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Determinants of Economic Sustainability: Exploring the Role of Knowledge Management with the Mediating Influence of Green Innovation in Pakistani Manufacturing SMEs

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ABSTRACT

This study investigates the interconnected dynamics of knowledge management, green innovation, and economic performance within the context of manufacturing Small and Medium-sized Enterprises (SMEs) in Lahore, Pakistan. The primary objective is to explore the impact of knowledge management on the economic performance of SMEs and ascertain the mediating role of green innovation in this relationship. The study adopts a quantitative research design grounded in positivism, targeting a population of manufacturing SMEs operating in Lahore. A sample size of 300 managerial-level employees is selected using a simple random sampling strategy, and data is collected through a survey instrument. The findings of the study reveal a significant positive effect of knowledge management on the economic performance of SMEs, affirming the crucial role of effective knowledge-sharing practices in fostering economic success. Furthermore, the study identifies a significant mediating effect of green innovation, highlighting the importance of incorporating environmentally sustainable practices in the innovation processes of SMEs. This research contributes novelty by contextualizing these relationships within the specific industrial landscape of Lahore, Pakistan, filling a gap in the existing literature. The incorporation of green innovation as a mediator adds a unique dimension to the study, emphasizing the relevance of sustainable practices in driving economic performance for SMEs in Lahore.

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1.0 Introduction

Environmental deterioration poses a significant risk to both the natural ecosystem and human economic prosperity. It impacts both the sustainable economic development (SED) and the performance of manufacturing companies (Hussain et al., 2023). Governments and commercial enterprises are transitioning to sustainable procedures and production techniques to safeguard natural habitats. The growing environmental challenges and responsibilities have influenced the role of small and medium-sized enterprises (SMEs) (Ndubisi et al., 2021). Small and Medium-sized Enterprises (SMEs) are considered vital to economies since they foster innovation in small and local economies, provide employment, and contribute to manufacturing. Over two-thirds of industrial pollution is caused by small and medium-sized enterprises (SMEs) since smaller industrial units prioritize the preservation of the natural environment to a lower extent (Mady et al., 2023). In developing nations, small and medium enterprises often rely on Conventional Production Methods (CPM) and prioritize production above environmental conservation and protection. CPM pose a threat to the environmental health (Albloushi et al., 2023).

Businesses engaging in activities that endanger the environment should adopt eco-friendly strategies for sustainable growth, such as implementing GI. Green innovation (GI) refers to the actions and strategies used to reduce the negative impact that corporate activities and production processes may have on the environment. This is achieved by focusing on developing more environmentally friendly goods, processes, technology, and management practices (Jamal & Habbe, 2023). GI is synonymous with environmental innovation and eco-innovation. The company emphasizes creating eco-friendly goods and processes by using organizational practices such as using green raw materials, eco-design principles, reducing raw material use, and minimizing emissions (Hasan & Rahman, 2023). Green products are environmentally friendly commodities, while green processes include new methods, equipment, and procedures that also result in eco-friendly products. GI is a crucial approach for environmental conservation, focusing on reducing resource consumption, preventing pollution, improving manufacturing processes, and implementing environmental management systems in business (Indrawati et al., 2023).

The studies on sustainable economics in Pakistani SMEs are revealed to have such gaps, that is, knowledge management and green innovation, which seem to be not only the determining factors but also the underlying dynamics of microeconomic sustainability. Although the literature is rich in general ideas on how knowledge management functions for the development of green innovation in the manufacturing SMEs of Pakistan, the issue of specific mechanisms is still a matter of research (Shahzad et al., 2020). An in-depth examination of this relationship is critical for closing the current knowledge gap, as it can provide useful results that can help explain the factors that promote or hinder sustainable practices in the industry (Polas et al., 2023).

The problem that has been identified is the need to conduct comprehensive research regarding green innovation that assists in the relationship between knowledge management and sustainable growth in Pakistani manufacturing SMEs. Researchers have not yet studied the intricate processes of the interplay between knowledge management and green innovation and their contributions to economic sustainability. Knowing green innovation as a mediator in

manufacturing SMEs is the key to the success of the targeted strategies that are aimed at improving sustainable practices in manufacturing SMEs. Hence, research is required that scrutinizes green innovation and economic sustainability, along with the more complex relationships of knowledge management in Pakistani manufacturing SMEs.

