

Institutional Pressure as a Catalyst: Linking Green Supply Chain Management to Sustainable Performance

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ABSTRACT

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Objective: This study investigates the impact of green supply chain management (GSCM) practices on sustainable performance, encompassing environmental, economic, and social dimensions, while examining the moderating role of institutional pressure in the context of an emerging economy. Drawing upon institutional theory and the resource-based view, the research examines how coercive, normative, and mimetic pressures shape the relationship between GSCM adoption and organisational sustainability outcomes.

Design/methodology/approach: A quantitative research design was employed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with Smart-PLS 4.8.0 software. Data were collected from 400 supply chain professionals across multiple industries in Pakistan through a structured questionnaire. The measurement model was assessed for reliability, convergent validity, and discriminant validity using Cronbach's alpha, composite reliability, average variance extracted, Fornell-Larcker criterion, cross-loadings, and heterotrait-monotrait ratio. The structural model was evaluated through path coefficients, t-statistics, and moderation analysis.

Findings: The results indicate that GSCM practices positively and significantly influence both environmental performance ($\beta = 0.148$, $p < 0.05$) and economic performance ($\beta = 0.219$, $p < 0.001$), while the direct effect on social performance was not statistically significant. The moderation analysis revealed significant interaction effects: normative pressure negatively moderates the GSCM–economic performance link ($\beta = -0.245$, $p < 0.001$), coercive pressure positively moderates the GSCM–economic performance relationship ($\beta = 0.163$, $p < 0.001$) and negatively moderates the GSCM–social performance link ($\beta = -0.109$, $p < 0.05$), and mimetic pressure negatively moderates the GSCM–environmental performance relationship ($\beta = -0.204$, $p < 0.01$).

Originality/value: This study contributes to the literature by decomposing institutional pressure into three distinct dimensions and examining their differential moderating effects on the GSCM–sustainable performance nexus across environmental, economic, and social outcomes. The findings offer novel theoretical insights into how different forms of institutional pressure can either strengthen or weaken the sustainability outcomes of GSCM practices in emerging economies.

Keywords: Green Supply Chain Management, Institutional Pressure, Sustainable Performance, Moderation, PLS-SEM, Emerging Economy

1| INTRODUCTION

Degradation of the environment, decreasing natural resources, and climate change create a sense of urgency for organizations to reexamine their supply chains and incorporate sustainable practices. Green supply chain management (GSCM) offers such an approach. Integrating the environment in supply chain management includes green purchasing, eco-design, and reverse logistics and waste reduction (Zhu et al., 2023; Luthra et al., 2024). Sustainability, which was previously a voluntary corporate social responsibility (CSR) initiative, is now a key feature of business strategy for many organizations. As such, academics and practitioners in operations and supply chain management are focused on the ways GSCM practices result in sustainable business practices.

The last ten years have changed corporate thinking around sustainable performance. An organization must now render value corresponding to economic success, sustainable management, and social protection to sustain the triple bottom line (El-Kassar and Singh, 2023; Dubey et al., 2024). This performance paradigm signals that the combination of a competitive advantage and balancing ecological preservation and social protection will result in organizational success. These GSCM practices help organizations address the gap between efficient operations and sustainability.

Although a growing literature on GSCM and its consequences exists, several gaps persist at the theoretical and empirical levels. The first is that majority of studies examine the influence of GSCM on overall organizational performance. These studies do not decompose performance into its environmental, economic, and societal dimensions. This approach ignores the multiple ways that GSCM might impact different elements of sustainability (Srivastava and Singh, 2023; Kumar et al. 2024). The second gap is that mostly unknown are the external institutional influences and the GSCM-performance relationship, especially in the developing economies of the global south where the regulatory systems and the institutions are still in the process of formation. Based on institutional theory, organizations adopt green practices in response to coercion, norms, and/or imitation (DiMaggio and Powell, 2023; Sarkar et al. 2024) from the environment within which they operate.

The third gap is that while many studies have recognized the role of institutional pressures in the context of GSCM, most studies have not examined the moderating role of institutional pressures on the effectiveness of corporate GSCM in the different dimensions of sustainable performance. Differentiating whether the institutional pressures of a given context enhance or constrain the performance of GSCM on the different dimensions of sustainment is imperative to the design of effective organizational sustainability strategies. This is especially true in countries like Pakistan, which are in the developing world, where the different combinations of highly diverse institutional forces, regulatory frameworks, and culture influence the maturity of industry and business practices.

Against the background of limited studies on GSCM practices in Pakistan, this study intends to examine and understand the relationship between GSCM practices and sustainable performances (environmental, economic, and social) as well as providing insights on the moderating effects of coercive, normative, and mimetic institute pressures. This study intends to answer the following research questions: (1) How do GSCM practices affect the dimensions of sustainable performance? (2) How do diverse forms of institutional pressures moderate the sustainable performance and GSCM relation? This study offers new insights for supply chain managers in developing countries and provides new insights in this area of knowledge.

The paper is organized as follows. The next section provides a literature review and a research hypotheses construction. The conceptual framework section provides the detailed model, including the research methodology section, which includes the sampling and analytical methods. This section is followed by a presentation of the results of an analysis performed with PLS-SEM (Partial Least Squares – Structural Equation Modeling). The Discussion section is a critical reflection based on the literature of the PLS-SEM results. This section is followed by the concise reporting of the conclusions, theoretical and managerial implications, and the proposal for future research.

2 | Literature Review

2.1 Green Supply Chain Management: Conceptual Framework

Green supply chain management (GSCM) is the integration of environmental initiatives across the entire supply chain, including sourcing, design, manufacturing, delivery, and post-use of the product (Srivastava, 2023; Zhu and Sarkis, 2024). GSCM reflects a shift in supply chain management, incorporating environmental sustainability into the processes of a business and enabling a reduction in a company's environmental impact while either retaining or improving operational efficiency. GSCM incorporates a number of other practices, including, but not limited to, fully integrated procurement, eco-design, and green distribution as well as reverse logistics and internal environmental management (Govindan et al., 2024).

