

COVID-19: The Black Swan for Green Supply Chain Management in Pakistan

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ABSTRACT

For the last few decades, the business practices have primarily been focusing on the green and sustainable practices that mainly focus on the preservation of the environment and correspond to corporate social responsibility. But the sudden outbreak of the COVID-19 pandemic has left unprecedented effects on the business world. Against this backdrop, the current study entails investigation of the antecedents and consequences of green supply chain management in the post-COVID-19 era. The term black swan stands true for the event. The term could be believed to be accurate as all aspects of the supply chain have been observed to be influenced by the swan (customers with panic/regulated buying, suppliers with hoarding, inventories witnessing bullwhip effects). The current study, therefore, offers a novel explanation by linking various actors of green supply chain management and how the interplay of those actors can influence the supply chain and overall firm performance post COVID-19.

KEYWORDS

Environmental Orientation (EO), Firm Performance, Green Supply Chain Management (GSCM), Supply Chain Quality Integration (SCQI)

1. INTRODUCTION

In this increasingly globalized world, the businesses are confronting with enormous challenges to remain competitive. And among many others, Greening is one of an important sustainability challenge which warrants organizational level intervention (Kuei et al., 2015; Savita et al., 2016). Therefore, the incorporation of green perspective into firm's strategic, functional, and operational levels is inevitable (Zhu et al., 2017). However, the debate over whether the green practices should be holistic

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encompassing both internal and external aspects of businesses, is still in its infancy stage (Linton et al., 2007; Zhu et al., 2008; Kohli & Hawkins, 2015; Vanalle et al., 2017). In this context, increasing concerns have been raised by various stakeholders over the organizational efforts and practices in going green (Linton et al., 2007). Though greening efforts entails very high investments costs (Freedman & Jaggi, 1981; Rothenberg et al., 2001; Wiseman, 1982; Zhu & Sarkis, 2004; Zhu, Sarkis, & Geng, 2005; Zhu, Sarkis, & Lai, 2007), nonetheless, its benefits are widely believed to outweigh the costs associated with it (Diabat et al., 2013; Kleindorfer et al., 2005; Orlitzky et al., 2003).

Going green is particularly a challenging task for the manufacturing firms because they have to maintain the production efficiency amid green considerations (Majumdar & Sinha, 2019; Tumpa et al., 2019). To make matters worse, the emergence of a world-wide pandemic in the shape of COVID-19 has made the task of going green even more challenging by disrupting the already in-placed greening processes (Araz et al., 2020). Thus, it goes without saying that COVID-19 has disrupted the supply chain (SC) networks worldwide. For instance, the SC of 94% of the Fortune 1000 firms have been negatively affected by the pandemic (Fortune, 2020). Around 5 million companies across the globe have direct or indirect supplier relationships with firms operating from Wuhan, China (the city where COVID-19 originated). Besides, 938 out of 1000 Fortune firms have tier-two or tier-one suppliers in the Wuhan region (Dun & Bradstreet, 2020). Therefore, it led to negative consequences on the global supply chain due to the lockdown of Wuhan city. Similarly, it has been observed that those regions having factories, warehouses and other operational facilities were often subject to closures and lockdowns because of high population densities. The resulting decrease in the socialization and commercial activities has led to undermine the operational and financial sustainability of the firms (Linton & Vakil, 2020).

COVID-19 has disrupted the SC networks like a “double-edged sword” The pandemic has not only affected the supply side of the SC but the demand side of SC has also been adversely influenced. The decrease in social activities due to the lockdown has reduced the demand for the products (Paul & Chowdhury, 2020) which led to minimal supply chain activities. Therefore, how to maintain firm’s financial sustainability in such uncertain Covid-times is a billion-dollar question which has led the academia to explore an area of research that was never investigated before. According to Ivanov (2020), there is a dearth of literature focusing on this very issue as she pointed out that “*the literature on analyzing the impacts of epidemic outbreaks on the commercial SCs is scarce* (p.2)”. Haleem et al., (2020) also suggested that the economic repercussions of pandemic are enormous as it has disrupted the world’s economic activities leading to disequilibrium in demand-supply balance, thus affecting the businesses, governments, and society as a whole. Therefore, the value of conducting such a study in these uncertain times caused by the COVID-19 pandemic is a contribution to the state of the art.

Another important line of inquiry which is not yet being given fair share of attention is the declining financial performance of firms due to the COVID-19 (Shen et al., 2020). It has been observed that the firms’ performance has been adversely affected both directly and indirectly during the pandemic times. The direct impacts have affected the costs associated with production, inventory, orders, and quality loss, whereas, indirectly, it has caused reduction in demand, lower purchasing capacity of customers, and disruption in SC (Shen et al., 2020). However, interestingly, the evidence found that sustainable firms have faced fewer financial losses compared to the less sustainable firms (Pasto & Vorsatz, 2020). Moreover, as noted earlier, the extant literature is rather scarce that highlights the performance of green firms in pandemic situations in the developing countries at large, let alone Pakistan. Therefore, the sustainable practices adopted by the firms in the wake of COVID-19 pandemic are an interesting line of inquiry which warrants further investigation.

