

**Linking Proactive Sustainability Strategy with Corporate Sustainability Performance:  
Determining Mediation and Moderation**

**Syeda Ridda Zainab**

Phd Scholar, Faculty of Management Sciences, International Islamic University, Islamabad at-  
[Kazmiridda@gmail.com](mailto:Kazmiridda@gmail.com)

**Kausar Fiaz Khawaja**

Faculty of Management Sciences, International Islamic University, Islamabad at-  
[kausar.khawaja@iiu.edu.pk](mailto:kausar.khawaja@iiu.edu.pk)

**Maryam Adrees**

Faculty of Management Sciences, International Islamic University, Islamabad at-  
[maryam.adrees@iiu.edu.pk](mailto:maryam.adrees@iiu.edu.pk)

**Abstract**

The purpose of this study is to investigate the role of proactive sustainable strategy on corporate sustainability Performance, determining mediation and moderation. For this, quantitative research approach was adopted and data was collected from 414 managers of telecom sectors of Pakistan. SPSS and AMOS was used to run statistical tests like: descriptive statistics, correlation, reliability and regression. The results revealed that all hypothesis H1, H2a, H2b, and H3 a, b, were accepted i.e. proactive sustainable strategy has a positive and significant impact on corporate sustainable performance by mediating and moderation. The study concluded with discussion limitation and future recommendation.

**Keywords:** Proactive sustainability strategy, Sustainable leadership, Corporate sustainability performance, Sustainability-oriented-Innovation Practices, Sustainability-oriented process and product deployment, Sustainability-oriented innovation competencies deployment

**Introduction**

Every information technology firm has a vision, mission, set of values and goals that they needed; and corporate strategies are set out these goals and priorities (Laljani, 2015). Firm strategy has been reported by leaders as managed to accomplish preset goals through the development and implementation of initiatives and policies (Laljani, 2015 and Andersen, 2000). The strategy has an important role to enhance corporate performance. Different types of Strategies can be used to enhance corporate performance. the strategy of change management is defined in terms of how a firm typically addresses change. It is a process that attempts to minimize any negative impacts that change creates while simultaneously capitalizing upon change (Aladwani2001); On the other hand, proactive strategies are those that businesses employ to predict challenges, risks and opportunities.

These strategies additionally contribute by minimizing or eliminating any associated expenditures and cutting down on operating expenses (Bronner and de Hoog, 2014). Proactive strategies are applicable to handle the threats, opportunities and challenges that an organization expects will take place in the future. Therefore the proactive strategy is a company's inclination to take the lead in altering its different strategic policies as opposed to responding to

circumstances. In the context of sustainability, Ashrafi et al. (2018) investigated the corporate sustainability of an organization that contributes most often to creating value from the social, environmental, as well as economic points of view, and encourages greater responsibility in the long term. Pathak et al; (2017) study reported IT industry can improve sustainability Performance through sustainability-oriented-innovation practices. According to Pathak et al. (2017a) sustainable oriented innovation practices use both technical and non-technological solutions from material procurement and manufacturing to operational organizational and success monitoring activities.

Moreover, Kasemsap (2018) reported that plastic of disposable electronic devices spreads pollution in the environment so to reduce environmental pollution and gain environmental sustainability; the IT industry has started doing recycling electronic waste and produce green product innovation. The same practices are followed in the Telecom industry of Pakistan. Furthermore, Ahmad, (2016); has described that Telenor is currently focusing on E-waste initiatives: Cell telephone recycling initiatives are being carried out in its business areas for many years. In addition, Telenor Pakistan prioritizes health, safety, defense, and the environment in its daily operations (HSSE). However, proactive sustainable strategy implementation is related to numerous risks, like: poor product and process inefficiency, over-utilization of useful resources, and non-conformity to standards of health and safety that can affect corporate sustainability performance. Top management could incorporate sustainable innovation practices into internal processes and policymaking to avoid sustainable strategic risks (Arjalies and Mundy, 2013; Bansal, 2005).

Thus, the purpose of conducting this study was to investigate whether sustainability-oriented innovation practices (product & process deployment and innovation competency deployment) mediates the relationship between independent variable proactive strategy and dependent variable sustainable performance. Corporate sustainability strategies is defined as balancing the needs of the company and society in terms of social, environmental, and economic factors (Baumgartner, 2014). According to Baumgartner and Rauter (2017) corporate-sustainability approach constitute of economical, environmental and social elements in align with strategic management process; that further illustrates a firm's strategic positioning for sustainable development. Similarly, Ukko, Nasiri, and Saunila, (2019) reported the need of developing and depolying sustainability strategy along with firm digital strategy and financial performance. Tsai et al, (2019) study investigated the Influences of environmental practices on performance. Besides all these studies conducted previously, Wijethilake (2017) and Tsai and Liao, (2016) reported the need to investigate the linkage between strategy- corporate performance in the Sustainability strategy domain.