Theory behind GSCM is multidisciplinary. Within the view of resources, capabilities, and processes, GSCM practices are unique, superior, and irreplaceable resources and processes that can bring sustained competitive advantage (Barney, 2023). From this perspective, GSCM enables organizations to improve their market reputation and waste reduction while achieving operational excellence that positively impacts the bottom line (Hart and Dowell, 2024). Additionally, from the perspective of stakeholder theory, the GSCM is deployed in response to the growing expectations of stakeholders to include regulatory, customer, supplier, and community stakeholders (Freeman et al., 2023).

Building on recent case studies, the implementation and practice of GSCM has been proven to strongly relate to positive performance outcome variables. Specific performance outcomes of GSCM practice include reduction in emissions and waste and maximization of resource effectiveness (Wang et al., 2023; Ahmed et al., 2024). There also exist positive relations to performance measurement for GSCM as cost savings, greater market share, and brand value (Khan et al., 2024). However, as pertains to the performance measurement of GSCM on social computing, the results and findings are rather mixed. Some of the results indicate that social performance of GSCM may be more relational and dependent on other factors including institutional support or stakeholder involvement (Nawaz et al., 2024).

2.2 GSCM and Environmental Performance

The ability to cut emissions, decrease resource consumption, reduce waste output, and adhere to regulations helps an organization's performance with the environment. Iqbal et al. (2023) show how this performance of an organization is improved through the integration of green principles in procurement, production, and logistics. Green procurement chooses to source raw material from suppliers with a focus on the environment. There is also eco-design which strives to decrease waste and lowers energy consumption throughout the manufacturing process. Further, wasted material is reduced through the improvement of the manufacturing process. Geng et al. (2024) demonstrate through research that by implementing green manufacturing and reverse logistics, a closed loop can be created in which the burden of the supply chain can be reduced. The negative impact of the supply chain on the environment can be significantly decreased.

Previously done research has shown the positive relationship of GSCM and environmental performance. In particular, manufacturing research across Asia has shown evidence whereby organizations that integrated comprehensive GSCM showed a significant decrease in the emissions of carbon, consumption of water, and waste generation. Similar studies done in Pakistan have shown a positive relation between GSCM and improvement in environmental performance and compliance, especially when supported by strong institutions (Ali et al., 2024). This can be justified from a resource-based view whereby GSCM practices are capabilities that enable an organization to utilize environmental resources better and outdo competition (Rehman et al., 2024).

H1: Green supply chain management practices have a significant positive effect on environmental performance.

2.3 GSCM and Economic Performance

Economic performance displays a company's ability to improve their financial performance and achieve their operational performance goals. Economic performance goals can be measured by revenue, cost, profitability, or even return on investment. A company's economic performance and GSCM integration have been studied together. The most common theory in this space indicated that investments in the environment lead to a company's FSCM practices, and ultimately economic performance. GSCM practices have been found to reduce the costs associated with operating a business due to reductions in waste and savings associated with conserved energy and optimized use of resources throughout the supply chain (Jabbour et al., 2024). Additionally, GSCM practices have been found to increase the revenue a company is able to generate due to the attractiveness of their product, increased reputation, and consumption of new green markets (Saeed et al., 2024).

The natural resource-based view (NRBV) looks to expand the traditional RBV, and where some may argue that companies are able to gain a competitive advantage through preservation of the environment and management of the sustainable ecosystems and stewardship of a company's products (Hart, 2023), practices related to GSCM have been demonstrated to be strategic investments that create value. A number of recent studies in the emerging markets has shown that GSCM practices have a positive effect on economic performance through cost leadership and improved operational performance and market position (Raza et al., 2024; Asim et al., 2025). The evidence shows that the economic value of GSCM is more pronounced in regions where environmental regulations are more stringent. Green practices that are adopted first gain the competitive advantage in the market, and avoid price penalties that may be associated with regulations (Bashir et al., 2024).

H2: Green supply chain management practices have a significant positive effect on economic performance.

2.4 GSCM and Social Performance

Social performance indicates how an organization affects different social systems such as the employee and the community, workplace, rights of labor and stakeholder's needs satisfaction (Gupta et al., 2023). The relationship between GSCM and social performance is theoretically established within the framework of stakeholder theory. Organizational need for social license to operate provides the basis for the integration of GSCM and social performance, and presumes that organizations have an obligation to satisfy diverse interests of their stakeholders (Freeman et al., 2023). Some of the ways through which GSCM is expected to enhance social performance are through the creation of safe manufacturing work processes, implementation of fair labor practices, and commitment to reduce pollution and environmental degradation (Nasir et al., 2024).

The studies on the empirical effects of GSCM on social performance have continued to be mixed and largely inconclusive. Some studies have reported an improvement in social outcomes as an indirect effect of GSCM due to the improvement of corporate reputation and trust of the stakeholders (Zahid et al., 2023), while others have reported weak and insignificant direct relations (Hussain and Malik, 2024). This inconclusiveness could be attributed to the fact that the social performance outcomes are largely dependent on corporate culture, mechanisms of Stakeholder engagement and the surrounding institutional environment in which organizations operate (Jamil et al., 2024). For the developing countries, where the formal mechanisms of social institutional frameworks have not been established, the effects of GSCM on social performance will be most likely more apparent on the environmental and economic dimensions (Mangla et al., 2024).

H3: Green supply chain management practices have a significant positive effect on social performance.

2.5 Institutional Pressure and Its Dimensions

Institutional theory is useful for shedding light on what motivates organizations to engage in various activities and the role that external factors play in influencing the behavior and performance of organizations (DiMaggio and Powell, 2023). As explained in institutional theory, organizations engage with their institutional environments defined by the existence of regulatory frameworks, cultural frameworks, and competitor related