Against this backdrop, the core aim of this study is to investigate the financial performance of sustainable firms that are part of manufacturing industry of Pakistan during COVID-19. Particularly, it aims to investigate the impact of environmental orientation of firms on their financial performance during COVID-19. We assume that this relationship has channeled through the Supply Chain Quality Integration (SCQI – defined as the inter firm relationship with suppliers and distributors/customers;

Carter & Ellram, 1994) and Green Supply Chain Management (GSCM – which covers the efforts to protect environment in the supply/value chain process; Zhu et al., 2007; An, 2008). Both SCQI¹ and GSCM² requires involvement of internal and external stakeholders (Flynn & Flynn, 2005; Huo et al., 2013; Vachon & Klassen, 2008). Therefore, the widespread nature of stakeholders could have influence on overall outcomes of SCQI and GSCM, the effects of which are yet to be tested empirically and thus it will be another key contribution of this study to the existing literature.

Another important contribution of this study is to analyze the environmental orientation of firms during the Covid times. The environmental orientation is led by both internal and external factors and its link with suppliers and distributors are also determined by such consideration (Lai et al., 2013; Zhu & Sarkis, 2007). Proactive environmental initiatives require the collaboration of supply chain players in quest for environmental protection (Ateş et al., 2012; Li et al., 2016). Suppliers and distributors, being the major partners, are often considered valuable in achieving ecological goals of firms. But how such orientation is linked with SCQI and GSCM and how these integrated factors influence the firms' performance in the time of pandemic is an area that has been largely ignored in earlier research studies. Consequently, this study aims to address this gap by investigating the impact of firms' environmental orientation on the financial performance of firms having green supply chain practices in this global pandemic situation. Furthermore, it also carries out an investigation of mechanism of SCQI and GSCM between the relationships of aforementioned variables through a serial mediation mechanism.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Environmental Orientation and Firm Performance

Environmental orientation is defined as the extent to which managers of the firm recognize the importance of firm's environmental problems. It is often embodied in corporate mission statements and includes two dimensions: internal environmental orientation and external environmental orientation (Benerjee, 2002). Therefore, it is a firm's action with an aim to improve the environment (Chan et al., 2012). In recent times, various stakeholders (i.e., government, regulators, customers and society) have stressed upon organizations to focus on protecting their environment (Gadenne et al., 2009; Leonidou et al., 2010). Its value has also been signified by the internal stakeholders because of its ability to save costs, increased employee morale, risk mitigation, customer attraction (Porter & van der Linde, 1995; Stone & Wakefield, 2000), and brand reputation (Doluca et al., 2018). Organizations are also forced to implement ecological strategies e.g., severe penalties are imposed on businesses not complying with environmental laws (Ervin et al., 2013; Patton & Worthington, 2003). Past studies have found that such strategic considerations increase firms' performance (Annandale et al., 2004; Golicic & Smith, 2013; Menon & Menon, 1997; Orlitzky et al., 2003; Stone & Wakefield, 2000; Zhu & Sarkis, 2004). An important aspect of firm's performance is the financial gains and the green investments directly and indirectly influence the financial performance of a firm. Such investments and considerations reduce cost (Porter & van der Linde, 1995; Stone & Wakefield, 2000) and consequently firms can derive financial benefits. Similarly, building customers' trust (Doluca et al., 2018), and brand attraction (Porter & van der Linde, 1995) lead to high sales volume and ultimately better financial performance. Thus, it is assumed that environmental orientation of a firm can positively influence its financial performance. It is hypothesized as follows:

H1: Environmental orientation positively influences firm's financial performance.

2.2 Environmental Orientation and GSCM Practices

Environmental orientation (both internal and external orientation) can influence GSCM in many ways. For instance, Chan et al. (2012) highlighted that both internal and external stakeholders

determine the pathways of the firm and orientation towards the environment and decisions related to supply chain are also influenced by such orientation. Internal environmental orientation focuses on the intra learning and knowledge sharing among employees at different levels which is an act of pro-environmental ideology initiated by corporate managers. Owing to the exhortations of these managers, this ideology is fused into the entire organization (Egri & Herman, 2000; Sharma, 2000). Such ideological stances motivate members of the organization to develop collective ecological operations and ultimately encourage them to identify ways that reduce environmental impact of business operations (Banerjee et al., 2003). While making choices for GSCM, such managers and employees consider the environmental footprints of the supply chain activities, and their eco-orientation influences their supply chain decisions.

On the other hand, through external environmental orientation, organizations are required to respond to demands of various stakeholders (Schout, 1991). If an organization functions within the constraints imposed by these institutions, it will enhance its legitimacy, stability and probability of survival (DiMaggio & Powell, 1983). According to Banerjee et al. (2003), these players construed external stakeholders as a group that impose formal (e.g., regulations) and informal (e.g., norms) rules that guide organizations to manage its affiliation with natural environment. Thus, managers with external environmental orientation would consider the ecological perspective of supply chain and would select those suppliers and distributors that can meet the environmental goals of the organization. It is therefore assumed that the environmental orientation of organizations influences the supply chain decisions and as a result, green practices are often cherished. Based on this assumption, the study hypothesizes it as follows:

H2: Environmental orientation positively influences GSCM practices.