Therefore the current study will investigate the association between proactive Sustainability Strategy and corporate sustainability performance. Maletic et al., (2015) has reported two forms of sustainable practices: sustainability-oriented process and product deployment (SOPPD) and sustainability-oriented innovation competencies deployment (SOICD). The SOPPD relates to the incorporation of sustainable aspects into the development of

products or processes; while the SOICD relates to the development and deployment of new knowledge and skills to facilitate technologies relating to sustainability and to deploy stakeholder skills. Besides these studies still, Maletič et al., (2015) in the future direction reported to investigate sustainability-oriented innovations practices as an antecedent corporate sustainability performance; whereas Tsai and Liao, (2016) illustrated that future research should examine the linkage between strategy–innovation–performance in the environmental strategy domain. In addition Alshehhi, Nobanee & Khare (2018) reported that more study is required to identify and connect relevant corporate factors with sustainability practices. Therefore keeping in sight the above-mentioned gaps the current study will examine the mediating role of sustainability-oriented innovation practices between proactive strategy and corporate performance.

### **Theoretical background and hypothesis development**

This study follows the theoretical underpinning of resource-based view theory (RBV) proposed by Barney (1986), which Werner thought was originally introduced in 1984 (Galbreath, 2005). It implies that a corporation is defined by the resources it incorporates, and thus each firm is distinct in terms of raw materials, assets, human capital, and human resources (Lin & Wu, 2014). According to RBV from Barney in 1991, businesses have heterogeneous resources and companies can have different strategies because they have varying resource combinations. They have different resource mixes. RBV says that the resources of the firm can be broadly specified to include the corporate assets, business processes, qualities of the business, information, or expertise that can help design and execute its strategies (Mata et al., 1995). Barney (1991) categorizes three kinds of resources: the physical and technical resources of plants and facilities, the human resources (training, experience, insights), and the resources of organizational capital (formal structure). Hence, with the current study, proactive sustainability strategy is intangible assets/resources that develop firm capabilities (Sustainability oriented innovation practice) that ultimately lead to firm performance (sustainability performance). In our research, firm resources are examined in terms of proactive sustainability strategy, sustainable leadership, and sustainability-oriented innovation practice, all of which contribute to the firm's competitive advantage and improve its performance. Furthermore, according to Gisip and Harun (2013), competitive advantage is context-specific. Therefore, this study will explore how companies' proactive sustainability strategy and Sustainability oriented innovation practice can help achieve sustainability performance.

### **Proactive sustainability strategy**

The strategy has an important role to enhance corporate performance. Different types of strategies can be used to enhance corporate performance. For instance, a knowledge management strategy is an approach that describes how a company manages its information and knowledge to better serve that company and its partners (Carrillo et al., 2000) the strategy for change management is defined as the manufacture in and around which an organization normally handles change. A strategy to mitigate any adverse effects caused by changed events and at the same time capitalize on the transition (Aladwani, 2001); Whereas proactive strategies are those which businesses use

to predict obstacles, threats, and opportunities, and help minimize operating costs by optimizing or removing some of them (Bronner & de Hoog, 2014). Some previous research has not been definitive about the links between sustainability and performance (Goyal et al., 2013; Hussain et al., 2018). For instance, Bhuyan et al. (2020) stated in cyber security research that the IT manager was considered to be an "application provider" and that it was not part of the strategic planning phase. This study reported there is a need for IT managers as part of strategic contributors. Because of this, they started a proactive approach for corporate sustainability performance.

### **Corporate sustainability performance**

Before considering the literature review on the link between sustainability-related innovation and corporate sustainability performance, it is crucial to define corporate sustainability. In recent years, the word CS has been designed as a precondition for obtaining improved company success (Linnenluecke & Griffiths, 2013). According to Schaltegger et al. (2013), CS can be defined as the successful market-oriented realization and integration of ecological, social, and economic challenges to a company. Moreover, CS is most commonly used to describe an organization's strategy for creating long-term value in societal, eco-friendly, and financial domains while inspiring greater openness (Ashrafi et al., 2018). Abdul-Rashid et al. (2017) investigated the impact of sustainable manufacturing techniques on sustainability performance. Citing to Li et al. (2020), proactive eco-friendly strategies improve eco-friendly performance by integrating green supply chains.