frameworks that facilitate or limit organizations' ability to adapt to the 'normal' practices and standards of the institution they engage with. These institutional demands manifest themselves through three distinct—though overlapping—forms of pressure: coercive pressure, normative pressure, and mimetic pressure (Scott, 2023; Awasthi et al., 2024). Coercive pressure is caused by the presence of regulatory and non-regulatory frameworks which can stem from governmental, industry, or environmental regulations, as well as governmental or regulatory agency initiatives to enforce compliance (Khan and Qianli, 2023). In GSCM, coercive pressure would mean that organizations are under a legal obligation to adopt green supply chain practices due to the existence of laws concerning emission norms, waste disposal regulations, and environmental compliance. In some countries and sectors, the coercive pressure is more pronounced due to more stringent regulatory frameworks, whereas in other places the pressure is more diffuse (Büyüközkan and Çifçi, 2024). Increasing coercive pressure for environmental compliance in Pakistan has been instituted through the Pakistan Environmental Protection Agency and the environmental protection departments at the provincial level, although enforcement remains weak (Soomro et al., 2024). There is pressure from employment, from industry, from expectations from other organizations, and from social networks (Sarkar et al., 2024). In the context of supply chains, these pressures take the form of industry best practices, the expectations of professional associations and customers for sustainable practices, responsible sourcing, and meeting the expectations of partners who demand that suppliers become more environmentally sustainable. Normative pressure has a great deal of influence on the voluntary adoption of GSCM practices by firms beyond what is required by law, as companies feel the need to bring their practices into line with industry customs and norms in order to sustain their standing and compete in the marketplace (Rehman et al., 2024). Pressure caused by the practices of successful firms and industry innovators causes mimetics (Dimaggio and Powell, 2023). Sustainability is a rapidly developing field and practice and firms have a great deal of uncertainty about implementing sustainable best practices. Because firms often lack a sustainable business framework and reliable, successful competitors, firms often imitate sustainable practices of perceived successful firms during market disruptions, technological revolutions, or environmental crises. In the context of GSCM, mimetics drives firms without a thorough evaluation of the context to copy the green supply chain practices of model firms and award-winning firms (Jia et al., 2024).

2.6 Moderating Role of Normative Institutional Pressure

Professional norms and industry culture bring normative pressure that can redefine the strength and direction of the GSCM-performance relationship. Overall, normative pressure shows a positive influence on GSCM. Although complex, the impacts of normative pressure on performance are many. When normative pressure is high, it produces a favorable condition for the institutionalization of the industry-based structure for the catalyzation and endorsement of the collaboration for the knowledge sharing to support the implementation of green practices (Sarkar et al., 2024). However, unbridled normative pressure may lead to the wedding of GSCM to green practices through compliance without the substantial commitment to their full implementation (Meyer and Rowan, 2023).

The relationship between GSCM and performance sustainability may differ in various dimensions of sustainable performance. For instance, ensemble GSCM practices adopted by other firms may reduce an organization's ability to maintain its economic advantage. This may be a dilemma in performance that relates to the economy. Meanwhile, in relation to performance that relates to the social dimension, an increase in the scope of stakeholder engagement, as well as more corporate social responsibility, may be an outgrowth of normative pressure (Nasir et al., 2024). In addition, normative pressure may stimulate more practices devoted to the environment such as the formalization of industry-related environmental standards (Luthra et al., 2023). In the dimension of performance that relates to economy, normative pressure may bring about an 'arms race' among competitors to adopt key GSCM practices and sustainability, thereby reducing the advantage of early adopters of these practices (Khan et al., 2024).

H4: Normative institutional pressure moderates the relationship between GSCM and environmental performance.

H5: Normative institutional pressure moderates the relationship between GSCM and economic performance.

H6: Normative institutional pressure moderates the relationship between GSCM and social performance.

2.7 Moderating Role of Coercive Institutional Pressure

Coercive institutional pressure caused by regulatory and policy demands can be critical in shaping the GSCM-performance nexus. Regulatory effect can strengthen GSCM by specifying a clear boundary and establishing a minimum threshold of operational advancement while providing a comparative advantage to all firms to allocate resources to the sustainability domain (Büyüközkan and Çifçi, 2024). Regulatory structures that strengthen the enforcement of compliance can positively impact the environmental outcomes of GSCM by ensuring that corporate sustainability is implemented in a comprehensive and systematic manner (Raza et al., 2024). The effect of coercive pressure on GSCM is not always positive. Excessive regulatory demands can drive up compliance costs and divert resources from productive GSCM investments ultimately creating a compliance culture that results in a minimum effort standard that is not geared to improve sustainability (Hussain et al., 2024). This is more likely to impact the economic dimension of sustainable performance, where the costs of compliance compete against the economic advantages of GSCM, restricting this dimension. Coercive pressure, while mandating workplace safety and providing GSCM aligned labor protections and controls, can improve outcomes for social performance, although the direct impact is likely to be minor (Asim et al., 2025).

H7: Coercive institutional pressure moderates the relationship between GSCM and environmental performance.

H8: Coercive institutional pressure moderates the relationship between GSCM and economic performance.

H9: Coercive institutional pressure moderates the relationship between GSCM and social performance.

2.8 Moderating Role of Mimetic Institutional Pressure

Mimetic institutional pressure is a consequence of organizations learning the behaviour of successful organizations. This pressure creates complex dynamics within the relationship between GSCM and performance. Due to the nature of learning through mimicking, organizations that learn to implement GSCM may not be able to sustain performance in the long run as they neglect to adapt the GSCM practices to their unique contexts (Dimaggio and Powell, 2023). In some cases, mimicking may cause organizations to implement GSCM practices, while neglecting the necessary cultural and structural changes, as well as the commitment, which are required for the successful implementation of these practices (Jia et al., 2024). In such cases, the performance gap caused by mimicking may be stronger on green performance, which requires a considerable level of integration among operational activities (Wang et al., 2024).

The performance gap caused by mimicking may be different across different performance dimensions. In the case of green performance, organizations may engage in superficial green activities which cause more harm than good to the environment, thereby weakening the GSCM-green performance relationship (Geng et al., 2024). In the case of economic performance, organizations may implement cost-saving GSCM practices after mimicking successful organizations, thus improving the economic returns of GSCM (Mangla et al., 2024). In the case of social performance, mimicking may have a limited moderating effect since social performance depends on the organization's commitment and involvement of stakeholders, as opposed to the practices adopted (Nawaz et al., 2024).

H10: Mimetic institutional pressure moderates the relationship between GSCM and environmental performance.

H11: Mimetic institutional pressure moderates the relationship between GSCM and economic performance.

H12: Mimetic institutional pressure moderates the relationship between GSCM and social performance.

