Exploring the influence of green supply chain practices on performance nexus

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ABSTRACT

This exploration examines the potential effects of certain control variables, like firm age, possession, and size of an environmental management organization certification, on any collaborative execution when adapting green supply chain system habits. The study will examine how these variables may influence different features of collective performance. This study employs a multi-step methodology, including a thorough review of existing literature, an empirical survey of 223 participant organizations, and an arithmetical examination to test the proposed conceptual structure to inform the two prospective and matter-of-fact outlooks. The studies have three phases. First, complete written work is reviewed to gain a deeper understanding of the topic. Next, a survey is conducted with responses from 223 participant organizations, and the data is collected. Finally, multiple retrogression analysis is used to evaluate the effects of firm age, possession, and firm size of an environmental management system certification on four elements of associated execution. The study's findings indicate a constructive correlation between fit size and these elements of corporate execution: social, environmental, and economic presentation. So, no connection was found between firm size and functional efficiency. Additionally, the study found that controlling an ecological management organization certification within Pakistani firms had a good effect on all staging elements when firm age did not correlate significantly with any of the four execution results. This study gives practical guides to supply chain executives in Pakistan and other nearby markets to understand better the correlation between these control variables and the execution on collective outcomes.

Keywords: Green supply chain management, Organizational performance, Collaborative execution

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Citation of this article:

Shams, U. A. (2024). Exploring the influence of green supply chain practices on performance nexus. *South Asian Journal of Operations and Logistics, 3*(2), 23-44. https://doi.org/10.57044/SAJOL.2024.3.2.2427

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1. Introduction

The topic of how the implementation of green supply chain management practices affects corporate performance has received significant attention in both academic and business spheres (Dubey et al., 2017). Organizations and governments are increasingly pressuring businesses to make their operations more sustainable (Vijayvargy et al., 2017). Managers are eager to implement green supply chain management practices because they can result in a range of benefits, such as reducing costs (Orlitzky et al., 2003), enhancing the company's image (Porter, 1991), increasing customer satisfaction (Kleindorfer et al., 2005), improving employee job satisfaction (Jun et al., 2006), and creating new market opportunities (Diabat et al., 2013). Studies on green supply chain management have explored a variety of areas, such as green operations, green design, green manufacturing, reverse logistics, and performance outcomes, as well as factors that promote or hinder the implementation of these practices (González-Benito & González-Benito, 2005a, b; Anthony, 2019). However, research on this topic, specifically in the Middle East and North African region, is limited and requires further investigation.

This research begins by defining the concept of the green supply chain, which relates to the integration of environmental considerations throughout the entire supply chain process. Various definitions found in the literature describe green supply chain management as a combination of activities that includes green procurement, environmental management of materials, environmental circulation, marketing, and reverse logistics (Hervani et al., 2005). The importance of reverse logistics is also emphasized in the definition (Sarkis, 2003). Furthermore, it is defined as the integration of environmental thinking into supply chain management, covering product design, supplier selection and material sourcing, manufacturing processes, product packaging, delivery of the product to consumers, and end-of-life management of the product after its use.

The definitions of green supply chain management found in the literature have been developed from earlier work, including that of Beamon (1999), who defined it as "the extension of the traditional supply chain to include activities that aim at minimizing environmental impacts of a product throughout its entire cycle, such as green design, resource-saving, harmful material reduction, and product recycling and reusing". Kumar and Putnam (2008) also proposed an extension of the traditional supply chain process and named it "cradle to grave," which means that the product has to be returned back to the origin (manufacturer) to be reused or properly disposed of.

Srivastava (2007) believed that green supply chain management practices must be integrated throughout the entire supply chain process, including the acquisition of raw materials, product design, manufacturing processes, finished product delivery, and end-of-life management of the product. The above definitions highlight that greening must encompass the entire supply chain and that a green supply chain is one that produces a degradable product using minimal resources and generates minimal waste (Younis et al., 2016).

1.1 Problem Statement

Literature argues that implementing green supply chain management practices can lead to trade-offs between economic, social, and environmental performance (González-Benito & González-Benito, 2005a, b; Dubey et al., 2017), while other studies suggest a negative association between these performance outcomes (Rao & Holt, 2005). To better understand this debate, this study uses the concept of "control variables" as a way to examine the relationship between sustainable corporate performance and the implementation of green supply chain management practices. By using control variables as an indicator, the study aims to understand "how" and "when" these variables may influence performance outcomes. This study aims to determine if there is a relationship between green supply chain practices and corporate performance (environmental performance, operational performance, economic performance, and social performance) within the context of green supply chain management (GSCM).

It seeks to answer the question of whether these control variables have an impact on the implementation of GSCM practices and how they relate to overall corporate performance.

1.2 Research Objective

Based on the literature review, the primary research objectives are:

(1) to examine the relationship between internal supply chain practices and various performance dimensions, including environmental performance, operational performance, economic performance, and social performance, within the context of green supply chain management (GSCM); and

(2) To offer recommendations for businesses and identify potential future research directions in the GSCM-corporate performance (CP) domain.

1.4 Significance of the Study

The study finds it noteworthy that some private, semi-government, and government organizations in Pakistan are implementing sustainable initiatives voluntarily, while others are required to do so by law. The research was motivated by the Pakistani leadership in environmental sustainability through various initiatives and achievements. However, some businesses are still skeptical about the resources needed and the potential outcomes of implementing green supply chain management practices, particularly those with small firm sizes, limited business age, or lacking EMS certification.

