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# Board composition, ESG practices, and firm performance: Evidence from the Pakistan stock exchange

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## ABSTRACT

This study delves into the intricate relationship between corporate governance factors, including board size and the proportion of non-executive directors, and firm performance, with a specialized focus on environmental, social, and governance (ESG) considerations. Employing a secondary data analysis methodology, the research draws insights from a comprehensive dataset comprising 100 companies listed on the Pakistan Stock Exchange over a period spanning from 2018 to 2022. The study investigates these relationships using rigorous regression analysis to uncover significant findings. The analysis reveals a robust positive correlation between larger board sizes and firm performance, indicating that companies with expanded boards tend to exhibit improved financial performance within the Pakistani market landscape. Conversely, a higher proportion of non-executive directors is associated with decreased performance, highlighting potential challenges stemming from board composition. Furthermore, the research unveils the pivotal role of ESG practices in augmenting the positive relationship between board size and firm performance. However, it notes that this enhancement weakens as the proportion of non-executive director's increases, suggesting a nuanced interplay between corporate governance structures and ESG considerations. Practically, the study underscores the critical importance of fostering diverse and well-structured boards while integrating ESG principles into corporate governance frameworks. By carefully considering board composition and embracing ESG practices, organizations can not only enhance their financial performance but also promote sustainability and long-term value creation, aligning with evolving stakeholder expectations and regulatory requirements in the Pakistani business landscape.

**Contribution/Originality:** Prior studies focused on either corporate governance (CG) or ESG's impact on firm performance. This research integrates all three, with ESG serving as a moderator. Analyzing this complex relationship is crucial for Pakistani companies, as it examines CG factors, firm performance, and ESG moderation for the first time.

## 1. INTRODUCTION

In recent decades, Corporate Governance (CG) and its relationship with firm performance (FP) have garnered substantial attention from scholars worldwide. To uncover the intricate link between CG and FP, scholars have done various studies. However, the consistency of this connection remains a topic of debate within the academic community. For instance, Mohan and Chandramohan (2018) found no significant relationship between CG factors and FP, suggesting that this association may vary across different industries. In contrast, Marashdeh (2014) presented mixed results, while Ahmed and Hamdan (2015) demonstrated a significant and positive correlation between CG and FP.

Similarly, in Pakistan, researchers have endeavored to decipher the connection between CG and FP, yielding mixed findings. For example, Yasser, Entebang, and Mansor (2011) failed to establish a significant relationship, while Akbar, Hussain, Ahmad, and Hassan (2020) revealed a noteworthy and positive connection between CG and FP. This variance in findings has underscored the need for further investigation. Given the diversity of results, this paper searches for additional evidence to support the ongoing discourse regarding the relationship between CG and FP. Additionally, this research explores the moderating impact of Environmental, Social, and Governance (ESG) scores, a concept that has gained prominence in recent years. ESG represents a company's commitment to integrating environmental, social, and governance considerations into its business model.

Jamil and Siddiqui (2020) have emphasized the strategic importance of Corporate Social Responsibility (CSR) and ESG practices, asserting that corporations dedicated to these principles can enhance their reputation and competitiveness. They contend that strategic adoption of CSR can yield several benefits, including improved customer relationships, effective risk management, increased innovation capacity, improved access to capital, and more effective human resource management. To enhance financial performance, Jamil and Siddiqui (2020) advocate for an emphasis on improving ESG performance. However, it must be taken into consideration that ESG responsibilities are inherently tied to the effective functioning of CG, albeit at an added cost and resource allocation.

Understanding the impact of CG on the operational success of organizations is of increasing importance in the modern business landscape. Scholars, professionals, and decision-makers from diverse backgrounds have dedicated significant attention to this topic, particularly in countries like Pakistan. It is very important to look into the complicated ways that governance methods and ESG factors interact to affect the performance of businesses in Pakistan, which is an emerging economy with a wide range of companies. This exploration holds significance not only for academic advancement but also for practical applications that may catalyze positive changes in the nation's commercial environment.

In light of these considerations, this paper intends to probe the impact of CG on FP and the influence of incorporating ESG activities within firms on the relationship between CG and FP.

In order to effectively address the research gap, this study seeks to answer the following research questions:

1. Does CG practices impact the financial success of firms in Pakistan?
2. How does ESG, within the Pakistani context, moderate the relationship between governance and business performance?

Utilizing an extensive dataset comprising 100 companies listed on the Pakistan Stock Exchange from 2018 to 2022, our analysis reveals compelling insights. Firstly, the study identifies a robust positive correlation between a company's board size and its overall performance. This suggests that businesses with larger boards tend to experience improved firm performance within the Pakistani market context. Conversely, our research uncovers a noteworthy negative association between the proportion of non-executive directors on a company's board and its performance. This finding implies that a higher concentration of non-executive directors may impede a firm's overall performance in the same environment. The study also underscores how ESG practices significantly enhance the positive correlation between board size and firm performance. However, it is essential to note that this reinforcing effect diminishes as the proportion of non-executive director's increases.

