Green Practices to Enhance Firm performance:
The Moderating Role of Organizational Green Culture

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Abstract

Environmental degradation is a global issue. At present, more than mere profitability is needed for businesses; environmental impacts must also be considered. So, due to social pressures and regulations, businesses must balance environmental sustainability and economic growth. For this, industrialists and academics focus on green aspects. Drawing upon the natural resource-based view theory (NRBVT), the study examines the impact of green human capital (GHC) and green supply chain management (GSCM) on firm performance (FP) with green innovation (GI) as a mediator. Moreover, it explores the neglected moderating role of organizational green culture (OGC). FP is measured as a higher-order construct of two distinct dimensions: environmental and financial performance. GHC, GSCM, GI and OGC are measured as lower-order constructs. The researchers utilized a cross-sectional design for this study. Primary data were collected (online and offline) from managers of the textile industry via questionnaire. A cover letter was attached to the questionnaire detailing the study's objectives and instructions for its completion. Three hundred six complete responses were collected and analyzed using Smart-PLS 3.2.9 (variance-based software). The findings confirm that GHC, GSCM, and GI positively and significantly impact on FP. Additionally, GI partially mediates between the links of GHC-FP and GSCM-FP. Moreover, the study confirms that OGC moderates the association between GI and FP. The study reveals that green resources are essential for textile performance. Managers should proactively implement ecological strategies within their businesses to improve performance.

Keywords: Firm Performance, Green Innovation, Organizational Green Culture, Green Supply Chain Management, Green Human Capital.

I.   Introduction

In the past, there was a lack of emphasis on ecological concerns among researchers, policymakers, and business owners due to the belief that firms had negligible impact on the environment. However, environmental degradation is a global issue (Kraus et al., 2020; Nguyen et al., 2023). At present, more than mere profitability and competitive advantage are needed for businesses; environmental impacts must also be considered (Kraus et al., 2020) as stakeholders also impose significant pressure to lessen the ecological impact of their manufacturing activities (Yu et al., 2017). So, due to societal pressures and regulatory policies, businesses require an increasingly balanced approach to environmental sustainability and economic growth (Tang et al., 2018). For this, industrialists and academics focus on green aspects (He et al., 2016; Kraus et al., 2020). The manufacturing industry significantly contributes to environmental issues like air and water pollution, wastage and depletion of natural resources, and climate change, all business concerns (Kraus et al., 2020; Zailani et al., 2012). Being

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environmentally conscious is increasingly crucial within firms, and it has emerged as a fundamental component of their holistic environmental strategy (Wang & Juo, 2021). Hence, ecological initiatives are essential for achieving sustainability (Ainin et al., 2016). So, promoting environmental performance other than operational and financial performance has become a prerequisite for businesses to respond to global challenges. The study focuses on environmental performance (ENVP) and financial performance (FINP) for evaluating firm performance (FP) (as a higher-order construct). Nowadays, businesses are highly vulnerable to sudden and noteworthy shifts in performance (Samad et al., 2017). It is an important research topic in business management (Asghar et al., 2020). It dictates how businesses achieve their objectives (Samad, 2018). Manufacturing, store, promotion, and economic objectives can impact a firm's performance positively or negatively (Abeysekara et al., 2019; Halim et al., 2017). Operational efficiency, revenue generation, and customer service help determine a business's prosperity. Firm performance mainly measures the efficiency and effectiveness of business operations (Sardana et al., 2020). Green Human Capital (GHC) is a full stream of knowledge, intangible abilities, and relations associated with environmental responsibility at both the firm and individual levels. The concept of green human capital was originated by Chen, (2008b). Green human capital frequently refers to intangible resources that are more vital than tangible ones (Shoaib et al., 2021). It can enhance environmentally friendly technologies and sustainable performance (Khan et al., 2024). Furthermore, green human capital also boosts financial performance, economic growth, and sustainable development (Agyabeng-Mensah & Tang, 2021; Onubi et al., 2024). Additionally, green supply chain management (GSCM) reduces the ecological impact of business operations. It also reduced waste and improved firm performance (Awan et al., 2017; Khan et al., 2021). Green supply chain management is critical for most businesses, especially in Asia (Novitasari & Agustia, 2021). An investigation in Ghana's manufacturing sectors utilized NRBVT and verified the significant impact of green supply chain management on firm performance (Asamoah et al., 2024). Manufacturers should implement green supply chain management features to satisfy customers for sustainability (Liu et al., 2020). Moreover, scholars are increasingly switching their focus from the general discussion to green innovation (GI) (Chakraborty & Biswas, 2020; Song & Yu, 2018; Takalo & Tooranloo, 2021). Green innovation can attain a "win-win" situation in safeguarding the environment and increasing revenue (Akhtar et al., 2024; Awan et al., 2019; Ha et al., 2024; Shahzad et al., 2020) while minimizing resource utilization (Guo et al., 2021). Green Innovation helps to mitigate adverse environmental impact and enhance firm performance (Hafeez et al., 2024; Liu, 2024; Maldonado-Guzmán et al., 2023; Tang et al., 2018) in order to increase productivity, market share, and public trust (Huang & Li, 2017; Song & Yu, 2018), improve existing products and technologies to attain sustainable development (Hafeez et al., 2024; Hart & Dowell, 2011; Rehman et al., 2021; Shu et al., 2016). The manufacturing sector must embrace green innovation to preserve the environment (Fernando & Wah, 2017). Prior studies also used green innovation as a mediator (Asad et al., 2024; Bonsu et al., 2024; Hafeez et al., 2024). The importance of organizational green culture (OGC) in the global industrial sector is widely acknowledged in academic literature. The growing focus on performance has made the organizational green culture extremely influential and necessary for firms in the present day (Imran & Jingzu, 2022; Roscoe et al., 2019; Sun et al., 2024; Wang, 2019). Organizational green culture influences the behaviors of team members regarding environmental protection (Chen et al., 2012; Gürlek & Tuna, 2018). Thus, organizational green culture increases environmental sensitivity in businesses and encourages them to generate green products by integrating green value into operations (Banerjee et al., 2003; Leonidou et al., 2015). Organizational green culture is significantly associated with firm performance (Imran & Jingzu, 2022) and green innovation (Gürlek & Tuna, 2018). Recent studies have used different variables to moderate green innovation and firm performance. Prior research by Xue et al. (2019) used managerial environmental concern and absorptive capacity as moderators. Another study by Nureen et al. (2023a) explored managerial environmental knowledge as a moderator. Recently, organizational green culture was used as a moderator between artificial intelligence and green product innovation (Lin, 2024).

Prior studies found inconclusive results of firm performance with green human capital (Agyabeng-Mensah & Tang, 2021; Khan et al., 2024; Muafi et al., 2021; Nureen et al., 2023a; Tjahjadi et al., 2023) and green supply chain management (Asamoah et al., 2024; Choi & Hwang, 2015; Nureen et al., 2023b; Tarigan et al., 2021). Additionally, green innovation has no definitive association with firm performance (Huang & Li, 2017; Maldonado-Guzmán et al., 2023; Tang et al., 2018), which requires additional investigation. So, these relationships need to be clarified and it is imperative to undertake additional investigations into these mechanisms. In order to understand the relationships among green human capital, green supply chain management and firm performance, it is necessary to incorporate additional elements as a mediator. Green innovation is regarded as a mediator in this investigation. The study uses organizational green culture as a moderator between green innovation and firm performance because the literature is almost silent. Hart, (1995) introduced "the natural resource-based view theory" (NRBVT), which stated that the "internally focused" approach is not enough for competition due to ecological concerns. Adopting environmentally focused initiatives (green aspects) helps businesses enhance their environmental performance and stay ahead of competitors (Hart, 1995). From NRBVT's perspective, a firm's performance and competitive advantage may be enhanced by managing challenges associated

with the natural environment (Hart & Dowell, 2011). A firm's performance is also associated with its corporate competencies, environmental resources, and pollution control techniques (Barney, 2000). In conclusion, it is indisputable that firms require essential green resources to attain a competitive edge and improve firm performance. The variables being studied, such as green human capital, green supply chain management, green innovation, and organizational green culture, possess the capacity to lessen pollution and safeguard the natural environment. This study makes an ample contribution to the academic and research communities by advancing the theoretical development of the NRBVT.

So, the current study investigates the impact of green human capital, supply chain management, and innovation on firm performance. Furthermore, green innovation mediates green human capital, green supply chain management, and firm performance, whereas organizational green culture moderates the relationship between green innovation and firm performance. For this, Pakistan's textile industry is selected as it is an important manufacturing sector of Pakistan. It is ninth in textile exports, fifth in production, and third in Asian cotton consumption. It is time to focus on the textile industry in terms of green aspects to meet international standards. The Pakistani government has pledged to protect the environment and achieve carbon neutrality. According to certain studies (Adenle et al., 2015; Sharma et al., 2022), environmental hazards are more prevalent in developing nations. Consequently, firms in these countries need help in utilizing their resources. This study enhances our understanding by examining how Pakistani manufacturing firms leverage their critical resources (i.e., green human capital, supply chain management, innovation, and organizational green culture) to achieve firm performance. This research is crucial as it addresses numerous knowledge gaps. First**,** it examines the direct impact of green human capital, supply chain management, and innovation on firm performance. Second**,** it investigates green innovation as a mediator in the connections between green human capital, green supply chain management, and firm performance. The results contribute to the expanding literature on green innovation in non-Western contexts, as this research is conducted in Pakistan. Third**:** To the author's knowledge, no prior empirical investigation has examined the moderating influence of organizational green culture between green innovation and firm performance association. Therefore, utilizing organizational green culture as a moderator in Pakistan's textile industry is unprecedented. Furthermore, this scholarly article uses the natural resource-based view theory (NRBVT) to analyze the proposed relationships. Moreover, it contributes to the attainment of the UN sustainable development goals (SDGs 9, 12, and 13), which include "industry, innovations, and infrastructure," "responsible consumption and production," and "climate action." Section 1 comprises the introduction to the investigation. Section 2 thoroughly evaluates the literature and establishes a solid theoretical foundation for the investigation. Section 3 highlights the methodology. The findings and discussions of the study are the subject of Section 4. Lastly, conclusions and implications are topics of Section 5. It also addresses the study's limitations and provides recommendations.

II. Literature Review and Development of Hypotheses

Firm performance (FP)

A prior study by Szilagyi, (1981) posits that firm performance comprises efficiency and effectiveness, which are the direct outcomes of a business or an organization's internal activities. Factors such as manufacturing, promotion, store, and financial objectives can positively or negatively impact a firm's performance (Abeysekara et al., 2019). Several scholars have examined different performance indicators to evaluate the performance of companies (Nomran & Haron, 2020). A study by Venkatraman and Ramanujam, (1987) assessed three categories of performance (organizational effectiveness, operational performance, and financial performance). Kaplan and Norton, (1996) developed the balanced scorecard method to measure conventional business performance. The firm's performance can be measured by either financial or non-financial measurements (Govindarajan & Gupta, 1992; Ittner & Larcker, 1998).

Green Human Capital (GHC)

Green human capital is "the sum of employees' pollution prevention or green innovation-related information, competence, expertise, intelligence, inventiveness, and dedications, and is entrenched in people, not firms" (Chen, 2008a). Zhao and Huang, (2022) asserted that green human capital aids organizations in complying with rigorous international environmental regulations, enhances organizational value, and meets customers' demanding ecological requirements. Furthermore, organizations must possess ecological information to identify the appropriate opportunities to change their processes and products to achieve environmental and firm performance (Chen, 2008a). Furthermore, Green human capital promotes sustainable economic development and improves financial performance (Agyabeng-Mensah & Tang, 2021). A firm's commitment to eco-friendly practices helps employees enhance their knowledge and skills (Tjahjadi et al., 2023).