2. Literature Review

2.1 Review on Variables

In their study on the impact of green supply chain management practices on corporate performance, King and Lenox (2001) utilized various control variables to control for other factors that may affect the results. These included factors such as the size of the company, the amount of capital invested, the rate of growth and investment in research and development, and the degree of regulatory compliance. The aim of their study was to determine the extent to which being "green" actually impacts corporate performance.

In their study of the relationship between environmental performance and economic performance, Russo and Fouts (1997) utilized various control variables to account for other factors that may affect the results. These control variables included industry concentration, the rate of growth of the firm, the size of the firm, the level of advertising, the amount of capital invested, and the rate of growth in the industry. The authors were attempting to determine whether a company's environmental performance has an impact on its economic performance and, if so, whether the growth rate of the industry plays a moderating role in this relationship.

Benito and Benito (2005) carried out an empirical analysis of the relationship between environmental proactivity and business performance. They used control variables such as firm size, age of the plant equipment, industry, and advanced production and operations management. The study concluded that environmental practices related to logistics processes lead to improved operational performance. Additionally, Al-Tuwaijri et al. (2004) examined the relationship between economic performance, environmental performance, and environmental disclosure, using firm size and public visibility as control variables. The study found a positive relationship between economic performance and environmental performance, as well as between environmental performance and disclosure.

In his study, Lee (2008) looked at the factors that drive small and medium-sized suppliers to implement green supply chain initiatives, using firm size and firm age as control variables. He found strong evidence that buyers are important in encouraging SME suppliers to adopt green practices.

Similarly, Link and Naveh (2006) examined the relationship between the environmental management standard ISO 14001, negative environmental impact, and business performance. They used firm-size Aa+ the time since the firm received the ISO 14001 certification as control variables. The study found that organizations with ISO 14001 certification may be more likely to allocate personal responsibility for environmental management within the firm.

In line with the studies previously mentioned, Russo (2009) also used ISO 14001, firm size, and firm age as control variables to evaluate the relationship between external and internal practices of green supply chain management (GSCM) and environmental, economic, and operational performance. The study used three models to examine these relationships. The findings were consistent with those of Link and Naveh (2006), showing that companies that adopted ISO 14001 early had lower emissions compared to those who adopted it later, and companies that operated under ISO 14001 for a longer period of time also had lower emissions.

Previous studies, such as Cordano et al. (2010), have used firm size as a single control variable to investigate the correlation between the development of basic environmental management systems and the success of implementing recycling and energy initiatives. Eltayeb et al. (2011) expanded on this by also incorporating additional control variables such as industry type, firm ownership, number of suppliers, and participation in green associations in order to evaluate the actual environmental, economic, and intangible outcomes that result from the adoption of green supply chain practices.

In the realm of green supply chain management and corporate performance, various control variables have been used in previous research. For example, Zhu and Sarkis (2007) employed institutional pressures; Wagner (2005) utilized financial measures such as debt-to-equity ratio and asset turnover ratio; Ann et al. (2006) considered industry type and company status; and Simpson et al. (2007) included investment, contracts, and assessment. A comprehensive overview of these control variables used in contemporary and modern research on GSCM.

The literature reviewed suggest that several key control variables are commonly used in research on the relationship between green supply chain management and corporate performance. Specifically, three control variables that have been frequently used in studies of this area are firm size, firm age, and environment management system certification. In this research, the aim is to examine the influence of these three control variables on various measures of corporate performance, including environmental performance, operational performance, economic performance, and social performance.

2.1.1 Review of green supply chain impact on corporate performance

Research on the impact of green supply chain management (GSCM) practices on corporate performance has been a focus of interest for academics, practitioners, and researchers. There are three main perspectives on this topic. The first perspective holds that implementing GSCM practices can be a burden for the organization and may entail significant upfront investments that might not yield short-term returns (Zhu et al., 2007; Rothenberg et al., 2001; Baloch & Rashid, 2022). Scholars who take this perspective include Friedman (1962).

The second perspective, proposed by other researchers, suggests that implementing GSCM practices could lead to negative economic performance. For instance, Sarkis (2003) argues that GSCM leads to an increase in operational costs, increased costs of procuring environmentally friendly items and materials, and increased training costs. It's important to mention the third school of thought, which holds that GSCM can have a positive effect on corporate performance by increasing efficiency, reducing costs, and increasing customer satisfaction. (Lee et al., 2015; Hashmi, 2022)

The second perspective on the impact of GSCM practices on corporate performance suggests that there is no relationship between environmental and economic performance (Fogler & Nutt, 1975; Freedman & Jaggi, 1982; Wiseman, 1982; Rashid & Rasheed, 2022). However, within this perspective, some researchers have a slightly different viewpoint. They believe that implementing GSCM practices

represents a trade-off between economic and environmental performance (Hashmi, 2023).

The third perspective on the impact of GSCM practices on corporate performance suggests that there is a positive relationship between implementing GSCM practices and corporate performance. According to this perspective, organizations can reap various benefits from implementing GSCM practices, such as reducing operational costs (Orlitzky et al., 2003), improving corporate image (Porter, 1991), increasing customer satisfaction (Kleindorfer et al., 2005), enhancing employee job satisfaction (Jun et al., 2006), and creating new market opportunities (Diabat et al., 2013). These researchers argue that GSCM implementation can drive overall organizational performance improvement in different areas.