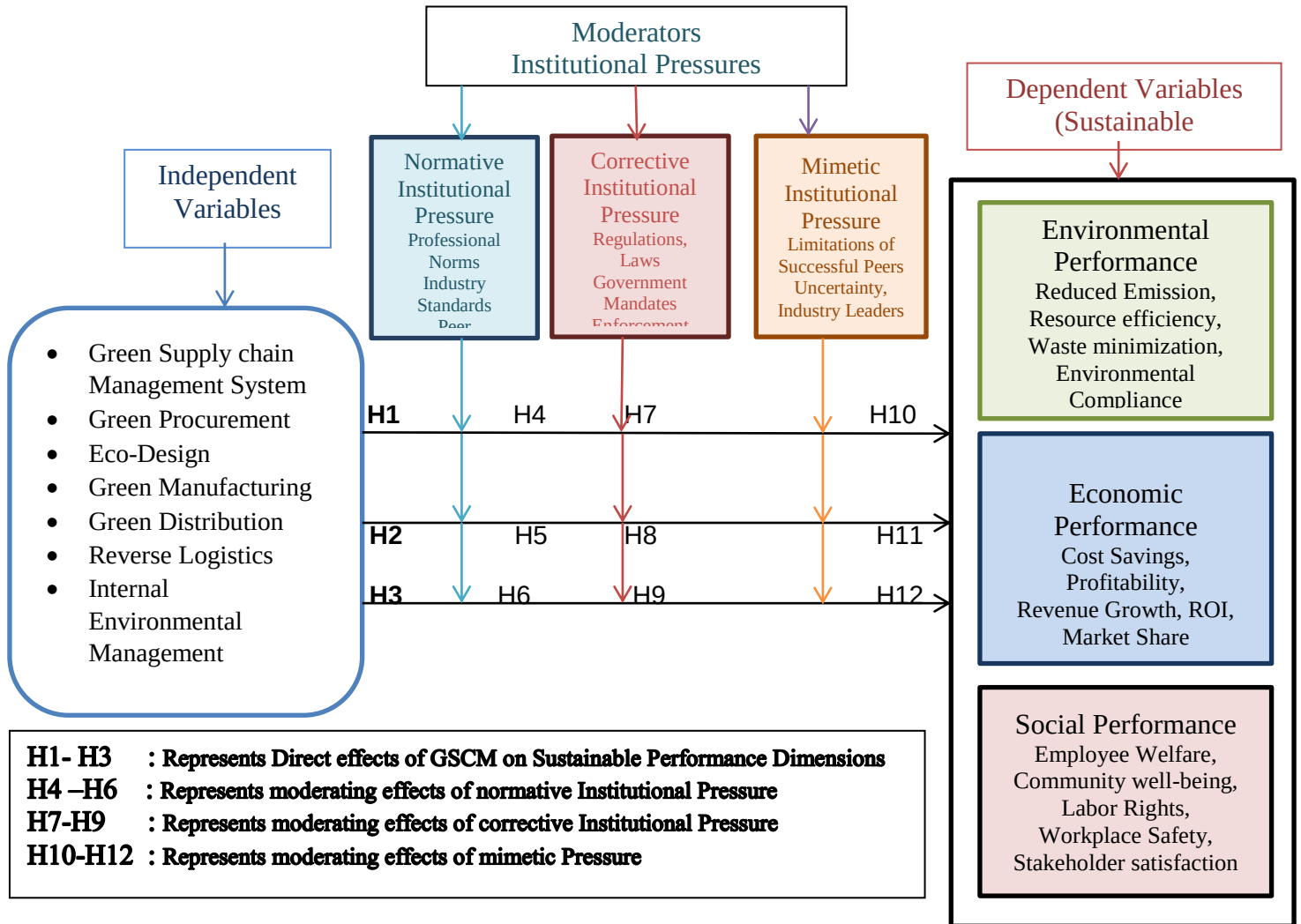


Figure-1 Conceptual Framework

3 | Research Methodology Research Design and Sample

This study applied a quantitative research approach, utilizing a cross-sectional survey, to collect data from supply chain professionals in Pakistan. The focus was on supply chain managers, procurement officers, sustainability officers, logistics coordinators, and environmental compliance officers in medium to large organizations in multiple sectors (i.e., manufacturing, textiles, FMCG, automotive, and services) and industries. A survey was designed based on earlier studies in the GSCM and institutional pressure literature. This ensured content validity and contextual relevance.

GSCM measurement items were based on Zhu and Sarkis (2020) and Govindan et al. (2020), and covered five dimensions of green supply chain practices. The dimensions of sustainable performance were created as three dimensions: environmental performance (based on Iqbal et al., 2023), economic performance (based on Singh et al., 2023), and social performance (based on Gupta et al., 2023). The measurement items of the institutional pressure constructs were based on Scott (2023) and Sarkar et al. (2024). Coercive, normative, and

mimetic pressure were each measured with three items. All items were measured on a five-point Likert scale, where 1 was “strongly disagree” and 5 was “strongly agree.”

We distributed 600 surveys to supply chain personnel through multiple online and offline channels in several regions and cities of Pakistan. After removing surveys with incomplete, inconsistent or unclear responses, we selected 400 surveys for further analysis, representing an effective response rate of 66.67 per cent. This response rate is exceptionally good for surveys in supply chain management and is well above the typical response rates of 40 to 60 per cent reported in recently published journals in the areas of operations and supply chain management (Hair et al., 2023; Kock and Hadaya, 2023). The high response rate enhances the scope of findings and lessens concerns about non-response bias.

The demographic survey of participants has the sample fairly distributed across key demographic traits. Male respondents composed 78% of the sample and females 22%. The 26–35 age group accounted for 55% of the sample. The remaining 45% of the sample were either younger than 25 or older than 41. 48% of the respondents were graduates and another 30% were postgraduates. 15% of the sample had qualifications in excess of postgraduate. The experience distribution showed that 33% of the sample had 8+ years’ experience, 25% had 1–3 years’ experience, and 42% had 4–7 years’ experience. For organizational position, 45% of the sample were in upper management, 38% were in middle management, and the remaining 17% were in lower management. Thus, a good representation of all management tiers was obtained in the survey.

SmartPLS 4.8.0 selected Partial Least Squares Structural Equation Modelling (PLS-SEM). PLS-SEM is appropriate for this study because it allows one to model constructs and their moderating effects, and does all of that while remaining largely indifferent to the shape of the data distribution. PLS-SEM also allows a researcher to focus on making predictions (Ringle et al., 2024). The analysis followed Hair et al. (2024) and made use of a two-step procedure. First, the PLS-SEM measurement model was assessed for reliability and validity of indicators, internal consistency, convergent validity, and discriminant validity. Second, the structural model was assessed through path coefficients, hypothesis testing and moderation analysis using the product indicator approach, in which interaction terms were represented by the multiplication of indicators.