2.3 Environmental Orientation and SCQI

As environmental orientation is both led internally and externally, the link of a firm with its suppliers and distributors are also determined by such consideration (Lai et al., 2013; Zhu & Sarkis, 2007). Proactive environmental initiatives require the collaboration of supply chain partners for environmental protection (Ateş et al., 2012; Li et al., 2016). Suppliers and distributors, being the major partners, are often considered valuable in achieving ecological goals of firms. For instance, Sony (China) has introduced “green partner quality certification system” that encourages all its partners to obey environmental standards set by the organization. Since 2002, around 1000 firms in China becomes green partners of Sony. In the same fashion, Huawei also introduced green partner certification program that motivate associated suppliers to consider the concepts; product life-cycle management and environmental management system (Yu et al., 2019). It has been observed that by applying quality integration, green capabilities of manufacturers and customers aligns with the overall green focus of the industry (Wu, 2013). Such practices ensure that the supply chain practices, following the firms’ orientation, try to safeguard environment and protect the ecological interests of firms. Thus, it is expected that higher the environmental orientation at the organizational level, the greater would be the chances of integration of various partners. Thus, the following hypothesis is assumed:

H3: Environmental orientation positively influences SCQI.

2.4 SCQI and GSCM Practices

SCQI covers both Supplier Quality Integration (SQI) and Customer Quality Integration (CQI). The SQI is defined as the process of establishing and maintaining collaborative relationships with the vendors so that the overall production processes are improved (Huo et al., 2013; Kuei et al., 2008). Such integrated relationships help in managing purchase and manufacturing processes, workflows, material sourcing and utilization (Flynn et al., 2010). Often SQI focused firms encourage suppliers

to contribute to environmental protection by having ISO 14001 certification (Flynn et al., 2010) and such practices lead to evolution of GSCM practices. Similarly, CQI advances quality proficiency by integrating customers' demands, interests, and preferences in product design and quality enhancement (Huo et al., 2013). When customers are part of quality integration, it has been observed that the ecological performance of a firm increases through adoption of green supply chain practices because customers prefer green practices (Zhu et al., 2005). Because these practices influence overall ecological footprints, the firms' involvement and focus on GSCM practices increase which ultimately leads to increased corporate image and improved performance (Kuei et al., 2008; Rao & Holt, 2005).

H4: SCQI positively influences GSCM practices

2.5 SCQI and Firm Performance

As SCQI represents both inter firm relationships i.e., with suppliers and distributors/customers (Carter & Ellram, 1994), it could be useful in developing other inter-firm collaborations (Dyer & Singh, 1998; Lorenzoni & Lipparini, 1999). The issue is more pertinent for manufacturing firms where global competition influences the overall firms' practices (Soltani et al., 2011). This encourages organizations to integrate quality measures in upstream and downstream supply chain operations (Flynn & Flynn, 2005; Huo et al., 2013). The SCQI influences the quality, lead-time, production volume and overall sales (Armistead & Mapes, 1993). SCQI improves firms' performance by valuing the role of suppliers and customers (Flynn et al., 2010) and so the partners aid internal and external SC operations. Additionally, integrating with supply chain partners results in decreasing the cost of financial exchanges and transactions among SC partners (Yang & Wei, 2013). Therefore, it is assumed that SCQI increases overall firm's financial performance, which is hypothesized below:

H5: Supply chain quality integration positively influences firm's financial performance

2.6 GSCM Practices and Firm Performance

The literature on green practices is full of mixed opinions as three schools of thoughts are present in this regard. The followers of first school of thought believe that implementing GSCM practices causes financial burden on an organization and such practices require huge investments with no possibility of short-term returns (Rothenberg et al., 2001; Zhu, Sarkis, & Lai, 2007). Others believe that GSCM practices increase operational cost in terms of procuring eco-friendly materials and items, hence, leads the firm to experience poor financial performance (Freedman & Jaggi, 1981; Wiseman, 1982; Zhu & Sarkis, 2004; Zhu, Sarkis, & Geng, 2005). So, the second school of thought suppose that environmental and financial performance are not related as it is merely a tradeoff between firms' environmental and financial performance. Whereas the followers of third school of thought argue that implementation of GSCM practices is positively related to organizational performance as it leads to increased customer satisfaction (Kleindorfer et al., 2005), reduced operational cost (Orlitzky et al., 2003), improved organizational image (Porter, 1996) and create more market opportunities (Diabat et al., 2013). As GSCM practices concentrate to reduce the adverse impact on the environment through forward and backward operations of supply chain (Vachon & Klassen, 2008), and there is increased focus on environmental effects of organizations (Chien & Shih, 2007), it is expected that the positive effects of GSCM would outweigh the associated costs. Furthermore, as GSCM has both direct and indirect bearings on the financial outcomes of a firm, it is expected that the financial performance of firms would increase when its involvement in GSCM practices is enhanced. Therefore, following hypothesis is proposed:

H6: GSCM practices positively influence firms' financial performance.

2.7 Mediating Role of SCQI & GSCM Practices

As a matter of fact, firms' financial performance is an outcome of various factors ranging from internal (e.g., environmental orientation), to integrations with external stakeholders (i.e., SCQI and GSCM) so, the link among these factors is rather obvious. The environmental orientation possesses strategic capability that guide organizations' strategy and behavior that ultimately improves performance parameters (Chan et al., 2012; Russo & Fouts, 1997). Therefore, environmentally friendly firms actively participate in reconfiguring their corporate practices to reduce the negative environmental impact of firms' operations and products (Banerjee et al., 2003). It requires proactive management of complex and changing environment in order to initiate successful quality integration and GSCM practices and resultantly enhancing organizations' valuable strategic capability (Gabler et al., 2015; Russo & Fouts, 1997). Such integration and GSCM focus align both the internal and external strategic orientation of the firms (Chan et al., 2012).