Wagner (2005) adopted a similar approach to Eltayeb et al. (2011) in examining the relationship between environmental and economic performance and the impact of corporate strategies related to sustainability and the environment. The study used more reliable and objective measures to measure both environmental and economic performance. To measure environmental performance, the study used total emissions, water consumption, and energy consumption. To measure economic performance, the study used return on employed capital, return on equity, and return on sales. The study used a sample of 37 paper firms in Germany, Italy, the Netherlands, and the UK and employed ordinary least squares regression with incomplete panel data. The study found that in some sensitive industries, it can be difficult to see a positive relationship between environmental and economic performance unless a more proactive environmental strategy is implemented, such as pollution prevention systems. This finding is consistent with the results obtained by Zhu and Sarkis (2007). However, the study also found that end-of-pipe strategies lead to little positive or even negative performance. The goal of this research is to investigate the relationship between the implementation of green supply chain practices and corporate performance and to determine the impact of various factors on corporate performance.

2.2 Review of Grounded Theories

According to Carter and Easton (2011), a review of literature in the field of supply chain management found that a majority of articles published between 1991 and 2000 did not utilize any theoretical frameworks. However, a significant shift was observed in the following decade, with approximately one-third of articles on green and sustainable supply chain management incorporating some sort of theoretical foundation. The literature suggests that three main theories have been used to explain the effects of implementing green supply chain practices on corporate performance: Freeman's stakeholder theory (1984), DiMaggio and Powell's institutional theory (1983), and Wernerfelt's resource-based theory (1984).

2.2.1 Stakeholder theory

According to Freeman (1984), "stakeholder theory" posits that organizations exist to benefit and satisfy all of their stakeholders, including the government, investors, political groups, customers, suppliers, communities, trade associations, and employees. As a result, businesses are increasingly adopting green supply chain management (GSCM) practices in response to pressures from various stakeholder groups, including employees, shareholders, environmental organizations, and government organizations, all of which play a role in influencing decision-making within the organization (Frooman & Murrell, 2005).

In recent years, Freeman (2002) has updated his stakeholder theory to argue that organizations must go beyond simply maximizing shareholder wealth in order to address the interests of all stakeholders who may be affected by or have an impact on the organization's purpose and existence. These stakeholders are considered potential beneficiaries or at-risk parties and should be taken into consideration by the organization (Post et al., 2002; Dubey, Gunasekaran, & Papadopoulos, 2017; Dubey et al., 2017). Freeman (2002) concludes that the role of beneficiaries should be expanded from shareholders to include all stakeholders and that they should be given equal decision-making authority as the firm's executives (Stieb, 2009). Additionally, Freeman argues that "each of these stakeholder

groups has the right not to be treated as a means to some end and therefore must participate in determining the future direction of the firm in which they have a stake" (Freeman, 2002, p. 39).

Ayuso et al. (2014) supported the view that stakeholder theory is closely connected to corporate social responsibility and can aid in analyzing the relationship between the organization and society, providing guidance for managers. In summary, as noted by Key (1999), Freeman's stakeholder theory aims to explain the relationship between the firm and its external environment and its behavior within this environment. It identifies the key players and relationships involved and seeks to empower all the groups and individuals involved.

2.2.2 Institutional theory

DiMaggio and Powell (1983) introduced the institutional theory in the early 1980s, which posits that firms adapt to their environment by adhering to legitimacy rules and regulations on one hand and by seeking social acceptance on the other. They argue that a firm's behavior may be driven by a strong social force, such as culture, law, or regulations. However, Zhu and Sarkis (2007) found that the implementation of green supply chain management practices is not always motivated by efficiency, but rather by the desire to achieve social legitimacy and business sustainability.

Institutional theory posits that government regulations can be a major factor driving businesses to adopt green supply chain practices. As a result, businesses in regions with strict environmental regulations, such as Europe and the USA, tend to implement GSCM practices more frequently than those in regions with less stringent legislation (Groenewegen &Vergragt, 1991). Adopting these practices may be costly, particularly if firms choose to implement cutting-edge technologies to reduce environmental impacts.

Institutional theory has been used in various research areas such as total quality management, quality cycles, and business continuity planning (Lin &Sheu, 2012). Lin and Sheu (2012) claim that institutional drivers can be internal, such as utilizing ISO 9000 to improve operational performance, or external, such as pressure to implement TQM to achieve social legitimacy. Institutional theory helps to explain whether the pursuit of social acceptance is driven by internal or external factors and how that may impact performance improvement.

2.2.3 Resource-based theory

The resource-based theory, also known as the resource-based view of the firm, posits that a firm's success is linked to its ability to effectively utilize its internal resources. This includes both tangible resources such as financial reserves and physical assets, as well as intangible resources such as reputation, employee skills and knowledge, and corporate culture. Wernerfelt (1984) challenged the traditional belief that a firm's success is solely determined by its external environment and argued that a firm's competitive advantage is derived from its unique internal resources. A firm need to effectively manage and utilize its resources in order to outperform its competitors. Russo and Fouts (1997) also argue that firms can outperform their competitors in terms of environmental performance by deploying new physical assets that improve internal processes, reduce resource use and waste.

The relationship between a firm's external environment and its internal resources was not fully understood until Barney (1986) and Conner (1991) clarified that a firm's resources cannot be evaluated independently. Their value is determined by the interaction with market conditions, and the most valuable resources are those that allow a firm to capitalize on market opportunities and mitigate market and competitor threats. Hunt and Davis (2012) also argued that resources can be both tangible and intangible entities that allow a firm to produce a value-adding product for a targeted market. They identified seven key types of resources: physical, legal, human, financial, relational, informational, and organizational.

