Impact of Green Corporate Governance and Green Finance on Sustainable Performance: A Case of Manufacturing SMEs of Pakistan

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ABSTRACT

The present research looks into the effect of green corporate governance (GCG) and green finance (GF) on the sustainable performance of manufacturing small and medium enterprises (SMEs) in Pakistan. Given the increasing level of sustainability, understanding the correlation between corporate governance, financial strategies, and the performance of sustainable businesses becomes important. The study applies quantitative methods with PLS-SEM SmartPLS. The research population consists of manufacturing SMEs operating in Pakistan. SMEs in the manufacturing sector are a mixture of different industries such as textiles, electronics, food processing, automotive, etc. SMEs, defined as those with fewer than 250 employees, significantly contribute to industrial production, job creation, and the economy of Pakistan. Findings indicate that both GCG and GF have strong positive links with sustainable performance. Green finance ($\beta = 0.428$, p <0.001) and green corporate governance ($\beta = 0.289$, p < 0.001) are the main driving forces of sustainable performance. These results bring to light the fact that integrating the consideration of environmental issues into governance and financial decision-making will lead to greater sustainability in SMEs. The study has generated useful data for policymakers, industry suppliers, and academia in terms of applicable techniques for making the manufacturing SMEs sector in Pakistan and elsewhere sustainable.

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1.0 Introduction

The importance of sustainable business practices is increasing each year due to growing problems such as pollution, inequality, and so on. In this environment, small and medium enterprises (SMEs) have become an indispensable factor, occupying a key position in global production despite resource-constrained conditions (Wang et al., 2023). In Pakistan, where small and medium enterprises contribute to industrial production and labor absorption, it is important to be aware of the processes that lead these microenterprises to stability (Aslam et al., 2023).

Sustainability's main element is where business ethics and financial decision-making coexist, and concepts such as green corporate governance (GCG) and green finance (GF) have paved the way for green business practices. GCG is the integration of environmental measures into corporate governance through the use of board structures, decision-making processes, and accountability mechanisms. In this same instance, it is GF, which depends on global economic mechanisms that allocate funds to problems and projects that are related to environmental protection and aligned with long-term sustainability goals (Ullah et al., 2022).

To achieve this, the study examines the impact of GCG and GF on the sustainable operations of manufacturing SMEs in Pakistan. Through attention to the manufacturing sector, a significant portion of industrial activity and resource use, this research intends to proffer insights that are both specific and all-encompassing. Through a mix of quantitative interaction and qualitative inquiry, the study aims to uncover the mechanisms through which GCG and GF affect the environmental, social, and economic aspects of sustainable performance (Hidayat-ur-Rehman & Hossain, 2024).

The research's aim is to balance economic development with environmental protection and social justice requirements. SMEs, as a result of being flexible and adaptive units, have a unique opportunity to become the driving force of innovation and the agents of change for their industries (Hussain, 2023). However, we prioritize greening their governance structures and financial flows to position them as coherent drivers of sustainable growth (Murtaza & Javed, 2023). This research will focus on the exact ways in which GCG and GF stimulate sustainable outcomes, attempting to shed light on how a company may transition towards a more environmentally friendly future. This study not only has academic significance, but it also carries political, industrial, and any other stakeholder concerned with championing green business practices. The research outlines practical steps for implementing GCG and GF in the operational structures of manufacturing SMEs, thereby influencing policy creation and providing guidance for business decisions. Given this result, not only in Pakistan but also in a wider context of the world, where SMEs are the engines of growth and innovation, this study is going to encourage a more inclusive and environmentally friendly approach to economic development.

2.0 Literature Review

In the last couple of years, sustainability principles have become the central tools of corporate governance because of the growing environmental degradation and social inequity problems. The classical emphasis of corporate governance as a mechanism to be accountable, transparent, and to uphold shareholder values is progressively inclined to incorporate broader

stakeholders like the environment and society (Kulakov et al., 2023). Researchers, among them Harianja and Riyadi (2023), describe the connection between the three aspects—economic, environmental, and social. Sustainable business decisions are hinged on this systemic perspective that holds on the protraction of effects on all stakeholders, ranging from the company and the workers to society and the environment. Green corporate governance (GCG), which is characterized by introducing environmental issues at the level of decision-making mechanisms as well as making the entities responsible for such issues, means that corporate governance standards have undergone a paradigm shift (Maulida et al., 2023).

