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IMPACT OF ESG PERFORMANCE ON THE FINANCIAL PERFORMANCE OF DIFFERENT PAKISTANI LISTED COMPANIES WHILE MODERATING ROLE OF ENVIRONMENTAL FACTORS

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ABSTRACT

The research article aims to examine the impact of ESG performance on the financial performance of Pakistani listed companies also considering the moderating role of the environmental factors. The quantitative research design has been employed in this research article which includes the numerical analysis. Following this manner, the secondary data was collected from various sources including annual reports, Reuters, and the World Bank for the period 2010 to 2022, particularly Pakistani-listed companies registered in the Pakistan Stock Exchange (PSX)**.** The study found that the ESG performance of Pakistani companies does not significantly impact their financial performance mainly concerning the company return on assets (ROA) while having a significant impact on return on equity (ROE). The relationship between CSR and financial performance is insignificantly moderated by CO2 emissions. It is also found that the effect of CSR measures and initiatives on Pakistani companies' financial performances is considerably not impacted by their CO2 emissions. In addition to this, CO2 was found to have an insignificantly moderate association between board independence and while partially moderate association with board size and company performance. Whereas, green emissions have a partially moderate association with CSR, board size, and board independence. The key limitation of the study is that the findings are particularly based on Pakistani-listed companies, which restricts the scope of this article

Keywords: ESG performance, corporate social responsibility (CSR), financial performance, CO2 emission

INTRODUCTION

The world has seen a substantial increase in the significance of sustainable investments in the context of global financial decision-making in the last several years. The awareness factors of Environmental, Social, and Governance (ESG) have increasingly encouraged and led investors to implement sustainability into their investment and financial strategies. The idea of Environmental, Social, and Governance (ESG) was created from ethical and responsible investments. ESG aids as a pathway for corporate risk management and operations (Wang and Sarkis, 2017). ESG has become a key debate of topic in the global economy considering its comprehensive effects and alignment with the global focus on sustainable development and low carbon (Paradis, and Schiehll, 2021). On the other hand, ESG and Corporate Social Responsibility (CSR) have been among business standards, those firms committed to the principles are being praised and also have an increased reputation in the market. Principles of Responsible Investment (PRI) and OECD (2011) highlight the role businesses play in sustainable development, thus indicating the management and direction of all company issues through an integrated set of operations and procedures that take into consideration the needs of the company's customers and workers as well as its impact on the environment and local communities.

A business corporation's primary objective is to achieve maximum profits. However, over the past

two decades, several businesses have not deliberately incorporated social and environmental goals into their corporate operations and plans. These stand for the core values of the business, which emphasize sustainability while giving equal importance to social, environmental, and financial results. A more sustainable culture is also enhanced by increasing the accuracy of the values and beliefs that these strategies produce. The study by Huang (2022) argues that these values and beliefs describe the organization's mission. Stakeholders have become increasingly concerned about non-financial metrics such as environmental, social, and governance performance (also known as ESG) as a consequence of the global financial crisis and its negative impact on growth and development (Albitar, Hussainey, Kolade, and Gerged, 2020).

Worrying indications suggest a great deal of individuals, especially in emerging and undeveloped countries, are living in substandard social circumstances including the frequency of poverty, hunger, inadequate access to healthcare, and lower literacy rates (Schoenmaker, 2018). Apart from socioeconomic challenges, communities all through the world and businesses face severe damage to the environment in several areas. The world appears to be on the brink of many important changes, especially in light of an increasing lack of water, air pollution, and environmental degradation that is threatening human civilization and affecting ecosystems (Onuselogu, and Shahzad, 2023). Meanwhile, continuous and well-coordinated efforts will be required for the growth of a circular economy.

A strategy that develops beneficial environmental and social outcomes and financial returns is known as a sustainable strategy. Sustainability in investing is the method of making long-term investment objectives the greatest importance while avoiding projects that might make immediate profits but risk the long-term viability of the investment. It has been stated that investing projects and companies have a lower possibility of encountering potential harm, regulatory penalties, or operational difficulties because social and environmental challenges are common in sustainable investments (Akhter et al. 2020). Stakeholders and companies in Pakistan have become increasingly aware of the impact of environmental, social, and governance factors and enhanced their abilities to attain long-term financial success and overall organizational goals.

PRI and Enhanced Analytics Initiatives (EAI) are two examples of recent concentrated efforts to promote the implementation of ESG into a firm's value and investment decision-making procedures. The concept of ESG has become prominent in well-developed countries but it has not lately been introduced and discussed in Pakistan, a developing country. Jamil, and Siddiqui, (2020) stated that SECP put forward an order in 2009 that all firms must involve ESG principles and its consideration in their annual reports.