Research has shown that various factors can influence firms to adopt green supply chain

management (GSCM) practices, but the pressure to reduce carbon footprint can lead to different reactions. Some firms may adopt compliance-based strategies such as short-term pollution abatement (Eltayeb et al., 2010) while others may proactively reengineer their operations to reduce material consumption and prevent pollution (Hart, 1995). It is only through the latter strategy that firms are likely to achieve a competitive advantage and reap benefits from GSCM practices (Laosirihongthong et al., 2013). Anthony (2019) found that using the resource-based view theory and a belief-action-outcome framework, information technology as a resource can significantly influence environmental performance in organizations.

The stakeholder theory, institutional theory, and resource-based theory, provide the theoretical foundation for this research. Based on the literature review of the application of various GSCM practices to different dimensions of corporate performance, the research objective and theoretical model are presented next.

2.3 Theoretical Model and Hypotheses Development

The theoretical model guiding this research is illustrated in Figure 1. The three independent variables in this model are: firm size, which is measured by the total number of employees the firm has; firm age, which refers to the number of years the firm has been in operation; and possession of environmental management system certification such as ISO 14001.

2.3.1 Environmental performance

This research will use the definition of environmental performance as defined by Younis et al. (2016), which states that environmental performance refers to an organization's ability to reduce air emissions, effluent waste and solid waste, as well as decrease consumption of hazardous and toxic materials and reduce the frequency of environmental accidents.

2.3.2 Operational performance

The definition of operational performance adopted in this research is a modified version used by Melnyk et al. (2003) and Zhu et al. (2008). Operational performance is defined as the improvement in the quality of the products a company produces while reducing lead times, which enhances the company's competitiveness in the marketplace and improves the chances of selling products in international markets (Younis et al., 2016).

2.3.3 Economic performance

The definition of economic performance used in this research is adopted from Younis et al. (2016), which define it as "the financial and marketing performance improvements resulting from implementing GSCM practices that lead to enhancing the firm's position compared to the industry average." Younis et al. (2016) define financial improvements as a decrease in the cost of raw materials and energy consumed, waste discharge costs, and environmental accident costs. Marketing-based improvements include an increase in average return on sales and an increase in average market share (Dubey et al., 2017).

2.3.4 Social performance

Social performance is defined by Wood (1991) as "a business organization's configuration of principles of social responsibility, processes of social responsiveness, and policies, programs, and observable outcomes as they relate to the firm's societal relationships". While some literature argues that implementing green supply chain management practices is a trade-off between economic, social, and environmental performance in organizational performance, others argue that there is a negative association between these performance outcomes (Zhu & Sarkis, 2007; Dubey et al., 2017). To understand this debate further, the concept of "control variable" is used to examine this paradox.
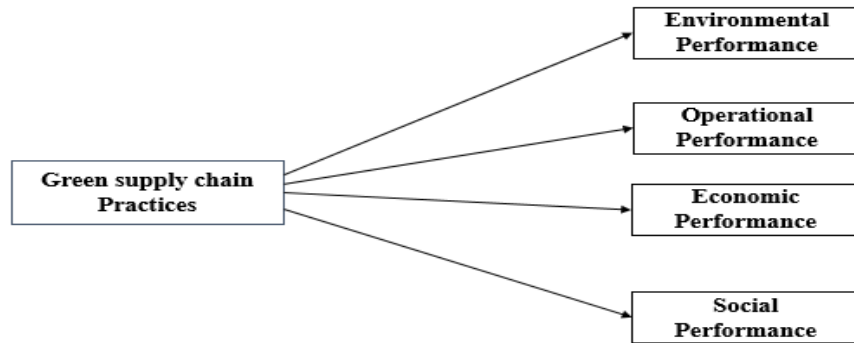
2.4 Conceptual Framework

Figure 1: Conceptual Framework

(Source: author's creation from literature)

2.5 Hypothesis

Based on these findings, the following hypotheses are proposed:

H1- Green supply chain has positive and significant influence on Environmental performance.

H2-Green supply chain has positive and significant influence on Operational performance.

H3- Green supply chain has positive and significant influence on Economic performance.

H4- Green supply chain has positive and significant influence on Social performance.

3. Research Methodology

The research approach plays a crucial role in guiding the overall research methodology. It refers to the systematic and structured plan that researchers adopt to address their research objectives (Rashid et al., 2023a, b). Selecting an appropriate research approach is necessary to ensure the validity and reliability of the findings (Alrazehi et al., 2021). There are different types of research approaches, each with its own characteristics and advantages (Kakar et al., 2023). The quantitative research approach, which involves the use of numerical data and statistical analysis, provides objectivity and generalizability. Considering my research objectives and the nature of the data to be collected, I have chosen the quantitative research approach. Although other approaches, such as qualitative or mixed methods, are also available, the quantitative approach aligns better with my study's focus on numerical analysis and the need to derive objective conclusions (Rashid & Rasheed, 2023).