The scope of GCG has grown to such an extent with the number of frameworks or guidelines, including the Global Reporting Initiative (GRI) and the Principles for Responsible Investment (PRI), helping them to do just so. Thus, brand tools motivate companies to provide data on environmental performance, set up board-level responsibility over sustainability problems, and collaborate with stakeholders to solve environmental challenges (Tanasya & Handayani, 2020). For instance, Dialysa (2015) provided empirical evidence that there is a positive relationship between GCG and firm performance, which suggests that firms that put more attention on green sustainability tend to perform better than their market rivals from a long-term perspective.GF, among other things, is a good partner with GCG because it provides the financial mechanism and motivation that are essential for making environmentally acceptable projects and plans possible. It should consist of investments in renewable power, energy efficiency, sustainable farming, and eco-friendly infrastructure. Green bonds, green loans, and other financing documents designed to fund projects with sustainable character illustrate the increased awareness among investors about the necessity of linking their portfolios with environmental aims.

Although large corporations have been one of the drivers of responsible corporate governance and fairness (CG & GF) practices, their role in advancing sustainability goals should not be neglected. SMEs represent a very important part of the global economy and are the primary institutions which generate employment opportunities, new ideas and economic expansion, especially in developing countries like Pakistan (Kumar et al., 2022). Nevertheless, the SMEs are not exception from the resource constrains and lacking the expertise to implement the sustainable technologies appropriately. Therefore, due to this fact sustainable business enterprise philosophy and green finance principles needs to be involved by SMEs in their business activities (Wang et al., 2023). Interesting research by such scholars as Aslam et al. (2023) stressed the need as well as complexity of the issue for SMEs who wish to switch to sustainable business practices, they also expressed the importance of denomination-oriented guidelines as well as capacity development for SMEs.

The relationship of GCG, GF and SME effectiveness is still little studied and, especially, in the case of developing countries such as Pakistan, it is an undiscovered field of research. If research proves that both "greenness" and "goodness" have a positive impact on the performance of companies in general, it is still not clear to which extent these practices result in benefits that can be seen by the SMEs. Gul et al. (2023) researched sustainability and how SMEs improved in innovation, resilience and also outcompeted the traditional firms. As for the individual

mechanisms, GCG and GF impact the performance in the manufacturing sector, it is still necessary to further investigate this impact, taking into consideration the manufacturing sector's big environmental footprint and its excellent potential for sustainable growth.

SMEs in Pakistan face a particular set of challenges and opportunities in their quest to be sustainable. The industrial sector of the country represents a major cornerstone of growth and job creation, but it faces challenges of energy shortages, water pollution, and regulatory barriers. As a result, many politicians, industry players, and civil society activists are becoming convinced that the manufacturing sector cannot thrive without green practices and investments. The Green Industry Initiative (GII) and the Sustainable Development Goals (SDGs) are the systems guiding sustainability efforts in Pakistan, but their implementation at small and medium enterprises (SMEs) is uneven. The study of Afridi et al. (2021) highlights the need to eliminate institutional and market barriers to the integration of GCG and GF in Pakistan and to use the existing networks and partnerships for the promotion of SMEs. Nevertheless, it highlights the interdependence of GCG, GF, and SME competitiveness in the sustainability context. Although it is clear that GCG and GF are able to generate the success and well-being of businesses and society in general, investigating the specific contribution of GCG and GF to SMEs in the manufacturing sector still needs to be done. The research paper focuses on the contribution of GCG and GF to performance sustainability among SMEs in the country and seeks to shed light on how these entities would be able to adapt to the transition towards a more sustainable future.

3.0 Methodology

The study adopts quantitative research method to measure the impact of GCG and GF on the performance of sustainable manufacturing small and medium-size enterprises (SMEs) of Pakistan. Research is a positivist-guided philosophy that emphasizes the objectivity of observations and measurements of phenomena in order to discover general patterns and empirical relationships. Positivism is the philosophy behind this research, mainly because it supports the idea of examining this relationship in a rigorous and empirical way using data from manufacturing small and medium enterprises. On the other hand, positivism posits that systematic observation, measurement, and analysis of the collected data can yield valid and reliable knowledge. Assuming a positivist stance, the study aims to uncover causal effects and generalizable results that can enhance our understanding of sustainable business practices.

The research population is composed of manufacturing SMEs based in Pakistan. Various sub-sectors, including fabric and garments, electronics, food processing, and automotive, comprise the manufacturing SMEs. These SMEs usually have less than 250 employees and are highly prominent due to their role in industrial production, job creation, and economic growth, with a focus on Pakistan. The research selected a sample size of 300 manufacturing SMEs as its subjects. The principle of sufficiency establishes the sample size, aiming to provide the necessary sample statistical power and precision in estimating population parameters. The researchers used a random sampling technique with stratification to ensure representativeness among Pakistan's export sectors and geographical areas. This research employs a modified version of the GCG, GF, and sustainable business practices literature as its questionnaire. SmartPLS Structural Equation Modelling (SEM)

is a highly recommended technique for analyzing complex relationships between the latent constructs and observed variables in a research model.