As stated by Ashrafi et al. (2018), CS is the most widely employed way by the corporation to develop value in the social, environmental, and economic domains from a long-term viewpoint, encouraging greater openness. (Pathak et al., 2017) study reported IT industry can improve sustainability Performance through sustainability-oriented-innovation practices. For example, in the early 1990s, HP noticed that governments would ban lead solders one day because lead is poisonous. It experimented with alternative solutions over the next decade, and by 2006 the company had produced solders that are an amalgam of tin, silver, and copper and had developed chemical agents to solder the problems of oxidation and defilement. As soon as HP came into force in July 2006, it must comply with the European Union directive restricting hazardous substances, which controls the utilization of lead in electronic devices (Nidumolu et al., 2009). This study reported there is a need in the IT business to grow sustainable goods and services by implementing proactive strategy through sustainability-oriented-innovation practice to investigate corporate sustainability performance (Pathak et al., 2017).

### **Sustainability-oriented innovation practices (sustainability-oriented process and product deployment and sustainability-oriented innovation competencies deployment)**

Pathak et al. (2017) reported that sustainable-oriented innovation practices use both technical and non-technical solutions, from material selection and manufacturing methods to organizational mission, structure, and performance reporting. Similar Pathak et al. (2017) stated that sustainable-oriented innovation practice is the development of products and services using non-polluting processes and systems, energy and natural resources conservation, economic

viability, safety and health for workers, communities, and consumers, and social and creative rewards for all working people.

However, the present research explores two sustainability-oriented innovation practices. One is sustainability-oriented process and product deployment and sustainability-oriented innovation competencies deployment. According to Pathak et al. (2017) sustainability-oriented innovation competence is the ability to reinvent operations with less energy and water usage, less pollution, less waste production, and experience in techniques such as carbon management, life cycle assessment, and the ability to know which goods or services are more environmentally sustainable and to know how renewable and non-renewable resources impact business ecosystems and industries. Similarly, keeping in mind the above analysis in the current study will investigate that the relationship between proactive sustainability strategy and corporate sustainability performance is mediated by sustainability-oriented process and product deployment and sustainability-oriented innovation competence deployment. According to Pathak et al. (2017), the sustainability-oriented process and product deployment are in two practices, green product innovation, and green process innovation, and sustainability-oriented innovation skills practice are in one form. These practices will be implemented in the current study for SOI innovation.

### **Sustainable leadership**

Sustainable leadership can thus be regarded as a management technique to enhance and produce sustainable returns, decrease excessive staff turnover, and drive innovation (Basu and Mukherjee, 2020). According to Lee et al. (2021), the most important factor in ensuring that sustainability is successfully implemented in the company is having a leader who actively advocates for the strategy. Adopting a proactive stance, sustainable leaders constantly watch the world for developments in the external market (George et al., 2021), and they maintain long-term relationships with both internal and external stakeholders. SL develop a long-term vision for their activities, prioritize green efforts, recognize sustainability issues, establish green governance frameworks, and promote both incremental and radical innovation (Basu & Mukherjee, 2020). Sustainability requires leaders who can devise methods, techniques, as well as programming, to promote financially viable community and organizational activities (Garcia de la Torre & Perez, 2021). SL is considered as the corporate core of green initiatives and environmental development, as it produces a sustainability vision for cultural transformation and collaborates with numerous stakeholders to combat climate change. (Al-Zawahreh et al., 2019). Many stakeholders in the green economy regard sustainable leadership as a high priority and widespread practice. According to Iqbal and Ahmad (2021), SL is viewed as a basic industry approach that facilitates organizational learning.

### **Research Hypothesis**

#### **Proactive sustainability strategy and corporate sustainability performance**

Proactive sustainability strategy has enhanced competitiveness through particular competencies (Sharma & Vredenburg, 1998; Bhupendra & Sangle, 2015), and it has a beneficial impact on csp in terms of cost benefit (Christmann, 2000). Additionally, according to Klassen and Whybark (1999), a proactive sustainability plan improves financial and environmental performance, skill

acquisition and development, manufacturing and environmental performance, and learning new abilities. (Judge & Douglas, 1998; Aragón-Correa et al., 2008), reducing waste and cost savings, improvement of quality in products and processes (Banerjee, 2001) and competitive advantages (Herrera, 2015). Wijethilake (2017) study examines that a sustainability control system has a mediating effect on the relationship of proactive strategy and corporate performance. The numerous drivers of corporate sustainability have recently been examined by (Papagiannakis et al., 2014; Kim & Lee, 2018).