Green Supply Chain Management (GSCM)

Green supply chain management was introduced in the 1990s, but its significance became apparent in 2000, as documented in a scientific publication (Samad et al., 2021). Bag et al. (2021) suggested that the "environmental stewardship movement" of the 1960s can be credited with developing this concept. It assumed a conventional form as a novel intellectual endeavor in the 1990s. The notion of sustainable supply chain management has evolved further over time (Dubey et al., 2017). It integrates ecological considerations with inter-organizational sustainable supply chain management techniques, such as logistical operations (Bu et al., 2020). As the concept of green supply chain management is so broad, providing a standardized explanation for green supply chain management is challenging (Schmidt et al., 2017). Several prevalent terms used are "sustainable supply network management," "green purchasing and procurement," "supply chain environmental management," and "green logistics and environmental logistics" (Tarigan et al., 2021).

Green Innovation (GI)

Green innovation is innovations in manufacturing processes and products that aim to achieve ecological goals by reducing the product's ecological footprint (Lin et al., 2014). Green innovation is an innovative strategy that helps organizations reduce pollution, generate greener products and energy saving, recycle and reuse, and manage the environment (Shahzad et al., 2020). Sadly, the prevailing circumstance in underdeveloped nations is a state of disgrace. The manufacturing sector must embrace green innovation to preserve the environment and ensure sustainability (Fernando & Wah, 2017). The innovation-oriented approach enables businesses to reduce pollution and safeguard the environment (Ifrim et al., 2018; Küçükoğlu & Pınar, 2016).

Organizational Green Culture (OGC)

Organizational culture is a shared system of ideas, beliefs, and values produced by management to change the organization's behavior and attitudes to achieve common company goals (Gürlek & Tuna, 2018). Organizational green culture is an essential and foundational principle of the organization aimed at safeguarding the environment (Wang, 2019). Organizational green culture enhances an organization's environmental awareness and promotes the development of environmentally friendly products by incorporating green values into their operations (Banerjee et al., 2003; Leonidou et al., 2015). It can be a valuable tool for helping companies achieve their environmentally proactive goals and improve their overall performance (Pham et al., 2018).

Natural Resource-Based View Theory (NRBVT)

"The resource-based view" (RBV) states that essential resources of firms help to gain competitive advantage (Barney, 1991). Hart, (1995) has recently introduced the "Natural Resource-Based View Theory" (NRBVT), which is an expansion of the RBV. This view posits that an "internally focused" approach is insufficient for competition due to ecological concerns. Hart, (1995) stated that organizations can gain a competitive advantage through proactive environmental practices. According to NRBVT, organizations can improve their performance and competitive advantage by effectively managing challenges related to the natural environment (Hart & Dowell, 2011). Hart, (1995) identifies several issues with the RBV theory. For example, it breaks the links between the natural environment of a business and the business itself. Capabilities of firms, pollution management, and resources related to the environment are critical for the success of a business (Barney, 2000). Pollution prevention, product stewardship, and clean technology are three approaches to sustainability (Hart, 1995) that lead to enhanced performance. In other words, implementing environmentally friendly practices can improve a firm's environmental strategy. Recent studies have demonstrated that green practices can effectively safeguard the natural environment (Agyabeng-Mensah & Tang, 2021; Gürlek & Tuna, 2018; Jabeen et al., 2023; Jabeen et al., 2024; Khan et al., 2021; Maldonado-Guzmán et al., 2023). By the logic of NRBVT, we believe that the investigated variables have the potential to assist organizations in enhancing their management of the natural environment; leveraging these helps to gain a competitive edge, which leads to enhanced performance.

Hypotheses Development

Human capital is crucial for supporting the execution of a strategy (Kaplan & Norton, 2004b; Talapatra et al., 2022). Human resources are significant in the organization's environmental management initiatives and ecological objectives (Munawar et al., 2022). Organizations that adopt environmentally conscious business strategies must prioritize their human capital's "green" component (Bag & Gupta, 2020). Green human capital significantly impacts environmental performance and provides a competitive advantage to an organization (Chen, 2008b). The human capital assist to implement green strategies to enhance firm performance is underscored by the demand for sustainability (Kaplan & Norton, 2004a). A study by (Khan et al., 2024) examined how green knowledge

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management affected green technology innovation and sustainable performance with mediation of green intellectual capital dimensions. The study utilized NRBVT and found that green technology innovation, green knowledge management, and sustainable performance are all mediated by green human capital. Another study on construction workers found that green human capital greatly influences environmentally friendly building practices. Also, a green work environment mediates the two (Onubi et al., 2024). According to Tjahjadi et al. (2023), implementing green human capital positively influences firm performance in Indonesia. Agyabeng-Mensah and Tang, (2021) found that green human capital impacts firm financial performance. However, prior research also showed some contradictory associations. As Nureen et al. (2023a) explored, firm performance is unaffected by green human capital. Consequently, the subsequent hypothesis is posited:

H1: Green human capital has a positive impact on firm performance.

Green supply chain management can improve firm performance by facilitating the implementation of practices related to managing the environment (Chu et al., 2017) and enhancing financial performance and competitiveness over time (Shafique et al., 2017). Firms must apply the various aspects of Green supply chain management to get better results (Singh et al., 2020). Tjahjadi et al. (2023) confirmed that green supply chain management impacts firm performance in the manufacturing industry. An investigation into the industrial sector in Ghana was recently carried out. Using PLS-SEM, researchers looked through data from 368 manufacturing companies. The findings validated the capacity of GSCM to improve firm performance. Additionally, green absorptive capacity positively mediates the pathways from customer collaboration and green purchasing to firm performance (Asamoah et al., 2024). Agbandzo et al. (2024) conducted a study on the cement industry. A total of 220 responses were collected from both professional and non-professional backgrounds. Outsourcing and logistical capabilities enhance both financial and non-financial performance, as indicated by PLS results. Another study was carried out in Iran to investigate how marketing capabilities and business performance are affected by several characteristics of competitive intelligence. A survey of 225 insurance company employees found that competitive intelligence significantly affects company performance and marketing capability (Tahmasebifard et al., 2018). Seman et al. (2019) confirmed that green supply chain management significantly enhances environmental performance and green innovation. However, some scholars found contradicting associations. A recent research by (Nureen et al., 2023b) found that green supply chain management does not significantly impact firm performance. We thus formulated the following hypothesis:

H2: Green supply chain management has a positive impact on firm performance.

Businesses engage in green activities when they perceive potential financial benefits, operational enhancements, and increased competitiveness (El-Kassar & Singh, 2019). Green product innovation involves creating a new product or service with less environmental impact than an existing or competing one (Paul et al., 2014). Green process innovation enhances manufacturing techniques and green technologies to produce goods and services with minimal environmental impact (Tang et al., 2018). The success of an organization is linked to implementing green processes and product innovation, which help to mitigate adverse environmental impacts by firms (Fernando & Wah, 2017). Green innovation aims to reduce energy utilization and pollution and promote waste recycling. Additionally, it encompasses designing environmentally friendly products (Zhang & Zhu, 2019). The increasing demand for eco-friendly products is a significant impetus for the company to implement innovative green strategies (Gupta & Barua, 2018). Bonsu et al. (2024) studied emerging markets in Africa. The results of 301 responses revealed that green innovation and corporate social responsibility can enhance environmental performance. Businesses comprehend market demand's strategic and operational consequences to improve performance (Chan et al., 2012; Lin et al., 2013). El-Kassar and Singh, (2019) revealed that green innovative firms have a more robust performance. Green innovation significantly improves performance and sustainability (Huang & Huang, 2024; Jabeen et al., 2024; Maldonado-Guzmán et al., 2023; Xue et al., 2019). Contrary to previous studies, various scholars argue that green innovation negatively affects firm performance. A relationship was discovered between developing environmentally friendly products and poor financial performance (Driessen et al., 2013). According to Seman et al. (2019), GI has the potential to reduce financial performance and raise organizational expenditures compared to its counterparts (Aguilera-Caracuel & Ortiz-de-Mandojana, 2013; Kraus et al., 2020). Additionally, green innovation leads to an increase in production costs (Ge et al., 2018). Consequently, the subsequent hypothesis is posited:

H3: Green innovation has a positive impact on firm performance.

Recent studies confirmed a positive association between green human capital, green supply chain management, green innovation, and firm performance (Maldonado-Guzmán et al., 2023; Tjahjadi et al., 2023). Additionally, a positive link exists between green innovation and green human capital and supply chain management (Ni et al., 2023; Seman et al., 2019; Song et al., 2021). The literature showed that green human capital and supply chain

management enhance firm performance (Choi & Hwang, 2015; Muafi et al., 2021). However, Nureen et al. (2023a) confirmed that green human capital exhibits a contradictory association with firm performance. In the same way, Nureen et al. (2023b) revealed that green supply chain management exhibits a contradictory association with firm performance. Hence, the connection between green human capital, green supply chain management, and firm performance remains unclear, and additional investigation is required by incorporating a mediator. For this, we employed green innovation as a mediator. Numerous scholars have employed green innovation as a mediator. A recent study investigated the impact of organizational green culture and ambidexterity on corporate sustainability, with green innovation as a mediating factor. Data were gathered from registered textile enterprises, and 307 replies were processed using Smart-PLS 4.0. The results validated the mediation of green innovation among the proposed connections (Hafeez et al., 2024). In another study, green innovation mediates between environmental performance and corporate social responsibility (Bonsu et al., 2024). Seman et al. (2019) confirmed that green supply chain management and environmental performance are mediated by green innovation. Zameer et al. (2022) discovered that green competitive advantage and environmental orientation are mediated by green innovation. Jnaneswar, (2024) showed that green innovation mediates the links between human resource management on environmental performance. Consequently, the subsequent hypotheses are posited:

H4a: Green innovation mediates between green human capital and firm performance.
H4b: Green innovation mediates between green supply chain management and firm performance.

Earlier studies confirmed a direct association between green innovation and organizational green culture and between organizational green culture and firm performance (Imran & Jingzu, 2022). Still, adding moderators to the model can strengthen green innovation and firm performance relationships. Recent studies used different variables as moderators between these links. According to a prior study, managerial concerns moderated between green innovation and firm performance (Tang et al., 2018). Nureen et al. (2023a) confirmed that the link between green innovation and firm performance is strengthened by managerial environmental knowledge. Lin, (2024) examined how organizational culture moderates between green innovation and artificial intelligence green. Agriculture enterprises in China were the subjects of the investigation. The PLS-SEM statistical results validated the significant influence of AI on green innovation aspects. It was also found that organizational green culture moderates between green product innovation and artificial intelligence. Ghrairi, (2022) collected a sample of 400 respondents via an online questionnaire. Findings demonstrated that organizational green culture has a strong moderating influence on ERP and firm performance. There is a need to examine another moderator between these connections. For this, the present study uses a moderator, namely organizational green culture. Organizational green culture was also used as a moderator in recent studies (Kwarteng et al., 2022; Qu et al., 2022; Wang et al., 2022). Organizational green culture emphasizes "eco-environmental values" and can provide valuable insights to a company in implementing environmentally friendly improvements in its operations (Banerjee et al., 2003; Leonidou et al., 2015; Roscoe et al., 2019). Organizational green culture impacts the firm and its employees, which is critical for green innovation (Gürlek & Tuna, 2018). Consequently, the subsequent hypothesis is posited:

H5: Organizational green culture positively and significantly moderates between the green innovation and firm performance.
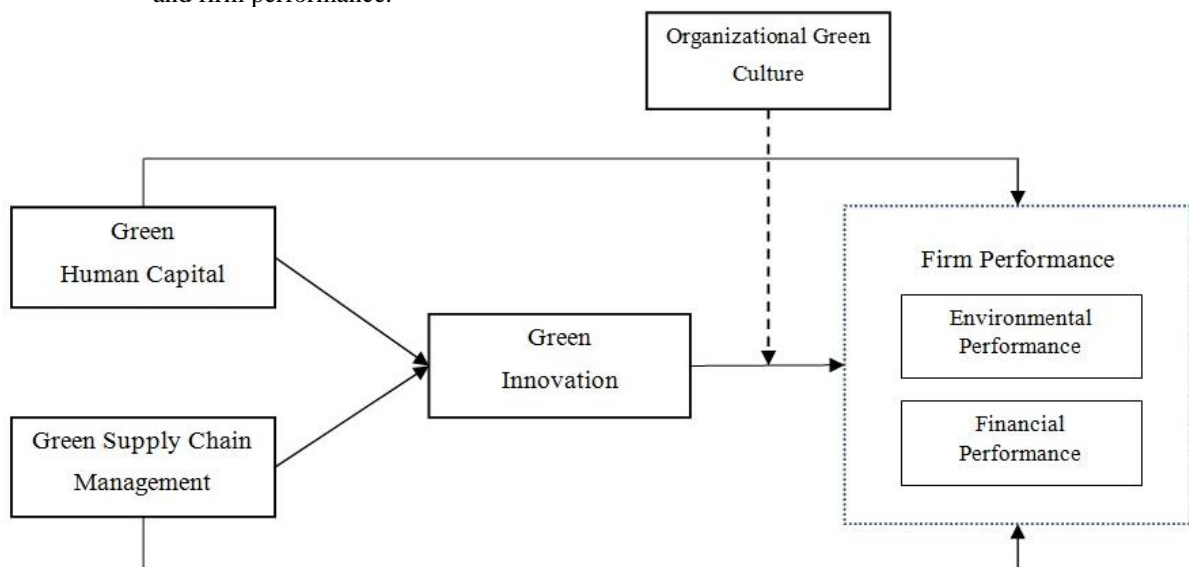

Figure 1: Theoretical Research Framework (Developed by authors)
Note(s): Black lines are direct relations; black dotted line is moderation effect.

III. Methodology

Population and Sampling

The research was conducted in the textile industry. The province of Punjab is home to seventy percent (70%) of Pakistan's textile industry, with Faisalabad serving as its hub. The textile industry's managers are targeted for data collection because they participate in decision-making and execute strategies (Ooi, 2014; Shahzad et al., 2020). The data collection period was between October 2023 and April 2024.

The researchers utilized a cross-sectional design for this study. First, we contacted (via email) the management of the textile industry before sending them a structured questionnaire. An online questionnaire was sent to those managers who agreed to participate in this study. Unfortunately, we did not receive much response. So, we visited the offices to distribute questionnaires and collect survey data and contacted them via WhatsApp, LinkedIn, and other social media platforms. The textile industry management was informed of the study's objectives before distributing the questionnaire. A cover letter was attached to the questionnaire detailing the study's objectives and instructions for its completion. We utilize the convenience sampling method to collect data, as a recent study by Zhang et al. (2024) utilized this method to collect data from Pakistan's textile industry. The data were collected in Multan, Faisalabad, and Lahore, home to Punjab's primary textile industry.

A sample size of 30 to 500 is generally appropriate for research studies (Roscoe, 1975; Sekaran & Bougie, 2016). Moreover, Azeem et al. (2021) studied the textile sector using a sample size of 294 in Pakistan. Zhang et al. (2024) collected 322 responses to study Pakistan's textile sector. Industrial managers were given five hundred seventy (570) structured questionnaires (via online and offline modes). Multiple visits were conducted at their workplace. Additionally, follow-up messages (via email and other social media platforms) were made to ensure a high response percentage. After removing incomplete ones, 306 replies were included in the statistical analysis. Variance-based software, Smart-PLS 3 version 3.2.9, was used for data analysis.

Measurement of scales

Green human capital is measured using the four-item scale adopted from prior studies (Chang, 2016; Chen, 2008b). Green supply chain management is measured using a ten-item scale and adopted from prior research (Tjahjadi et al., 2023). According to Zhu et al. (2013), green supply chain management has two dimensions: internal chains ("internal environmental management and eco-design") and external chains ("customer cooperation with environmental concerns, green purchasing, and investment recovery"). Green innovation is measured using the four-item scale and adopted from a prior study (Chang, 2011). Organizational green culture is comprised of six items and was adopted by a prior study by Wang, (2019), which used scales from prior research (Banerjee, 2002; Fraj et al., 2011). Firm performance is a higher-order construct comprising two distinct dimensions: environmental and financial performance. A three-item scale of environmental performance is adopted from a study by (Xue et al., 2019), and a four-item scale of financial performance scale is adopted from a study by (Ha & Nguyen, 2020). The self-reported approach is utilized to assess firm performance. The managers were requested to rate their firm performance based on environmental and financial performance. All constructs (lower-order and higher-order constructs) in this study are reflective. This research used a 5-point Likert scale: "1 = strongly disagree and 5 = strongly agree."

Common method bias (CMB)

The present investigation used questionnaires to obtain data from a single source. A common method bias (CMB) could thus be present. CMB problem is associated with self-report survey data (Podsakoff & Organ, 1986). It can potentially inflate the relationship between measured variables (Conway & Lance, 2010). This bias was reduced by incentivizing participants to provide candid responses and allowing them to maintain their anonymity. Additionally, they offered voluntary participation and guaranteed that their information would be utilized exclusively for scientific research.

Harman's single-factor test is used using statistical methods, and the outcome shows that a single factor comprises 35.711% (<50%) of the overall variance. Therefore, the CMB issue is not present in the data. Next, we performed a comprehensive collinearity test to calculate the variance inflation factors (VIF), which is highly compatible with the PLS-SEM suggested by (Kock, 2015). Our analysis revealed VIF values ranging from 1.204 to 2.308(<3.3), supporting the conclusion that CMB does not pose a significant risk to our research.
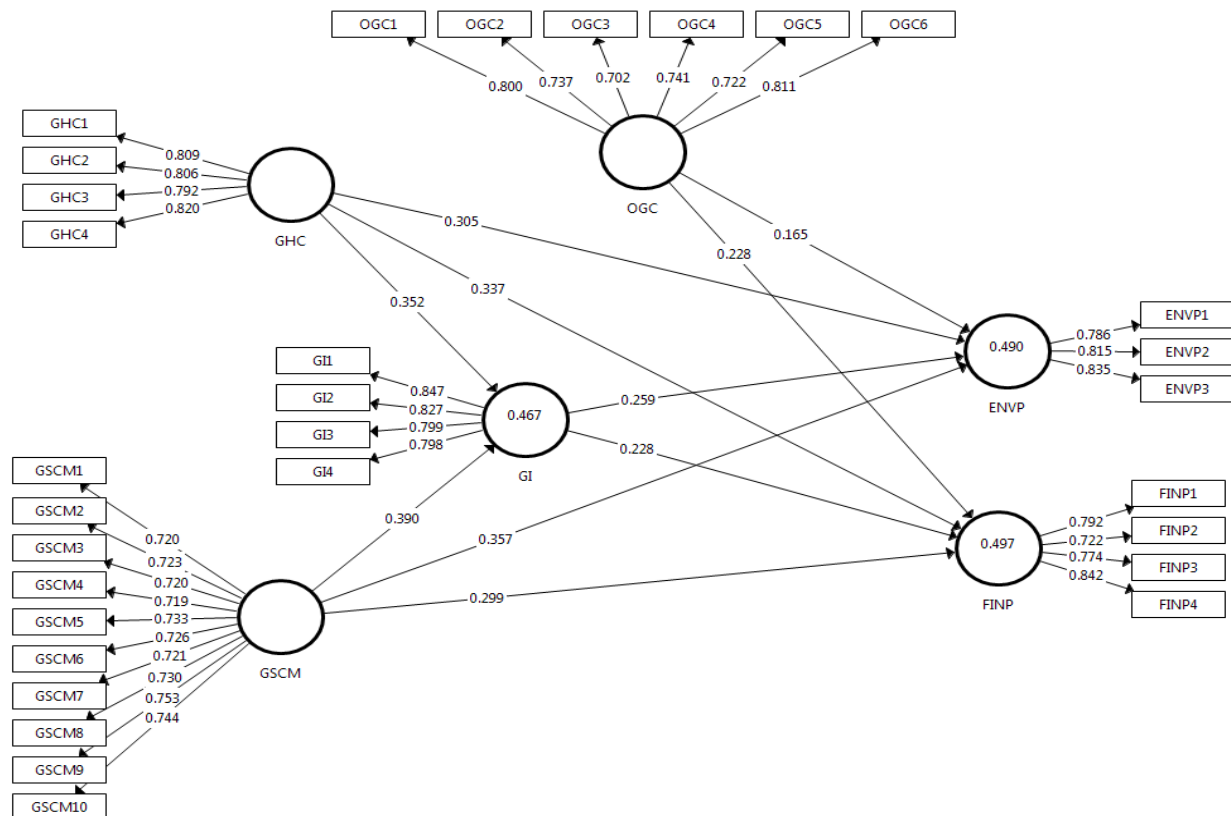
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Demographic information of respondents

The respondents' demographic information is given in this section (Table 1). The first demographic question is about the gender of the respondents. The study comprised 281 male participants (91.8%) and 25 female participants (8.2%). In the second demographic question, the age of the respondents is discussed. Out of 306 respondents, 106 (34.6%) belong to the 25-34 years age group, 179 (58.5%) belong to the 35-44 years age group, and 21 (6.9%) belong to age 45 years or above. The third question concerns qualification; most respondents (38.2%) have bachelor's degrees. The next question is related to placement city. One hundred thirty-two respondents (43.1%) belong to Faisalabad, 98 respondents (32.0%) to Multan, and 76 respondents (24.8%) belong to Lahore. One hundred ninety-four respondents (63.4%) belong to small-size firms, and 112 (36.6%) belong to medium size firms. The last demographic question is related to the business type of the textile industry. The data were collected from different textile business types. There were 92 (301%) Garments stitching, 68 (22.2%) Weaving, 56 (18.3%) Dyeing finishing, 51 (16.7%) Ginning, and 39 (12.7%) Spinning types participated in this study. Table 1 presents a thorough explanation.

Table 1: Demography of respondents

Features	Options	Frequencies	Percentage
Gender	Male	281	91.8
	Female	25	8.2
Age (Years)	25–34	106	34.6
	35–44	179	58.5
	45 and above	21	6.9
Qualification	Intermediate	32	10.5
	Bachelor	117	38.2
	Masters	83	27.1
	MPhil/MS	56	18.3
	PhD	18	5.9
City	Multan	98	32
	Faisalabad	132	43.1
	Lahore	76	24.8
Firm size	Small	194	63.4
	Medium	112	36.6
Business type	Ginning	51	16.7
	Spinning	39	12.7
	Weaving	68	22.2
	Dyeing and finishing	56	18.3
	Garments stitching	92	30.1

Source: Author's compilation

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Figure 2: Measurement model
Source: Author's compilation

IV. Data Analysis

Measurement model assessment

We employed Smart-PLS 3 version 3.2.9 (variance-based software) to examine the proposed research model, as (Ringle et al., 2015) indicated. The PLS-SEM analysis commences with evaluating the measurement model (Figure 2, Tables 2-4) to confirm that only reliable and valid constructs are employed in the structural path model (Figure 3, Table 5). This approach is practical for a model that includes high-order constructs and involves a complex model (Hair et al., 2017). We employed prior studies' most up-to-date reporting guidelines (Hair et al., 2017; Ringle et al., 2020). The PLS-SEM analysis commences by evaluating the measurement model to ensure that only dependable and valid constructs are employed in the structural path model. An evaluation was conducted to determine the reliability and validity of the constructs' indicators. In this study, only firm performance is a higher-order construct, and all other constructs are lower-order. The measurement model assessment results are presented in Table 2-4, Figure 2. The outer loadings (Figure 2, Table 2) of environmental performance range from 0.786 to 0.835, financial performance ranges from 0.722 to 0.842, firm performance (higher-order construct) ranges from 0.906 to 0.907, green human capital ranges from 0.792 to 0.820, green supply chain management ranges from 0.719 to 0.753, green innovation ranges from 0.798 to 0.847, and organizational green culture ranges from 0.702 to 0.811. The results showed that all constructs have suitable factor loadings. The variance inflation factor (VIF) values of environmental performance range from 1.442 to 1.547, financial performance ranges from 1.399 to 2.008, firm performance (higher-order construct) 1.709, green human capital ranges from 1.575 to 1.850, green supply chain management ranges from 1.774 to 2.083, green innovation ranges from 1.689 to 1.973and organizational green culture ranges from 1.496 to 2.099. The results showed that all constructs have adequate VIF values, as Hair et al. (2017) stated. Therefore, our structural model is devoid of collinearity. The composite reliability (CR) (Table 2) of environmental performance (0.853), financial performance (0.864), firm performance (0.902), green human capital (0.882), green supply chain management (0.919), green innovation (0.890), and organizational green culture (0.887) are acceptable. The variance inflation factor (AVE) values (Table 2) of environmental performance (0.660), financial performance (0.614), firm performance (0.822), green human capital (0.651), green supply chain management (0.531), green innovation (0.669), and organizational green culture (0.567) are satisfactory.