The relationship between ESG and financial performance is being extensively discussed in academic literature as an ESG framework is incorporated into business growth plans and operations management procedures (Minutolo et al., 2019). According to Fatemi et al. (2015), business ESG information disclosure can improve transparency of information and reduce financing expenses by addressing agency issues and information imbalance. However, the relationship between ESG performance and financial performance in Pakistan remains ambiguous and inconclusive, despite growing evidence on an international scale. There has been a lack of research on the topic existing studies have not particularly investigated the impact of ESG performance on the financial performance of Pakistani listed firms. Previous studies that have been conducted in the context of Pakistan mainly highlighted the impact of ESG ratings on the financial performance of banks, and other non-financial firms (Jamil, and Siddiqui, 2020; Hira et al. 2023). Therefore, the study aims to close the gap by comprehensively analyzing the impact of ESG performance on the financial performance of different listed Pakistani firms considering the moderating role of environmental factors.

Aims and objectives

The research article aims to examine the impact of ESG performance on the financial performance of Pakistani listed companies also considering the moderating role of the environmental factors.

To investigate the impact of ESG performance on financial performance

To analyze the moderating effect of environmental factors specific to Pakistan on the ESG-financial performance relationship.

To provide recommendations for Pakistani companies and investors on incorporating environmental factors into their ESG strategies for optimal financial performance.

The paper's research questions are,

What is the impact of ESG performance on the financial performance of Pakistani listed companies also considering the moderating role of the environmental factors?

LITERATURE REVIEW

Impact of ESG on Financial Performance

ESG performance indicators including ethical and socially conscious investments, are used by financial and non-financial management. ESG factors are important to investors because they correlate with financial success (Friede et al., 2015; Lin et al., 2019). When making decisions and allocating resources, ESG assesses how much a company considers social (S), environmental (E), and governance (G) factors. ESG variables are non-financial factors that influence a company's performance. The score assesses how businesses manage climate change, supply chains, workforces, trust, and innovation (Liu et al., 2012).

Modern sustainability assessments use Corporate Social Responsibility (CSR). Organizations that help the local area and climate are most appreciated. The financial impact of corporate social responsibility on Pakistani companies was examined by Ansu-Mensah et al. (2021). It was revealed that building sustainability plans with stakeholders improves an organization's reputation and long-term profitability. Impartial board members are also crucial as corporations' boards are divided for efficient administration and decision-making. Khuong et al. (2021) examined whether autonomous board members increase profitability. It was indicated that Independent directors are expected to advise on financial management and risk mitigation which ultimately contributes towards sustainability efforts. Board and company size are also important CSR factors because they improve the community and environment (Ansu-Mensah et al., 2021). Pakistani companies value CSR and its financial impact, according to Nahum and Carmeli (2020). Building positive stakeholder relationships with a good CSR strategy enhances a company's reputation and financial performance.

Good environmental sustainability and finance management decisions determine a company's board of directors' autonomy. More autonomous board members increase expertise and diversity which strengthens board independence. Independent directors reduce risks and manage finances impartially (Khuong et al., 2021). A larger board of directors could provide broader perspectives and experience on sustainability issues and complexities, that affect navigation and company funds. ESG and financial performance can also be affected by company size (Nahum and Carmeli, 2020). A larger, more diverse group with more sustainability and financial performance experience affects independent direction and company financial resiliency. The size of a company can also affect its environmental, social, and governance efforts and financial performance (Dionne et al., 2019).

ROA and ROE are key financial factors that are widely accepted on how ESG factors influence financial performance. ROA decides an organization's profitability while keeping into consideration its resources. Meanwhile, ROE decides profitability because of its proprietors' value (Koundouri et al., 2022). Gerard (2019) revealed that organizations that stick to ESG standards are all the more socially mindful and financially steady as CSR drives are impacted by the board's independence and the organization's size. Taylor et al. (2018) evaluated how these attributes collaborate and what they might mean for ESG and financial achievement. The findings indicated that a financially strong organization could uphold critical environmental and social drives.