2.0 Literature Review

2.1 Knowledge Management and SME's Economic Performance

Many studies have highlighted the significance of knowledge management in small and medium-sized enterprises (SMEs) to enhance efficiency, innovation, and overall economic performance. Research conducted by Nuel et al. (2023) shown that efficient knowledge management techniques have a substantial impact on the operational performance of small and medium-sized enterprises (SMEs), resulting in enhanced economic results. Knowledge management helps small and medium-sized enterprises (SMEs) effectively use their internal intellectual resources, exchange knowledge, and foster innovation, all crucial for attaining economic prosperity (Fakhrunnisa et al., 2023). Research indicates that information management has a favorable impact on small and medium-sized enterprises' innovative capacity, leading to improved economic performance. Widodo (2023) found a direct correlation between knowledge management and innovation in small and medium-sized enterprises (SMEs), highlighting the significant impact of innovation on economic prosperity. SMEs may enhance economic performance by successfully managing and using knowledge to promote a culture of continuous learning and innovation (Makkonen et al., 2014). Knowledge management is associated with enhanced decision-making processes in small and medium-sized enterprises (SMEs). It is crucial for economic performance because making well-informed decisions using information and insights may improve resource allocation, strategic planning, and operational effectiveness (Rao et al., 2023).

2.2 Green Innovation and SME's Economic Performance

Previous studies suggest that businesses implementing green innovation practices outperform their competitors by efficiently utilizing green resources, responding promptly to consumer needs, and adding significant value and resources to the organization. GI, as stated in, is a modern and esteemed approach to process and production management aimed at mitigating environmental issues and pollution, while also limiting adverse impacts on resources and energy consumption (Muangmee et al., 2021). The adoption of green standards is strongly linked to senior management's commitment, which is influenced by internal variables like as management commitment, supplier ties, and regulatory and consumer pressure.

Green infrastructure (GI) may be achieved by including methods such using eco-friendly materials in product design and minimizing water, electricity, and raw material use (Baeshen et al., 2021). The researchers in reference [2] used the PLS-SEM approach and discovered a positive relationship between Green Innovation (GI) adoption and Green Innovation strategy in small and medium enterprises (SMEs) (Oncioiu et al., 2018). They suggested that companies should establish a Green Innovation strategy to enhance environmental organizational legitimacy and improve Green Innovation performance.

2.3 Green Innovation as Mediator

Seman et al. (2019) investigate the correlation between absorption capacity and GI adoption in small and medium enterprises (SMEs) via the Partial Least Squares Structural Equation Modeling (PLS-SEM) method, along with the mediating effects of sustainable capabilities such sustainable orientation, sustainable human capital, and sustainable cooperation. The researchers of reference Chang (2011) examined data from Ghanaian manufacturing businesses to elucidate the correlation among green supply chain integration, manufacturing practices, and SNP by using the PLS-SEM model. Additionally, a study shown that sustainability factors, such environmental and economic performance, significantly impact Green Innovation processes in the Malaysian hotel industry, as analyzed by the PLS-SEM model (Yuan & Cao, 2022). As stated by reference green transformational leadership minimally impacts GI and indirectly affects the industry's environmental performance via GI. A study conducted by Iqbal et al. (2021) using the PLS-SEM model to examine the variables influencing GI adoption in small and medium enterprises in Pakistan. The study on small and medium enterprises (SMEs) in Thailand suggests that Green Innovation (GI) positively influences the competitive advantage of green product lines and the development of innovative green products. Another study found that adopting GI has the most significant impact on Sustainable Natural Resource Practices (SNP), affecting economic, social, and environmental performance.