Table 2: Reliability and Validity

Construct	Items	Loadings	VIF	CR	AVE
Environmental Performance	ENVP1	0.786	1.458	0.853	0.660
	ENVP2	0.815	1.442		
	ENVP3	0.835	1.547		
Financial Performance	FINP1	0.792	1.813	0.864	0.614
	FINP2	0.722	1.399		
	FINP3	0.774	1.530		
	FINP4	0.842	2.008		
Firm Performance	ENVP	0.906	1.709	0.902	0.822
	FINP	0.907	1.709		
Green human capital	GHC1	0.809	1.724	0.882	0.651
	GHC2	0.806	1.747		
	GHC3	0.792	1.575		
	GHC4	0.820	1.850		
Green supply chain management	GSCM1	0.720	1.784	0.919	0.531
	GSCM2	0.723	1.795		
	GSCM3	0.720	1.801		
	GSCM4	0.719	1.819		
	GSCM5	0.733	1.805		
	GSCM6	0.726	1.774		
	GSCM7	0.721	1.843		
	GSCM8	0.730	1.839		
	GSCM9	0.753	2.083		
	GSCM10	0.744	1.970		
Green innovation	GI1	0.847	1.973	0.890	0.669
	GI2	0.827	1.892		
	GI3	0.799	1.740		
	GI4	0.798	1.689		
Organizational green culture	OGC1	0.800	1.788	0.887	0.567
	OGC2	0.737	1.496		
	OGC3	0.702	1.506		
	OGC4	0.741	1.773		
	OGC5	0.722	1.648		
	OGC6	0.811	2.099		

Source: Author's compilation
Note(s): VIF = variance inflation factor, CR = composite reliability, AVE = average variance extracted.

Table 3 display the results of descriptive statistics, correlation analysis, square roots of the AVE values and Heterotrait-Monotrait ratios (HTMT). The mean values of ENVP, FINP, GHC, GSCM, GI, and OGC are 3.854, 3.799, 3.979, 4.031, 3.972, and 4.045 respectively. The vast majority of responders agree based on all of the mean values. The correlation between the variables might take on values between -1 and +1, as seen in Table 3. The relationship's direction and strength are explained. A direct relation (positive), an inverse relation (negative), and no relation (when both variables are zero means no relationship). The correlation values among study constructs are positive. For Discriminant validity, the study also examined HTMT among constructs. The results of HTMT are presented in Table 3. The HTMT values range from 0.234 to 0.804. The findings revealed that all HTMT values are in an acceptable range. The study confirmed the discriminant validity.

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Table 3: Descriptive statistics, correlations and HTMT (discriminant validity)

Construct	Mean	SD	ENVP	FINP	GHC	GSCM	GI	OGC
ENVP	3.854	0.816	0.812	*0.837*	*0.768*	*0.733*	*0.739*	*0.406*
FINP	3.799	0.831	0.644	0.784	*0.759*	*0.688*	*0.697*	*0.461*
GHC	3.979	0.805	0.601	0.611	0.807	*0.804*	*0.749*	*0.350*
GSCM	4.031	0.674	0.603	0.580	0.693	0.729	*0.730*	*0.234*
GI	3.972	0.799	0.587	0.566	0.623	0.634	0.818	*0.239*
OGC	4.045	0.766	0.332	0.392	0.295	0.207	0.199	0.753

Source: Author's compilation
Note(s): Underlined values on diagonals are square root of AVE values. Correlations are given below diagonals. Above diagonals are the HTMT ratios (italicized values), SD = standard deviation.
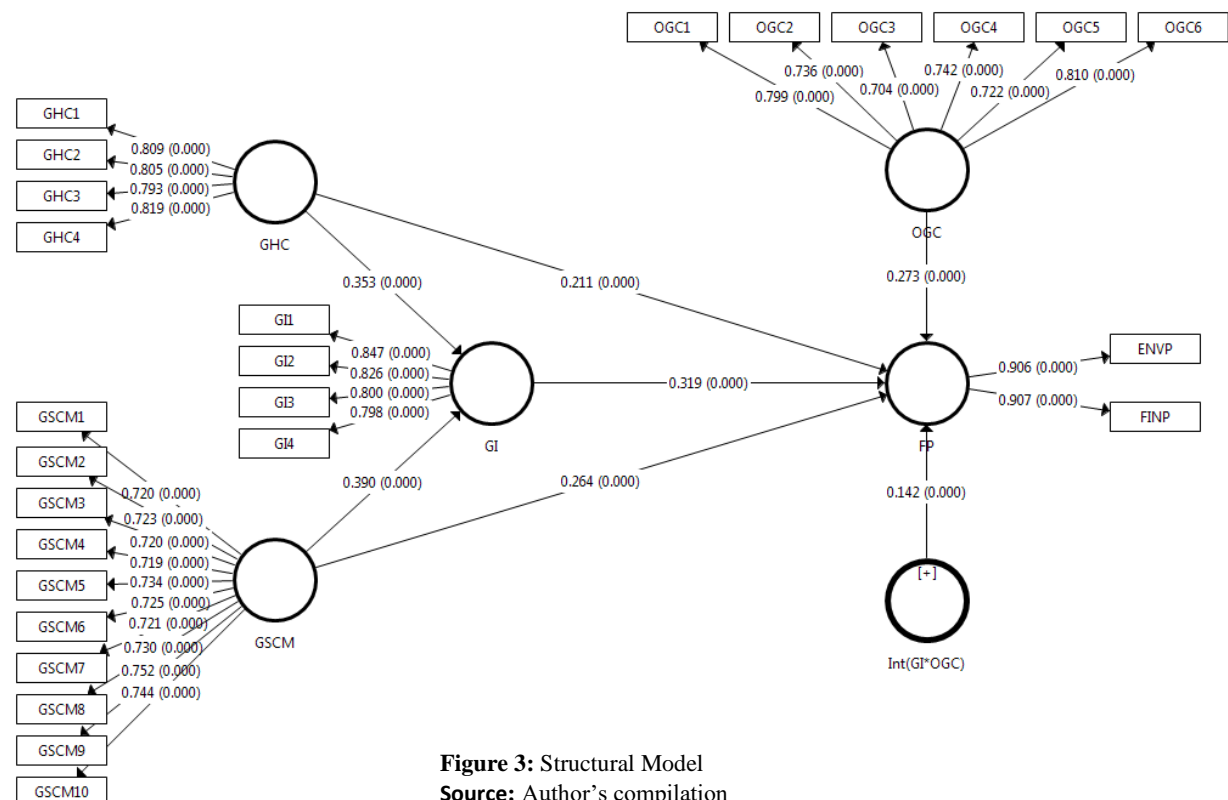
The next step is to evaluate R^2 for "predictive accuracy" and Q^2 for "predictive relevance." Table 4 presents the results of R^2 and Q^2. R^2 statistics explains endogenous variable variance explained by exogenous variable. For green innovation, the R2 value is 0.467, which means that green human capital and supply chain management can explain a 46.7% change in green innovation. Additionally, Green innovation, human capital, and supply chain management explain 49.0% and 49.7% of changes in environmental and financial performance. The R^2 values of 0.467, 0.490, and 0.497 for green innovation, environmental and financial performance validate predictive accuracy. Moreover, Q^2 values obtained by blindfolding approach, higher than zero imply good reconstruction and predictive relevance. The Q^2 values of 0.308, 0.314, and 0.297 for green innovation, environmental, and financial performance indicate model has predictive relevance.

Table 4: Predictive accuracy (R^2) and predictive relevance (Q^2)

Construct	R^2	Q^2
ENVP	0.490	0.314
FINP	0.497	0.297
GI	0.467	0.308

Source: Author's compilation
Note(s): ENVP = environmental performance, FINP = financial performance, GI = Green Innovation.

Figure 3: Structural Model
Source: Author's compilation

Structural model assessment

The findings validate the suitability of the measurement model for conducting structural models (Hair et al., 2017). Ultimately, we utilized the bootstrapping procedure to test hypotheses (Table 5 and Figure 3), employing 10,000 bootstrap samples. H1 predicted that green human capital is positively related to firm performance. The statistical analysis confirms it (β=0.372, t=6.938, p=0.000), confirming hypothesis H1. H2 predicted that green supply chain management is positively related to firm performance. Results support it (β=0.411, t=7.849, p=0.000), supporting hypothesis H2. Green innovation positively relates to firm performance (β=0.349, t=6.547, p=0.000), supporting hypothesis H3.

The study examined the mediating role of green innovation, as hypothesized in H4a and H4b. We employed the method of analysis suggested by Preacher and Hayes, (2008) and Nitzl et al. (2016) to conduct the mediation analysis. Results of the mediation analysis (Table 5) confirm that all direct and indirect relations (H4a and H4b) are significant. The findings confirm hypothesis H4a by demonstrating that green innovation partially mediates the green human capital and firm performance links (β=0.117, t=3.561, p=0.000). Moreover, results confirm hypothesis H4b by discovering that green innovation partially mediates green supply chain management and firm performance links (β=0.142, T=4.509, p=0.000). In addition, we calculated the variance accounted for (VAF) to determine the mediation level, as Nitzl et al. (2016) recommended. The VAF values of 34.79% (H4a) and 32.03% (H4b) confirm partial mediation, as indicated by the criterion proposed by Hair et al. (2017).