In Pakistan, ESG-consistent organizations get extraordinary opportunities and face several difficulties. Due to consistent regulatory changes, it is difficult to monitor sustainability efforts. The developing revenue of financial investors in ethical businesses and organizations makes ESG factors simpler to incorporate to make value. However, it is affected by the changing of the business world due to economic instability (Waheed and Drive, 2019). To plan and complete ESG techniques that work on Pakistan's sensitive and complex situations, it is essential to sort out the country's momentous

environmental, social, and governance issues and opportunities. By this, the impact of environmental, social, and governance (ESG) factors on financial performance is improved in Pakistan's rapidly changing corporate landscape (Jamil and Siddiqui, 2020). Changes impact stakeholder assumptions in Pakistan's social and economic landscape. Organizations should alter their arrangements because of these changes. Organizations that pursue worldwide sustainability directions and go about as great corporate residents in environmental sustainability are ESG-consistent and are also valued by the communities. This might affect client steadfastness and business discernment (Van Holt and Whelan, 2021).

Moderating Effect of Environmental Factors on ESG and Financial Performance

In recent years, ESG performance has grown in popularity. For businesses to achieve long-term financial success, good governance, environmental protection, and social responsibility are becoming increasingly important (Patil et al., 2021). According to Yu et al. (2022), external environmental factors can impact an organization's financial and ESG performance.

ESG performance is quickly becoming a global standard for demonstrating a company's environmental and social responsibility commitment. When evaluating a company's performance, ESG issues are considered (Almeyda and Darmansya, 2019). ESG scores assess a company's social and environmental stewardship. Strong ESG performance reduces market volatility and information asymmetry while demonstrating an organization's societal and environmental commitment (Tarmuji et al., 2016). Companies with high ESG scores work hard to protect the environment and are less likely to be sued. ESG management is frequently used to assess a company's corporate social performance (Sassen et al., 2016). Firm risk is the likelihood that a company's value will fall due to future uncertainty. El Khoury et al. (2019) use stock prices, the stock market, internal accounting risk, and income accounting risk to assess risk. Finances operate cyclically. Adequate ESG information disclosure boosts the confidence of external investors and corporate management in the company's long-term growth prospects. This increase in self-assurance attracts additional capital (Taghizadeh-Hesary and Yoshino, 2020).

Carbon dioxide emissions pose a significant environmental challenge, prompting scientific investigation. A company's carbon emissions, also known as the carbon footprint, impact its financial performance and ability to achieve social and environmental objectives (Liou and Rao-Nicholson, 2021). According to Udeagha and Ngepah (2023), implementing clean technologies, conserving energy, and prioritizing sustainability can enhance a business's profitability. These emissions can impact a company's financial performance and its relationship with environmental, social, and governance factors. Instead of just measuring carbon dioxide, a company's environmental impact must be assessed by measuring all greenhouse gases. Galama and Scholtens (2021) recommend assessing businesses' environmental impact. Greenhouse gas emissions harm the environment and cause climate change. Understanding how these emissions affect environmental, social, and governance initiatives and financial prosperity can help us understand the ecological variables that affect Pakistani businesses' long-term viability.

Strong environmental regulations in Pakistan may improve the regulatory environment, which could benefit ESG-focused businesses (Wu and Tham, 2023). Strong regulation encourages businesses to become green independently and work hard for profits. Businesses would need more money and expertise to manage ESG issues if the regulations are stricter or inconsistent with good business practices (Baah et al., 2020). Pakistan's climate and environmental conditions worsen the situation, especially since natural resource-based businesses are more vulnerable to such changes. Therefore, sector-specific regulations are needed. Agriculture and energy are especially vulnerable to climate change, which reduces efficiency and profitability (van Benthem et al., 2022).

Theoretical Framework

Tipple Bottom-line Theory

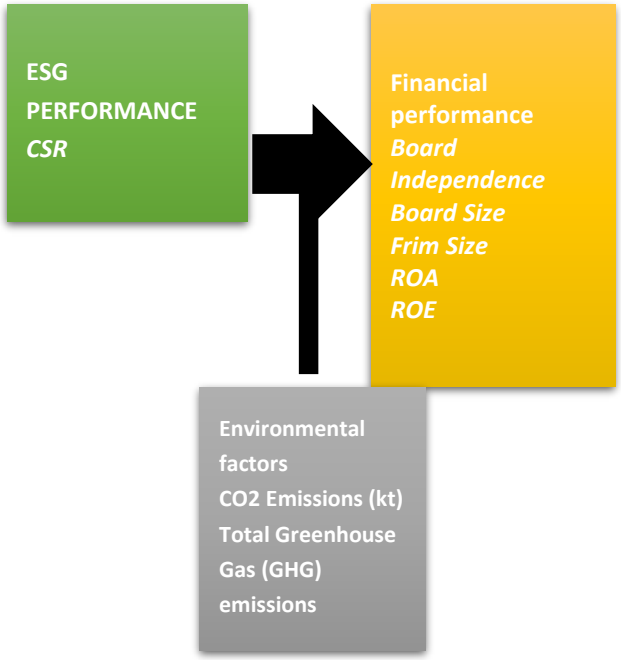
John Elkington's Triple Bottom Line (TBL) theory explains how ESG performance affects the financial performance of Pakistani listed companies. TBL evaluates a company's performance and finances. This theory also considers the association of social