3.1 Data Collection Source

For this research, I have opted for primary data collection as the main source of information. Primary data refers to the data that is collected firsthand by the researcher specifically for the purpose of the study (Khan et al., 2022a, b). This approach allows for the collection of fresh and original data that directly addresses the research objectives. To gather primary data, various methods will be employed, including surveys, interviews, or observations. Surveys will be conducted to gather quantitative data from a targeted sample of participants, enabling the collection of specific and measurable information (Rasheed & Rashid, 2023). Additionally, in-depth interviews will be conducted to gain qualitative insights and capture nuanced perspectives on the research topic. By employing primary data collection, I aim to ensure the relevance and specificity of the data collected, facilitating a comprehensive analysis and interpretation of the research findings.

3.2 Sampling Procedure

In this study, a non-probability sampling procedure, specifically convenient sampling, will be employed to select participants for data collection. Convenient sampling is chosen due to its practicality and ease of access for potential participants (Rashid et al., 2021). This method involves selecting individuals who are readily available and accessible to the researcher, often based on convenience or proximity (Khan et al., 2023). The participants will be chosen from a specific population that aligns with the research objectives. While convenient sampling may introduce some degree of bias, it provides a practical solution when time, resources, or logistical constraints restrict the use of other sampling techniques (Rasheed et al., 2023). The use of convenient sampling will enable efficient data collection, ensuring the feasible and timely completion of the research study. However, it is important to acknowledge that the findings may be limited in terms of generalizability to a broader population, and caution should be exercised when interpreting the results (Hashmi et al., 2020a, b).

3.3 Sample Size

To determine the appropriate sample size for this study, G Power software will be utilized. G Power is a widely used statistical software that assists researchers in estimating the required sample size based on various factors, including the research design, statistical tests, effect size, alpha level, and desired power (Khan et al., 2021). By inputting these parameters into the software, it will generate the recommended sample size needed to achieve sufficient statistical power for the study. The determination of an adequate sample size is crucial to ensuring the reliability and generalizability of the research findings (Agha et al., 2021). By using G Power, this study will aim to employ an optimal sample size that balances statistical power with available resources and constraints. This approach will enhance the rigor and credibility of the research outcomes, ensuring that the results are statistically meaningful and representative of the target population (Rashid et al., 2022a, b).

3.4 Statistical Technique: Regression Analysis

In this study, regression analysis will be employed as the primary statistical technique for data analysis. Regression analysis is a powerful tool that examines the relationship between a dependent variable and one or more independent variables. It allows for the identification and quantification of the impact of independent variables on the dependent variable, facilitating the exploration of cause-and-effect relationships (Rashid et al., 2020). Using regression analysis, this study aims to assess the strength and direction of the associations between variables of interest (Hashmi & Mohd, 2020). Additionally, regression analysis enables the examination of predictive relationships, allowing for the development of models that can estimate the value of the dependent variable based on the values of the independent variables (Haque et al., 2021; Das et al., 2021). Through the application of regression analysis, this research will provide valuable insights into the factors influencing the dependent variable and contribute to a deeper understanding of the research phenomenon (Hashmi et al., 2021a, b).

Table 01: Instrument

Variable	No of items	Source
Green supply chain Practices	5	(Agyabeng-Mensah et al., 2020)
Environmental performance	3	(Zhou et al., 2021)
Economic performance	5	(Zhou et al., 2021)
Social performance	3	(Zhou et al., 2021)
Operational Performance	4	(Zhou et al., 2021)

4. Results and Analysis

4.1 Response Rate

The totals of 250 questionnaires were distributed to individuals working in manufacturing firms in Karachi, Pakistan. These manufacturing firms are related to the textile sector. A total of 223 responses

were collected, which is an 89.3% response rate.

4.2 Demographic Profile of the Participant

The demographic profiles of the respondents are shown in the below table:

Table 02: Demographic Profile of the Participant

Demographic variable	Category	Frequency	Percentage
Gender	Male	183	82.1
	Female	40	17.9
Age	Less than 25 years	46	20.6
	25- 30 years	130	58.3
	36-40 years	47	21.1
	Above 40 years	0	0
Experience	less than 3 years	102	45.7
	3 to 6 years	96	43.0
	7 to 10 years	25	11.2
	above 10 years	0	0
Designation	Executive	110	49.3
	Assistant Manager	80	35.9
	Manager	33	14.8
	Senior Manager	0	0
	Director	0	0
Income	25,000- 40,000	92	41.3
	41,000- 70,000	64	28.7
	71,000- 100,000	57	25.6
	Above 100,000	10	4.5
Education	Diploma	20	9.0
	Intermediate or less	63	28.3
	Graduation	79	35.4
	Masters	53	23.8
	M Phil/PhD	8	3.6

4.3 Descriptive Statistics

Descriptive statistics was analyzed to check the univairate normality of data. The results of descriptive statistics based on the mean, standard deviation, skewness and kurtosis. Hair et al. (2009) stated gives the acceptable minimum value of skews is -2.5 while the maximum skews is +2.5 (Rashid et al., 2019). Given below Table illustrating the summarized outcomes for the descriptive statistics of this study:

Table 03: Descriptive Statistics

Construct	Mean	Std. Dev.	Skewness	Kurtosis
Environmental Performance	3.49	0.83	-.407	-.131
Operational Performance	3.55	0.69	-.382	-.043
Economic Performance	3.57	0.67	-.866	1.016
Social Performance	3.49	0.82	-.443	-.153

The calculated results for descriptive study emphasize that minimum skewness is (sk=0.382) and the highest skewness is (sk=0.523) both are for Operational Performance (OP) (Mean=3.55, S.D=0.69) and Green supply chain practices (GSCP) (Mean=3.31, S.D=0.73) respectively. On the other hand, the least kurtosis (k=0.043) and highest kurtosis (k=1.016) are for Operational Performance (OP) (Mean=3.55, S.D=0.69) and Economic Performance (ECP) (Mean=3.57, S.D=0.67). These outcomes indicating that all calculated skewness and kurtosis are not less than and greater than +2.5, so it can be safely assumed that there is no issue with the normality of the data.