4 |Results and Discussion

4.1 Measurement Model Assessment

Convergent Validity and Reliability: The measurement model was evaluated for reliability and convergent validity. As per the criteria stated, Table 1 shows that all item loadings are greater than 0.70 with the majority of items falling in 0.71 - 0.93 range. This indicates a strong representation of items for their respective latent constructs. (Hair et al., 2024). There are a few exceptions such as MP3 (0.633), which is just above the minimum boundary, but is acceptable in exploratory social sciences (Sarstedt et al., 2024). The Cronbach's alpha values for all constructs were greater than 0.60, which is the minimum acceptable limit for initial research, and far exceeded the threshold of 0.70 for research reliability (Henseler, 2024). The values of the composite reliability (CR) for the constructs ranged from 0.751 to 0.929, which is acceptable. The average variance extracted (AVE) for all constructs was also satisfactory and ranged from 0.600 to 0.837 (Fornell and Larcker, 2023; Hair et al., 2024).

Table 1. Factor Loadings, Cronbach’s Alpha, Composite Reliability and AVE

Constructs	Items	Loading	AVE	CR	Cronbach Alpha
GSCM	GSCM1	0.856	0.646	0.886	0.864
	GSCM2	0.713			
	GSCM3	0.753			
	GSCM4	0.828			
	GSCM5	0.858			
EN-P	EN-P1	0.718	0.826		
	EN-P2	0.826			

EP	EN-P3	0.749	0.6	0.849	0.836
	EN-P4	0.851			
	EN-P5	0.718			
	EP1	0.875			
	EP2	0.791			
SP	EP3	0.84	0.711	0.903	0.898
	EP4	0.837			
	EP5	0.871			
	SP1	0.907			
	SP2	0.899			
CP	SP3	0.854	0.837	0.929	0.921
	SP4	0.794			
	SP5	0.868			
	CP1	0.862			
	CP2	0.819	0.71	0.812	0.798
MP	CP3	0.847			
	MP1	0.888			
	MP2	0.804	0.612	0.751	0.689
NP	MP3	0.633			
	NP1	0.914			
	NP2	0.925	0.837	0.903	0.902
	NP3	0.905			

Notes: GSCM = Green Supply Chain Management; EN-P = Environmental Performance; EP = Economic Performance; SP = Social Performance; CP = Coercive Institutional Pressure; NP = Normative Institutional Pressure; MP = Mimetic Institutional Pressure.

Discriminant validity was evaluated based on the Fornell-Larcker criterion, cross-loading analysis, and the HTMT ratio. As indicated in Table 2, the values from Fornell-Larcker suggest adequate discriminant validity since the square root of the AVE for each construct (diagonal values) is greater than the correlations for that construct and the other constructs. For all the diagonal values of CP (0.843), EN-P (0.774), EP (0.843), GSCM (0.804), MP (0.782), NP (0.915) and SP (0.872), each correlations of inter-constructs are less than the diagonal values, thus, confirming that each construct has more variance in its own indicators compared to other constructs (Hair et al., 2024).

Table 2. Fornell-Larcker Criterion

	CP	EN-P	EP	GSCM	MP	NP	SP
CP	0.843						
EN-P	0.403	0.774					
EP	0.623	0.413	0.843				
GSCM	0.511	0.475	0.536	0.804			
MP	0.559	0.441	0.583	0.624	0.782		
NP	0.494	0.526	0.684	0.438	0.582	0.915	
SP	0.49	0.467	0.623	0.451	0.543	0.78	0.872

Notes: Diagonal values represent the square root of AVE. GSCM = Green Supply Chain Management; EN-P = Environmental Performance; EP = Economic Performance; SP = Social Performance; CP = Coercive Institutional Pressure; NP = Normative Institutional Pressure; MP = Mimetic Institutional Pressure.

The cross-loading data in Table 3 substantiate discriminant validity by showing that each indicator loads most strongly with its own construct as compared to all other constructs. Indicators for CP, EN-P, EP, GSCM, MP, NP, and SP have their highest primary loadings with their own constructs, indicating that the indicators are unique proxies for their related latent variables. Although some moderate cross-loadings exist between related constructs (e.g., some MP and CP items and some SP items cross-load on NP), these co-occurrences can be expected and are found to be consistent with the sustainability and supply chain management literature regarding the occurrence of environmental manipulations and performance outcomes together with institutional pressures (Kamble et al., 2024; Alzoubi et al., 2025). In all cases, the primary loadings are much stronger than the secondary loadings indicating that discriminant validity is satisfied (Sarstedt et al., 2024).

Table 3. Cross Loadings

	CP	EN-P	EP	GSCM	MP	NP	SP
CP1	0.862	0.438	0.53	0.409	0.387	0.377	0.439
CP2	0.819	0.255	0.429	0.451	0.343	0.401	0.339
CP3	0.847	0.306	0.597	0.44	0.657	0.469	0.444
EN-P1	0.431	0.718	0.316	0.306	0.354	0.387	0.301
EN-P2	0.256	0.826	0.275	0.311	0.336	0.318	0.3
EN-P3	0.241	0.749	0.197	0.291	0.228	0.289	0.247
EN-P4	0.351	0.851	0.285	0.397	0.262	0.318	0.376
EN-P5	0.263	0.718	0.432	0.457	0.443	0.592	0.485
EP1	0.502	0.29	0.875	0.377	0.427	0.53	0.547
EP2	0.415	0.362	0.791	0.483	0.592	0.525	0.465
EP3	0.621	0.337	0.84	0.562	0.545	0.579	0.538
EP4	0.689	0.405	0.837	0.445	0.413	0.62	0.572
EP5	0.341	0.334	0.871	0.369	0.485	0.618	0.49
GSCM1	0.501	0.34	0.457	0.856	0.651	0.468	0.51
GSCM2	0.528	0.137	0.341	0.713	0.478	0.179	0.21
GSCM3	0.489	0.426	0.361	0.753	0.357	0.262	0.257
GSCM4	0.353	0.529	0.437	0.828	0.516	0.448	0.447
GSCM5	0.269	0.379	0.529	0.858	0.488	0.312	0.305
MP1	0.467	0.42	0.48	0.611	0.888	0.52	0.555
MP2	0.458	0.356	0.54	0.359	0.804	0.514	0.449
MP3	0.401	0.218	0.308	0.553	0.633	0.275	0.169
NP1	0.448	0.499	0.672	0.474	0.526	0.914	0.699
NP2	0.476	0.504	0.615	0.482	0.591	0.925	0.712
NP3	0.43	0.44	0.589	0.239	0.479	0.905	0.729
SP1	0.516	0.462	0.628	0.555	0.627	0.719	0.891
SP2	0.567	0.502	0.601	0.44	0.498	0.684	0.883
SP3	0.353	0.341	0.425	0.342	0.448	0.639	0.872
SP4	0.319	0.456	0.462	0.278	0.287	0.566	0.817
SP5	0.352	0.285	0.572	0.32	0.461	0.764	0.893