and environmental factors (Baranauskas and Raiien, 2022). Financial, social, and environmental bottom lines are interconnected in TBL theory. Finances and benefits include the economic bottom line. Jha and Rangarajan (2020) examine how ESG practices affect an organization's profitability, cost viability, and long-term viability. The study uses TBL to examine corporate performance and social and environmental issues.

The social bottom line in Triple Bottom Line (TBL) is what business choices mean for society. This incorporates representative fulfilment, local area association, and cultural effect. Svensson et al. (2018) analyzed ESG rehearses influence on financial results by focusing on the social factors. It was indicated that upgrading worker prosperity and local area commitment to sustainability efforts can improve environmental, social, and governance endeavors, prompting financial performance. This shows what social drives mean for a company's funds. The environmental bottom line estimates how much a company uses or damages resources, assets, and biological systems. Hence, it is critical to determine the efforts of the companies regarding their association with environmental sustainability and performance. Khan et al. (2023) believe this factor is crucial to understanding environmental change. The TBL theory assisted in evaluating the sustainability efforts of public organizations in Pakistan by determining how environmental, social, and governance factors influence the financial performance and the executives.

Financial indicators, environmental impact metrics, and social responsibility are studied using TBL. CSR, board independence, board size, and firm size are considered alongside profitability, ROI, and cost savings. To understand how ESG policies affect financial outcomes, CO2 and GHG emissions must be considered (Andersson et al., 2022). The TBL theory was used to analyze the complex relationships between financial, social, and environmental factors to understand better how ESG performance affects the financial success of Pakistani listed companies (PSX). This theory revealed the complex factors affecting financial success and sustainable business practices in Pakistan's social, economic, and environmental contexts (Tate and Bals, 2018). Due to its flexibility, TBL theory allowed component relationship analysis, which provided a more profound understanding than financial metrics.

Conceptual Framework



The above conceptual framework various variables in the research paper as ESG performance is indicated as an independent variable that was measured by CSR. In addition, the study examined the impact of ESG performance on financial performance where financial performance was indicated as a dependent variable as it is measured by Board Independence, Board Size, Firm Size, ROA, and ROE. The framework further illustrates environmental factors such as moderating factors which are measured by CO2 Emissions (kt) and Total Greenhouse Gas (GHG) emissions.

METHODOLOGY

The study adopted a secondary quantitative approach, relying solely on statistical analysis to investigate the impact of ESG performance on the financial performance of different Pakistani listed companies. Skinner, (2020) stated that secondary quantitative refers to numerical data that has already been gathered, analyzed, and organized by various websites, reports, or financial statements. The study collected secondary data due to its reliability and consistency from a wide range of annual, reports and websites. In addition, annual reports from selected Pakistani companies presented financial statements

and ESG (Environmental, Social, Governance) disclosures. It collected data from Reuters which is a renowned website for providing financial data of companies, presents relevant information on companies and their overall performance. On the other hand, the study included the moderating role of environmental factors; thus, environmental data specific to Pakistan including pollution levels, and resource consumption, was sourced from databases of the World Bank data. The current approach to data collection ensured strong and precise information for the analysis enhancing the study's depth and accuracy.

Considering the sample of the study, the research paper targeted 20 Pakistan Stock Exchange-listed companies with the period spanning from 2010-2022. Rigours selection criteria were employed for consistency and representativeness of the sample potentially encompassing, company size, industry sector, and data accessibility. The study's objective was to develop a sample of Pakistani companies that accurately represented a range of industries and company sizes by concentrating on specific factors. The approach to sample selection aimed at enhancing the study's reliability and drawing more accurate conclusions about Pakistan's large business environment.