The organization's sustainability plan is a fundamental driver of corporate sustainability. (Lartey et al., 2020; Whittington & Galpin, 2012). Recent study suggests a considerable correlation between sustainability and objective metrics of company success (Lartey et al., 2020). Some previous research has shown that a sustainability strategy is more likely to achieve enhanced corporate sustainability performance and shareholder value if sustainability is included in the overall organizational strategy (Eide et al., 2020). The proactive sustainability approach is implicitly related to environmental values and communicates the significance of sustainable development (Graves & Sarkis, 2018). RBV theory states that enhancing company performance requires an intangible asset, like a proactive sustainability approach. And based on the aforementioned logic, this study suggests the following hypothesis:

**H1: Proactive Sustainability Strategy positively related to corporate sustainability performance.**

#### **Sustainability-oriented-innovation-practices as a mediator**

Innovation is known as one of the main drivers of corporate sustainability performance and is therefore crucial for adopting sustainable practices (Avery & Bergsteiner, 2011). By adopting sustainable leadership practices is described as actions that build continuous value for the environment, the coming generation, and the community (Al-Zawahreh et al., 2019). Sustainability-oriented process and product deployment (SOPPD) are linked to the incorporation of sustainability aspects in product or process development. (Tan et al., 2011); Jitmaneeroj (2016) reported that implementing sustainability-oriented-innovation-practices would contribute to improving the performance of corporate sustainability. Sustainable practices firms are more likely to increase competitiveness, save more costs and raise the overall performance of the workplaces for the workers and society (Opoku et al., 2015). The adoption of sustainable practices leads to a competitive edge as reported by Robinson et al. (2006) for example, cost-saving from waste reduction, increased human growth, improved working practices by avoidance of risks associated with an unsafe or insecure building site, loyalty, better market access, improved picture sales, and repeated enterprises.

Moreover, evidence has been shown that businesses that also adopt sustainable-oriented innovation practices have higher earnings, enhanced efficiency, increased employee and consumer satisfaction, good health and safety, and mitigating environmental effects (Pham & Kim, 2019). According to Baron and Kenny (1986), RBV theory says intangible assets make capabilities and the capabilities that result in their performance. Keeping in front the above theory sustainability-oriented innovation practices that lead to corporate sustainability performance. The deployment of sustainable innovation competencies (SOICD) involves variables related to the creation and

deployment of new expertise and skills to promote sustainability-related innovations as well as to the deployment of stakeholder competencies. (Kuzma et al., 2020) analyze the influence of innovation on the performance of organizational sustainability and environmental, economic, and social sustainability.

The influence of sustainability strategies on organizational efficiency was thoroughly examined in the previous studies (Boons et al., 2013). According to Baron and Kenny (1986), RBV theory says, the strategies are the intangible asset of an organization that makes practices and that result from its performance. A similar proactive sustainability strategy is intangible assets that make capabilities and lead to SOIP as in the result of sustainability performance. Based on the above theory sustainability-oriented competencies deployment is capabilities that lead to performance (corporate Sustainability performance). Similarly as the basis of the argument given above the current study report the following hypothesis:

**H2a:** Sustainability-oriented process and product deployment mediate the relationship between proactive sustainability strategy and corporate sustainability performance and vice versa.

**H2b:** sustainability-oriented innovation competencies deployment mediates the relationship between proactive sustainability strategy and corporate sustainability performance and vice versa.

### **Sustainable leadership as moderates**

Sustainable leadership (SL) is described as actions and practices that build continuous value for the environment, the coming generation, and the community (Fernandez et al., 2020; Al-Zawahreh et al., 2019). SL typically works proactively and continuously scans the atmosphere where the organization operates to monitor for changes from the outside environment (Lambert, 2020). Furthermore, "sustainable leadership is concerned with creating current and future profits for an organization while improving the lives of all concerned" (Iqbal & Ahmad, 2021). In the perspective of sustainable leadership, sustainable leaders are the core aspect of green initiatives and the eco-friendly performance of their firm., as they are responsible for developing an eco-friendly agenda by transforming organizational culture and establishing alliances with different stakeholders with eco-friendly concerns, and achieving eco-friendly goals (Al-Zawahreh et al., 2019; Kuo et al., 2021; Song-Turner & Morgan, 2021).