Notes: GSCM = Green Supply Chain Management; EN-P = Environmental Performance; EP = Economic Performance; SP = Social Performance; CP = Coercive Institutional Pressure; NP = Normative Institutional Pressure; MP = Mimetic Institutional Pressure.

Table 4 shows the HTMT results confirming yet again the case for discriminant validity. Each of the HTMT values fall below the sample's conservative cutoff value of 0.85, with the values for GSCM-MP (0.835), NP-SP (0.849), and MP-EP (0.716) being the most notable. As per Henseler et al. (2023), HTMT values less than 0.90

show adequate discriminant validity. The sample has been conservative and used a cutoff value of 0.85 to assure rigor. The results show that all constructs are separate and therefore not redundant. This further substantiates the measurement model for the structural model analysis.

Table 4. Heterotrait-Monotrait (HTMT) Ratio

	CP	EN-P	EP	GSCM	MP	NP	SP
CP							
EN-P	0.477						
EP	0.708	0.442					
GSCM	0.645	0.506	0.593				
MP	0.748	0.532	0.716	0.835			
NP	0.58	0.564	0.756	0.468	0.703		
SP	0.556	0.504	0.674	0.473	0.614	0.849	

Notes: GSCM = Green Supply Chain Management; EN-P = Environmental Performance; EP = Economic Performance; SP = Social Performance; CP = Coercive Institutional Pressure; NP = Normative Institutional Pressure; MP = Mimetic Institutional Pressure.

Structural Model Assessment: The structural model was evaluated through hypothesis testing with bootstrapping 5000 times. The t-statistics and p-values of the path coefficients were reported. Results of direct effects of GSCM on the three components of sustainable performance are reported in Table 5. H1 states that GSCM will have a positive effect on environmental performance. Results showed H1 to be significant ($\beta = 0.148$, $t = 2.102$, $p = 0.036$). H2 states that GSCM will have a positive effect on economic performance, and again, the results were found to be significant ($\beta = 0.219$, $t = 3.562$, $p = 0.000$). H3 states that GSCM will have a positive effect on social performance. The results of this hypothesis were found to be not significant ($\beta = -0.077$, $t = 1.158$, $p = 0.247$). This concludes that the GSCM practices do not have a positive effect on social performance unless there are other factors.

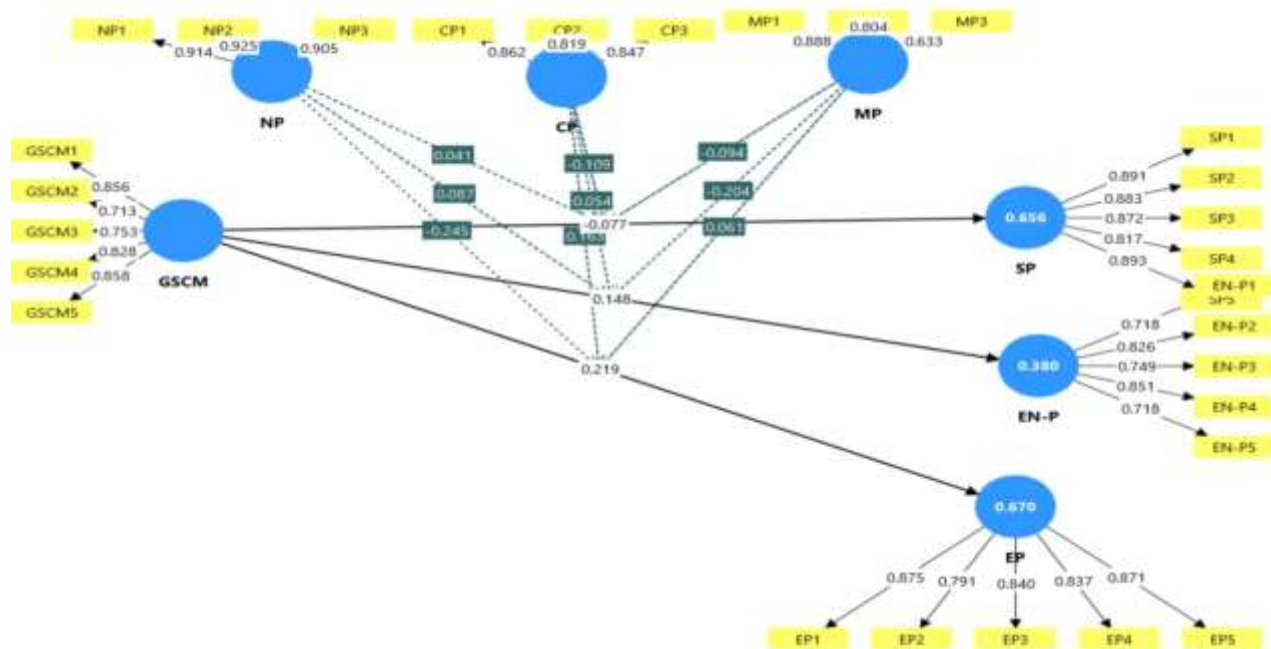


Figure-2 PLS-SEM

Table 5. Path Coefficients (Direct and Moderation Effects)