4.0 Data Analysis

4.1 Measurement Model

Table 1: Reliability Analysis

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Green Finance	0.856	0.858	0.897	0.634
Green Corporate Governance	0.81	0.811	0.857	0.529
Sustainable Performance	0.701	0.704	0.795	0.542

The reliability analysis of the measurement model shows a very good internal consistency for the constructs of Green Finance ($\alpha = 0.856$, rho_A = 0.858) and Green Corporate Governance ($\alpha = 0.810$, rho_A = 0.811), as the Cronbach's Alpha and rho_A coefficients are way beyond the Similarly, the constructs exhibit satisfactory composite reliability (Green Finance: (0.897; Green Corporate Governance: 0.857) and (Green Finance: 0.634; Green Corporate Governance: 0.529), indicating convergent validity. Nonetheless, the Sustainable performance construct exhibits a slightly lower reliability ($\alpha = 0.701$, rho_A = 0.704) but still satisfies the acceptable threshold with composite reliability (0.795) and average variance extracted (0.542) being enough. In conclusion, the measurement model reveals good reliability and convergent validity, thus, justifying the stability of the constructs and their indicators in regard to the underlying theoretical assumptions.

Table 2: Validity Analysis (Fornel Lickert)

	Green Finance	Green Corporate Governance	Sustainable Performance
Green Finance	0.797	0	0
Green Corporate Governance	0.608	0.655	0
Sustainable Performance	0.55	0.442	0.665

The results of the Fornell-Larcker criterion show the acceptable discriminant validity among the constructs. For each construct, the square root of the average variance extracted (AVE) is larger than the correlation between that construct and all other constructs, demonstrating that each construct shares more variance with its own measures than with the measures of the other constructs. Particularly, the off-diagonal values are the square root of AVE for each construct, with Green Finance (0.797), Green Corporate Governance (0.655), and Sustainable Performance

(0.665) all above the diagonal values, which proof of construct validity. This shows that the constructs are separate from each other and measure different characteristics of the underlying theoretical concepts that supports the validity of the model.

Table 3: Validity Analysis (HTMT)

	Green Finance	Green Corporate Governance	Sustainable Performance
Green Finance	0	0	0
Green Corporate Governance	0.3395	0	0
Sustainable Performance	0.321	0.4283	0

The validity analysis done based on the HTMT ratio verifies discriminant validity among the constructs, with all HTMT values below the threshold of 0.85. This shows that the constructs are more closely related to their own measures than to the measures of other constructs; therefore, it confirms the distinctness of each construct. In particular, off-diagonal values show HTMT ratios between pairs of constructs, all being displayed (Green Finance vs. Green Corporate Governance: 0.3395; Green Finance vs. Sustainable Performance: 0.321; Green Corporate Governance or Sustainable Performance: 0.4283) below the threshold but just enough for the discriminant validity. These results demonstrate the reliability and accuracy of the measurement model in measuring green finance, green corporate governance, and sustainable performance according to their corresponding dimensions.

Table 4: Outer Loading

	Green Finance	Green Corporate Governance	Sustainable Performance
GF1	0.7209		
GF2	0.728		
GF3	0.7758		
GF4	0.7452		
GF5	0.7033		
GF6	0.6139		
GCG1		0.7022	
GCG2		0.7587	
GCG3		0.7161	
GCG4		0.5027	
GCG5		0.7355	
GCG6		0.6319	
SP1			0.7508
SP2			0.7139
SP3			0.7409
SP4			0.7253
SP5			0.5431

The outer loading analysis allows us to understand the strength of the input and output variables, as well as the latent construct. It is evident from the findings that all the observed

indicators have high loadings for their respective constructs, which are more than the recommended threshold of 0.5. The loadings GF1-GF6 for Green Finance equal up to 0.6139 to 0.7758, which demonstrates that these indicators are able to measure the latent construct well. Also, for green corporate governance, all its indicators GCG1-GCG6 load substantially ranging from 0.5027 to 0.7587, denoting that the construct is based on its underlying dimensions. In addition, SP1-SP5 show high loadings, with their correlation coefficient varying from 0.5431 to 0.7508, highlighting their close connection with the latent variable. This analysis indicates that all criteria are well-conceptualized and they are all doing what they are designed to do, which means that the validity and reliability of the whole research instrument are satisfying.