Furthermore, as the firm's performance is an outcome of both quality integration between internal and external stakeholders, the role and involvement of management, suppliers, customers and other stakeholders increases (Zhao et al., 2013). Integration between manufacturers and suppliers helps a firm to have best knowledge on production scheduling, delivery, lead time and inventory levels that assist firms to have inter-organizational processes optimization (Zhang & Huo, 2013; Zhao et al., 2013), improved quality, increased delivery and cost benefits (Robinson & Malhotra, 2005; Yeung, 2008). All of these aforementioned factors eventually contribute to improving overall firm's performance (Flynn & Zhao, 2014).

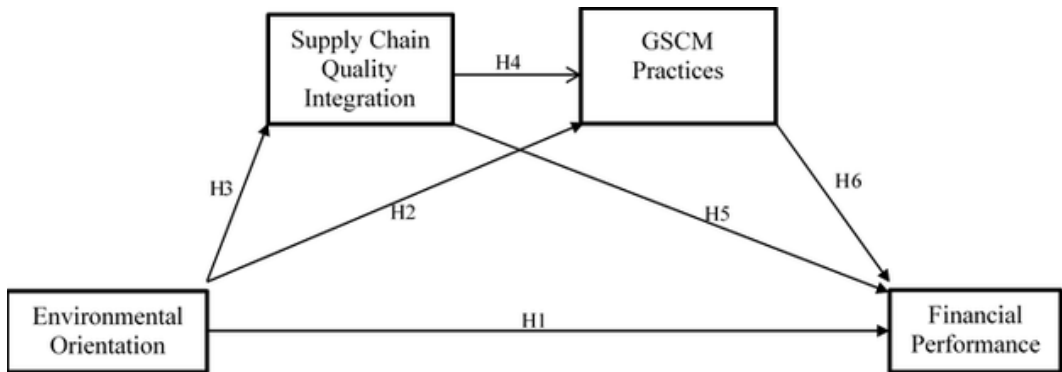
Similarly, customer quality integration encourages organizations to better understand customers' environmental concerns and requirements which mitigates design errors (Kaynak & Hartley, 2008) and improves quality through better product development (Lai et al., 2012). Furthermore, efforts aimed at protecting environment (through integrated and green SC) improve the corporate image and overall firm performance (Yu et al., 2019). The integrated SC reduces waste and defects, thus plummeting burden on natural resources and ultimately improving firms' impact on environment (Kuei et al., 2008; Vachon & Klassen, 2007; Wiengarten & Pagell, 2012; Zhu & Sarkis, 2004) which is the basis of firms' performance. Thus, it is assumed that environmental orientation of firm leads to both SCQI and GSCM which further improve firm performance; hence a serial mediation mechanism is assumed and hypothesized below:

H7: Environmental orientation and financial performance relationship is serially mediated by SCQI and GSCM practices.

This study draws its origin from the resource-based view (RBV) and stakeholders' theory for analyzing external environmental pressures in context of environmental orientation, institutional theory for analyzing internal environmental pressures and eco-modernization theory (EMT) for GSCM practices. Stakeholder theory asserts that firms need to sustain their competitive advantages via meeting stakeholders' demands. Resource-based View (RBV) can be used to complement stakeholder theory, because firms may perceive stakeholders' satisfaction as an important asset. Whereas Institutional Theory propagates that external factors such social, political, and economic pressures influence firms' strategies and organizational decision-making as firms seek to adopt legitimate practices in the view of other stakeholders (North, 1990). Further, Eco-modernization theory (EMT) was used to develop GSCM-related practices and policies where the latter is evaluated using the green innovation perspective (Berger *et al.*, 2001).

Based on the above theoretical and empirical linkages among the variables, Figure 1 below shows the proposed Framework:

Figure 1. Proposed framework`



3. RESEARCH METHODOLOGY

The data of the current study is collected from various manufacturing firms. These firms are the major source of environmental degradation and pollution through the release of toxic and hazardous wastes (Khan et al., 2009). Moreover, it has also been observed that some industrial estates in Pakistan unethically release a wide range of contaminants into their nearby natural drain which has long-lasting impact on ecosystem's sustainability (Mahmood et al., 2019). Bearing this in mind, the manufacturing sector of Pakistan needs to revive its corporate practices but there is a dearth of literature focusing on this very issue (Mumtaz et al., 2018a&b; Nadeem & Siddiqui, 2017). Hence, the data was collected from companies in Pakistan which were from textile, food and beverages, fertilizers and chemicals, automotive, pharmaceuticals, petroleum and electronics industries. More specifically, only those companies were selected which have ISO certifications 9001, 14001 and 26000 and are listed in Pakistan Stock Exchange (PSX) during this pandemic period. The selected organizations publish their annual reports for general public and such publicly available information exhibits that they effectively participate in environmentally sustainable development through green initiatives (Shahzad et al., 2020).