2.4 Hypothesis of the Study

H1: There is a signifnact effect of knowledge management on economic performance of SME’s

H2: There is a signifnact mediating effect of green innovation between knowledge management on economic performance of SME’s

3.0 Methodology

In this study quantitative research approach is adopted, where a positivist research philosophy is used to examine the leading determinants of economic sustainability in manufacturing SMEs operating in Pakistan. The research population consisted of SMEs in manufacturing sector in Pakistan and the study consisted of 300 employees at managerial levels in Lahore. Lahore was preferably picked out as the prominent economic and industrial hub of Pakistan because it has a wide range of manufacturing SMEs belonging to different industries, giving an idea of the economic scenario of the whole country. Lahore's strategic position determines that the conclusions drawn from the city can serve as a reference to its neighboring SMEs across the country. The richness of industrial context of Lahore gives our research an ability to recognize intricate interactions between knowledge management, green innovation and economic sustainability and all that under the unique operational environment of Pakistani manufacturing SMEs.

A random sampling strategy which uses a pure probability principle was used to ensure that the selected individuals demonstrate appropriate diversity. Data collection was mainly done by an online survey, which was meant to find out the knowledge management practices, green

innovation initiatives as well as economic performance of the small and medium enterprises chosen as the respondent. The survey questionnaire was used to collect the response from participants who were to give their knowledge management strategies perspectives and the extent to which the innovation practices of their organizations were influenced by these strategies. Further, the survey incorporates the questions about the economic performance indicators. The choice of 300 managerial-level employees who were the representatives of SMEs and were believed to be able to provide the multifaceted views and robust data for analysis was the most important.

In order to analyze the data, Partial Least Squares Structural Equation Modeling (PLS-SEM) was used. PLS SEM is a technique that allows to examine a models' relationships, which makes it a good method of choice for the research's focus on the complex interaction between knowledge management, green innovation, and economical sustainability in the context of manufacturing SMEs. PLS SEM approach provides the basis for considering the whole set of relationships and their potential indirect impacts on the studied SMEs' stability, hence giving more accurate picture of economic sustainability of SMEs under study.

4.0 Results

4.1 Reliability Analysis

The reliability analysis, as shown in Table 4.1, looks at the consistency and stability of the measurement scales that are used for this study on internal consistency. The constructs consist of three categories: economic performance, green innovation, and knowledge management. They show good reliability, as their Cronbach's alpha values are 0.8092, 0.7063, and 0.7721 consecutively. These values are higher than the 0.70 level, which is the threshold, implying high reliability. On the other hand, the constructs demonstrate good composite reliability, and their scores are higher than the minimum acceptable value of 0.70, being 0.8686 for economic performance, 0.7159 for green innovation, and 0.8381 for knowledge management. The AVE values, which indicate the variance of the constructs in the first factor as compared to the measurement error, are also acceptable, with economic performance being the highest at 0.5716, green innovation at 0.5677, and knowledge management at 0.4641.

Tabel 4.1 Reliability Analysis

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Economic Performance	0.8092	0.8172	0.8686	0.5716
Green Innovation	0.7063	0.7082	0.7159	0.5677
Knowledge Management	0.7721	0.7749	0.8381	0.4641

4.2 Validity Analysis

In the HTMT ratios, validity, which is utilized to test the discriminant validity among the main constructs—economic performance, green innovation, and knowledge management—will be investigated. The HTMT values are calculated for pairs of constructs, typically 0.85 or higher, and are considered to have concerns about discriminant validity. Therefore, in this scenario, the values of HTMT are 0.7144 and 0.6751 between economic performance, green innovation, and knowledge management, respectively. Since the values are lower than the threshold, it can be assumed that the discriminant validity is satisfactory. Nevertheless, the value of 0.6205 for the variable HTMT between green innovation and knowledge management is a bit higher, although still within the satisfactory range. This results in distinguishing the applied constructs from each other, which reinforces the reliability of the structure model and its ability to capture the unique variance related to economic performance, green innovation and knowledge management in manufacturing SMEs**.**

Tabel 4.2 HTMT

	Economic Performance	**Green Innovation**	**Knowledge Management**
Economic Performance			
Green Innovation	0.7144		
Knowledge Management	0.6205	0.6751	