4.4 Reliability Analysis

The internal consistency and errors related to the data collection process were tested by the

application of reliability analysis. For the acceptance criterion, the reliability value for each construct should not be less than 0.70 (Hair et al., 2009; Rashid & Amirah, 2017). The table below has the calculated outcomes for reliability analysis:

Table 04: Reliability Analysis

Construct	α	Mean	Standard Deviation
Environmental Performance	.788	3.49	0.83
Operational Performance	.804	3.55	0.69
Economic Performance	.793	3.57	0.67
Social Performance	.800	3.49	0.82

The mention above reliability outcomes indicating that the highest reliability is (α=0.804) is for Operational Performance (OP) (Mean=3.55, S.D=0.69) and the least reliability is (α=0.788) is for Environmental Performance (EP) (Mean=3.49, S.D=0.83). Thus these outcomes indicating that the reliability value for all constructs is not less than 0.70 so that all adapted constructs are reliable for current study (Rashid, 2016).

4.5 Correlation Analysis

The uniqueness of constructs and multicollienrity issue was examined by the application of bivariate correlation analysis. It emphasizes the relationship strength among each pair of constructs and correlation values for each pair should not less than +0.30 as well as not greater than +0.90 (O'Brien & Sharkey Scott, 2012). The given below table presents the summarized outcomes for the correlation analysis:

Table 05: Bivariate Correlation

Construct	T_GSCI	T_EP	T_OP	T_ECP	T_SP
Green supply chain practices	1				
Environmental Performance	.597**	1			
Operational Performance	.455**	.540**	1		
Economic Performance	.472**	.446**	.494**	1	
Social Performance	.437**	.487**	.435**	.626**	1

** Correlation is significant at the 0.01 level (2-tailed).

The results shown in presented above table shows that the variables Social Performance (SP) (Mean=3.49, S.D =0.82) and Economic Performance (ECP) (Mean=3.57, S.D=0.67) has the strongest relationship (r=0.626). Whereas, the variables Social Performance (SP) (Mean=3.49, S.D=0.82) and Operational Performance (OP) (Mean=3.55, S.D=0.69) has the weakest relationship (r=0.435). These outcomes indicating that the relationship among each pair of variables is not less than +0.30 as well as not greater than +0.90. So that all adapted constructs used in this study has no issue with multicollienrity and also measure distinct concept.

4.6 Hypothesis Testing

The hypothetical model of this study was tested by the application of regression analysis. These were calculated by using SPSS software while the outcomes for each hypothesis are presented in given below sections:

4.6.1 Hypothesis 1

The hypothesis one proposed that "green supply chain practices has positive influence on environmental performance" this hypothesis was tested by simple regression analysis. Summarized outcomes are presented in given below tables:

Table 06: Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.597a	.357	.354	.66363

a. Predictors: (Constant), Green supply chain practices
b. Dependent VariableEnvironmental Performance

The outcomes presented in mention above table of model summary indicating that the value of adjusted r-square is (0.354) which illustrates that green supply chain practices can predicts 35.4% variance in environmental performance, while this relationship has the chances of error which is 0.66363.

Table 07: ANOVA

ANOVAª

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	53.940	1	53.940	122.479	.000b
	Residual	97.329	221	.440		
	Total	151.270	222			

a. Dependent Variable:: Environmental Performance

b. Predictors: (Constant), Green supply chain practices

The ANOVA table of the regression analysis determines the significance of the overall relationship between environmental performance (EP) and green supply chain practices (GSCP). The outcomes show that the sig-value is 0.00, which means green supply chain practices (GSCP) have a significant relationship with environmental performance (EP).

Table 08: Coefficients

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	Environmental Performance	1.265	.206		6.149	.000
	Green supply chain practices	.672	.061	.597	11.067	.000

a. Dependent Variable: : Environmental Performance

The above coefficient section of regression analysis determines the effect size of the independent variable on the dependent variable. According to the results, the beta value is (0.597) and the sig-value is (0.000 <0.05), which means if green supply chain practices (GSCP) increase by a single unit, then environmental performance (EP) will significantly increase by 0.597 units. So the hypothesis was retained.

4.6.2 Hypothesis 2

Hypothesis 2 proposed that "green supply chain practices have a positive influence on operational performance." This hypothesis was tested by simple regression analysis. Summarized outcomes are presented in the below tables:

Table 09: Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.455a	.207	.204	.61294

a. Predictors: (Constant), Green supply chain practices
b. Dependent VariableOperational Performance

The outcomes presented in mention above table of model summary indicating that the value of adjusted r-square is (0.204) which illustrates that green supply chain practices can predicts 20.4%

variance in Operational performance, while this relationship has the chances of error which is 0.61294.