There are over 2,924 ISO certified manufacturing firms in Pakistan but considering the time constraints, a sample of 385 was considered representative of the population (Cochran, 2007; Comrey & Lee, 2013). This sample size is considered appropriate because if the sample size is more than 200, there are less chances of any problems with data normality (Hair et al., 2019). Moreover, GPower software was also used to calculate the minimum sample size and the result of its calculation has shown an even smaller number than 200 as minimum sample size required to achieve the power of 0.8. The unit of analysis for this study was organizations because firms' performance was to be assessed. The respondents of the study were selected through convenience sampling technique because sampling frame was not available. The 240 useful responses (62.33% response rate) are mainly from supply chain, operations, procurement, marketing, logistics, and production department with minimum qualification of graduation. As shown in Table 1 below, environmental orientation is measured using 11 items scale adopted from Wisker and Kwiatek (2019). A 14-items supply chain quality integration scale is adopted from the work of Baharanchi (2009), while the GSCM is operationalized by using Zhu, Sarkis, & Lai's (2008) 26 items scale measured on a five-point Likert scale. Firm's financial performance is measured using five items scale and it was also adopted from the work of Zhu, Sarkis and Lai (2008). The questionnaire used a survey instrument is given in the appendix at the end. All the adopted scales are being validated from previous studies and found to be reliable as the Cronbach alpha value of all scales are more than 0.7 (Hair et al., 2019).

Table 1. Variables and its Sources

Variables/Themes	No. of items	Adopted from	Scales
Environmental Orientation	11	Wisker and Kwiatek (2019).	5-point Likert scale (1-5) <i>strongly disagree to strongly agree</i>
SCQI	6	Baharanchi (2009)	5-point Likert scale (1-5) <i>strongly disagree to strongly agree</i>
GSCM	26	Zhu, Sarkis and Lai (2008)	5-point Likert scale (1-5) <i>Not at all to very large extent</i>
Firm Performance	5	Zhu, Sarkis and Lai (2008)	5-point Likert scale (1-5) <i>Not at all to significant</i>

Data was entered, screened, and analyzed in Statistical Package for Social Sciences (SPSS) version 24 (IBM, 2016). Missing cases exceeding 15 percent threshold were removed (Hair et al., 2019). The assumptions of regression analysis were tested and ensured. Serial mediation analysis was performed using the PROCESS Macro developed for SPSS (Hayes, 2017). Respondents' profile revealed that majority of the respondents (68%) belonged to supply chain department, while the rest were from marketing, procurement, logistics and operations department. 65% of the respondents belonged to middle level management and 80% of respondents have the work experience of up to 10 years.

4. EMPIRICAL RESULTS

Table 2 represents the results for descriptive statistics, correlation, and factor analysis. The mean scores (i.e., 2.88-3.95) are reported against five-point scale which shows the agreement of respondents about presence of environmental orientation, SCQI and GSCM at the organization. It is also evident that all the measures are reliable (Cronbach alpha values 0.72-0.93). The correlation results demonstrate that environmental orientation is significantly related with SCQI ($r = 0.17$, $p < 0.01$), GSCM ($r = 0.21$, $p < 0.01$), and financial performance ($r = 0.33$, $p < 0.01$). Similarly, SCQI is significantly related with GSCM ($r = 0.46$, $p < 0.01$) and financial performance ($r = 0.19$, $p < 0.01$). Furthermore, green supply chain management is also significantly and positively related with firm financial performance ($r = 0.29$, $p < 0.01$). Moreover, factor loadings are also above the threshold values of 0.50 (i.e., 0.533-0.927), while both CR and AVE values exceeded the standardized values (i.e., 0.50). The four factors model showed highest fitness values ($\chi^2/df=2.54$, $CFI=0.91$, $SRMR=0.039$, $RMSEA=0.041$), when compared with the one, two and three factor models.

The hypotheses testing results are shown in Table 3, where result outputs of Hayes Process Macro (Hayes, 2017) are reported. It is evident from the table that environmental orientation significantly influences financial performance ($\beta = .1096$, $p = .061$), GSCM ($\beta = .2834$, $p = .000$), and SCQI ($\beta = .1979$, $p = .000$). SCQI also significantly influences GSCM ($\beta = .1803$, $p = .022$), and financial

Table 2. Mean, Standard deviations and Pearson Correlation

	Mean	SD	Factor loading	CR	AVE	EO	SCQI	GSCM	FP
EO	3.95	0.56	0.533-0.871	0.89	0.53	0.86			
SCQI	3.64	0.91	0.613-0.834	0.95	0.59	.17**	0.93		
GSCM	3.51	0.74	0.592-0.926	0.91	0.52	.21**	.46**	0.92	
FP	2.88	0.53	0.715-0.927	0.82	0.54	.33**	.19**	.29**	0.72

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

performance ($\beta = .3091$, $p = .016$). GSCM predicts firm's performance significantly ($\beta = .1638$, $p = .011$). Thus, the direct paths are significant and H1-H6 are supported.

Results of serial mediation were also calculated by using Process Macro (Hayes, 2017). The benefit of this approach, as delineated by Van Jaarsveld et al. (2010, p. 1496), is that it allows the isolation of each mediator's indirect effect: GSCM and SCQI; further, this method also provides provision of investigation of "the indirect effect passing through both of these mediators in a series" (H7). This procedure is proposed by Hayes (2013) as a method that is way better than substitute assessments of mediating effects. Hayes' mediation approach "directly tests the indirect effect between the predictor and the criterion variables through the mediator via a bootstrapping procedure, addressing some weaknesses associated with the Sobel test" (Van Jaarsveld et al., 2010, p. 1497). The bootstrap re-sampling method requires a lot smaller number of assumptions than the Baron and Kenny's (1986) approach, offers tests of significance in small samples and is broadly recognized across vast array of literatures (Gardner et al., 2011). The results of serial mediation analysis are also shown in the table where it is evident that the all the indirect paths from employees' environmental orientation to financial performance are significant. The serial/sequential mediation results also highlight that the relationship between environmental orientation and financial performance is serially mediated by the SCQI and GSCM ($\beta = .2194$, LLCI = 0.0651, ULCI = -0.0252), thus H7 is also supported. Hence, the entire hypotheses in this study are found to be supported as shown in the table 4 below.