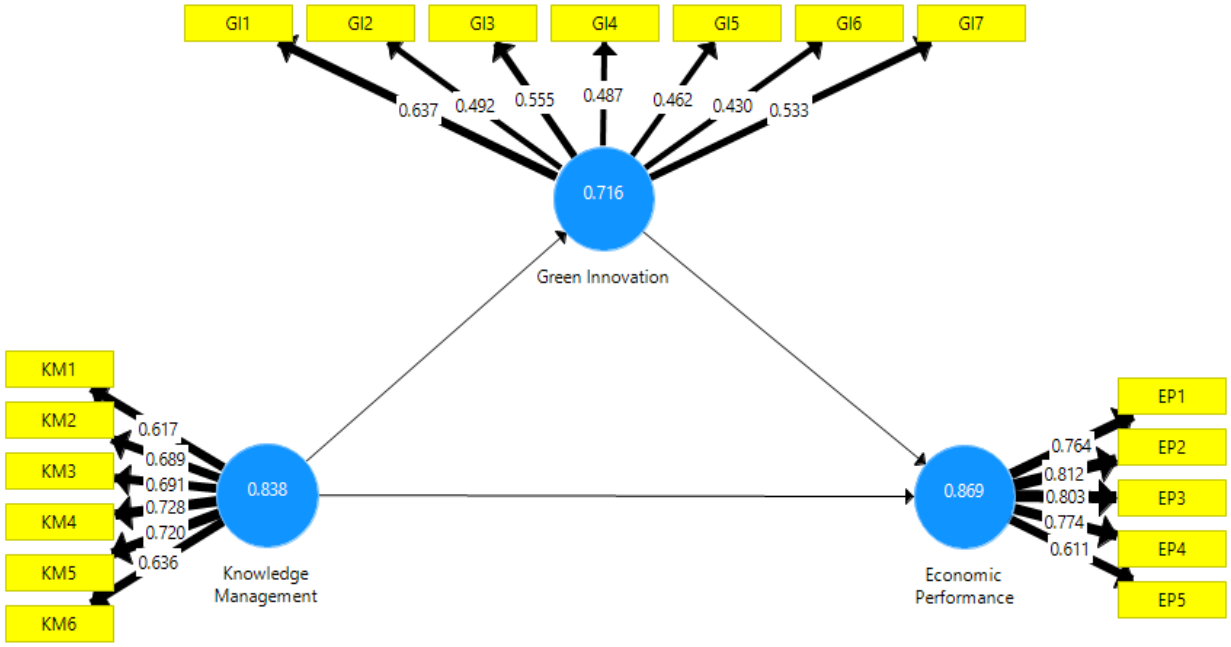

Figure 4.1: Measurement Model

4.3 Structural Equational Model

The structural equation model (SEM) results are presented in Tables 4.4 and 4.5, outlining the direct and mediation effects in the study. In Table 4.4, examining the direct effects, it is evident that both green innovation and knowledge management have substantial positive impacts on economic performance. Specifically, green innovation exhibits a direct effect with a path coefficient of 0.2999, indicating its significant contribution to enhancing economic performance. Similarly, knowledge management demonstrates a robust direct effect with a higher path coefficient of 0.3675, emphasizing it's even more pronounced influence on economic performance. Moreover, Table 4.4 highlights the interplay between knowledge management and green innovation, indicating a path coefficient of 0.5233, underlining a strong association between the two constructs. Moving to Table 4.5, which delves into the mediation effect, the path coefficient for the Knowledge Management -> Green Innovation -> Economic Performance pathway is 0.1569. This signifies a significant mediation effect, indicating that green innovation mediates the relationship between knowledge management and economic performance.

Tabel 4.4 Direct Effect

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Green Innovation -> Economic Performance	0.2999	0.3012	0.0466	6.4395	0
Knowledge Management -> Economic Performance	0.3675	0.3674	0.0387	9.496	0
Knowledge Management -> Green Innovation	0.5233	0.5277	0.0387	13.5301	0

Tabel 4.5 Mediation Effect

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Knowledge Management -> Green Innovation -> Economic Performance	0.1569	0.1595	0.0304	5.158	0