## 2. LITERATURE REVIEW

### *2.1. Corporate Governance (CG) and Firm Performance (FP)*

CG is a critical aspect of how companies operate and make decisions. Ntim (2018) defines CG as either "narrow," primarily focused on enhancing shareholder value through internal mechanisms, potentially disregarding other stakeholders like customers, employees, and the local community, or as a means to align corporate actions and company assets with shareholders' objectives, as described by Sternberg (2009). The question arises: Why do we need CG? The answer lies in the Agency problem, rooted in the separation between management and finance, where managers raise funds from investors who rely on their expertise, but investors must ensure their investments are not misused. This leads to conflicts of interest, information imbalances, and defective contractual relationships between shareholders and managers, often resulting in managers prioritizing personal gain over shareholders' interests. CG, guided by its goals and objectives, as highlighted by Rooh, Zahid, Malik, and Tahir (2021), serves as a control mechanism to prevent unethical actions and align interests between principals and Agents, ultimately mitigating Agency costs (Khan, Muttakin, & Siddiqui, 2013). Additionally, Stakeholder theory, introduced by Freeman (2001) emphasizes that companies are integral to society and must balance shareholder interests with responsibilities to individuals, such as general people, suppliers, investors, lenders, government, society, workers, and the environment. It recognizes that a company's impact extends beyond owners and underscores the significance of deeming the welfare of people and society alongside shareholders' interests (Donaldson & Preston, 1995).

The significance of CG becomes evident when considering its role in preventing corporate failure. Lakshan and Wijekoon (2012) emphasize that corporate failure can be caused by factors such as management incompetence, societal and cultural influences, public planning, and economic uncertainty. To mitigate this risk, it's crucial to assess the influence of diverse factors, including government entities, management, auditors, directors, the workforce, and regulatory institutions, on a company's financial performance. As a result, CG has become a fundamental factor determining a company's prosperity or downfall.

Recognizing the importance of CG, supervisory institutions worldwide, such as the Securities and Exchange Commission (SEC), have established CG codes and implemented legislation to uphold accountability and transparency standards: the Sarbanes-Oxley Act in the United States and Pakistan's CG Code under the Securities and Exchange Commission of Pakistan (SECP) (Ibrahim, 2006; Javid & Iqbal, 2008). A robust CG code safeguards the interests of stakeholders in organization and promotes fair and impartial markets for all economic participants. Key values such as transparency, accountability, risk management, and responsibility guide it. The CG Index (CGI) is used to assess compliance with CG principles through indicators like ownership structure, public disclosure, control over related party transactions, board procedures, board structure, and shareholder rights. Stronger compliance with these principles not only correlates with improved financial performance but also reflects a company's commitment to responsible corporate citizenship, positively impacting the broader socio-economic landscape (Khan & Mahmood, 2023).

#### *2.1.1. Board Size*

The board of directors plays a pivotal role in overseeing a corporation's internal affairs (Lefort & Urzúa, 2008). The board's primary duty is to supervise both internal and external operations, aiming for favorable outcomes (Al Azeez, Sukoharsono, & Andayani, 2019). This involves providing strategic direction and addressing Agency problems within the company. According to Cadbury (1992) directors have responsibilities that encompass setting strategic goals, supervising goal implementation, monitoring management, and reporting stewardship to shareholders. The board is comprised of the CEO, inside directors (senior managers within the company), and outside directors. When considering various projects, including good and bad ones, the CEO proposes,

necessitating thorough discussions and negotiations among the diverse board members to achieve a consensus that aligns with the company's growth and success (Raheja, 2005).

Guest (2009) demonstrates that board size does not have a significant impact on FP. Interestingly, the negative relationship between board size and FP is most pronounced in larger firms with more board members. Guest's evidence suggests that larger boards face challenges related to poor communication and decision-making, leading to inefficiencies. Adnan, Htay, Rashid, and Meera (2011) argue that larger boards experience slower decision-making processes, which hinder corporate consistency. Smaller boards, in contrast, tend to exhibit better FP and offer stronger incentives for CEO performance through remuneration and the possibility of dismissal (Yermack, 1996). This indicates that as board size increases, harmonization and communication challenges, along with Agency issues, tend to outweigh any potential benefits. Consequently, corporate performance declines (Jensen, 1993). Larger boards also encounter obstacles in reaching timely and unanimous decisions due to increased negotiation and compromise needs, resulting in more moderate outcomes and less variability in corporate performance (Cheng, 2008). While Levit and Malenko (2016) argue that larger boards enhance transparency and oversight capabilities, it's essential to strike a balance to ensure effective governance without sacrificing efficiency. In the context of the above-cited literature, the study suggests the following hypothesis:

*Hypothesis 1: There is a negative relationship between board size and firm performance (FP).*

### *2.1.2. Non-Executive Director*

Non-executive directors play a vital role in maintaining a company's integrity, safeguarding investors' interests, and providing valuable external expertise. They help temper excessive behavior and offer guidance during corporate transitions. However, their part-time commitments and potential lack of expertise can constrain their effectiveness, leading to calls for restrictions on simultaneous directorships to ensure robust governance (Pass, 2004). Empirical evidence by Byrd and Hickman (1992) strongly supports the significant role of independent non-executive directors in protecting shareholder interests. Independence from CEO influence, as emphasized by Weisbach (1988) enables these directors to effectively curb managerial consumption of perks. Independent non-executive directors are a cornerstone of effective CG and act as a potent deterrent against financial statement fraud (Beasley, 1996). While Baliga, Moyer, and Rao (1996) suggest that the impact of duality status on long-term operating performance remains inconclusive, studies like (Azeez, 2015) reveal a notable positive impact of CEO and chairman duality on financial performance, while research by Mura (2007) underscores the significant positive relationship between the proportion of non-executive directors and financial performance. The study, taking into account the previously discussed literature, proposes the following hypothesis:

*Hypothesis 2: An increase in the proportion of non-executive directors on the board positively affects firm performance (FP)*

### *2.2. Environmental, Social, and Governance (ESG) and Firm Performance (FP)*

ESG, a crucial concept in the financial world, serves as a means for investors to evaluate a company's behavior and anticipate its future financial performance by assessing sustainability factors (Jamil & Siddiqui, 2020). It encompasses ESG elements, focusing on non-financial indicators related to sustainability, ethics, and CG. ESG due diligence, as outlined by Afeef and Kakakhel (2022) and Villmann (2021) involves an ongoing and objective process of gathering and assessing ESG practices or concerns, with the findings communicated through various document disclosures. The three pillars of ESG – ESG factors - address issues such as human rights, climate change, board accountability, and ethical practices (Hebb, Hawley, Hoepner, Neher, & Wood, 2015). Corporate sustainability, as emphasized by Dobbs and Van Staden (2016) is essential for environmental preservation, resource protection, and addressing global challenges like climate change.

The integration of ESG information into trading decisions marks a significant advancement in stock markets (Adomako & Tran, 2022; Alcaide González, De La Poza Plaza, & Guadalajara Olmeda, 2020). Firms with strong ESG performance, robust CG, and a larger scale exhibit greater resilience in economic downturns and a heightened ability to withstand financial crises (Ahmad, Mobarek, & Raid, 2023). Research highlights a positive correlation between CSR disclosure and financial performance across diverse manufacturing sectors (Chen, Feldmann, & Tang, 2015). Javeed and Lefen (2019) employing advanced statistical models, identify key drivers affecting the relationship between CSR and FP, particularly focusing on CEO power and ownership structure. ESG reporting not only stimulates demand for shares but also influences stock prices, thereby affecting market dynamics (Cheng, Ioannou, & Serafeim, 2014). The connection between CSR and financial performance is consistently demonstrated in multiple studies, while the research of Velte (2017) emphasizes the positive impact of ESG performance on return on assets (ROA). Also, researchers like Nirino, Santoro, Miglietta, and Quaglia (2021); Albitar, Hussainey, Kolade, and Gerged (2020) and Khan, Serafeim, and Yoon (2016) stress how important ESG practices are for meeting the needs of stakeholders and how they improve financial performance, especially when sustainability issues are taken into account. However, Flammer (2015) has shown that the link between CG and FP remains largely unaltered after the implementation of ESG practices. Grounded on the above literature, the study postulates the following hypotheses:

*Hypothesis 3: ESG score has a positive impact on the FP.*

*Hypothesis 4: ESG score has no moderating impact on relationship between board size and FP.*

*Hypothesis 5: ESG score has no moderating impact on relationship between proportion of non-executive director and FP.*

## 3. RESEARCH METHODOLOGY, RESEARCH SAMPLE, AND DATA COLLECTION

Initially, the sample encompassed all listed firms on the Pakistan Stock Exchange (PSX). However, due to data constraints, we narrowed down our sample to consist of 100 companies listed on the PSX during the fiscal years from 2018 to 2022. We specifically selected these companies from the PSX100 index as of April 2023.