Table 1

Table of Variable Measurement

Variables	Measurement
Independent Variable ESG Performance is defined as the combined score of the company's environmental, social, governance, and practices.	CSR (Corporate Social Responsibility)
Dependent Variable Financial Performance	Board Independence, Board Size, Return On Assets (ROA), Return On Equity (ROE)
Moderating Variable Environmental Factors	CO2 Emissions (kt), Total Greenhouse Gas (GHG) emissions

The study used Tobin's Q formula as it used to measure a company's market value relative to its assets. Particularly it helps in comparing the market value of a company's outstanding shares to the replacement of its costs. Moreover, the research paper utilized statistical analysis such as regression analysis to investigate the relationship between the variables. It used this technique in an attempt to find out how financial performance is affected by ESG (Environmental, Social, and Governance) performance. Furthermore, moderation analysis techniques were utilized to evaluate the impact of environmental issues, including greenhouse gas emissions and air pollution, on the relationship between financial performance and ESG performance. To do this, it was necessary to determine if environmental factors strengthened or attenuated the relationship between financial measures and ESG performance.

Results and Analysis

Descriptive Statistics

Descriptive statistics is a set of methods that serve the purpose of presenting and summarizing the basic data into meaningful and interpretive form (Kaur et al., 2018). Table 1 demonstrates the descriptive statistics and the variables involved in the following study. Thus, it can be interpreted from Table 1 that the CSR mean value is 2894301 which states the average CSR investment of Pakistani companies. Whereas its standard deviation is determined to be, 3785862, which indicates that the CSR investment of Pakistani companies is expected to be deviated from 3785862. Moreover, the mean value for board independence is 0.71, which shows the average board independence ratio of the Pakistani listed companies, while this ratio is expected to deviate by 0.16. Furthermore, the average board size of Pakistani listed companies is 8.26, which states that on average the company has 8 board of directors, whereas its standard deviation is determined to be 1.31, which indicates that the deviation in the mean value by 1. In addition, net income mean value is computed as 1542.4 while its standard deviation is determined as 3527.3 which indicates that the mean value of net income can be increased or decreased by this value. Concerning the firm size, the mean value is determined to be 9.42, while the standard deviation is computed as 1.49, which causes the deviation in the mean value. Additionally, the ROA mean value is 0.04 which states the average return on assets of Pakistani companies. Whereas its standard deviation

is determined to be, 0.06, which indicates that the ROA of Pakistani companies to, expected to deviate from 0.06. Moreover, the average return on equity of Pakistani companies is 10.03, which states that on average the company obtains the ROE of 10.03, whereas its standard deviation is determined to be 90.36, which indicates that the deviation in the mean value by 90.36. In addition to this, the mean average value of total green is 399671.4 while indicating a standard deviation value is 45106.61, which implies that total green can be increased or decreased by this value. The mean average value of CO2 emissions is 74484.2 and the standard deviation value is 89765.5.

Table 2

Descriptive statistics

Descriptive Analysis

Variable	Obs	Mean	Std. Dev.	Min	Max
Csrrs	273	2894301	3785862	30000	4.94E+07
board independence	273	0.711458	0.165328	0.181818	1.125
board size	273	8.267399	1.31658	6	12
net income	272	1542.402	3527.374	-3559.36	21247
firm size	273	9.422984	1.498063	7.152347	14.62816
Roa	273	0.043486	0.068073	-0.20747	0.221918
Roe	273	10.03917	90.36517	-755.391	1046.25
totalgreen~c	273	399671.4	45106.61	323172.4	470078.7
co2emission	273	74484.28	89765.56	0.710994	208990.7

Correlation Analysis

Correlation analysis is the statistical approach that is used in the research to analyze the linear relationship between the research variables. The coefficient value is used to examine the positive, negative, and significant association (Olilingo and Putra, 2020). The below table 2 presents the correlation analysis of the variables involved in this study. Table 2 shows that CSR and board independence have a positive, significant, but weak relationship with the coefficient value of 0.21 since the value is closer to zero than 1. Moreover, board size has a weak relationship with CSR and board independence, however, it has a negative association with CSR (-0.04) since the value is closer to 0 than 1. In addition to this, board size has a negative association with board independence (-0.01). In addition to this, net income, which is the control variable, has a positive and weak association with CSR and board independence with coefficient values of (0.14), and (0.18). Moreover, net income and board size have a positive and weak relationship, indicating the value of coefficient (0.01). Additionally, the firm size, which is also the control variable, has a positive, weak, and significant association with the variable including CSR (0.27) and board independence (0.32) while a negative and weak relationship with board size (-0.06).