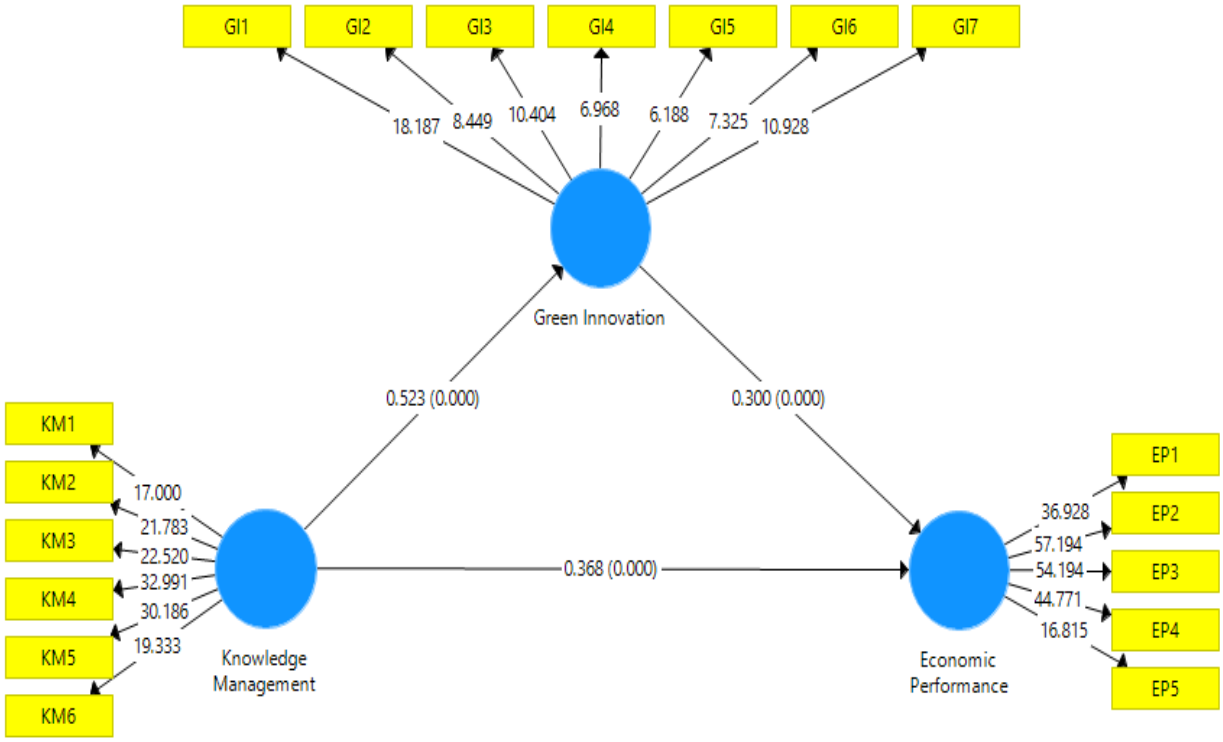

Figure 4.2: Structural Equational Model.

Discussion and Conclusion

The first hypothesis predicts the presence of a considerable impact of knowledge management on the economies of small and medium enterprises. The topic of knowledge management (KM) has been widely recognized as an essential factor that is of paramount importance for an organization's overall performance and competitive advantage. Knowledge is regarded as a strategic asset that, if it is managed properly, can bring about better decision-making, innovation, and hence overall performance (Fakhrunnisa et al., 2023; Mady et al., 2023). In small and medium enterprises that usually function with limited resources, knowledge utilization is one of the critical factors that can form the basis for business performance (Ndubisi et al., 2021).

Numerous studies have proven that knowledge management is a critical component of SMEs' performance. On the other hand, Jamal and Habbe (2023) revealed that enterprising SMEs that rely on knowledge management practices are more innovative, which, in turn, has a positive impact on their financial performance. Further, research by Oncioiu et al. (2018) has shown that knowledge management is essential for the growth of SMEs and they can be more competitive and financially better, which result from knowledge management. Therefore, the current study is in connection with existing literature with the null hypothesis of a positive and significant relationship between knowledge management and the economic performance of SMEs.