Table 5: Results of structural model evaluation

Construct	β value	SD	t-statistics	P-values	BCCI [LL, UL]
Total effects					
GHC -> FP	0.323	0.054	6.004	0.000	[0.216, 0.428]
GSCM -> FP	0.388	0.052	7.413	0.000	[0.282, 0.487]
GI -> FP	0.319	0.057	5.628	0.000	[0.209, 0.431]
Mediation analysis					
GHC -> GI -> FP	0.112	0.033	3.441	0.001	[0.058, 0.187]
GSCM -> GI -> FP	0.125	0.031	4.005	0.000	[0.071, 0.193]
Moderation analysis					
Int (GI*OGC) -> FP	0.142	0.033	4.240	0.000	[0.075, 0.207]
Direct effects					
GHC -> FP	0.211	0.057	3.726	0.000	[0.100, 0.320]
GSCM -> FP	0.264	0.055	4.811	0.000	[0.151, 0.368]
Indirect effect					
GHC -> GI	0.353	0.07	5.069	0.000	[0.213, 0.480]
GSCM -> GI	0.390	0.068	5.752	0.000	[0.209, 0.431]
GI -> FP	0.319	0.057	5.628	0.000	[0.253, 0.521]

Source: Author's compilation
Note(s): GHC = Green Human Capital, GSCM = Green Supply Chain Management, GI = Green Innovation, OGC= Organizational Green Culture, FP = Firm Performance, β value = path coefficients, SD = standard deviation, BCCI = Bias Corrected Confidence Interval, LL = lower limit, UL = upper limit.
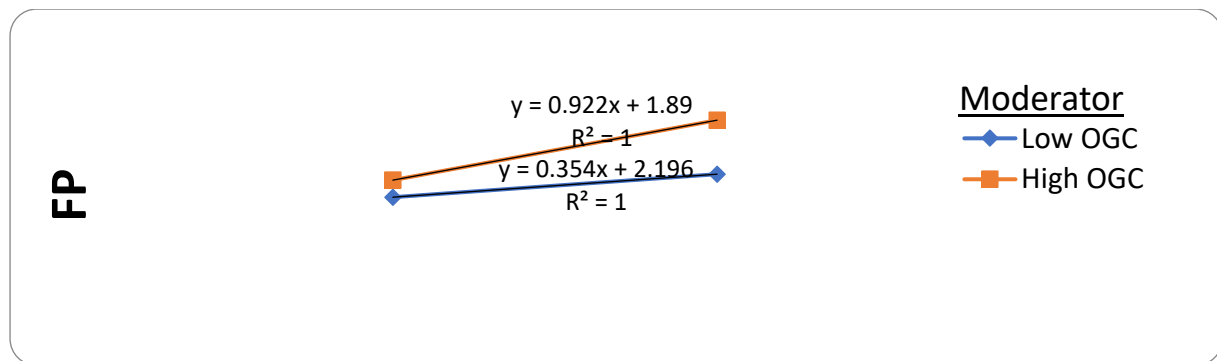
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Figure 4: Slope analysis
Source: Author's compilation

The study also examines the moderating role of organizational green culture between the association of green innovation and firm performance as proposed in hypothesis H5 (Table 5, Figure 3-4). The outcome indicated that the interaction term (Int GI*OGC) between green innovation and firm performance was significant. The findings of moderation analysis confirmed that organizational green culture significantly and positively moderates the association of green innovation and firm performance (β=0.127, t=4.568, p=0.000). This proves H5, showing that organizational green culture moderates' connections between green innovation and firm performance. Using simple slope analysis, we further investigated this relationship's substantial impact. Interactions were plotted at two standard deviations from the mean of organizational green culture: one at +1 and one at -1. We constructed a simple slope to test how intensely green innovation correlates with company performance across high- and low-green culture levels. The conditional direct impact results provided more evidence in favor of H5, showing that the favorable connection was more robust with increasing organizational green culture. Green innovation affects performance more when green culture is high (1 SD above the mean). Low green culture (1 SD below the mean) reduces the effect.

V.   Discussion and Conclusion

It is crucial to consider eco-friendly practices when economies have been compelled to prioritize social and environmental issues due to industrialization and population expansion. Employing the "natural resource-based view theory," the study explored the nexus among green human capital, green supply chain management, green innovation, organizational green culture, and firm performance (a higher-order construct comprising two distinct dimensions: environmental and financial performance). Primary data were collected from managers working within Pakistan's manufacturing industry (Textile industry). Smart-PLS version 3.2.9 statistical tool was used to analyze the responses of 306 individuals. Findings of PLS-SEM confirmed that green human capital, green supply chain management, and green innovation are essential for firm performance (H1, H2 and H3). The findings of H1 are consistent with a recent study (Agyabeng-Mensah & Tang, 2021; Muafi et al., 2021). Onubi et al. (2024) confirmed that green human capital enhances eco-friendly construction practices. A recent study revealed that green technology innovation and sustainable performance in enterprises can also be fostered by green human capital (Khan et al., 2024). The outcome of H2 is consistent with the conclusions drawn in previous research (Choi & Hwang, 2015; Tarigan et al., 2021). A recent study on the manufacturing sector confirmed that green supply chain management practices substantially influence firm performance (Asamoah et al., 2024). For H3, prior studies corroborate the findings (Maldonado-Guzmán et al., 2023). A study on the manufacturing sector confirmed that green innovation can improve environmental performance (Bonsu et al., 2024). Moreover, the connections between green human capital, green supply chain management, and firm performance were confirmed to be mediated by green innovation via mediation analysis (H4a and H4b). The results of H4a align with a prior investigation by Muafi et al. (2021). The outcome of H4b aligns with prior research (Seman et al., 2019). Hafeez et al. (2024) confirmed the mediation of green innovation between the link of corporate sustainability and organizational green culture. Finally, the research revealed that organizational green culture moderates between green innovation and firm performance (H5). Lin, (2024) confirmed that organizational green culture moderates the association between green product innovation and artificial intelligence. Qu et al. (2022) found that organizational green culture positively moderates green innovation and green absorptive capacity links. Pakistani manufacturing firms must prioritize green practices ("e.g., green human capital, green supply chain management, green innovation, and organizational green culture") as these are critical factors for firm performance.

Theoretical Implications

The current study advances theory and offers significant results. This research expands existing knowledge by investigating a framework that includes firm performance as a higher-order construct comprising two distinct dimensions: environmental and financial performance. First, existing literature found a contradictory connection between green human capital and firm performance (Nureen et al., 2023a; Tjahjadi et al., 2023). It also addresses the need for a clearer understanding of the relationship, as highlighted by scholars (Agyabeng-Mensah & Tang, 2021; Muafi et al., 2021; Tjahjadi et al., 2023). We discovered a direct and significant association between green human capital and firm performance per our proposed hypothesis. Therefore, our research offers concrete evidence in favor of the claims made by NRBVT (Hart, 1995) and confirms that green human capital is a valuable asset for organizations, helps to achieve a competitive edge, and improves firm performance (Hart & Dowell, 2011). Second, we explored the contradictory link of green supply chain management with firm performance, as discussed by prior studies (Choi & Hwang, 2015; Nureen et al., 2023b). We aim to provide further clarification on the nature of this relationship, as requested by scholars such as Choi and Hwang, (2015) and Tarigan et al. (2021). Our research indicates a direct and significant link between green supply chain management with firm performance. Our study empirically supports the propositions of NRBVT (Hart, 1995) and confirms that green supply chain management can effectively address ecological issues and improve performance. Third, as Huang and Li, (2017) and Maldonado-Guzmán et al. (2023) discussed, we analyzed the unclear connection of green innovation with firm performance. The results are similar to prior studies by Maldonado-Guzmán et al. (2023) and Tang et al. (2018). Our study verified that green innovation has a favorable and noteworthy influence on firm performance. Green innovation aligns with the principles of NRBVT (Hart, 1995) and can protect the environment while generating higher revenue (Awan et al., 2019; Shahzad et al., 2020).Fourth, we discovered that green innovation mediates green human capital, supply chain management, and firm performance. Analyzing green innovation as a mediator is a fresh theoretical approach in a developing country with limited research (Nureen et al., 2023a). Findings indicate that green innovation is pivotal for Pakistani textile firms. The study contributes to NRBVT literature by taking the perspective of developing countries and demonstrating that green innovation remains an essential performance component. Fifth, this investigation explored the neglected role of organizational green culture as a moderator between green innovation and firm performance. The statistical analysis revealed that a solid green culture within an organization enhances green innovation and firm performance relationship. The study also advances NRBVT theory in academia and research. Finally, by examining Pakistan's textile industry, the study expands existing knowledge. The investigated variables are all crucial to improving firm environmental and financial performance.

Managerial Implications

Our proposed research framework provides industry practitioners and decision-makers with several practical implications regarding greening organizations and leveraging firm performance. The dynamic global business environment compels organizations to adopt a proactive stance regarding ecological surveillance and environmental sustainability to enhance their operational effectiveness. In doing so, managers are advised to proactively implement ecological strategies like green human capital, green supply chain management, and green innovation within their organizations to enhance performance. Organizations must focus on their green talent through hiring, compensation, training, and other procedural systems. Managers must steadfastly resolve to utilize and develop effective information systems to preserve their green human capital. Employees are more committed to attaining environmental goals when their organizations have exceptional ecological programs. By adopting green supply chain management, manufacturing organizations in developing nations may find it easier to increase productivity and quality while maintaining competitiveness. Organizations must consistently try to improve and update their human capital and green supply chain management.

The study suggests that managers focus on green innovation as green innovation promotes sustainable growth and provides organizations with a "first mover advantage" (Soewarno et al., 2019). Organizational green culture is a fundamental organization-building element critical for successfully adopting and implementing green innovation, which increases firm performance. Additionally, the research advises managers that green innovation and organizational green culture are critical factors in enhancing firm performance and should be implemented and energized to their total capacity. Moreover, sustainable development objectives can be attained by utilizing these variables. To maintain the satisfaction of their stakeholders, managers and leaders must devote significant organizational time and resources to enhancing their green human capital, green supply chain management, green innovation, and organizational green culture capabilities. These can enhance the reputation of their business, provide competitive advantage, enhance ecological and financial performance, and help to accomplish UN SDGs. Failure to prioritize these environmentally friendly considerations could adversely affect businesses.

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Limitations and Recommendations

Like previous investigations, this study has specific constraints that subsequent researchers may resolve. The current investigation is being carried out in one particular domestic setting, specifically the textile sector of Punjab province, Pakistan. Our results need more generalizability to different cultural contexts. To examine how the outcomes vary across industries, subsequent researchers may utilize this methodology to collect data from various sectors, including automobiles, fertilizers, chemical and optical products. In the future, scholars may utilize sampling methods other than convenience sampling to collect data. The study was conducted in Pakistan, a nation renowned for its distinct cultural milieu. Subsequently, scholars may investigate this framework in other countries. Future investigations could involve comparative studies. The data was obtained from a few cities in Punjab, including Multan, Faisalabad, and Lahore. This framework can be extended to other cities or provinces by the researcher. Future researchers may enhance the sample size to conduct this framework. Future researchers might analyze this model by utilizing green knowledge management as an independent variable. The study confirmed organizational green culture as a moderator between green innovation and firm performance. However, future researchers may use artificial intelligence or green transformational leadership as moderators. Subsequent researchers might analyze this model with green innovation dimensions (i.e., "product innovation, process innovation and managerial innovation"). Moreover, our study may be subject to specific limitations due to the cross-sectional design. In the future, longitudinal data may be utilized to investigate the interrelationships among the constructs in greater depth.

Competing interest statement

All the authors have no competing conflict of interest

Author(s) Contribution Statement

Fahad Zain contributed to the conception and design of the study. Muhammad Abubakar Tahir wrote the introduction and literature sections. Fahad Zain and Kamran Ali organized the database, performed the statistical analysis and interpretation of the results. Muhammad Abubakar Tahir and Fahad Zain fit the study according to the academic structure. All authors contributed to the manuscript revision, read, and approved the submitted version.