In addition, Russell et al. (2021) found in their research when management involvement in sustainable practice decisions was deficient, it failed to conduct "disconnected" activities. Sustainability incorporation at the strategic level is opposed to organizations that only undertake sustainability efforts because of institutional requirements. In other words, leaders must engage in individual motivation and in how they guide others to develop sustainable practices to create effective sustainability practices (Eide et al., 2020). Recent research and studies have shown that organizational sustainability initiatives and performance can be predicted by various management variations, including inherent motivation and sustainable leadership (Fontoura, 2020; Cavazotte et al., 2021). Organizations that embrace sustainable leadership practices will reap several benefits. These advantages concentrate primarily on conserving natural environment resources and productivity of resources and energy use (Titus & Hoole, 2021). Research has

shown that organizations, combined with sustainability, innovation, and sustained leadership approaches, can increasingly improve their profit and efficiency even though the present global economic crisis and recession (Iqbal et al., 2021).

Eide et al. (2020) reported the links between the personal motivation of leaders for sustainability and the sustainability strategies of organizations through intellectual leadership. Awan and Khan (2021) study examines the moderation role of sustainable leadership between relationships of sustainability strategy and social performance. Al-Zawahreh et al. (2019) study investigated the positive relationship of sustainable leadership with green management practices. Moreover, Iqbal, Ahmad, Nasim, et al. (2020) study reported that sustainable leadership has positively influenced Sustainable development by mediating the role of a learning organization. Pham and Kim (2019) study report the positive relationships between sustainable practices and sustainability performance and the moderating effect of leadership competencies on these relationships. Previous research considered leadership as a particular organizational resource (Awan & Khan, 2021).

Almohtasb et al. (2021) said leaders play a key role in providing their companies with information and training on sustainability issues. Based on the arguments above, we argue that sustainable leadership act as a moderator in the linkage between PSS and sustainability-oriented innovation practices. Keeping in front above theory sustainable leadership is capabilities that lead to performance (corporate Sustainability performance). According to Baron and Kenny (1986), a moderator is a third variable that affects the intensity and/or direction of a relationship between independent and dependent variables. The involvement of a moderator could change the relationship between dependent and independent variables (Sekaran & Bougie, 2019). Therefore, the current study reports the following hypothesis:

**H3a:** sustainable leadership moderates the relationship between proactive sustainability strategy and sustainability-oriented process and product deployment and vice versa.

**H3b:** sustainable leadership moderates the relationship between proactive sustainability strategy and sustainability-oriented innovation competencies deployment and vice versa.