For the second hypothesis, the study found a significant mediating effect of green innovation between knowledge management and SMEs' economic success. Green innovation, frequently associated with environmentally sustainable practices, has been the highlight of organizational plans due to socially responsible requirements and ethical market demands (Seman

et al., 2019).The incorporation of green innovation into the operations of SMEs may as well aid in environmental sustainability by improving economic performance. The empirical evidence clearly demonstrates that green innovation, as a mediating agent, connects knowledge management and economic performance. By way of illustration, García-Machado and Martínez-Ávila (2019) noted that when knowledge management and green innovation are environmentally conscious, they positively affect financial performance. With respect to this, Sun and Sun (2021) spelled out the mediating effects of environmental innovations on the relationship between knowledge management capabilities and economic performance in large Spanish firms. Now, the current study broadens the research findings to the SME sector, expecting that green innovation practices mediate the effect of knowledge management on economic performance.

Implications, Recommendations and Novelty of the Study

This study's implications are varied, as it opens up a wide range of useful insights for practitioners and policymakers who are concerned with the Pakistani manufacturing SME sector. Firstly, increased knowledge management shows the positive link between knowledge sharing and business performance, which calls for the development of a knowledge management culture within SMEs. The top management and the company's leaders should give the same attention to the design of powerful knowledge management systems, which will provide the opportunity to use intellectual capital efficiently. This can be achieved by budgeting for training and mentoring programs, adopting advanced knowledge-sharing platforms, and cultivating a collaborative work environment that encourages the free flow of ideas and information.

Green innovation serves as a mediating factor for SMEs striving to achieve both environmental sustainability and economic success. Actions that incorporate environmental friendliness into innovation procedures are not only in alignment with the changing regulatory requirements, but they also provide opportunities to make a difference in the market and become more competitive. SMEs should be encouraged to include sustainable practices into their operational strategies and make them possible through a culture of innovation that pays attention to environmental problems. This strategy not only aids in the development of sustainable societies and healthy environments but it is also a good PR strategy for SMEs in a context where consumers are paying more and more attention to the sustainability of businesses.

The following recommendations of the study involve policymakers, who are recommended to build an environment that would encourage knowledge management and green innovation among SMEs. Governments will need to create an environment for SMEs that allows them to invest in knowledge management technology and environmental protection measures. Providing resources, incentives, and supportive frameworks can achieve this. Furthermore, educational and awareness programs can be developed that help businesses learn about and adopt green innovation. Participation and strategic alliances between governments, business associations and educational institutions can be the decisive factors for the propagation of best practices and the establishment of a learning and innovative culture in the SME segment.

This research is unique in that it places knowledge management, eco-innovation, and economic development in the context of the Pakistani SME manufacturing sector, particularly

inside Lahore city. This research has explored the interplay between these elements in different situations. This study specifically focuses on the Pakistani region, offering insights tailored to guide future research and policymaking in the country's entrepreneurial sector. The green innovation in this study as a moderating element stands out as a unique aspect, which reflects the growing awareness of environmental protection in small and medium businesses' economic prosperity. This paper contributes to filling the gap in the study of the very complex relations between knowledge management, green innovation and the performance of small and medium-sized enterprises (SMEs) in Lahore.

Zulfiqar Hussain Awan: Problem Identification and Model Devolpement,
Javeria Islam: Supervision and Drafting
Muhammad Arshad: Literature search, Methodology

Conflict of Interests/Disclosures

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References

Albloushi, B., Alharmoodi, A., Jabeen, F., Mehmood, K., & Farouk, S. (2023). Total quality management practices and corporate sustainable development in manufacturing companies: the mediating role of green innovation. *Management Research Review*, *46*(1), 20-45.

Baeshen, Y., Soomro, Y. A., & Bhutto, M. Y. (2021). Determinants of green innovation to achieve sustainable business performance: Evidence from SMEs. *Frontiers in Psychology*, *12*, 767968.

Chang, C.-H. (2011). The influence of corporate environmental ethics on competitive advantage: The mediation role of green innovation. *Journal of Business Ethics*, *104*, 361-370.

Fakhrunnisa, E., Puspaningrum, A., & Kurniawati, D. T. (2023). The Influence Of Knowledge Management And Entrepreneurial Orientation On Business Performance Mediated By Competitive Advantage (A Study On Smes In The City Of Bandar Lampung). *Journal Research of Social Science, Economics, and Management*, *3*(04), 853-869.