Moreover, ROA (return on assets) has a significant, weak, and negative association with CSR (-0.03), board size (-0.05), board independence (-0.20), and firm size (-0.03) while significant, weak, and positive relationship with net income (0.12). Other than that, ROE (return on equity) has a significant, weak, and positive association with all the research variables followed by the correlation value of CSR (0.009), board independence (0.01), board size (0.06), net income (0.16), firm size (0.14) and ROA (0.00) since the value of the coefficient is closer to zero than one. The correlation of total green with CSR (0.13), board independence (0.20), board size (0.08), net income (0.12), firm size (0.25), ROA (0.00), and ROE (0.08) is weak and positive. In addition to this, it is found from the above table that the relationship of CO2 emissions is positive and weak with CSR (0.05) and board independence (0.04) while negative and weak with board size (-0.01), net income (-0.10), firm size (-0.02), ROA (-0.06) and ROE (-0.11).

Table 3

Correlation analysis

Correlation Analysis

	csrrs	boardi~e	boards~e	netinc~e	firm size	roa	roe	totalgreen~c	co2emissio~t
csrrs	1								
boardindep~e	0.2185*	1							
boardsize	-0.0407	-0.0103	1						
net income	0.1401*	0.1851*	0.0159	1					
firm size	0.2765*	0.3236*	-0.0658	0.7829*	1				
roa	-0.0364	-0.2001*	-0.058	0.1278*	-0.0349	1			
roe	0.0099	0.0128	0.0633	0.1638*	0.1480*	0.0411	1		
totalgreen~c	0.1397*	0.2011*	0.0833	0.1226*	0.2521*	0.0004	0.0806	1	
co2emissio~t	0.0567	0.0465	-0.1523*	-0.1002	-0.0276	-0.0661	-0.1141	0.4355*	1

Hausman test

Hausman test is the statistical approach and specification test, which is employed to differentiate between the random effect model and the fixed effect model (Jaba et al., 2017). The Hausman test includes two hypotheses the null hypothesis and the alternative hypothesis. The null hypothesis of this test is: that the preferred model has random effects, while it alternative hypothesis is: that the preferred model has fixed effects. This can be examined through the Prob>chi2 value, if the value is below 0.05, it states that the preferred model has the fixed effects therefore the alternative hypothesis will be selected (Zulfikar and STp, 2018). The below table 3 above shows the results of the Hausman test of the current study, as the three are the two dependent variables therefore; the table below shows the two models. Model 1, which is for the ROA, has the Prob>chi2 value of 0.0062, therefore the preferred model has fixed effects and thus the alternative hypothesis will be selected. Model 2 which concerns the ROE, has the Prob>chi2 value of 0.4853 is above the predetermined value of the model, and this indicates that the performed model has random effects and null hypothesis will be accepted.

Table 4

Hausman test

Hausman test	
	Prob>chi2
Model 1 (ROA)	0.0062
Model 2 (ROE)	0.4853

Based on the Hausman test, the regression analysis of ROA and ROE is conducted and it is presented in Tables 5 and 6. If the P>|z| is lower than 0.05 then the impact of the independent variable on the dependent variable is said to be significant. According to Table 5, it is indicated CSR concerning ESG performance has an insignificant impact on the financial performance of Pakistani firms which is measured through the ROA and the value is 0.50. Moreover, board independence has a significant impact on the companies' ROA since the value is 0.01 which is lower than 0.05. In addition to this, board size shows a significant impact on the firm ROA (0.00) as the p-value computed is less than the predetermined p-value. Furthermore, there is a significant influence of the net income of the company on their financial performance as the p-value computed for ROA is lower than the predetermined value i.e. 0.00. It is also indicated that there is a significant impact of the firm size of a company on their financial performance as the p-value computed for ROA is lower than 0.05 i.e. 0.00. The moderating effect is also indicated in this study that CO2 and CSR have an insignificantly moderating impact on ROA i.e. 0.69. In addition to this, CO2 and BI have an insignificantly moderating impact on ROA i.e. 0.17. CO2 and BS also have a significant moderating impact on ROA i.e. 0.03. Table 5 also shows that there is an insignificant moderating impact on ROA by greenhouse emissions and CSR. Whereas, greenhouse emissions and BI as well as greenhouse emissions and BS have a significant moderating impact on ROA.