Table 10: ANOVA

Model3	Sum of Squares	Df	Mean Square	F	Sig.
ANOVAa					
1 Regression	21.717	1	21.717	57.806	.000b
Residual	83.028	221	.376		
Total	104.745	222			
a. Dependent Variable:: Operational Performance					
b. Predictors: (Constant), Green supply chain practices					

The ANOVA table of regression analysis determine the significance of overall relationship between Operational performance (OP) and green supply chain practices GSCP. The outcomes show that, as the sig-value is (0.00) which means green supply chain practices (GSCP) has the significant relationship with Operational performance (OP)

Table 11: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
Coefficients					
	B	Std. Error	Beta		
1 Operational Performance	2.140	.190		11.266	.000
Green supply chain practices	.427	.056	.455	7.603	.000
a. Dependent Variable: : Operational Performance					

The given above coefficient section of regression analysis determine the effect size of independent variable on dependent variable. According to results the value of beta is (0.455) and sig-value is (0.000 <0.05) which means if green supply chain practices (GSCP) increases by the single unit then the Operational performance (OP) will significantly increase by 0.455 unit. So the hypothesis two was retained.

4.6.3 Hypothesis 3

The hypothesis three proposed that "green supply chain practices has positive influence on Economic performance" this hypothesis was tested by simple regression analysis. Summarized outcomes are presented in given below tables:

Table 12: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Model Summary				
1	.472a	.223	.219	.59502
a. Predictors: (Constant), Green supply chain practices				
b. Dependent VariableEconomic Performance				

The outcomes presented in mention above table of model summary indicating that the value of adjusted r-square is (0.219) which illustrates that green supply chain practices can predicts 21.9% variance in Economic performance, while this relationship has the chances of error which is 0.59502.

Table 13: ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
ANOVAa					
1 Regression	22.402	1	22.402	63.272	.000b
Residual	78.246	221	.354		
Total	100.647	222			

a. Dependent Variable:: Economic Performance

b. Predictors: (Constant), Green supply chain practices

The ANOVA table of regression analysis determine the significance of overall relationship between Economic performance (ECP) and green supply chain practices GSCP. The outcomes shows that, as the sig-value is (0.00) which means green supply chain practices (GSCP) has the significant relationship with Economic performance (ECP)

Table 14: Coefficients

Coefficients					
Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig.
1 Economic Performance	2.133	.184		11.565	.000
Green supply chain practices	.433	.054	.472	7.954	.000

a. Dependent Variable: : Economic Performance

The given above coefficient section of regression analysis determine the effect size of independent variable on dependent variable. According to results the value of beta is (0.472) and sig-value is (0.000 <0.05) which means if green supply chain practices (GSCP) increases by the single unit then the Economic performance (ECP) will significantly increase by 0.472 unit. So the hypothesis three was retained.

4.6.4 Hypothesis 4

The hypothesis four proposed that "green supply chain practices have positive influence on Social performance" this hypothesis was tested by simple regression analysis. Summarized outcomes are presented in given below tables:

Table 15: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.437a	.191	.188	.73793

a. Predictors: (Constant), Green supply chain practices

b. Dependent VariableSocial Performance

The outcomes presented in mention above table of model summary indicating that the value of adjusted r-square is (0.188) which illustrates that green supply chain practices can predicts 18.8% variance in Social performance, while this relationship has the chances of error which is 0.73793.

Table 16: ANOVA

ANOVAª					
Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	28.480	1	28.480	52.300	.000b
Residual	120.345	221	.545		
Total	148.825	222			

a. Dependent Variable:: Social Performance

b. Predictors: (Constant), Green supply chain practices

The ANOVA table of regression analysis determine the significance of overall relationship between Social performance (SP) and green supply chain practices GSCP. The outcomes shows that, as the sig-value is (0.00) which means green supply chain practices (GSCP) has the significant relationship with Social performance (SP)

Table 17: Coefficients

Coefficients					
Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig.
1 Social Performance	1.872	.229		8.187	.000
Green supply chain practices	.489	.068	.437	7.232	.000

a. Dependent Variable: : Social Performance

The given above coefficient section of regression analysis determine the effect size of independent variable on dependent variable. According to results the value of beta is (0.437) and sig-value is (0.000 <0.05) which means if green supply chain practices (GSCP) increases by the single unit then the Social performance (SP) will significantly increase by 0.437 unit. So the hypothesis four was retained.

5. Discussions, Conclusion and Recommendations

5.1 Conclusion

The aim of research is to evaluate the impact of green practices in the supply chain on social, environmental, economic, and operational performance. Current research was done on the manufacturing sector, specifically on the textile firms located in Karachi, Pakistan. Research was done using a quantitative approach. Basically, the research was conducted on existing research studies, such as Natural Resource-Based View Theory (NRBV). The targeted population of research is all the employees working in the SC department of textile firms. To obtain data, it was not possible to collect data from the whole population; thus, the sample size was calculated using G* Power software. Thus, a sample size of 223 was calculated. A structured questionnaire was developed and circulated among 250 employees, from which 223 responses were obtained that were used to obtain the final results of the research. To test the hypothesis, SPSS software was used, and regression analysis was done, through which it was found that all the proposed hypotheses were retained. It was found that green practices in the supply chain have a positive impact on the social, economic, environmental, and operational performance of manufacturing organizations. Among all the variables, it was observed that green SC practices have the greatest impact on the environmental performance of firms, as they have the highest beta value of 0.597. Thus, we can conclude that the execution of green practices in textile firms can enable them to enhance their capabilities and competencies in terms of environmental performance and others.