For this study, our data collection method relied on secondary sources, primarily involving the analysis of annual reports from the selected companies. We directly extracted the necessary information about the independent variables from the annual reports, specifically from the Corporate Governance (CG) sections. Simultaneously, information concerning the dependent variable, Return on Equity (ROEQ), was meticulously obtained from the financial statements presented within each annual report.

Furthermore, we computed the Environmental, Social, and Governance (ESG) score for each sampled firm through content analysis. We utilized the Thompson Reuters ESG Score metrics to determine these scores, adhering to the established methodology by Chen et al. (2015) and Jamil and Siddiqui (2020).

### *3.1. Firm Performance (FP)*

The consensus on a definitive set of dependent factors that comprehensively account for a company's Firm Performance (FP) remains elusive, as pointed out by Azeez (2015). Scholars such as Bhagat and Black (2001) and Mashayekhi and Bazaz (2008) have categorized these measures into two primary domains: investor returns and accounting returns. To represent these categories, usually three proxies are used: Return on Assets (ROA), Return on Equity (ROEQ), and Earnings per Share (EPS). Similar to the study of Zhang, Yuan, and Zhi (2017) this research also uses ROEQ as a performance measure. We calculate ROE by dividing post-tax operating profit by total equity.

### *3.2. Corporate Governance (CG)*

This study incorporates two distinct Corporate Governance (CG) variables as independent factors. These variables encompass the proportion of non-executive directors on the board and the assessment of board size, quantified through the number of total board members. Non-executive directors, in particular, are defined as the

total number of such directors divided by the entire board composition. These governance parameters play a pivotal role in evaluating the organizational framework and decision-making mechanisms within the company.

### *3.3. ESG Score*

The study utilizes the ESG score (ESGS) as a moderating variable to assess how a firm's adherence to ESG practices influences the relationship between CG and FP. In the perspective of Shah, Ahmad, and Mahmood (2018) the board links shareholders and management and is responsible for safeguarding shareholders' rights and overseeing management's decisions. In Pakistan's emerging market, there are no strict regulations for non-financial information disclosure. Instead, it is the fiduciary duty of board members, as emphasized in the modified 2017 Pakistan's Code of CG as noted by Naveed, Sohail, Abdin, Awais, and Batool (2020). Consequently, readily available ESG data following international standards is scarce. Enterprises in emerging markets tend to produce fewer Corporate Social Responsibility (CSR) reports and rarely investigate sustainability performance compared to financial data analysis, as highlighted by Cohen, Holder-Webb, and Zamora (2015) and Khan (2019). Afeef and Kakakhel (2022) find a positive correlation between higher ESG disclosure and sustainable outcomes, while Khalid, Razzaq, Ming, and Razi (2022) suggest greater integration of ESG data into decision-making processes.

Content analysis, a method that objectively measures the occurrence of specific words, ideas, or sentences in texts, calculates ESGS (Halvorsen & Palmquist, 1980). Content analysis, as noted by Harwood and Garry (2003) is versatile and can be used both qualitatively in early research stages and quantitatively to determine the frequency of observed phenomena. The study tracks the methodology used by Jamil and Siddiqui (2020) for calculating ESG scores (ESGS) from annual reports using the Thomson Reuters model, as shown in Table 1.

### *3.4. Control Variable*

Similar to Azeez (2015) this paper incorporates three crucial controlling variables: size, leverage, and age, essential to account for potential confounding factors impacting the CG-FP correlation. Company size, measured by the logarithm of total assets, has a significant impact on compensation for top management. Larger firms often see higher CEO pay due to their greater contribution to firm value (Dang, Li, & Yang, 2018). The CEO's role becomes more critical with firm size, leading to higher compensation. Serrasqueiro and Maçãs Nunes (2008) find a positive link between performance and size, benefiting from scale effects and market adaptability. In contrast, Klapper and Love (2004) argue that large firms may face inefficiencies affecting performance. We measure company size using the logarithm of total assets. The ratio of total liabilities to total assets, which represents leverage, impacts performance by limiting financial flexibility, constraining free cash flow, and inviting creditor scrutiny (Jensen, 1986). Age signifies the company's duration of listing on the PSX, calculated by applying the natural logarithm to the number of years on the PSX.