## Research Framework

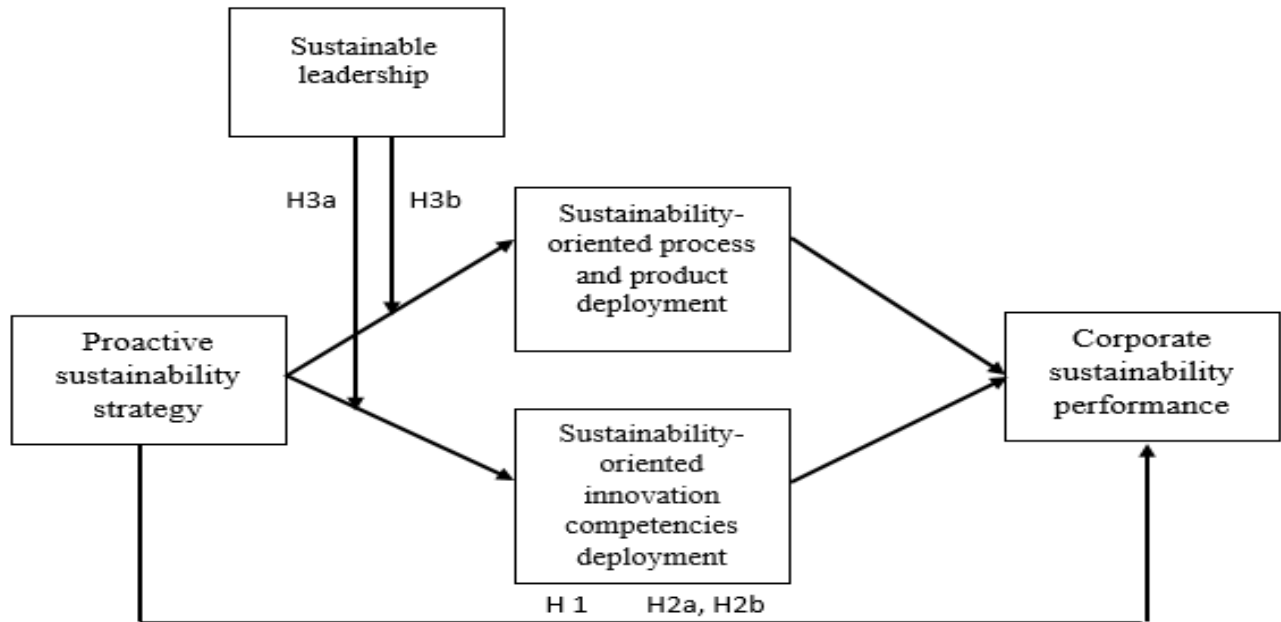


Figure 1: Research Model

## Methodology

## Data Collection and Sample

For the current study, survey research design was adopted to collect data in order to empirically investigate the relationship between the proposed variables and the relationships. Using convenience sampling technique, questionnaires were emailed to 500 employees of telecommunication companies located in Islamabad/Rawalpindi, Pakistan. To handle the CMB (common method biasness), time-lag study was led and responses were collected with 15 days gap at three different time period. At time-1 responses on independent variable and moderating variable i.e. about firm strategy and leadership were asked; after fifteen days respondents were inquired about sustainable practices of the firm; and at time-3 after 15 days respondent rated about firm performance. In total 414 complete responses were received.

## Instrument

**Proactive Sustainability Strategy:** Independent variable, proactive sustainability strategy was measured using seven (7) items scale by Seroka-Stolka, and Fijorek (2020). **Sustainable Leadership:** fourteen (14) items by Mc-Cann and Holt (2010) was used to measure the moderating variable sustainable leadership. **sustainability-oriented process and product deployment (SOPPD):** The 9-item scale developed by Siebenhuner, Anold, Kleef and Roome (2007) was used to measure SOPPD. **Sustainability-oriented innovation competencies deployment (SOCID):** The 5-item scale developed by Siebenhuner, Anold, Kleef and Roome

(2007) was used to measure SOICD. Corporate sustainability performance: to measure dependent variable sustainability performance, 9 item scale by Zailani et al. (2012) was adapted. All the scales adapted was measured using five-point likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Lastly, to check control variables one way ANOVA was conducted and the results revealed no variable needed to be controlled.

### Results

Table 1 and 2 depicts measurement model evaluation, mean, standard deviation, Composite reliability, average variance extract and correlation between the study variables. As reported in table 1, mean and standard deviation calculated as: “Corporate sustainability performance” (M=4.56, S.D=0.52), “Proactive sustainability strategy” (M=4.92, S.D=0.19), “Sustainability-oriented process and product deployment” (M=4.86, S.D=0.23), “Sustainability-oriented-innovation competence deployment” (M=4.84, S.D=0.28), “Sustainable leadership” (M=4.87, S.D=0.19). Results also revealed a significant associating between PSS and SOPPD ( $r= 0.171$ ,  $p<0.05$ ), SOICD ( $r= 0.125$ ,  $p<0.05$ ), SL ( $r= 0.510$ ,  $p<0.05$ ) and CSP ( $r= 0.219$ ,  $p<0.05$ ). Similarly, sustainable leadership is significantly related to SOPPD ( $r= 0.553$ ,  $p<0.05$ ) and SOICD ( $r= 0.514$ ,  $p<0.05$ ).

Table I: Correlation, Descriptive, Reliability and Validity Analysis

	Mean	SD	CR	AVE	CSP	PSS	SOPPD	SOICD	SL
CSP	4.5649	0.52470	0.939	0.626	1				
PSS	4.9217	0.19064	0.882	0.593	.219**	1			
SOPPD	4.8610	0.23247	0.874	0.522	.142**	.171**	1		
SOICD	4.8425	0.28066	0.869	0.613	.214**	.125*	.517**	1	
SL	4.8749	0.19345	0.812	0.625	0.484**	0.510**	0.553**	0.514**	1

Note: N=414 where SD = Standard deviation; CR = “Composite Reliability”, AVE = “Average Variance Extracted”, CSP = “Corporate sustainability performance”, PSS = “Proactive sustainability strategy”, SL = “sustainable leadership”; SOPPD = “Sustainability-oriented process and product deployment”, SOICD = “Sustainability-oriented-innovation competence deployment”.