Table 5

Regression Analysis (ROA)

Regression Analysis (ROA)						
roa	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
csrrs	8.24E-09	1.24E-08	0.66	0.507	-1.61E-08	3.26E-08
board independence	0.403129	0.160111	2.52	0.012	0.089318	0.716941
board size	-0.06943	0.015026	-4.62	0	-0.09888	-0.03998
net income	1.67E-05	2.13E-06	7.85	0	1.26E-05	2.09E-05
firm size	-0.02634	0.007037	-3.74	0	-0.04013	-0.01255
Co2*CSR	6.81E-15	1.74E-14	0.39	0.696	-2.73E-14	4.09E-14
Co2*BI	3.55E-07	2.60E-07	1.37	0.172	-1.54E-07	8.64E-07
Co2*BS	-4.76E-08	2.29E-08	-2.08	0.038	-9.25E-08	-2.67E-09
greenhouseemission*csr	-2.07E-14	3.30E-14	-0.63	0.531	-8.53E-14	4.39E-14
Greenhouse emission*BI	-1.31E-06	4.42E-07	-2.96	0.003	-2.18E-06	-4.44E-07
Greenhouse emission*BS	1.49E-07	3.81E-08	3.92	0	7.46E-08	2.24E-07

If the P>|z| is lower than 0.05 then it indicates the impact of the independent variable on the dependent variable is significant. According to Table 6, it is indicated that CSR concerning ESG performance has a significant impact on the financial performance of Pakistani firms which is measured through the ROE and the value is 0.04. Moreover, board independence has a significant impact on the companies' ROE since the value is 0.09 which is lower than 0.05. In addition to this, board size shows an insignificant impact on the firm ROE (0.56) as the p-value computed is less than the predetermined p-value. Furthermore, there is an insignificant influence of the net income of the company on their financial performance as the p-value computed for ROE which is greater than the predetermined value i.e. 0.34. It is also indicated that there is an insignificant impact of the firm size of the company on their financial performance as the p-value computed for ROE is greater than 0.05 i.e. 0.74. The moderating effect is also indicated in this study that CO2 and CSR have an insignificantly moderating impact on ROE i.e. 0.20. In addition to this, CO2 and BI have an insignificantly moderating impact on ROE i.e. 0.4. CO2 and BS also have insignificant moderating impacts on ROE i.e. 0.9. Table 6 also shows that there is a significant moderating impact on ROE by greenhouse emission and CSR i.e. 0.04. Whereas, greenhouse emission and BI as well as greenhouse emission and BS have insignificantly moderating impact on ROE i.e. 0.14 and 0.68 respectively.

Table 6

Regression Analysis (ROE)

Regression Analysis (ROE)						
Roe	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Csrrs	4.47E-05	2.24E-05	2	0.045	9.08E-07	8.86E-05
board independence	-477.223	286.6408	-1.66	0.096	-1039.03	84.58254
board size	15.27832	26.4062	0.58	0.563	-36.4769	67.03352
net income	0.00319	0.003382	0.94	0.346	-0.00344	0.009819
firm size	3.010399	9.108038	0.33	0.741	-14.841	20.86183
Co2*CSR	3.73E-11	2.95E-11	1.27	0.206	-2.04E-11	9.50E-11
Co2*BI	-0.00032	0.000453	-0.7	0.486	-0.0012	0.000572
Co2*BS	-3.89E-06	3.94E-05	-0.1	0.921	-8.1E-05	7.34E-05
greenhouseemission*csr	-1.19E-10	5.93E-11	-2.01	0.044	-2.35E-10	-3.04E-12
Greenhouse emission*BI	0.001144	0.00079	1.45	0.148	-0.0004	0.002693
Greenhouse emission*BS	-2.8E-05	6.83E-05	-0.41	0.68	-0.00016	0.000106

Hypothesis Assessment

S.NO	Hypothesis	Status
HI	CSR has a significant impact on the Financial performance of Pakistani companies	Partially Accepted
H2	Board independence has a significant impact on the Financial performance of Pakistani companies	Accepted
H3	Board size has a significant impact on the Financial performance of Pakistani companies	Partially Accepted
H4	Net income significantly influences the Financial performance of Pakistani companies	Partially Accepted
H5	Firm size significantly influences the Financial performance of Pakistani companies	Partially Accepted
H6	CO2 emission significantly moderates the relationship between CSR and firm performance	Rejected
H7	CO2 emission significantly moderates the relationship between board independence and firm performance	Rejected
H8	CO2 emission significantly moderates the relationship between Board size and firm performance	Partially Accepted
H9	Greenhouse emissions significantly moderate the relationship between CSR and firm performance	Partially Accepted

H10	Greenhouse emissions significantly moderate the relationship between board independence and firm performance	Partially accepted
H11	Greenhouse emissions significantly moderate the relationship between Board size and firm performance	Partially accepted