### *3.5. Regression Model*

This study utilizes a multiple regression model to analyze the relationship between CG variables and FP, considering how ESG scores moderate this connection. This approach is consistent with previous studies, such as Azeez (2015), Khan and Mahmood (2023) and Mashayekhi and Bazaz (2008). The linear model employed is as follows:

$$ROEQ = \beta_0 + \beta_1\ NOOFD + \beta_2\ NED + \beta_3\ ESGS + \beta_4\ LEVERAGE + \beta_5\ SIZECO + \beta_6\ AGE + \beta_7\ ESG*NOOFD + \beta_8\ ESG*NED + \varepsilon$$

**Table 1.** Calculation of ESG score using Thomson Reuters model.

| Pillar | Category | Category scores | Category weights | Sum of category weights | New category weights | New category weights | Pillar scores | ESG scores (Average of pillar scores) |
|---|---|---|---|---|---|---|---|---|
| Environmental | Resource use | 1 | 11% | 34% | 32% | (11%/34%) | 1 | 0.67 |
| | Emissions | 1 | 12% | | 35% | (12%/34%) | | |
| | Innovation | 1 | 11% | | 32% | (11%/34%) | | |
| Social | Workforce | 0 | 16% | 36% | 45% | (16%/35.5%) | 0.22 | |
| | Human rights | 0 | 5% | | 13% | (4.5%/35.5%) | | |
| | Community | 1 | 8% | | 23% | (8%/35.5%) | | |
| | Product responsibility | 0 | 7% | | 20% | (7%/35.5%) | | |
| Corporate governance | Management | 1 | 19% | 31% | 62% | (19%/30.5%) | 0.77 | |
| | Shareholders | 0 | 7% | | 23% | (7%/30.5%) | | |
| | CSR strategy | 1 | 5% | | 15% | (4.5%/30.5%) | | |

Table 1 calculation of ESG score using Thomson Reuters model

## 4. RESULTS AND DISCUSSIONS

### *4.1. Descriptive Statistics*

These descriptive statistics offer an outline of the dataset's mean value, variations, and ranges for the variables under consideration.

**Table 2.** Descriptive statistics.

| Variable description | Variable name | Observation | Mean | Std. dev. | Min. | Max. |
|---|---|---|---|---|---|---|
| Dependent | ROEQ | 473 | 20.29 | 31.03 | -86.64 | 295.09 |
| Independent | NOOFD | 500 | 8.47 | 1.74 | 3.00 | 13.00 |
| | NED | 500 | 0.48 | 0.11 | 0.22 | 0.85 |
| Moderator | ESGS | 500 | 0.55 | 0.22 | 0.00 | 1.00 |
| Control | LEVERAGE | 471 | 0.56 | 0.25 | 0.01 | 1.01 |
| | SIZECO | 472 | 24.90 | 1.71 | 16.37 | 29.29 |
| | AGE | 500 | 3.53 | 0.68 | 0.00 | 4.69 |

**Note:** ROEQ (Return on equity), NOOFD (Number of directors), NED (Percentage of non-executive directors), ESGS (Environmental, social, and governance score), Leverage (Leverage), SIZECO (Company size), AGE (Company age).

Table 2 provides descriptive statistics for a range of financial, governance, and control variables. Notably, the dependent variable includes Return on Equity (ROEQ). These statistics reveal that ROEQ has a wide range, with an average of 20.29 but a high deviation of 31.03, indicating significant variability in company profitability.

In contrast, the independent variables, such as NOOFD and NED, have relatively small standard deviations, implying less variability. Additionally, the moderator variable ESGS shows some diversity in environmental, social, and governance practices but tends to be moderately centered on a mean of 0.55. Among the control variables, LEVERAGE indicates moderate financial risk with a mean of 0.56, while SIZECO and AGE exhibit less variability in their means, indicating relative stability in firm size and age.

These statistics imply that the company's profitability (ROEQ) varies significantly within the sample, potentially influenced by factors like governance (NOOFD, NED) and ESGS. The data also suggests that firms tend to maintain moderate financial leverage and remain relatively consistent in size and age. Understanding these implications can guide further analysis and decision-making in the context of financial and corporate performance.

### *4.2. Correlation Matrix*

The correlation matrix is a vital statistical device, elucidating the relationships between variables within a dataset. It employs values ranging from -1 to 1 to signify both the strength and direction of linear connections between variable pairs. A correlation coefficient of 1 denotes a perfect positive linear correlation, while -1 indicates a complete inverse relationship. When the coefficient hovers around 0, it signifies minimal to negligible linear associations, implying a lack of substantial linear interdependence among variables.

**Table 2**. Correlation matrix.

| Variables | ROEQ | NOOFD | NED | ESGS | Leverage | SIZECO | AGE |
|---|---|---|---|---|---|---|---|
| ROEQ | 1 | | | | | | |
| NOOFD | 0.1116 | 1 | | | | | |
| NED | -0.1005 | 0.1273 | 1 | | | | |
| ESGS | 0.127 | 0.1574 | -0.1679 | 1 | | | |
| Leverage | 0.1675 | 0.0817 | 0.0741 | 0.1396 | 1 | | |
| SIZECO | -0.0293 | 0.3159 | 0.1467 | 0.189 | 0.5772 | 1 | |
| AGE | -0.0111 | 0.1586 | 0.0731 | 0.1675 | -0.0239 | 0.0835 | 1 |