García-Machado, J. J., & Martínez-Ávila, M. (2019). Environmental performance and green culture: The mediating effect of green innovation. An application to the automotive industry. *Sustainability*, *11*(18), 4874.

Hasan, M. J., & Rahman, M. S. (2023). Determinants of eco-innovation initiatives toward sustainability in manufacturing SMEs: Evidence from Bangladesh. *Heliyon*, *9*(7).

Hussain, S., Gul, R., & Ullah, S. (2023). Role of financial inclusion and ICT for sustainable economic development in developing countries. *Technological Forecasting and Social Change*, *194*, 122725.

Indrawati, H., Caska, C., Hermita, N., Sumarno, S., & Syahza, A. (2023). Green innovation adoption of SMEs in Indonesia: what factors determine it? *International Journal of Innovation Science*.

Iqbal, S., Akhtar, S., Anwar, F., Kayani, A. J., Sohu, J. M., & Khan, A. S. (2021). Linking green innovation performance and green innovative human resource practices in SMEs; a moderation and mediation analysis using PLS-SEM. *Current Psychology*, 1-18.

Jamal, D. K., & Habbe, A. H. (2023). Green Innovation for Small-to Medium-Sized Enterprises (SMEs): Systematic Literature Review. *Indonesian Journal of Economic & Management Sciences*, *1*(6), 791-804.

Mady, K., Battour, M., Aboelmaged, M., & Abdelkareem, R. S. (2023). Linking internal environmental capabilities to sustainable competitive advantage in manufacturing SMEs: The mediating role of eco-innovation. *Journal of Cleaner Production*, *417*, 137928.

Muangmee, C., Dacko-Pikiewicz, Z., Meekaewkunchorn, N., Kassakorn, N., & Khalid, B. (2021). Green entrepreneurial orientation and green innovation in small and medium-sized enterprises (SMEs). *Social Sciences*, *10*(4), 136.

Ndubisi, N. O., Zhai, X. A., & Lai, K.-h. (2021). Small and medium manufacturing enterprises and Asia's sustainable economic development. *International Journal of Production Economics*, *233*, 107971.

Nuel, O. I. E., Peace, N. N., & Ifechi, A. N. (2023). Knowledge management: Implications to SMEs performance in Nigeria. *Nurture*, *17*(2), 103-111.

Oncioiu, I., Ifrim, A. M., Petrescu, A. G., & Bîlcan, F. R. (2018). Role of green innovation and business performance: Evidence from romanian smes. *Electrotehnica, Electronica, Automatica*, *66*(2), 129-134.

Polas, M. R. H., Tabash, M. I., Bhattacharjee, A., & Dávila, G. A. (2023). Knowledge management practices and green innovation in SMES: the role of environmental awareness towards environmental sustainability. *International Journal of Organizational Analysis*, *31*(5), 1601-1622.

Rao, S., Nandini, A. S., & Zachariah, M. (2023). Knowledge management for SMEs: a pragmatic approach. *Knowledge Management Research & Practice*, *21*(4), 795-805.

Seman, N. A. A., Govindan, K., Mardani, A., Zakuan, N., Saman, M. Z. M., Hooker, R. E., & Ozkul, S. (2019). The mediating effect of green innovation on the relationship between green supply chain management and environmental performance. *Journal of Cleaner Production*, *229*, 115-127.

Shahzad, M., Qu, Y., Zafar, A. U., Rehman, S. U., & Islam, T. (2020). Exploring the influence of knowledge management process on corporate sustainable performance through green innovation. *Journal of Knowledge Management*, *24*(9), 2079-2106.

Sun, Y., & Sun, H. (2021). Green innovation strategy and ambidextrous green innovation: The mediating effects of green supply chain integration. *Sustainability*, *13*(9), 4876.

Widodo, D. S. (2023). The Nexus of Entrepreneurial Orientation and Knowledge Management on Business Performance of SMEs in West Java: Role of Competitive Advantage. *Journal of law and sustainable development*, *11*(7), e1364-e1364.

Yuan, B., & Cao, X. (2022). Do corporate social responsibility practices contribute to green innovation? The mediating role of green dynamic capability. *Technology in Society*, *68*, 101868.