5. FINDINGS AND DISCUSSION

Environmental concerns have gained attention of stakeholders and influencing the way firm performance is gauged. This has led to emergence of the practices that lead to involvement of both internal and external stakeholders in the firms' green and sustainable activities. Of such activities, supply chain quality integration (SCQI) and green supply chain management (GSCM) have gained considerable attention with the advent of 21st century. Increasingly, organizations are realizing that environmental management and protection is the most important strategic issue. This requires firms to collaborate on quality issues with its supply chain partners i.e., suppliers and customers. Today, firms are under severe pressure by several players such as government, society and customers to act in an environmentally responsible manner. For example, more than 40,000 companies have applied

Table 3. Summary of sequential mediation

	B	SE	P	LLCI	ULCI
Direct effect:					
EO-FP	.1096	.0804	.061		
EO-GSCM	.2834	.0624	.000		
EO-SCQI	.1979	.0619	.000		
SCQI-GSCM	.1803	.0832	.022		
SCQI-FP	.3091	.0430	.016		
GSCM-FP	.1638	.0362	.011		
Indirect effect:					
Total indirect effect	0.1335	.0317		0.2151	0.0735
EO-SCQI-FP	0.0914	.0293		0.0117	0.0607
EO-GSCM-FP	0.0901	.0403		0.1531	0.0169
EO-SCQI-GSCM-FP	0.2194	.0174		0.0651	0.0252

Table 4. Summary of Hypothesis testing Result

Sr #	Hypothesis	Result
1.	<i>H1: Environmental orientation positively influences firm's financial performance</i>	Supported
2.	<i>H2: Environmental orientation positively influences GSCM practices.</i>	Supported
3.	<i>H3: Environmental orientation positively influences SCQI.</i>	Supported
4.	<i>H4: SCQI positively influences GSCM practices</i>	Supported
5.	<i>H5: Supply chain quality integration positively influences firm's financial performance</i>	Supported
6.	<i>H6: GSCM practices positively influence firms' financial performance.</i>	Supported
7.	<i>H7: Environmental orientation and financial performance relationship is serially mediated by SCQI and GSCM practices.</i>	Supported

for ISO 14001, the environmental management system, to keep up with the environmental standards (Zhu & Sarkis, 2006). Furthermore, the outbreak of pandemic in the previous and current year (i.e., COVID-19) has also transformed the way things were being practiced by businesses previously. Due to the closures, lockdowns and destruction of value chain (from supplier to customers), reduction in demands and the resultant decline in sales have created a novel economic crunch globally. This has led to poor financial performance of firms, which is yet another challenge which is faced by the firms to tackle along with existing challenges of ecological considerations. By valuing these firm level issues, an important objective of this study is to find a way of overcoming these challenges and reporting the determinants and mechanism that may provide a direction to improve financial performance of firms. By considering both the study's value and existing gaps in literature, this research entails investigation of effects of firms' environmental orientation on financial performance through serial mediation mechanism of SCQI and GSCM.

Environmental orientation refers to the firm and managerial ability towards environmental prevention and improves overall firm performance. These findings are consistent with the results of previous studies (e.g., Banerjee et al., 2003; Chan, 2010). To the best of researchers' knowledge, this is the first study of its kind that studied the impact of environmental orientation on firms' performances with the serial mediation of SCQI and GSCM in context of Pakistan manufacturing industry. The findings also elaborate the positive relationship of environmental orientation and supply chain quality integration. The extant literature is silent on this issue as the researchers could not find any study that has analyzed the impact of environmental orientation on supply chain quality integration. The prior studies have measured the results with suppliers' green development (Bai & Sarkis, 2010) but the findings of the current study highlight that environmental orientation improves the integration with suppliers and customers (SCQI) which improve the ecological considerations and overall financial performance of firms. Supply chain quality integration and firms' performance is positively correlated which is consistent with the findings of prior literature suggesting that organizational performance will enhance if organizations manage associations with their supply chain partners (Hamali, Prihandoko, Kurniawan, & Ramdhani, 2020; Subburaj, Sriram, & Mehroliia, 2020). It also enhances the quality and promotes operational efficiency which in turn lead to improved financial performance. The study also contributes to the GSCM practices context, as the past studies highlight the individual dimensions of GSCM predicted by the environmental orientation, e.g., green marketing, customer green cooperation, green purchasing, and investment recovery (Chan et al., 2012) but effects of environmental orientations and the overall effect of GSCM remains largely uninvestigated.

Both SCQI and greening the organizational supply chain processes aim to focus on protection of environment at large. Recently, organizations are focusing on GSCM practices on both its upstream and downstream ends in order to respond better in context of governmental and societal pressure. Such organizational efforts are found to have fruitful outcomes for organizations, e.g., enhanced

firm performance (Green et al., 2012; Tan et al., 2019). The results of our study also highlight that firms' financial performance is influenced by GSCM, SCQI and environmental orientation of firms. These results are consistent with the previous findings (e.g., Green et al., 2012). These findings thus support the school of thought that believes that green investments lead to increased firms' financial and overall performance (Khan & Qianli, 2017; Mitra & Datta, 2014) particularly in the times of challenging business environment such as COVID-19 pandemic. In the context of GSCM practices, present study confirms that firms' environmental orientation and supply chain quality integration help organizations in Pakistan to implement GSCM practices (improving customer green management) which improve the overall financial performance of firms by motivating suppliers and customers to invest in GSCM. Thus, the assumption of serial mediation through SCQI and GSCM is also supported.