Table 3 reveals specific relationships among variables. The correlation matrix displays the pairwise correlations between the variables in the dataset. Positive values indicate a positive linear relationship, while negative values indicate a negative linear relationship. In this case, we can see that ROEQ, which is the dependent

variable, has weakly positive correlations with NOOFD (0.1116), ESGS (0.127), and LEVERAGE (0.1675). This means that ROEQ is somewhat linked to these independent variables. Notably, ROEQ has a negative correlation with NED (-0.1005) and SIZECO (-0.0293). Among the independent variables, SIZECO and LEVERAGE exhibit a relatively strong positive correlation (0.5772), while AGE appears to have weak correlations with most other variables. Understanding these relationships is valuable for identifying potential multicollinearity concerns and selecting relevant variables for regression modeling. Additionally, the weak positive correlation of 0.0741 between NED and LEVERAGE hints at a slight tendency for these variables to increase together. Finally, the 0.0835 correlation between SIZECO and AGE indicates that larger companies tend to have a higher AGE. These insights guide the analytical process by illuminating the intricate dynamics within the dataset.

### *4.3. Regression Analysis*

The study conducted a pooled OLS linear regression using STATA 13, with ROEQ as the dependent variable, NOOFD and NED as independent variables, and LEVERAGE, SIZECO, AGE as control variables, while ESGS served as the moderating variable. We rooted this choice in the understanding that ROEQ effectively captures the complex interplay and influences present within the array of dependent variables, offering a comprehensive perspective for analysis. Table 4 presents the results of the Pooled OLS regression. Table 4 presents the results of a regression analysis with various independent variables and the dependent variable, ROEQ. Among the independent variables, NOOFD, NED, ESGS, LEVERAGE, and SIZECO exhibit statistically significant effects on ROEQ, while AGE's impact is not statistically significant. However, the model's overall explanatory power, as indicated by the R-squared value of 0.108. Notably, the model is not being considered due to the existence of autocorrelation and heteroskedasticity confirmed by the relevant tests shown in Table 6 and Table 7. indicating that the assumptions underlying the regression analysis are violated. Addressing these issues through techniques like robust standard errors or alternative modeling approaches is essential to improving the model's validity and reliability.

**Table 3.** Pooled OLS regression.

| Variables | ROEQ |
|---|---|
| NOOFD | 0.178*** |
| | (0.0486) |
| NED | -0.0978** |
| | (0.0467) |
| ESGS | 0.119** |
| | (0.0489) |
| LEVERAGE | 0.287*** |
| | (0.0556) |
| SIZECO | -0.280*** |
| | (0.0590) |
| AGE | -0.0151 |
| | (0.0469) |
| ESGS*NOOFD | 0.1000** |
| | (0.0440) |
| ESGS*NED | -0.0592 |
| | (0.0494) |
| Constant | -0.0201 |
| | (0.0455) |
| Observations | 470 |
| R-squared | 0.108 |

**Note:** Standard errors in parentheses.*** p<0.01, ** p<0.05.

Diagnostic tests, which are performed to validate the results in Table 4, include the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity, the Variance Inflation Factor (VIF) test for multicollinearity, and the Wooldridge test for first-order autocorrelation in panel data, shown in Table 5, Table 6, and Table 7.

**Table 4**. Testing multicollinearity.

| Variable | VIF | 1/VIF |
|---|---|---|
| NOOFD | 1.21 | 0.828 |
| NED | 1.1 | 0.913 |
| ESGS | 1.16 | 0.859 |
| Leverage | 1.58 | 0.634 |
| SIZECO | 1.77 | 0.564 |
| AGE | 1.08 | 0.922 |
| ESGS*NOOFD | 1.16 | 0.864 |
| ESGS*NED | 1.1 | 0.910 |
| Mean VIF | 1.27 | 0.812 |

Table 5 indicates that multicollinearity was not the primary issue in the model. The VIF assesses the presence of multicollinearity among predictor variables within the model. Typically, a VIF value of 1 implies the absence of significant multicollinearity, while higher values, usually greater than 10, suggest a greater degree of multicollinearity. In this example, all VIF values are close to 1, indicating that substantial multicollinearity is not a primary issue in the model. This is advantageous, as substantial multicollinearity can result in unreliable coefficient estimations.