Relationships	β	Mean	SD	T-Stats	P Values	Status
GSCM $\rightarrow$ EN-P	0.148	0.146	0.07	2.102	0.036	Supported
GSCM $\rightarrow$ EP	0.219	0.218	0.061	3.562	0	Supported
GSCM $\rightarrow$ SP	-0.077	-0.069	0.066	1.158	0.247	Not Supported
NP x GSCM $\rightarrow$ EN-P	0.087	0.092	0.054	1.594	0.111	Not Supported
NP x GSCM $\rightarrow$ EP	-0.245	-0.244	0.025	9.797	0	Supported
NP x GSCM $\rightarrow$ SP	0.041	0.036	0.038	1.063	0.288	Not Supported
CP x GSCM $\rightarrow$ EN-P	0.054	0.041	0.073	0.743	0.457	Not Supported
CP x GSCM $\rightarrow$ EP	0.163	0.163	0.033	4.887	0	Supported
CP x GSCM $\rightarrow$ SP	-0.109	-0.110	0.045	2.432	0.015	Supported
MP x GSCM $\rightarrow$ EN-P	-0.204	-0.196	0.07	2.92	0.004	Supported
MP x GSCM $\rightarrow$ EP	0.061	0.059	0.039	1.558	0.119	Not Supported
MP x GSCM $\rightarrow$ SP	-0.094	-0.089	0.05	1.87	0.062	Not Supported

Notes: GSCM = Green Supply Chain Management; EN-P = Environmental Performance; EP = Economic Performance; SP = Social Performance; CP = Coercive Institutional Pressure; NP = Normative Institutional Pressure; MP = Mimetic Institutional Pressure.

Table 5 contains the moderation analysis results, and shows several interaction effects. With normative pressure (NP), the interaction term NP $\times$ GSCM has a negative coefficient ($\beta = -0.245$, $t = 9.797$, $p = 0.000$), thus, H5 is accepted. With increasing normative pressure, the GSCM practices are less likely to contribute to positive economic outcomes. The reason may be that, with many companies engaging in the same practices, the positive economic consequences of the differentiation may be diminished. Normative pressure did not show a significant moderating effect on the GSCM – environmental performance (H4: $p = 0.111$) and GSCM – social performance (H6: $p = 0.288$) relationship.

Regarding the impact of coercive pressure (CP), a positive and significant moderating effect of GSCM on economic performance ($\beta = 0.163$, $t = 4.887$, $p = 0.000$) is supported, thus, H8 is accepted. This effect is attributed to the constituting regulations of environmental investments and their cost savings and competitive advantage. Coercive pressure was found to negatively moderate the GSCM – social performance relationship ($\beta = -0.109$, $t = 2.432$, $p = 0.015$) and thus, H9 is accepted. From these results, it may be concluded that regulatory compliance demands take up resources and focus away from social services. Regulatory coercion does not present a significant moderator for the relationship between GSCM and other environmental performance (H7: $p = 0.457$).

Regarding mimetic pressure (MP), the results indicate a significant negative moderation of the GSCM–environmental performance relationship ($\beta = -0.204$, $t = 2.920$, $p = 0.004$) in line with H10, where the imitative adoption of GSCM practices provides no substantial environmental benefits and undermines the ecological integration. Mimetic pressure did not significantly moderate the relationship between GSCM and economic performance (H11: $p = 0.119$) or GSCM and social performance (H12: $p = 0.062$). Out of the twelve hypotheses tested, seven were accepted and five were not, thus partially confirming the proposed conceptual model.

Table 6. Summary of Hypothesis Testing Results

Hypothesis	Path	β	T-Value	P-Value	Result
H1	GSCM $\rightarrow$ EN-P	0.148	2.102	0.036	Supported
H2	GSCM $\rightarrow$ EP	0.219	3.562	0	Supported
H3	GSCM $\rightarrow$ SP	-0.077	1.158	0.247	Not Supported
H4	NP x GSCM $\rightarrow$ EN-P	0.087	1.594	0.111	Not Supported
H5	NP x GSCM $\rightarrow$ EP	-0.245	9.797	0	Supported
H6	NP x GSCM $\rightarrow$ SP	0.041	1.063	0.288	Not Supported
H7	CP x GSCM $\rightarrow$ EN-P	0.054	0.743	0.457	Not Supported
H8	CP x GSCM $\rightarrow$ EP	0.163	4.887	0	Supported
H9	CP x GSCM $\rightarrow$ SP	-0.109	2.432	0.015	Supported
H10	MP x GSCM $\rightarrow$ EN-P	-0.204	2.92	0.004	Supported
H11	MP x GSCM $\rightarrow$ EP	0.061	1.558	0.119	Not Supported
H12	MP x GSCM $\rightarrow$ SP	-0.094	1.87	0.062	Not Supported

Notes: Supported = $p < 0.05$; Not Supported = $p > 0.05$.

The results of this research further facilitate the understanding of the intricate relationships between GSCM practices, institution-induced pressures, and sustainable performance outcomes. The results show that practices related to GSCM significantly predict both environmental and economic performance, and, with a high degree of confidence, do not significantly predict social performance. The results are consistent with the resource-based view, which argues that the practices of GSCM create environmental outputs by using resources efficiently and reducing wastes, while also achieving returns in economic terms through cost savings and competitive edge (Hart, 2023; Govindan et al., 2024). A positive and significant effect of GSCM on environmental performance ($\beta = 0.148$) is in line with the studies of Ahmed et al. (2024) and Hussain et al. (2023), which concluded that extensive implementation of GSCM leads to measurable progress on environmental goals.

The finding that GSCM has a stronger impact on economic performance ($\beta = 0.219$) than environmental performance points to the perceived Pakistani context of GSCM as predominantly incorporating efficiency improving tools that add economic value. This is in line with Khan et al. (2024) and Raza et al. (2024), who showed that GSCM practices in developing countries bring major economic advantages through cost and energy efficiency and improve market competitiveness. The absent direct effect of GSCM on social performance ($\beta = -0.077$) is noteworthy and shows that the social value of GSCM may be mediated by other corporate factors such as social value commitments, stakeholder engagement, and the presence of social governance structures. This is in line with Nawaz et al. (2024) and Mangla et al. (2024), who said that the social aspect of sustainability needs additional efforts beyond GSCM.