References

Abeysekara, N., Wang, H., & Kuruppuarachchi, D. (2019). Effect of supply-chain resilience on firm performance and competitive advantage: A study of the Sri Lankan apparel industry. *Business Process Management Journal, 25*(7), 1673-1695. https://doi.org/10.1108/BPMJ-09-2018-0241

Adenle, A. A., Azadi, H., & Arbiol, J. (2015). Global assessment of technological innovation for climate change adaptation and mitigation in developing world. *Journal of environmental management, 161*, 261-275. https://doi.org/10.1016/j.jenvman.2015.05.040

Agbandzo, E. D., Novixoxo, J. D., Buah, C., Agbeka, J. K., Asamoah, E., Quayson, M., & Azila-Gbettor, M. E. (2024). Influence of Logistics Capabilities and Outsourcing on Organizational Performance. *8*(1), 19-40. https://doi.org/10.52283/NSWRCA.AJBMR.20240801A02

Aguilera-Caracuel, J., & Ortiz-de-Mandojana, N. (2013). Green innovation and financial performance: An institutional approach. *Organization & Environment, 26*(4), 365-385. https://doi.org/10.1177/1086026613507931

Agyabeng-Mensah, Y., & Tang, L. (2021). The relationship among green human capital, green logistics practices, green competitiveness, social performance and financial performance. *Journal of Manufacturing Technology Management, 32*(7), 1377-1398. https://doi.org/10.1108/JMTM-11-2020-0441

Ainin, S., Naqshbandi, M. M., & Dezdar, S. (2016). Impact of adoption of Green IT practices on organizational performance. *Quality & Quantity, 50*, 1929-1948. https://doi.org/10.1007/s11135-015-0244-7

Akhtar, S., Li, C., Sohu, J. M., Rasool, Y., Hassan, M. I. U., & Bilal, M. (2024). Unlocking green innovation and environmental performance: the mediated moderation of green absorptive capacity and green innovation climate. *Environmental Science and Pollution Research, 31*(3), 4547-4562. https://doi.org/10.1007/s11356-023-31403-w

Asad, M., Aledeinat, M., Majali, T. e., Almajali, D. A., & Shrafat, F. D. (2024). Mediating role of green innovation and moderating role of resource acquision with firm age between green entrepreneurial orientation and performance of entrepreneurial firms. *Cogent Business & Management, 11*(1), 2291850. https://doi.org/10.1080/23311975.2023.2291850

Asamoah, D., Acquah, I. N., Nuertey, D., Agyei-Owusu, B., & Kumi, C. A. (2024). Unpacking the role of green absorptive capacity in the relationship between green supply chain management practices and firm performance. *Benchmarking: An International Journal, 31*(8), 2793-2818. https://doi.org/10.1108/BIJ-09-2022-0564

Asghar, B., Wasim, A., Qazi, U., & Rasool, A. (2020). Financial and non-financial practices driving sustainable firm performance: Evidence from banking sector of developing countries. *Sustainability, 12*(15), 6164. https://doi.org/10.3390/su12156164

Awan, U., Khattak, A., & Kraslawski, A. (2019). Corporate social responsibility (CSR) priorities in the small and medium enterprises (SMEs) of the industrial sector of Sialkot, Pakistan. *Corporate social responsibility in the manufacturing and services sectors*, 267-278. https://doi.org/10.1007/978-3-642-33851-9_15

Awan, U., Kraslawski, A., & Huiskonen, J. (2017). Understanding the relationship between stakeholder pressure and sustainability performance in manufacturing firms in Pakistan. *Procedia Manufacturing, 11*, 768-777. https://doi.org/10.1016/j.promfg.2017.07.178

Azeem, M., Ahmed, M., Haider, S., & Sajjad, M. (2021). Expanding competitive advantage through organizational culture, knowledge sharing and organizational innovation. *Technology in Society, 66*, 101635. doi: https://DOI:10.1016/j.techsoc.2021.101635

Abeysekara, N., Wang, H., & Kuruppuarachchi, D. (2019). Effect of supply-chain resilience on firm performance and competitive advantage: A study of the Sri Lankan apparel industry. *Business Process Management Journal, 25*(7), 1673-1695. doi: https://doi.org/10.1108/BPMJ-09-2018-0241

Adenle, A. A., Azadi, H., & Arbiol, J. (2015). Global assessment of technological innovation for climate change adaptation and mitigation in developing world. *Journal of environmental management, 161*, 261-275.

Agbandzo, E. D., Novixoxo, J. D., Buah, C., Agbeka, J. K., Asamoah, E., Quayson, M., & Azila-Gbettor, M. E. (2024). Influence of Logistics Capabilities and Outsourcing on Organizational Performance. *8*(1), 19-40. doi: https://doi.org/10.52283/NSWRCA.AJBMR.20240801A02

Aguilera-Caracuel, J., & Ortiz-de-Mandojana, N. (2013). Green innovation and financial performance: An institutional approach. *Organization & Environment, 26*(4), 365-385.

Agyabeng-Mensah, Y., & Tang, L. (2021). The relationship among green human capital, green logistics practices, green competitiveness, social performance and financial performance. *Journal of Manufacturing Technology Management, 32*(7), 1377-1398.

Ainin, S., Naqshbandi, M. M., & Dezdar, S. (2016). Impact of adoption of Green IT practices on organizational performance. *Quality & Quantity, 50*, 1929-1948.

Akhtar, S., Li, C., Sohu, J. M., Rasool, Y., Hassan, M. I. U., & Bilal, M. (2024). Unlocking green innovation and environmental performance: the mediated moderation of green absorptive capacity and green innovation climate. *Environmental Science and Pollution Research, 31*(3), 4547-4562.

Asad, M., Aledeinat, M., Majali, T. e., Almajali, D. A., & Shrafat, F. D. (2024). Mediating role of green innovation and moderating role of resource acquisition with firm age between green entrepreneurial orientation and performance of entrepreneurial firms. *Cogent Business & Management, 11*(1), 2291850.

Asamoah, D., Acquah, I. N., Nuertey, D., Agyei-Owusu, B., & Kumi, C. A. (2024). Unpacking the role of green absorptive capacity in the relationship between green supply chain management practices and firm performance. *Benchmarking: An International Journal, 31*(8), 2793-2818.

Asghar, B., Wasim, A., Qazi, U., & Rasool, A. (2020). Financial and non-financial practices driving sustainable firm performance: Evidence from banking sector of developing countries. *Sustainability, 12*(15), 6164.

Awan, U., Khattak, A., & Kraslawski, A. (2019). Corporate social responsibility (CSR) priorities in the small and medium enterprises (SMEs) of the industrial sector of Sialkot, Pakistan. *Corporate social responsibility in the manufacturing and services sectors*, 267-278.

Awan, U., Kraslawski, A., & Huiskonen, J. (2017). Understanding the relationship between stakeholder pressure and sustainability performance in manufacturing firms in Pakistan. *Procedia Manufacturing, 11*, 768-777.

Azeem, M., Ahmed, M., Haider, S., & Sajjad, M. (2021). Expanding competitive advantage through organizational culture, knowledge sharing and organizational innovation. *Technology in Society, 66*, 101635. doi: https://DOI:10.1016/j.techsoc.2021.101635

Bag, S., & Gupta, S. (2020). Examining the effect of green human capital availability in adoption of reverse logistics and remanufacturing operations performance. *International Journal of Manpower, 41*(7), 1097-1117. . https://doi.org/10.1108/IJM-07-2019-0349

Bag, S., Gupta, S., Kumar, S., & Sivarajah, U. (2021). Role of technological dimensions of green supply chain management practices on firm performance. *Journal of Enterprise Information Management, 34*(1), 1-27. https://doi.org/10.1108/JEIM-10-2019-0324

Banerjee, S. B. (2002). Corporate environmentalism: The construct and its measurement. *Journal of business research, 55*(3), 177-191. https://doi.org/10.1016/S0148-2963(00)00135-1

NSWRCA

Banerjee, S. B., Iyer, E. S., & Kashyap, R. K. (2003). Corporate environmentalism: Antecedents and influence of industry type. *Journal of marketing, 67*(2), 106-122. https://doi.org/10.1509/jmkg.67.2.106.18604

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of management, 17*(1), 99-120. https://doi.org/10.1177/014920639101700108

Barney, J. B. (2000). Firm resources and sustained competitive advantage *Economics meets sociology in strategic management,* 203-227. https://doi.org/10.1016/S0742-3322(00)17018-4

Bonsu, M. O.-A., Guo, Y., & Zhu, X. (2024). Does green innovation mediate corporate social responsibility and environmental performance? Empirical evidence from emerging markets. *Journal of Applied Accounting Research, 25*(2), 221-239. https://doi.org/10.1108/JAAR-10-2022-0271

Bu, X., Dang, W. V., Wang, J., & Liu, Q. (2020). Environmental orientation, green supply chain management, and firm performance: empirical evidence from Chinese small and medium-sized enterprises. *International journal of environmental research and public health, 17*(4), 1199. https://doi.org/10.3390/ijerph17041199

Chakraborty, D., & Biswas, W. (2020). Going green with green HRM practices–A strategic initiative for reinvigorating performance optimization in companies. *Prabandhan: Indian Journal of Management, 13*(10-11), 8-26. https://.doi.org/10.17010/pijom/2020/v13i10-11/156006

Chan, R. Y., He, H., Chan, H. K., & Wang, W. Y. (2012). Environmental orientation and corporate performance: The mediation mechanism of green supply chain management and moderating effect of competitive intensity. *Industrial marketing management, 41*(4), 621-630. https://doi.org/10.1016/j.indmarman.2012.04.009

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. https://doi.org/10.1007/s10551-011-0914-x

Chang, C. H. (2016). The determinants of green product innovation performance. *Corporate Social Responsibility and Environmental Management, 23*(2), 65-71.https://doi.org/10.1002/csr.1361

Chen, Y.-S. (2008a). The driver of green innovation and green image–green core competence. *Journal of business ethics, 81*, 531-543. https://doi.org/10.1007/s10551-007-9522-1

Chen, Y.-S. (2008b). The positive effect of green intellectual capital on competitive advantages of firms. *Journal of business ethics, 77*, 271-286. https://doi.org/10.1007/s10551-006-9349-1

Chen, Y. S., Chang, C. H., & Wu, F. S. (2012). Origins of green innovations: the differences between proactive and reactive green innovations. *Management Decision, 50*(3), 368-398. https://doi.org/10.1108/00251741211216197

Choi, D., & Hwang, T. (2015). The impact of green supply chain management practices on firm performance: the role of collaborative capability. *Operations Management Research, 8*, 69-83. https://doi.org/10.1007/s12063-015-0100-x

Chu, S. H., Yang, H., Lee, M., & Park, S. (2017). The impact of institutional pressures on green supply chain management and firm performance: Top management roles and social capital. *Sustainability, 9*(5), 764. https://doi.org/10.3390/su9050764

Conway, J. M., & Lance, C. E. (2010). What reviewers should expect from authors regarding common method bias in organizational research. *Journal of business and psychology, 25*, 325-334. https://doi.org/10.1007/s10869-010-9181-6

Driessen, P. H., Hillebrand, B., Kok, R. A., & Verhallen, T. M. (2013). Green new product development: The pivotal role of product greenness. *IEEE Transactions on Engineering Management, 60*(2), 315-326. http://doi.org/10.1109/TEM.2013.2246792

Dubey, R., Gunasekaran, A., & Papadopoulos, T. (2017). Green supply chain management: theoretical framework and further research directions. *Benchmarking: An International Journal, 24*(1), 184-218. https://doi.org/10.1108/BIJ-01-2016-0011

El-Kassar, A.-N., & Singh, S. K. (2019). Green innovation and organizational performance: The influence of big data and the moderating role of management commitment and HR practices. *Technological forecasting and social change, 144*, 483-498. https://doi.org/10.1016/j.techfore.2017.12.016

Fernando, Y., & Wah, W. X. (2017). The impact of eco-innovation drivers on environmental performance: Empirical results from the green technology sector in Malaysia. *Sustainable Production and Consumption, 12*, 27-43. https://doi.org/10.1016/j.spc.2017.05.002

Fraj, E., Martínez, E., & Matute, J. (2011). Green marketing strategy and the firm's performance: the moderating role of environmental culture. *Journal of Strategic Marketing, 19*(4), 339-355. https://doi.org/10.1080/0965254X.2011.581382

Ge, B., Yang, Y., Jiang, D., Gao, Y., Du, X., & Zhou, T. (2018). An empirical study on green innovation strategy and sustainable competitive advantages: Path and boundary. *Sustainability, 10*(10), 3631. https://doi.org/10.3390/su10103631

Ghrairi, A. M. (2022). Impact of Management Control System on the Organizational Performance amid Covid-19. *Australian Journal of Business and Management Research, 6*(2), 33-44. https:/doi.org/10.52283/NSWRCA.AJBMR.20220602A03

Govindarajan, V., & Gupta, A. K. (1992). *Linking control systems to business unit strategy: impact on performance*: https://doi.org/10.1007/978-1-4899-7138-8_29

Guo, J., Zhou, Y., Ali, S., Shahzad, U., & Cui, L. (2021). Exploring the role of green innovation and investment in energy for environmental quality: An empirical appraisal from provincial data of China. *Journal of Environmental Management, 292*, 112779. https://doi.org/10.1016/j.jenvman.2021.112779

Gupta, H., & Barua, M. K. (2018). A grey DEMATEL-based approach for modeling enablers of green innovation in manufacturing organizations. *Environmental Science and Pollution Research, 25*, 9556-9578. https://doi.org/10.1016/j.jenvman.2021.112779

Gürlek, M., & Tuna, M. (2018). Reinforcing competitive advantage through green organizational culture and green innovation. *The service industries journal, 38*(7-8), 467-491. https://doi.org/10.1080/02642069.2017.1402889

Ha, N. M., Nguyen, P. A., Luan, N. V., & Tam, N. M. (2024). Impact of green innovation on environmental performance and financial performance. *Environment, Development and Sustainability, 26*(7), 17083-17104.