**Table 6.** Testing heteroskedasticity.

| Breusch-Pagan / Cook-Weisberg test for heteroskedasticity |
|---|
| Ho: Constant variance |
| Variables: Fitted values of ROEQ |
| Chi2(1) = 648.47 |
| Prob > chi2 = 0.0000 |

However, tests for heteroskedasticity and autocorrelation within the model indicate the presence of the problem, which could affect the reliability of standard errors and coefficient estimations. In Table 6, the Breusch-Pagan / Cook-Weisberg test is executed. We observe that the test statistic demonstrates considerable magnitude, and the accompanying p-value is extremely close to 0. These findings provide indications of heteroskedasticity within my model. Heteroskedasticity has the potential to influence my standard errors' dependability and introduce inefficiencies in my coefficient estimations. The Wooldridge test is utilized, in Table 7 to examine initial autocorrelation in panel data. The p-value of 0.0209 indicates the significance of the test statistic (F-statistic). This implies that there is preliminary autocorrelation in my model's residuals. Autocorrelation violates the assumption of error independence and can result in skewed coefficient estimations and unreliable hypothesis tests.

**Table 5**. Testing autocorrelation.

| Wooldridge test for autocorrelation in panel data |
|---|
| H0: No first-order autocorrelation |
| F(1, 98) = 5.516 |
| Prob > F = 0.0209 |

In response to the presence of autocorrelation and heteroskedasticity, the study employed pooled regression with robust standard errors (Table 8). Assumptions about heteroscedasticity and other types of model misrepresentation might not hold true in some cases. Using robust standard errors in regression analysis can help with these situations. When the traditional assumptions of ordinary least squares (OLS) regression may not fully hold, robust standard errors offer more accurate and reliable inferences. This approach ensures robust and dependable analysis, even when traditional OLS assumptions may not hold.

**Table 6.** Pooled OLS linear regression with robust standard errors.

| Variables | ROEQ |
|---|---|
| NOOFD | 0.178*** |
| | (0.0575) |
| NED | -0.0978** |
| | (0.0382) |
| ESGS | 0.119*** |
| | (0.0415) |
| Leverage | 0.287*** |
| | (0.0918) |
| SIZECO | -0.280*** |
| | (0.0819) |
| AGE | -0.0151 |
| | (0.0349) |
| ESGS*NOOFD | 0.1000*** |
| | (0.0333) |
| ESGS*NED | -0.0592 |
| | (0.0487) |
| Constant | -0.0201 |
| | (0.0393) |
| Observations | 470 |
| R-squared | 0.108 |

**Note:** Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

The next regression with Driscoll-Kraay standard errors, shown in Table 9 gave the same results, confirming that the first results in Table 8 were stable and that the relationships between the dependent and independent variables were statistically valid. These results provide added confidence in the study's findings and the stability of the identified relationships.

**Table 7**. Pooled OLS linear regression with Driscoll-Kraay standard errors.

| Variables | ROEQ |
|---|---|
| NOOFD | 0.178*** |
| | (0.0159) |
| NED | -0.0978** |
| | (0.0216) |
| ESGS | 0.119*** |
| | (0.0130) |
| Leverage | 0.287*** |
| | (0.0587) |
| SIZECO | -0.280*** |
| | (0.0264) |
| AGE | -0.0151 |
| | (0.0193) |
| ESGS*NOOFD | 0.1000*** |
| | (0.0126) |
| ESGS*NED | -0.0592 |
| | (0.0440) |
| Constant | -0.0201 |
| | (0.0419) |
| Observations | 470 |
| Number of groups | 100 |
| R-squared | 0.108 |

**Note:** Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

### *4.4. Interpretation and Findings*

In Table 8 and Table 9, the model summary provides a comprehensive assessment of how well the regression model aligns with the data and evaluates the overall significance of the model. The dataset comprises 470