Table2: Confirmatory Factor Analysis - Measurement Model

Model	$\chi^2$	Df	$\chi^2/Df$	CFI	GFI	AGFI	IFI	TLI	RMSEA
Five (5) factor model (PSS, SL, SOPPD, SOICD,CSP)	1483.967	553	2.683	.924	.903	.899	.925	.919	.064
One factor model (PSS, SL,	7785.395	560	13.902	.413	.353	.272	.415	.377	.177

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SOPPD,  
SOICD,CSP)

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Note: N = 414; where PSS = “Proactive sustainability strategy”, SL = “Leadership”; SOPPD = “Sustainability-oriented process and product deployment”, SOICD = “sustainability-oriented-innovation competence deployment”, CSP = “Corporate sustainability performance”.

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### Hypothesis testing (Mediation Analysis)

Results of hypothesis H1 and H2 (mediation analysis) is reported in table 3. Hypothesis 1 states that PSS is positively related to CSP with  $\beta = 0.588$ ,  $p < 0.001$ ; Hypothesis 2a states that SOPPD mediates the relationship between PSS and CSP; and Hypothesis 2b states that SOICD mediates the relationship between PSS and CSP. The full mediation was confirmed according to the process suggested by Hayes (2017) i.e. if there is no zero reported between lower and upper confidence interval. As the values in table 3 depicted no zero, therefore mediation is proved and hypothesis 1 and 2 is accepted.

Table3 : Mediation Analysis Results

Relationship	B	SE	T	P
1 Direct effects of PSS on CSP	0.5390	0.1301	4.1423	0.0000
2 Total Effect of PSS on CSP	0.5883	0.1288	4.5666	0.0000
<b>Indirect Effects</b>				
	E	SE	LL	UL
PSS → SOPPD → CSP	0.493	0.0329	0.0024	0.1283
PSS → SOICD → CSP	0.0632	0.0397	0.0031	0.1562

Note: N = 414; where CSP = “Corporate sustainability performance”, PSS = “Proactive sustainability strategy”, SL = “sustainable leadership”; SOPPD = “Sustainability-oriented process and product deployment”, SOICD = “Sustainability-oriented-innovation competence deployment”. Bootstrap Sample Size=5000. E= “Effect”, LL= “Lower Limit”, CI= “Confidence Interval”, UL= “Upper Limit”.

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### Moderation Regression Analysis

In line with moderation hypothesis i.e. Hypothesis 3a and 3b; table 4 depicts interaction between PSS, SL and SOPPD ( $\beta = 0.0843$ ,  $p < 0.0005$ ); and PSS, SL and SOICD ( $\beta = 0.0733$ ,  $p < 0.0005$ ) as significant. Moreover, the conditional direct effects reported in Table 4 illustrates that the relationship between PSS and SOPPD strengthens in presence of high sustainable leadership ( $\beta = 0.33$ ,  $p < 0.05$ ); as compared to low sustainable leadership ( $\beta = 0.17$ ,  $p < 0.05$ ). Similarly, the relationship between PSS and SOICD strengthens in presence of high sustainable leadership ( $\beta = 0.39$ ,  $p < 0.05$ );

as compared to low sustainable leadership ( $\beta = 0.21, p < .05$ ). Thus, hypothesis is accepted. Figure 2a and b shows the interaction plot.

Table 4: Moderated Regressions Analysis for sustainable leadership					
H	Interaction Effect	B	SE	T	P
H3a	PSS*SL→SOPPD	0.0843	0.0451	1.7253	0.0004
H3b	PSS*SL→SOICD	0.0733	0.0432	1.7324	0.0004
Conditional effects (PSS*SL→SOPPD)					
Level of Moderator	E	Boot SE	LL	UL	
-1 SD	0.17***	0.05	0.09	0.34	
M	0.30**	0.05	0.04	0.18	
+1 SD	0.33**	0.06	0.15	0.44	
Conditional effects (PSS*SL→SOICD)					
-1 SD	0.21***	0.06	0.08	0.45	
M	0.30**	0.07	0.05	0.21	
+1 SD	0.39**	0.05	0.32	0.55	

**Note:** N = 414; where PSS = “Proactive sustainability strategy”, SL = “sustainable leadership”; SOPPD = “Sustainability-oriented process and product deployment”, SOICD = “Sustainability-oriented-innovation competence deployment”. Bootstrap Sample Size=5000. E= “Effect”, LL= “Lower Limit”, CI= “Confidence Interval”, UL= “Upper Limit”.