6. STUDY IMPLICATIONS, LIMITATIONS, AND FUTURE DIRECTIONS

The changing environmental dynamics and increased focus on the environmental considerations influence the overall organizational strategies and practices (Halldórsson et al., 2015). In order to respond to these changes, firms need to incorporate both internal and external resources. This study focuses on integration of internal and external factors and their influences on the overall financial performance of firms. The originality of this research is represented through the conceptual framework build upon the existing literature which has not yet been empirically investigated. In course of that, this paper analyzes GSCM on overall SCM practices, which ranges from upstream to downstream practices (Yu et al., 2014).

Therefore, considering the afore-mentioned study gap and earlier calls for research, this study entails the investigation of firms' environmental orientation (both internal and external) and its influence on SCQI (suppliers and distributors/customer integration). Additionally, the inclusion of GSCM also adds value to the existing literature as it also covers the consideration of green values including various stakeholders (suppliers, distributors etc.) of supply chain value network. Thus, focus is on aligning the internal and external factors/stakeholders to achieve the ecological and environmental goals. This study further proposes that integration at these levels increases overall image, quality, reputation, and ultimately overall financial performance of a firm. Our findings contribute to this discussion by providing empirical support that environmental monitoring is an enabler of environmental collaboration. The relationship of these mechanisms has been empirically investigated in only few studies earlier in the sustainability context. Our findings are in line with Blome et al. (2014) who suggested that environmental monitoring of suppliers could act as an integrating force that deepens trust and collaboration between supply chain members. Halldorsson et al. (2015) also argues that a combination of the resource-based view and supply chain management is able to offer an inter-organizational view of competitiveness. Prior literature argues that GSCM practices can create valuable, rare, inimitable and non-substitutable resources. Hence, the consideration of both internal and external stakeholders in predicting the financial performance through green considerations is an addition to the existing literature.

Our findings highlight that financial performance is an outcome of consideration of both internal and external stakeholders. Internally the firms' orientation for environment gives direction to a firm and its management. If the environmental orientation is high, it is expected that the members would try to integrate the suppliers and customers/distributors in the supply chain and the organizational goals would become center of focus while developing such integrative relationship. Furthermore, it also highlights that high environmental orientation leads to evolution of GSCM practices where, again, the focus is on ecological considerations of firms. The mechanism of SCQI and GSCM collectively predict the financial performance of firm. This study responds to the research call of Yu et al. (2014) who found that both external and internal activities should be drawn upon by the firms and this would have synergistic effects on the firm performance.

This study provides an insight to the managers to improve financial performance of firms by embedding sustainable business practices. Though, this approach has been applied and empirically tested in developed countries, the evidence from the developing countries in general and Pakistan in particular, is very rare. During the ongoing pandemic of Covid-19, the transportation services are also being disrupted which has crippled the overall supply chain system of firms. Therefore, our findings propose that an autonomous mode of transportation should be in place to avoid delays in logistics. Wiseman (2021, p. 13) also propagates that new transportation technologies which provide a private space or space for very few people are the future transportation technologies.

Like others, our paper does have limitations which pave way for the future line of inquiries. The foremost recommendation for future research is to use longitudinal study design, thus accounting for the perceptions in the long-run particularly in the aftermath of COVID-19 pandemic. Another interesting line of inquiry could also be directed towards investigating the real time financial performance through various methods (e.g., Tobin's Q) in long run. Furthermore, the explanatory mechanism could be investigated in more detail, for instance, both the SCQI and GSCM are multidimensional constructs and testing them in tandem may not give true picture of all the aspects. Therefore, future researchers could investigate these constructs while considering them as a multidimensional measure. Last but not the least, the firm's performance may also be gauged by incorporating other aspects e.g., operational, innovative, environmental performance which could be linked to the financial performance.

DATA AVAILABILITY STATEMENT

The dataset used to infer the results of the current study is available from authors upon request.

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ENDNOTES

- ¹ SCQI can be defined as “the degree to which an organization’s internal functions and external supply chain partners strategically and operationally collaborate with each other to jointly manage intra- and inter-organizational quality-related relationships, communications, processes, etc., with the objective to achieve high levels of quality-related performance at low costs” (Huo *et al.*, 2013).
- ² GSCM is defined as integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes and the delivery of the final product to the consumers as well as an end-of-life management of the product after its useful life (Renewable and Sustainable Energy Reviews, 2016).

APPENDIX A - SURVEY QUESTIONNAIRE

Section 1: General Information

This section aims to understand more about you and your organization.