observations. The R-squared value of 0.108 in both Table 8 and Table 9, indicates 10.8% of the changeability in the ROEQ can be attributed to the independent variables. Interpreting the coefficients from Table 8 and Table 9 provides valuable insights into the relationships between the independent variables and ROEQ. The coefficients for NOOFD are same in both tables, suggesting that a one-unit increase in NOOFD corresponds to a 0.1785-unit increase in ROEQ ($p<0.01$), holding other variables constant. This result is significant and contradictory to hypothesis (H1), rendering it acceptable to accept an alternative hypothesis. This implies that a higher number of directors is associated with a higher return on equity, which is proved by previous studies (Agyemang Badu & Appiah, 2017; Dalton, Daily, Ellstrand, & Johnson, 1998; Kalsie & Shrivastav, 2016; Larmou & Vafeas, 2010; Malik, Wan, Ahmad, Naseem, & Rehman, 2014). The findings of Alabdullah, Ahmed, and Muneerali (2019); Almutairi and Quttainah (2017) and Levit and Malenko (2016) are also in favor of a large board. Similarly, for NED, both tables showed same coefficients. The results imply that a one-unit increase in the percentage of non-executive directors is linked to a decrease of 0.0978 units in ROEQ ($p<0.05$). This result is also significant but contradictory to hypothesis (H2), suggesting that we should accept the alternative hypothesis that a greater proportion of non-executive directors might lead to a lower return on equity. This result also resonates with findings in previous studies (Azeez, 2015; Guo & Kga, 2012; Hermalin & Weisbach, 1991; Mura, 2007). The coefficient of ESGS reveals a positive relationship, with a one-unit increase in ESG score associated with a 0.1187-unit increase in ROEQ ($p<0.01$) in both tables. This result supports the hypothesis (H3) that ESG practices enhance performance, being consistent with previous studies (Albitar et al., 2020; Carnini Pulino, Ciaburri, Magnanelli, & Nasta, 2022; Grewal, Hauptmann, & Serafeim, 2017; Khan et al., 2016; Maji & Lohia, 2023; Velte, 2017). Moving to control variables in Table 8 and Table 9, higher LEVERAGE is associated with a higher ROEQ ($p<0.01$), while larger companies, as measured by SIZECO, tend to have a lower ROEQ ($p<0.01$). Similarly, AGE of the company, as shown in Table 8 and Table 9, does not significantly impact ROEQ. Regarding interaction effects, ESGSNOOFD is significant ($p<0.01$) in both Table 8 and Table 9, rendering it necessary to reject the hypothesis (H4) and accept alternative hypothesis that ESG score moderates the relationship between board size and FP. This result is also supported by Albitar et al. (2020). However, in Table 8 and Table 9, ESGSNED is statistically insignificant with same coefficient, similar to the study of Triyani, Setyahuni, and Kiryanto (2020) suggesting that to accept hypothesis (H5) that ESG score does not moderate the relationship between the proportion of non-executive directors and FP.

## 5. CONCLUSION

The in-depth study shows how many complicated links there are between CG indicators, especially board composition, and how ESG factors affect FP in Pakistan. The research reveals a positive relation between board size and company performance, suggesting that a diverse and experienced board can substantially influence overall success. However, an excessive reliance on non-executive directors negatively affects decision-making efficiency. The study emphasizes the vital role of a high ESG score in driving better business performance, highlighting the significance of integrating sustainability, social responsibility, and effective governance into operations for ethical behavior and financial gains.

The findings also suggest that aligning robust ESG principles with a diverse board can enhance positive outcomes. The study's insights offer opportunities for companies to strategically merge ESG initiatives with board composition, fostering growth and value creation. Policymakers, practitioners, and companies can draw practical insights from this study to enhance governance, board structures, and sustainable practices for improved performance. It's important to acknowledge the complexity of these linkages, which require ongoing research and adaptability.

This work contributes to the growing knowledge in this field, paving the way for more empirical research and strategic enhancements that could significantly transform CG landscapes in Pakistan.

### *5.1. Limitations*

There was a big problem getting ESG scores from Pakistani companies for the research paper that looked at how CG affects FP in terms of ESG factors. The lack of consistent and easily accessible ESG ratings on official websites necessitated manual data collection from company reports, introducing complexities and potential inaccuracies due to subjective interpretation. This could potentially compromise the validity and generalizability of the research findings, as well as the reliability of the ESG score data. To address this, it is recommended that Pakistani companies prioritize disclosing standardized ESG ratings on their websites. This move would streamline research efforts, enhance transparency, and assist stakeholders in making informed decisions based on a company's ESG performance. This practice could benefit both researchers and the business sector in Pakistan.

### *5.2. Recommendations*

This paper's findings include numerous key recommendations for Pakistani businesses and officials. First, encouraging board diversity through the appointment of directors with varied backgrounds may greatly improve the caliber of decisions made as well as overall performance. A strong commitment to ESG practices should also be made because they not only guarantee sustainable business operations but also have a favorable impact on financial performance. Firms are encouraged to handle rising LEVERAGE cautiously and apply smart financial measures to avoid unnecessary risk, despite the unexpectedly favorable association between LEVERAGE and performance raising concerns. For governance and decision-making procedures to remain successful, non-executive director makeup must be balanced. Businesses must regularly evaluate CG practices and ESG ratings to stay adaptable in a changing marketplace. Last but not least, the intricate connections between company size, AGE, and performance deserve greater investigation and research to reveal more profound insights. Scholarly research has extensively explored the intricate relationship between CG and FP. Core CG mechanisms like board composition, executive compensation, shareholder rights, and audit quality play pivotal roles in shaping a company's decisions and trajectory. The effectiveness of these mechanisms varies across industries, countries, and time periods, adding complexity to the understanding of this relationship. Incorporating ESG factors into CG introduces further complexity, raising questions about their impact on FP. Future research is crucial to better comprehend how ESG interacts with CG, aiding in sustainable value creation and improved financial performance. These insights benefit policymakers, investors, and corporate leaders, guiding responsible governance and sustainable growth in a dynamic global landscape.

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