Conclusion and Recommendations

The article examined the impact of ESG performance on the financial performance of Pakistani listed companies and also considered the moderating role of environmental factors. It utilized various statistical techniques including regression, correlation, and Hausman, and determined factors that measure the impact of ESG performance on financial performance. The research paper found that CSR investment has an insignificant impact on the financial performance of a company regarding return on assets(ROA) and a significant impact on return on equity (ROE) while board independence also indicated a significant influence on ROA and ROE. In addition, Board Size was found to have a significant impact on the indicators of ROA and an insignificant impact on ROE. Firm size and Net income were illustrated as significant influencers of financial performance with respect to ROA and insignificant with respect to ROE. Moreover, this paper also explored the moderating effect of CO2 emissions and GHG emissions on the relationship between ESG performance and financial performance. In this case, CO2 emissions were found to insignificantly moderate the relationship where GHG emissions insignificantly moderated impact and the relationship between board independence and RAO as well as ROE. From the findings above, it can be concluded that there is a growing emphasis on ESG factors in global finance decision-making, and also their direct impact on the financial performance of Pakistani listed companies is nuanced. In addition, it shows that board independence and net income play a significant part in influencing a company's financial performance. The findings emphasize the significance of considering the moderating variable in the name of environmental factors particularly GHG emissions in comprehending the moderating effects on the relationship between ESG and financial performance.

It also examined the moderating effect of environmental factors more greenhouse gas and CO2 emissions thus showing the moderating relationship between ESG and financial performance. In this case, it was concluded that the association between CSR and financial performance is insignificantly moderated by CO2 emissions. It indicates that the effect of CSR measures and initiatives on Pakistani companies' financial performances is considerably not impacted by their CO2 emissions. Consequently, CO2 was found to have an insignificantly moderate association between board independence and while partially moderate association with board size and company performance. While green emissions have a partially moderate association with CSR, board size, and board independence.

The study's conclusions shed light on how Pakistani company's financial performance and environmental, social, and governance (ESG) performance relate to each other. The paper concluded that these companies' financial performance, particularly in terms of Return on Equity (ROE) and Return on Assets (ROA) is not significantly affected by their ESG performance. It implies that, although ESG factors might be significant for additional aspects of corporate sustainability and responsibility, in the context of the Pakistani business landscape, their direct impact on financial indicators like profitability and efficiency might be limited.

The above findings and conclusion have a wide range of implications for Pakistani listed companies and investors. The companies need to focus on improving board independence and also maintaining strong financial performance to enhance their overall competitiveness in the market. In addition, investors must consider the ESG performance but also the moderating effects of environmental factors when assessing investment opportunities in Pakistani companies. It is suggested that policymakers and governing bodies must encourage companies to adopt more sustainable practices by providing incentives, rules, and guidelines that foster successful ESG implementation in corporate strategies. The study contributed to the understanding of ESG's impact on financial performance, particularly highlighting how ESG factors including CSR, board independence board

size, along with environmental factors including CO2 and GHG emissions affect the relationship between the above variables. It covered the relationships presenting crucial insight into sustainable practices in Pakistan.

Based on the research paper's findings, it is recommended that Pakistani companies should focus on a comprehensive approach to implementing ESG principles into their operations while also acknowledging the broader societal and environmental impacts of their actions. It includes sharing ESG-related metrics with stakeholders, integrating proactive environmental management techniques, and also engaging with them to promote awareness and support for sustainable practices. Even though the direct impact of ESG performance on financial metrics like ROA and ROE may not immediately be relevant, companies can develop resilience, enhance their reputation, and contribute to long-term sustainable growth by prioritizing transparency and stakeholder education. Moreover, the study's insight into the moderating influence of environmental factors on governance practices highlights the significance of environmental risk management for Pakistani companies. The companies need to conduct a thorough evaluation of their environmental risks, considering factors such as CO2 and GHG emissions. The companies can proactively reduce potential risks that can have a negative influence on their governance practices and also on their overall organizational performance.

The study was limited as it solely focused on Pakistani companies, which limited the generalizability of its findings to a broader context. In addition, the study's sample was confined to the specific geographical business environment, and the findings of the study could not be universally applicable across international marketing and diverse settings. Therefore, such restriction in scope could potentially overlook variations in ESG practices, financial dynamics, and environmental factors presented in other regions or industries thereby by limiting the study's broader Lovelace and applicability beyond the context of Pakistani companies.

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