The analysis of moderation presents the dimension-specific and intricate effects of institutional pressures on the GSCM-performance nexus. The negative moderation of normative pressure on the GSCM-economic performance relationship ($\beta = -0.245$) shows that normative pressure may lead to a level playing field where competing firms may adopt the same GSCM practices. This may eliminate the first mover advantage and competitive edge that early implementers get to enjoy (Khan et al., 2024). This contradicts the common view that normative pressure will generally enhance the effectiveness of GSCM and implies that in the case of economic outcomes, firms may be better off having their own distinct GSCM rather than benchmarking it against industry standards.

Meanwhile, the positive moderation of coercive pressure in the GSCM-economic performance relationship ($\beta = 0.163$) shows that the presence of regulations can create a more favorable environment for GSCM that can provide greater economic benefits through environmental and cost saving investments, and by achieving compliance and accessing environmentally concerned markets (Büyüközkan and Çifçi, 2024). In contrast, the negative moderation of coercive pressure in the GSCM-social performance relationship ($\beta =$

–0.109) suggests that compliance with regulatory demands may negatively affect the availability of resources, leading to a defocus of firms from social objectives toward social sustainability (Hussain et al., 2024). This shows the tough trade-offs organizations are faced with when fulfilling regulatory obligations across the dimensions of sustainability.

The negative moderation of mimetic pressure on the GSCM – environmental performance association ($\beta = -0.204$) offers empirical evidence for the theory that the imitative adoption of GSCM practices may result in surface level adoption that yields little to no environmental benefits (Dimaggio and Powell, 2023). Where GSCM practices are adopted by organizations largely through an emulative process, organizations may adopt practices visibly, but may not support the practices needed for transformation and integration (Jia et al., 2024). This illustrates that when adopting GSCM, there needs to be a focus on intrinsic motivation and the creation of context adapted solutions rather than adopting a practice that is revered by competitors and copying it mechanically.

5 | CONCLUSION

This paper studies green supply chain management (GSCM) in Pakistan and its effects on sustainable performance and institutional pressure. The relationship between GSCM and ecological and economic performance was supported by the analysis of 400 supply chain professionals employing the PLS-SEM framework and Smart-PLS 4.8.0. GSCM has no negative or positive influence on social performance. In an emerging economy, institutional pressure has a symmetrical and at times, counter effect on the GSCM-performance relationship in the moderation analysis.

6 | IMPLICATIONS

6.1 Theoretical Implications

This study has enhanced the existing scholarly literature and the GSCM and sustainable performance theory through several avenues. First, by distinguishing sustainable performance, this study has given the sustainable performance theories a boost by addressing the limitations of aggregate performance measures proposed by Srivastava and Singh (2023) and Luthra et al. (2024), and explaining how individual components of sustainability can be impacted differently by GSCM. The finding that GSCM is positive towards environmental and economic performance, demonstrates that social performance is seen as a challenge and is the responsibility of the organization and involves efforts outside of the GSCM practices.

The study expands institutional theory by analyzing specific instances of moderation of three dimensions of institutional pressure on the GSCM-performance relation. Describing the consequences of the different types of coercive, normative and mimetic pressures on diverse economic, social and environmental outcomes adds depth and flexibility to the operationalization of the sustainability challenge (Sarkar et al. 2024, Awasthi et al. 2024). This study shows that normative pressure diminishes the economic impacts of GSCM, while coercive pressure propels them. This demonstrates the complexity and the intricacy of the relationship between institutions and organizational performance, with respect to the GSCM, in particular.

This study adds to the scant, yet growing, literature on institutional complexity in supply chain sustainability by demonstrating that conflicting institutional demands exist when an organization implements the GSCM (Meyer and Rowan, 2023). The finding that coercive pressure improves economic outcomes and worsens social outcomes demonstrates that in the context of the GSCM, conflicting pressures create an institutional framework within which organizations must address the sustainability challenge.

6.2 Managerial Implications

A number of conclusions can be drawn specifically for supply chain managers and company leaders regarding the strategic level. To begin, Green Supply Chain Management (GSCM) positively impacts the environment and bottom line, creating a clear benefit for organizations to adopt Green Supply Chain practices. To this end, management should promote GSCM operations that help companies gain more operational benefits at a lesser (or negligible) impact on the environment. Some examples include procurement practices of goods and/or services that help save energy and minimize waste, as well as efficient logistics practices used in the supply chain (Wang et al, 2023; Ali et al, 2024).

Second, different impacts of GSCM in the context of different institutions need to be appreciated. The presence of mandatory regulation and the relationship of GSCM to the economy creates a win-win situation for both the organization and the environment, as organizations can now meet their green strategies through mandatory compliance. In the presence of sustainable GSCM practices, the impact of mimetic is seen as pressure on the environment and thus management should avoid adopting a purely mimetic approach to GSCM, and instead should support the development of localized green supply chain practices (Jia et al, 2024).

Third, the absence of an impact of GSCM on social performance indicates that in the absence of strategic social sustainability initiatives, management can expect little/no social benefit from GSCM. Thus, the establishment of services related to employee and community welfare, and instituting stakeholders engagement processes, may be necessary to ensure social benefits accrue to GSCM (Nawaz et al, 2024).

6.3 Limitations and Future Research

This study has numerous limitations and opportunities for future studies. One limitation of this study is the cross-sectional research design. Cross-sectional research designs only allow exploration of associations and relationships. Therefore, there is a possibility this study and others that rely on this design may be subject to institutional pressures. To overcome this limitation, future studies may employ longitudinal research designs to capture relationships over time and improve the understanding of the GSCM and sustainable performance (Hair et al., 2024). Another limitation is the data was collected in only Pakistan. This may have further restricted the generalization of studies. To improve understanding of the GSCM, future studies may carry out similar studies in other developing and developed countries that have diverse institutional frameworks (Mangla et al., 2024; Rehman et al., 2024). Another limitation is the existing literature has provided little or no explanation about the role of institutional pressure and the mechanisms of institutional pressure as a catalyst for sustainable performance. As most studies use self-report surveys with limited objective performance metrics and single data sources, this study also is constrained by those limitations. Future studies may eliminate the limitations imposed by self-report surveys by using multiple data sources and performance measures (Rehman et al., 2024). In addition, the GSCM may be studied in the context of top management, corporate culture, and corporate technology to determine the limits of the relationships.

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