1. Gender
 - a. Male
 - b. Female
2. Age
 - a. 20 – 30
 - b. 31-40
 - c. 41-50
 - d. Above 50
3. Qualification
 - a. Intermediate
 - b. Graduation
 - c. Post-Graduation
 - d. Other
4. What is your current position level?
 - a. Top Management
 - b. Middle Management
 - c. Supervisory Level
 - d. Non-managerial
 - e. Other.....
5. What is your designation in the company?
 - a. Procurement / Supply Chain Manager
 - b. Operations Manager
 - c. Marketing Manager
 - d. Logistics Manager
 - e. Others.....
6. How long you have worked in the company?
 - a. **0-1**
 - b. 1 – 5 years
 - c. 5 – 10 years
 - d. More than 10 years
7. Is your organization an Environment Management System (EMS) certified?
 - a. Yes
 - b. No

SECTION 2

Table 5. Survey questionnaire

<i>1. Strongly disagree 2. disagree 3. Neither Agree nor Disagree 4. Agree 5. Strongly Agree</i>						
Sr. No	Environmental Orientation	1	2	3	4	5
1	Environmental issue is not very relevant					
2	Make an effort for every employee understand the importance of environmental preservation					
3	Promote environmental preservation as major goal across all department					
4	Has a clear policy statement urging environmental awareness in every area of operations					
5	Environmental preservation is high priority activity					
6	Preserving the environment is a central corporate value					
7	The natural environment does not currently affect firm's business activity					
8	The financial well-being of firm does not depend on the state of the natural environment					
9	Environmental preservation is largely an issue of maintaining a good public image					
10	Firm's responsibility to its customers, stakeholders, and employees is more important than our responsibility toward environmental preservation					
11	Environmental preservation is vital to our firm's survival					
	<i>Supplier Integration</i>	1	2	3	4	5
12	You have effective communication with your customers on research activities and new product development (R&D).					
13	You and your customers have transparent information about each other's inventory status.					
14	You and your customers provide each other with each other's production plan.					
15	You collaborate with your customers development program(s).					
16	You and your customers are aware of each other's medium-term and long-terms policy and strategies.					
17	You and your customers share technical information with each other if required.					
18	You have long-term relationships with your customers .					
	<i>Customer Integration</i>	1	2	3	4	5
19	You have effective communications with your suppliers on research activities and new product development (R&D).					
20	You and your supplier have transparent information about each other's inventory status.					
21	You and your suppliers provide each other with each other's production plan.					
22	You collaborate with your supplier's development program(s).					
23	You and your suppliers are aware of each other medium-term and long-terms policies and strategies?					
24	You and your suppliers share technical information with each other if required.					
25	You have long-term relationships with your suppliers .					
<i>1. Not at all 2. Small Extent 3. Moderate 4. Large Extent 5. Very Large Extent</i>						
Sr. No	Green procurement practices	1	2	3	4	5
26	Ensure suppliers meet their environmental objectives					
27	Require suppliers to have ISO 14001					
28	Purchasing energy saving equipment					

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Table 5. Continued

<i>1. Strongly disagree 2. disagree 3. Neither Agree nor Disagree 4. Agree 5. Strongly Agree</i>						
Sr. No	Environmental Orientation	1	2	3	4	5
29	Evaluate suppliers on specific environmental criteria					
30	Use paperless methods to order materials					
31	Procure products that are made using recycled packages					
	Green manufacturing practices	1	2	3	4	5
32	Produce products that have packages which can be recycled					
33	Control power consumption in the products					
34	Use Life Cycle Assessment to evaluate environmental load					
35	Replacing hazardous substances with that are environmentally friendly					
36	Ensure products have recyclable contents					
37	Minimize the use of materials in packaging					
38	Encourage reuse of products and recycled materials					
	Green distribution practices	1	2	3	4	5
39	Promoting recycling and reuse programs among the employees					
40	Use of alternative fuels					
41	Reducing the size of packaging					
42	Cooperating with suppliers to standardize packaging					
	Reverse Logistics	1	2	3	4	5
43	Seasonal inventory					
44	Processing returned merchandise					
45	Restocking					
46	Recalling salvage					
47	Screening defective merchandise					
48	Redistribution					
<i>1. Not considering it 2. Planning to consider it 3. Considering 4. Initiating implementation 5. Implementing successfully</i>						
	Eco-design	1	2	3	4	5
49	Design of products for reduced consumption of material/energy (ECO1)					
50	Design of products for reuse, recycle, recovery of material, component parts (ECO2)					
51	Design of products to avoid or reduce use of hazardous products and/or their manufacturing process (ECO3)					
<i>1. Not at all 2. A little bit 3. To some degree 4. Relatively significant 5. Significant</i>						
	Environmental performance (EP)	1	2	3	4	5
52	Reduction of air emission (EP1)					
53	Reduction of waste water (EP2)					
54	Reduction of solid wastes (EP3)					
55	Decrease of consumption for hazardous/ harmful/ toxic materials (EP4)					

continued on following page

Table 5. Continued

1. Strongly disagree 2. disagree 3. Neither Agree nor Disagree 4. Agree 5. Strongly Agree						
Sr. No	Environmental Orientation	1	2	3	4	5
56	Decrease of frequency for environmental accidents (EP5)					
57	Improvement of an enterprise's environmental situation (EP6)					
	Economic performance (ECP)	1	2	3	4	5
58	Decrease of cost for materials purchasing (ECP1)					
59	Decrease of cost for energy consumption (ECP2)					
60	Decrease of fee for waste treatment (ECP3)					
61	Decrease of fee for waste discharge (ECP4)					
62	Decrease of fine for environmental accidents (ECP5)					
	Operational performance (OP)	1	2	3	4	5
63	Increase amount of goods delivered on time (OP1)					
64	Decrease inventory levels (OP2)					
65	Decrease scrap rate (OP3)					
66	Promote products' quality (OP4)					
67	Increase product line (OP5)					
68	Improve capacity utilization (OP6)					

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