5.2 Discussion

All the proposed hypotheses were consistent with existing studies, as all the hypotheses were retained. The current findings of the research study are discussed in the following sections:

Hypothesis one, "Green supply chain practices have a positive influence on environmental performance," was retained, and the answer to research question one is: Does green supply chain practice have a relationship with environmental performance? It matched the existing literature. For instance, many authors have established that green practices in SC have a positive influence on the performance of the environment (Green et al., 2005; Kannan et al., 2005). GPs are the dominant strategies that mainly depend on the demands and needs of their clients for managing products according to the environment. These practices basically allow firms to acknowledge and fulfill the needs of their customers or clients. All four main GP's are related to each other and require cross-functional support from the executives of the organization; thus, it is concluded that industrial engineering and management are crucial elements to increasing the performance of the company. The findings of another study stated that IEM is the practice that influences the performance of the environment (Kannan et al., 2005). Eco-design is also another practice of GSCM that suggests designing products by following ecological standards by following their life cycle. The design of a product can be generated, managed, and utilized by reducing the energy and utilization of products and designing eco-friendly items.

Consequently, minimization occurs in generating waste that ultimately leads to increased EP. Cooperation with suppliers for the sake of GP provides smooth and clean operational activities specifically related to production (Zhu & Sarkis, 2008).

Hypothesis two, "The green supply chain has a positive influence on practices operational performance," was retained, and the answer to research question two was:Does green supply chain practice have a relationship with operational performance? It matched the existing literature. For instance, GPs are likely to increase the performance of operations through improvements in the quality of products, reduce the level of inventory, and increase the status of accuracy in delivery time (Green et al., 2012). The researcher Yu et al. (2018) believed that GPs have a positive and significant impact on OP, specifically in terms of flexibility, accurate delivery, product quality, and cost. GPs offer a chance for the improvement of firm processes, waste recycling, and drawing new customers and suppliers. Green practices enable firms to save money and reduce delivery times by maintaining cooperation with their suppliers and customers. It also minimizes the level of inventory. Therefore, enhancing OP (Zailani et al., 2012)

Hypothesis three, "green supply chain has a positive influence on practices and economic performance," was retained, and the answer to research question three was: Does green supply chain practice have a relationship with economic performance? It matched the existing literature. For instance, the performance of the economy is mainly related to the sector of manufacturing competence to minimize the level of related costs associated with the bought material, consumption of energy, waste management, and release of waste for ecological purposes (Baah et al., 2022). Businesses can achieve their objectives on the path to a successful economy by reducing energy consumption and waste. Secondly, manufacturing units can indirectly achieve benefits for the economy by enhancing elements of loyalty and reputation of the company by executing GPs (Abdullah & Thurasamy, 2015). Few research studies in the same field obtained the results that GPs positively influence economic performance (Zhu et al., 2017; Zhu & Sarkis, 2007).

Hypothesis four, "green supply chain has a positive influence on practices and social performance," was retained, and the answer to research question three was: Does green supply chain practice have a relationship with social performance? It matched the existing literature. For instance, the worldwide movement and variations that have occurred in the last few years enable firms around the world to take action on the factor of social responsibility. The community highly needs to certify business-related activities. Consequently, the significance of sustainability in communities in balancing and keeping sustainability in the corporate system has grown, and it is predicted that businesses are more delicate towards the relations of stakeholders. The approach to social performance was evaluated by means of practices like social projects, the safety of investors, and education-related prospects for every worker or employee. The research studies that are presented above evaluated the impact of green practices on ecological and economic performance.

5.3 Implications

The current study has provided few practical implications for policymakers and practitioners related to manufacturing. Many of the practitioners and manufacturers of countries give preference to enhancing their economic situations and avoid taking risks specifically related to the economy. But the author Hart (1995) stated that there is no chance for industries that put efforts into achieving short-term profits to be successful for a long period of time while ignoring the ecological situation. Current research accounts for the significance of performing in a win-win situation in which the aim of gaining profits overlaps with the goal of profit maximization but also social gains. Moreover, the current study will provide support to firm managers in order to attain knowledge and information about the related benefits of green practices.

This particular research has certain implications for practitioners. This empirical research provides an effective and strong basis for practitioners and managers to introduce and implement the concept of green practices in the SC system for achieving financial benefits and also achieving market-

based goals. The results of the study highly encourage executives and managers to adopt green practices in their internal SC processes. As it will help firms in cleaner production that will continuously enhance sustainability in their processes, reduce the level of risks for humanitarians, and also minimize risk for the environment.

5.4 Limitations and Recommendations

Every research study has some limitations, and the researcher also gives some recommendations to future researchers as well as the organization to fill these limitations. This study also has the a few limitations and recommendations; including, the researchers tested the adoption of green supply chain practices by textile firms in Karachi and found that the GSCP adopted by textile firms can enhance EP, SP, and OP. It is recommended that it be tested in other manufacturing sectors, i.e., pharmaceuticals, automotive, printing and packaging, etc. So the current framework can be generalized. This study focuses on overall green supply chain practices and explores their impact on corporate performance, i.e., environmental performance, operational performance, and social performance. It is recommended for future studies to expand this framework by adding various green supply chain practices and testing individual practices on internal organizational performance. In Pakistan, there is less focus on green environmental practices. This study found that GSCP plays a vital role in the enhancement of environmental performance, social performance, and operational performance. So, the textile sector should implement the GSCP in their operations. This study focuses on the direct impact of GSCP on corporate performance and does not focus on other related factors. In future studies, some control variables can be incorporated, i.e., firm age, size, and environmental management certification.

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