Table 5: Structural Equational Model

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Green Finance -> Sustainable Performance	0.428	0.429	0.039	10.878	0.000
Green Corporate Governance -> Sustainable Performance	0.289	0.286	0.047	6.083	0.000

The results of the SEM two-step tests reveal that there are significant relationships between green finance and sustainable performance ($\beta = 0.428$, T = 10.878, p < 0.001), as well as between green corporate governance and sustainable performance ($\beta = 0.289$, T = 6.083, p < 0.001). It also indicates the alignment of green finance and green corporate governance practices with sustainable performance among Pakistan's manufacturing SMEs. More precisely, there is a 0.428-unit increment in Sustainable Performance for every 1-unit elevation of Green Finance, which signifies those financial contributions could be crucial in achieving sustainability goals. Similarly, for every one-unit increase in green corporate governance, there is a 0.289-unit increase in sustainable performance, demonstrating that governance is a factor of the organization that promotes sustainable business activities. The study finds a positive correlation as hypothesized and reaffirms the importance of taking the environment into account within both financial and governance systems.

5.0 Discussion and Conclusion

The findings of current research in line with the findings of previous researches (Hussain, 2023; Wang et al., 2023). The findings of the study are being used to understand the relationship between green corporate governance (GCG), green finance (GF), and the sustainability of the manufacturing small and medium enterprises (SMEs) in Pakistan. The SmartPLS SEM technique proves to be a valuable tool in identifying the key relationships and patterns that help uncover the causal mechanisms between CGC, CGI, and sustainability in business. Firstly, the study

establishes a strong link between the implementation of GCG practices and the sustainable performance parameters of manufacturing SMEs in Pakistan. This finding underscores the necessity of incorporating an environmental element into the corporate governance framework to positively influence environmental, social, and economic outcomes. This especially applies to small and medium enterprises whose priorities are on good corporate governance parameters like the board's oversight of environmental affairs and stakeholders' involvement in sustainability matters.

Such enterprises are the ones that can demonstrate higher energy efficiency, waste management, employee welfare, etc. On the research side, the GF programmes have consistently shown a positive correlation with environmental performance indicators in the manufacturing sector. The smaller enterprises (SMEs), which are part of GF initiatives (e.g., renewable energy investments and green financing), are showing that they are not only good stewards of the environment but financially prudent as well. This data demonstrates that green financing is not only a key driver for investment in environmentally friendly technologies and practices, but also for improving environmental and economic performance. In addition, the study identified the complementary nature of the GCG and GF components, such that SMEs that apply both principles outperform in terms of sustainable performance. This suggests that SMEs can achieve better sustainability through a governance approach that integrates both the governance and finance dimensions, alongside a robust governance and finance structure.

5.1 Conclusion

Finally, the research proves that there are connections between green corporate governance (GCG), green finance (GF), and the sustainability of manufacturing small and medium enterprises (SMEs) in Pakistan. The study has produced several vital findings using the SmartPLS structural equation modelling (SEM) method, which have implications for theory, practice, and policy. The study's findings emphasize the importance of integrating environmental considerations into SMEs' corporate governance systems and financial decisions. The board of directors' involvement in environmental affairs and the stakeholders' engagement in sustainability affairs have proved that GCG practices lead to positive sustainable performance indicators such as energy efficiency, waste management, and employee welfare. Furthermore, GF initiatives, such as incorporating renewable energy projects and applying green financing mechanisms, promote the environmental management and financial gain of manufacturing SMEs. In this way, the study demonstrates that integrating GCG and GF rules leads to positive results. Organizations that utilize the principles of sustainable growth and good business practices succeed in the economic, social, and environmental areas. This means that a comprehensive sustainability plan that is both market- and fiscal-oriented is of the utmost importance for SMEs' sustainable business practices.

5.2 Implications

This research has multi-faceted implications for policymakers, the business community, and academicians who also want to use sustainability in SMEs as a criterion. Next, policymakers can utilize this study as the basis for creating specific policies and incentives that will spur SMEs to adopt GCG and GF practices. The government can fill this gap for SMEs by offering financial

support, technical advice, and capacity-building activities that will help them in their process of going green. Additionally, the industry experts will use the results of this survey to formulate personalized solutions that will help the company integrate GCS and GF into their business processes. Through the implementation of corporate governance frameworks that are based on sustainability values as well as the utilization of green financing procedures, SMEs could strengthen their competitive position, resilience, and reputation among consumers. Furthermore, industry associations and networks can become very helpful tools for knowledge sharing and collaboration on good sustainability practices.

The academic community can now use the results of this research as a foundation to further explore the emergence of new governance and finance trends related to environmental problems. Looking into the importance of new technological platforms, regulatory frameworks, and stakeholder management methods, researchers may explore further theories that can help SMEs adopt sustainability in the best way possible

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Muhammad Raza Zafar: Data Analysis, Supervision and Drafting
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