Ha, T., & Nguyen, P. (2020). Social capital, knowledge sharing and firm performance. *Management Science Letters, 10*(12), 2923-2930.

Hafeez, M., Yasin, I, Zawawi, D., Odilova, S., & Bataineh, H. A. (2024). Unleashing the power of green innovations: the role of organizational ambidexterity and green culture in achieving corporate sustainability. *European Journal of Innovation Management*. doi: https://doi:10.1108/ejim-04-2023-0274

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Richter, N. F., & Hauff, S. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. https://doi.org/10.1007/978-3-319-57413-4_15

Halim, E. H., Mustika, G., Sari, R. N., Anugerah, R., & Mohd-Sanusi, Z. (2017). Corporate governance practices and financial performance: The mediating effect of risk management committee at manufacturing firms. *Journal of International Studies, 10*(4).

Hart, S. L. (1995). A natural-resource-based view of the firm. *Academy of management review, 20*(4), 986-1014. https://doi.org/10.5465/amr.1995.9512280033

Hart, S. L., & Dowell, G. (2011). Invited editorial: A natural-resource-based view of the firm: Fifteen years after. *Journal of management, 37*(5), 1464-1479. https://doi.org/10.1177/0149206310390219

He, Z.-X., Xu, S.-C., Shen, W.-X., Long, R.-Y., & Chen, H. (2016). Factors that influence corporate environmental behavior: Empirical analysis based on panel data in China. *Journal of Cleaner Production, 133*, 531-543. https://doi.org/10.1016/j.jclepro.2016.05.164

Huang, J.-W., & Li, Y.-H. (2017). Green innovation and performance: The view of organizational capability and social reciprocity. *Journal of business ethics, 145*, 309-324. https://doi.org/10.1007/s10551-015-2903-y

Huang, Y.-C., & Huang, C.-H. (2024). Exploring institutional pressure, the top management team's response, green innovation adoption, and firm performance: evidence from Taiwan's electrical and electronics industry. *European Journal of Innovation Management, 27*(3), 800-824. doi: https://doi.org/10.1108/EJIM-03-2022-0126

Ifrim, A. M., Stoenică, I. C., Petrescu, A. G., & Bîlcan, F. R. (2018). The impact of green innovation on organizational performance: Evidence from Romanian SMEs. *Academic journal of economic studies, 4*(1), 82-88. https://doi.org/10.1007/s10551-015-2903-y

Imran, M., & Jingzu, G. (2022). Green organizational culture, organizational performance, green innovation, environmental performance: A mediation-moderation model. *Journal of Asia-Pacific Business, 23*(2), 161-182. https://doi.org/10.1080/10599231.2022.2072493

Ittner, C. D., & Larcker, D. F. (1998). Innovations in performance measurement: Trends and research implications. *Journal of management accounting research, 10*, 205.

Jabeen, R., Khan, K. U., Zain, F., & Atlas, F. (2023). Buy green only: Interplay between green marketing, corporate social responsibility and green purchase intention; the mediating role of green brand image. *Business Strategy & Development, 6*(3), 503-518. doi: https://doi.org/10.1002/bsd2.258

Jabeen, R., Kijkasiwat, P., Zain, F., & Liew, C. Y. (2024). Organisational Greening Process and SMEs' Performance in the Textile Industry: Evidence from Pakistan. *Thammasat Review, 27*(1), 77-108. doi: https://DOI:10.14456/tureview.2024.4

Jnaneswar, K. (2024). Demystifying the relationships among green HRM, green work engagement, green innovation and environmental performance: a serial mediation model. *Social Responsibility Journal, 20*(6), 1193-1213. doi: https://Doi:10.1108/SRJ-08-2023-0457

Kaplan, R. S., & Norton, D. P. (1996). Using the balanced scorecard as a strategic management system. *Harvard Business Review, 74*(1), 75-85.

NSWRCA

Kaplan, R. S., & Norton, D. P. (2004a). Measuring the strategic readiness of intangible assets. *Harvard Business Review, 82*(2), 52-63.

Kaplan, R. S., & Norton, D. P. (2004b). *Strategy maps: Converting intangible assets into tangible outcomes* (Vol. 13): Harvard Business Press.

Khan, A. N., Mehmood, K., & Kwan, H. K. (2024). Green knowledge management: A key driver of green technology innovation and sustainable performance in the construction organizations. *Journal of Innovation & Knowledge, 9*(1), 100455. https://doi.org/10.1016/j.jik.2023.100455

Khan, S. A. R., Yu, Z., Golpira, H., Sharif, A., & Mardani, A. (2021). A state-of-the-art review and meta-analysis on sustainable supply chain management: Future research directions. *Journal of Cleaner Production, 278*, 123357. https://doi.org/10.1016/j.jclepro.2020.123357

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration (ijec), 11*(4), 1-10.

Kraus, S., Rehman, S. U., & García, F. J. S. (2020). Corporate social responsibility and environmental performance: The mediating role of environmental strategy and green innovation. *Technological Forecasting and Social Change, 160*, 120262. https://doi.org/10.1016/j.techfore.2020.120262

Küçükoğlu, M. T., & Pınar, R. İ. (2016). The mediating role of green organizational culture between sustainability and green Innovation: A research in Turkish companies. *Business And Management Studies: An International Journal, 6*, 64-85. doi: https://Doi:10.15295/BMIJ.V6I1.208

Kwarteng, A., Simpson, S. N. Y., & Agyenim-Boateng, C. (2022). The effects of circular economy initiative implementation on business performance: the moderating role of organizational culture. *Social Responsibility Journal, 18*(7), 1311-1341. https://doi.org/10.1108/SRJ-01-2021-0045

Leonidou, L. C., Fotiadis, T. A., Christodoulides, P., Spyropoulou, S., & Katsikeas, C. S. (2015). Environmentally friendly export business strategy: Its determinants and effects on competitive advantage and performance. *International Business Review, 24*(5), 798-811. https://doi.org/10.1016/j.ibusrev.2015.02.001

Lin, J., Zeng, Y., Wu, S., & Luo, X. R. . (2024). How does artificial intelligence affect the environmental performance of organizations? The role of green innovation and green culture. *Information & Management, 61*(2). doi: https://doi.org/10.1016/j.im.2024.103924

Lin, R.-J., Chen, R.-H., & Huang, F.-H. (2014). Green innovation in the automobile industry. *Industrial Management & Data Systems, 114*(6), 886-903. https://doi.org/10.1108/IMDS-11-2013-0482

Lin, R.-J., Tan, K.-H., & Geng, Y. (2013). Market demand, green product innovation, and firm performance: evidence from Vietnam motorcycle industry. *Journal of Cleaner Production, 40*, 101-107. https://doi.org/10.1016/j.jclepro.2012.01.001

Liu, J., Liu, Y., & Yang, L. (2020). Uncovering the influence mechanism between top management support and green procurement: The effect of green training. *Journal of Cleaner Production, 251*, 119674. https://doi.org/10.1016/j.jclepro.2019.119674

Liu, L. (2024). Green innovation, firm performance, and risk mitigation: evidence from the USA. *Environment, Development and Sustainability, 26*(9), 24009-24030. https://doi.org/10.1016/j.jclepro.2019.119674

Maldonado-Guzmán, G., Garza-Reyes, J. A., & Pinzón-Castro, S. Y. (2023). Green innovation and firm performance: the mediating role of sustainability in the automotive industry. *Management of Environmental Quality: An International Journal, 34*(6), 1690-1711. doi: https://doi.org/10.1108/MEQ-02-2023-0058

Muafi, M., Norek, T., & Siswanti, Y. (2021). *The influence of green human capital on business performance: The mediation role of innovation activity.* Paper presented at the In The Importance of New Technologies and Entrepreneurship in Business Development: In The Context of Economic Diversity in Developing Countries: The Impact of New Technologies and Entrepreneurship on Business Development (pp. 1371-1380). Springer International Publishing. https://doi.org/10.1007/978-3-030-69221-6_102

Munawar, S., Yousaf, H. Q., Ahmed, M., & Rehman, S. (2022). Effects of green human resource management on green innovation through green human capital, environmental knowledge, and managerial environmental concern. *Journal of Hospitality and Tourism Management, 52*, 141-150. https://doi.org/10.1016/j.jhtm.2022.06.009

Nguyen, T. T., Grote, U., Neubacher, F., Do, M. H., & Paudel, G. P. (2023). Security risks from climate change and environmental degradation: implications for sustainable land use transformation in the Global South. *Current Opinion in Environmental Sustainability, 63*, 101322. https://doi.org/10.1016/j.cosust.2023.101322

Ni, L., Ahmad, S. F., Alshammari, T. O., Liang, H., Alsanie, G., Irshad, M., . . . Bakir, S. M. d. M. A. (2023). The role of environmental regulation and green human capital towards sustainable development: The mediating role of green innovation and industry upgradation. *Journal of Cleaner Production, 421*, 138497. https://doi.org/10.1016/j.jclepro.2023.138497

Nitzl, C., Roldan, J. L., & Cepeda, G. (2016). Mediation analysis in partial least squares path modeling: Helping researchers discuss more sophisticated models. *Industrial management & data systems, 116*(9), 1849-1864. https://doi.org/10.1108/IMDS-07-2015-0302

Nomran, N. M., & Haron, R. (2020). A systematic literature review on Sharī'ah governance mechanism and firm performance in Islamic banking. *Islamic Economic Studies, 27*(2), 91-123. https://doi.org/10.1108/IES-06-2019-0013

Novitasari, M., & Agustia, D. (2021). Green supply chain management and firm performance: The mediating effect of green innovation. *Journal of Industrial Engineering and Management, 14*(2), 391-403. https://doi.org/ 10.3926/jiem.3384

Nureen, N., Liu, D., Irfan, M., Malik, M., & Awan, U. (2023a). Nexuses among green supply chain management, green human capital, managerial environmental knowledge, and firm performance: evidence from a developing country. *Sustainability, 15*(6), 5597. https://doi.org/10.3390/su15065597

Nureen, N., Sun, H., Irfan, M., Nuta, A. C., & Malik, M. (2023b). Digital transformation: fresh insights to implement green supply chain management, eco-technological innovation, and collaborative capability in manufacturing sector of an emerging economy. *Environmental Science and Pollution Research, 30*(32), 78168-78181. https://doi.org/10.1007/s11356-023-27796-3

Onubi, H. O., Carpio, M., & Hassan, A. S. (2024). Job satisfaction in green construction projects: antecedent roles of green work climate, pro-environmental construction practice and green human capital. *Engineering, Construction and Architectural Management, 31*(5), 1857-1878. https://doi.org/10.1108/ECAM-06-2022-0548

Ooi, K.-B. (2014). TQM: A facilitator to enhance knowledge management? A structural analysis. *Expert Systems with Applications, 41*(11), 5167-5179. https://doi.org/10.1016/j.eswa.2014.03.013

Paul, I., Bhole, G., & Chaudhari, J. (2014). A review on green manufacturing: it's important, methodology and its application. *Procedia materials science, 6*, 1644-1649. https://doi.org/10.1016/j.mspro.2014.07.149

Pham, N. T., Phan, Q. P. T., Tučková, Z., Vo, N., & Nguyen, L. H. (2018). Enhancing the organizational citizenship behavior for the environment: the roles of green training and organizational culture. *Management & Marketing, 13*(4), 1174-1189.

Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of management, 12*(4), 531-544. https://doi.org/10.1177/0149206386012004

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior research methods, 40*(3), 879-891. https://doi.org/10.3758/BRM.40.3.879

Qu, X., Khan, A., Yahya, S., Zafar, A. U., & Shahzad, M. (2022). Green core competencies to prompt green absorptive capacity and bolster green innovation: the moderating role of organization's green culture. *Journal of Environmental Planning and Management, 65*(3), 536-561. https://doi.org/10.1080/09640568.2021.1891029

Rehman, S. U., Kraus, S., Shah, S. A., Khanin, D., & Mahto, R. V. (2021). Analyzing the relationship between green innovation and environmental performance in large manufacturing firms. *Technological Forecasting and Social Change, 163*, 120481. https://doi.org/10.1016/j.techfore.2020.120481

Ringle, C. M., Sarstedt, M., Mitchell, R., & Gudergan, S. P. (2020). Partial least squares structural equation modeling in HRM research. *The international journal of human resource management, 31*(12), 1617-1643. https://doi.org/10.1080/09585192.2017.1416655

Ringle, C. M., Wende, S., & Becker, J.-M. (2015). Smart-PLS 3. Smart-PLS GmbH, Boenningstedt. *Journal of Service Science and Management, 10*(3), 32-49.

Roscoe, J. T. (1975). *Fundamental research statistics for the behavioral sciences* (Vol. 2). New York: Holt Rinehart & Winston.

Roscoe, S., Subramanian, N., Jabbour, C. J., & Chong, T. (2019). Green human resource management and the enablers of green organisational culture: Enhancing a firm's environmental performance for sustainable development. *Business Strategy and the Environment, 28*(5), 737-749. https://doi.org/10.1002/bse.2277

Samad, S. (2018). Examining the effects of environmental strategy and competitive advantage on business performance. *Management Science Letters, 8*(9), 891-902.

Samad, S., Nilashi, M., Almulihi, A., Alrizq, M., Alghamdi, A., Mohd, S., . . . Azhar, S. N. F. S. (2021). Green Supply Chain Management practices and impact on firm performance: The moderating effect of collaborative capability. *Technology in Society, 67*, 101766. https://doi.org/10.1016/j.techsoc.2021.101766

Samad, S., Yusuf, M., Yassien, A., & Ahmed, W. (2017). Influence of formulation and implementation strategy on organizational performance: A case in Ministry of Health. *Research Journal of Applied Sciences, Engineering and Technology, 12*(1), 37-44.

Sardana, D., Gupta, N., Kumar, V., & Terziovski, M. (2020). CSR 'sustainability' practices and firm performance in an emerging economy. *Journal of Cleaner Production, 258*, 120766. https://doi.org/10.1016/j.jclepro.2020.120766

NSWRCA

Schmidt, C. G., Foerstl, K., & Schaltenbrand, B. (2017). The supply chain position paradox: green practices and firm performance. *Journal of supply chain management, 53*(1), 3-25. https://doi.org/10.1111/jscm.12113

Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach* (7th ed.). West Sussex, UK: john wiley & sons.

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. https://doi.org/10.1016/j.jclepro.2019.03.211

Shafique, M., Asghar, M., & Rahman, H. (2017). The impact of green supply chain management practices on performance: Moderating role of institutional pressure with mediating effect of green innovation. *Business, Management and Economics Engineering, 15*(1), 91-108. https://doi.org/10.3846/bme.2017.354

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. https://doi.org/10.1108/JKM-11-2019-0624

Sharma, G. D., Kraus, S., Srivastava, M., Chopra, R., & Kallmuenzer, A. (2022). The changing role of innovation for crisis management in times of COVID-19: An integrative literature review. *Journal of innovation & knowledge, 7*(4), 100281. https://doi.org/10.1016/j.jik.2022.100281

Shoaib, M., Abbas, Z., Yousaf, M., Zámečník, R., Ahmed, J., & Saqib, S. (2021). The role of GHRM practices towards organizational commitment: A mediation analysis of green human capital. *Cogent Business & Management, 8*(1), 1870798. https://doi.org/10.1080/23311975.2020.1870798

Shu, C., Zhou, K. Z., Xiao, Y., & Gao, S. (2016). How green management influences product innovation in China: The role of institutional benefits. *Journal of business ethics, 133*, 471-485. https://doi.org/10.1007/s10551-014-2401-7

Singh, S. K., Del Giudice, M., Chierici, R., & Graziano, D. (2020). Green innovation and environmental performance: The role of green transformational leadership and green human resource management. *Technological Forecasting and Social Change, 150*, 119762. https://doi.org/10.1016/j.techfore.2019.119762

Soewarno, N., Tjahjadi, B., & Fithrianti, F. (2019). Green innovation strategy and green innovation: The roles of green organizational identity and environmental organizational legitimacy. *Management decision, 57*(11), 3061-3078. https://doi.org/10.1108/MD-05-2018-0563

Song, W., & Yu, H. (2018). Green innovation strategy and green innovation: The roles of green creativity and green organizational identity. *Corporate Social Responsibility and Environmental Management, 25*(2), 135-150. https://doi.org/10.1002/csr.1445

Song, W., Yu, H., & Xu, H. (2021). Effects of green human resource management and managerial environmental concern on green innovation. *European Journal of Innovation Management, 24*(3), 951-967. https://doi.org/10.1108/EJIM-11-2019-0315

Sun, H., Bahizire, G. M., Pea-Assounga, J. B. B., & Chen, T. (2024). Enhancing employee green performance through green training: the mediating influence of organizational green culture and work ethic in the mining sector. *Journal of Cleaner Production, 449*, 141105. https://doi.org/10.1016/j.jclepro.2024.141105

Szilagyi, A. D. (1981). *Management and performance*. Santa Monica, Calif.: Goodyear Pub. Co.

Tahmasebifard, H., Fazael, S., Souran, V., Mirzaagha, M., & Pouyan, M. (2018). The Effect of Competitive Intelligence on Marketing Capabilities and Organizational Performance. *Australian Journal of Business and Management Research, 5*(8), 11-19.

Takalo, S. K., & Tooranloo, H. S. (2021). Green innovation: A systematic literature review. *Journal of Cleaner Production, 279*, 122474. https://doi.org/10.1016/j.jclepro.2020.122474

Talapatra, S., Santos, G., & Gaine, A. (2022). FACTORS AFFECTING CUSTOMER SATISFACTION IN EATERY BUSINESS-AN EMPIRICAL STUDY FROM BANGLADESH. *International Journal for Quality Research, 16*(1). https://doi.org/10.24874/IJQR16.01-11

Tang, M., Walsh, G., Lerner, D., Fitza, M. A., & Li, Q. (2018). Green innovation, managerial concern and firm performance: An empirical study. *Business strategy and the Environment, 27*(1), 39-51. https://doi.org/10.1002/bse.1981

Tarigan, Z. J. H., Siagian, H., & Jie, F. (2021). Impact of enhanced Enterprise Resource Planning (ERP) on firm performance through green supply chain management. *Sustainability, 13*(8), 4358. https://doi.org/10.3390/su13084358

Tjahjadi, B., Agastya, I. B. G. A., Soewarno, N., & Adyantari, A. (2023). Green human capital readiness and business performance: do green market orientation and green supply chain management matter? *Benchmarking: An International Journal, 30*(10), 3884-3905. https://doi.org/10.1108/BIJ-10-2021-0622

Venkatraman, N., & Ramanujam, V. (1987). Measurement of business economic performance: An examination of method convergence. *Journal of management, 13*(1), 109-122. https://doi.org/10.1177/0149206387013001

Wang, C.-H. (2019). How organizational green culture influences green performance and competitive advantage: The mediating role of green innovation. *Journal of Manufacturing Technology Management, 30*(4), 666-683. https://doi.org/10.1108/JMTM-09-2018-0314

Wang, C. H., & Juo, W. J. (2021). An environmental policy of green intellectual capital: Green innovation strategy for performance sustainability. *Business Strategy and the Environment, 30*(7), 3241-3254. https://doi.org/10.1002/bse.2800

Wang, S., Abbas, J., Sial, M. S., Álvarez-Otero, S., & Cioca, L.-I. (2022). Achieving green innovation and sustainable development goals through green knowledge management: Moderating role of organizational green culture. *Journal of Innovation & Knowledge, 7*(4), 100272. https://doi.org/10.1016/j.jik.2022.100272

Xue, M., Boadu, F., & Xie, Y. (2019). The penetration of green innovation on firm performance: Effects of absorptive capacity and managerial environmental concern. *Sustainability, 11*(9), 2455. https://doi.org/10.3390/su11092455

Yu, W., Ramanathan, R., & Nath, P. (2017). Environmental pressures and performance: An analysis of the roles of environmental innovation strategy and marketing capability. *Technological Forecasting and Social Change, 117*, 160-169. https://doi.org/10.3390/su11092455

Zailani, S., Jeyaraman, K., Vengadasan, G., & Premkumar, R. (2012). Sustainable supply chain management (SSCM) in Malaysia: A survey. *International journal of production economics, 140*(1), 330-340. https://doi.org/10.1016/j.ijpe.2012.02.008

Zameer, H., Wang, Y., Yasmeen, H., & Mubarak, S. (2022). Green innovation as a mediator in the impact of business analytics and environmental orientation on green competitive advantage. *Management Decision, 60*(2), 488-507. https://doi.org/10.1108/MD-01-2020-0065

Zhang, F., & Zhu, L. (2019). Enhancing corporate sustainable development: Stakeholder pressures, organizational learning, and green innovation. *Business Strategy and the Environment, 28*(6), 1012-1026. https://doi.org/10.1002/bse.2298

Zhang, J., Jehangir, F. N., Yang, L., Tahir, M. A., & Tabasum, S. (2024). Competitive Advantage and Firm Performance: The Role of Organizational Culture, Organizational Innovation, and Knowledge Sharing. *Journal of the Knowledge Economy, 15*(2), 1-27. doi: https://DOI:10.1007/s13132-024-01910-3

Zhao, W., & Huang, L. (2022). The impact of green transformational leadership, green HRM, green innovation and organizational support on the sustainable business performance: Evidence from China. *Economic research-Ekonomska istraživanja, 35*(1), 6121-6141. https://doi.org/10.1080/1331677X.2022.2047086

Zhu, Q., Sarkis, J., & Lai, K.-h. (2013). Institutional-based antecedents and performance outcomes of internal and external green supply chain management practices. *Journal of Purchasing and Supply Management, 19*(2), 106-117. https://doi.org/10.1016/j.pursup.2012.12.001

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