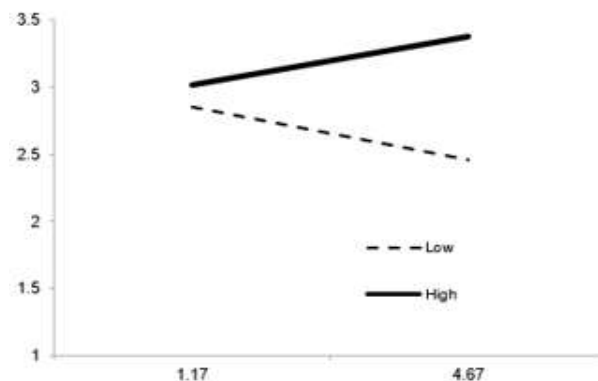


Figure 2a: Interaction Plot (PSS\*SL→SOPPD)

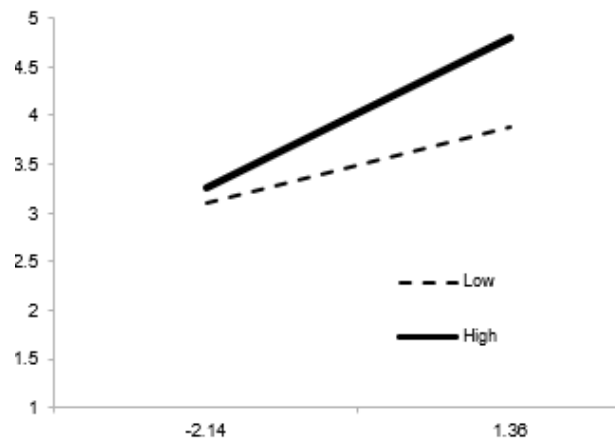


Figure 2b: Interaction Plot (PSS\*SL → SOICD)

### Discussions

Due to rapidly declining reserves, concerns regarding inequality of wealth, and corporate social, economic and environmental responsibilities, sustainability has received greater consideration in business related studies and practices recently (Harangozó and Zilahy, 2015). In recent years, industries have been urged to incorporate people, process, and environmental issues into their business operations due to intense demand from various governmental agencies, consumers, vendors, competitors, and communities both locally and globally (Masoumik, Abdul-Rashid, & Olugu, 2014). For academics and practitioners alike, sustainability-oriented innovation is a novel and quickly developing field of research (Pathak and Singh 2017). According to earlier research, firms are placing finest polices and strategies for integrating sustainable practices into effect. In this respect, this study aims to design a research model for evaluating the association between strategies and performance, which could be helpful to managers and practitioners.

In short, the current study investigated first: the relationship between proactive PSS and CSP; second: sustainable oriented innovation practices (SOPPD ad SOICD) mediates the relationship between the said strategy and performance; third: the moderating role of SL between PSS and SOPPD and SOICD. To empirically examine the proposed hypothesis, moderation and mediation analysis was performed using technique suggested by Hayes (2017); Model 1 was used to check the moderating role of sustainable leadership between PSS and SOPPD and SOICD; and the results revealed significant interaction. Similarly, Model 4 was used to investigate the mediating role of SOPPD and SOICD between PSS and CSP; and the results revealed a significant relationship. Hence hypothesis 1,2a, 2b, 3a, 3b is approved.

### Limitation and Future research directions

Besides from all the major contribution made and major research gaps filled in the current research, there were some limitations that when addressed may provide further avenues for future researchers. Firstly: current research was limited to telecommunication industry, therefore in future for generalizability the same research framework may be studied in different industries and

cultural settings. Secondly: in future longitudinal study should be conducted where development and deployment of strategies and its impact should be thoroughly investigated. Thirdly: moderating variables like organizational culture, climate, strategic intend and mediating variables like green innovation practices, dynamic capabilities and sustainable management can be used to further investigate corporate sustainability performance.

### Conclusion

The current study has established that proactive strategy, sustainable leadership in the context of sustainability oriented innovation practices (SOPPD, SOICD) are required as an important factors for corporate sustainable performance. The empirical evidence significantly approved the proposed underlying mechanism and conditions by explaining why and how these determinants influence the performance. Study revealed that sustainability oriented innovation practices mediated the relationship between PSS and CSP, by deploying practices related to product, process and competencies. The study also reported that sustainable leadership as a condition that may increase the positive impact of PSS and SOPD, SOICD.

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