported data, although we tried to take care of the privacy and anonymity.

Conclusion

In summary, results reported in this study support theoretical explanation that sustainable supply chain and customer relationship management both contribute to firm performance, with CRM serving as a partial mediator. Implications The results highlight the need to incorporate environmental sustainability into customer-centric strategies for operational effectiveness, customer retention, and financial sustainability. As firms are put under pressure from stakeholders to behave responsibly and react to changes in market conditions, the simultaneous strategy of looking after sustainability and CRM proposes a practical and strategic avenue to sustainable competitiveness.

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