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The Influence of Various Corporate Governance Dimensions on Financial Performance Indicators: An Empirical Study of Cement Companies Listed on the Pakistan Stock Exchange

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Abstract
This study investigates the influence of corporate governance dimensions on financial performance indicators, specifically Return on Equity (ROE) and Return on Assets (ROA), in cement companies listed on the Pakistan Stock Exchange (PSX). A quantitative approach is employed to analyze 20 active firms using data from PSX, NBP, and other reputable sources from 2011 to 2023. Various statistical models, including Pooled OLS, Random Effects, and Fixed Effects, are evaluated. The Fixed Effects Model is identified as the most robust and reliable for the analysis. Board independence, board activity, CEO duality, managerial ownership, and institutional ownership significantly enhance ROE and ROA. Additionally, board gender diversity, firm size, and firm age positively influence financial performance. Financial leverage exhibits a weakly significant negative impact on performance, while board size does not significantly affect ROE or ROA. The models demonstrate moderate explanatory power (Adjusted R^2: 0.352 and 0.330), highlighting the substantial role of corporate governance practices in explaining financial performance variations. The study provides updated empirical evidence specific to Pakistan's cement sector, filling a research gap on the relationship between corporate governance dimension and financial performance indicators in emerging markets. The findings emphasize the importance of adopting structured and inclusive governance practices to optimize financial performance. These insights are crucial for corporate leaders,

policymakers, and investors aiming to improve governance standards and competitiveness. Sound governance practices promote sustainable financial performance and ethical business conduct, fostering sector-wide improvements and economic stability. The study focuses solely on the cement sector in Pakistan, which may limit the generalizability of the findings to other industries or regions. Future studies could explore the influence of external factors, such as regulatory frameworks and market dynamics, on the relationship between corporate governance and financial performance. Expanding research to other industries or regions would provide a broader understanding of governance practices in emerging economies.
Key words: CG Dimensions, Financial indicators, Cement Sector, Pakistan Stock Exchange, Fixed effect Model

Introduction

This section provides a comprehensive overview of the relationship between corporate governance and financial performance, with a focus on the cement sector in Pakistan. Corporate governance is defined in multiple ways, reflecting contextual and regional variations. The most widely accepted definition, as established by the Cadbury Committee (1992), is that corporate governance refers to the system by which companies are directed and controlled. Other definitions emphasize internal practices that improve financial performance and value maximization (Jensen, 2010), as well as the external institutional environment in which firms operate (Bassanini, Scarpetta, & Hemmings, 2001). In general, corporate governance can be seen as a framework of rules, structures, and practices that guide company management, ensuring stakeholders' capital is protected and generating returns.

Corporate governance is informed by several economic and business management theories, including Agency Theory, Stewardship Theory, Stakeholder Theory, Managerial Signaling Theory, Resource Dependence Theory, Institutional Theory, Tokenism Theory, Social Contract Theory, Legitimacy Theory, and Political Theory. These theories offer insights into the relationships between governance structures and firm financial performance. Agency theory, for example, focuses on the relationship between shareholders and management, while Stewardship theory highlights the role of trust in governance structures.

This section further explores various corporate governance mechanisms that influence financial performance. Key mechanisms include ownership structure, board independence, board size, board diversity, CEO duality, and audit committees. Ownership structure aligns the interests of shareholders and managers (Mustafa, Che-Ahmad, & Chandren, 2018), while audit committees, especially after the Sarbanes-Oxley Act of 2002, play a critical role in ensuring accountability and protecting stakeholders' interests. These governance mechanisms are crucial in fostering market confidence and enhancing the financial performance of firms, with studies showing that effective governance practices lead to improved profitability, valuation, and growth (Siddiqui, YuSheng, & Tajeddini, 2023).

In terms of financial performance, key indicators such as Return on Equity (ROE), Return on Assets (ROA), Gross Profit, and Profitability Ratios (PR) are often used to assess the impact of corporate governance mechanisms. Research suggests that good governance leads to higher net income and greater investor confidence, contributing to improved financial outcomes (Mishra & Mohanty, 2018; Xuan & Loang, 2023). However, weak corporate governance structures can lead to a lack of investor confidence, negatively impacting financial performance (Abdo & Fisher, 2007).

The focus of this study is to examine the relationship between corporate governance and the financial performance of firms in the cement sector in Pakistan, with a specific emphasis on listed companies on the Karachi Stock Exchange. Corporate governance has gained substantial importance in Pakistan over the past two decades, especially with initiatives like the Securities and Exchange Commission of Pakistan's (SECP) Code of Corporate Governance and the establishment of the Pakistan Institute of Corporate Governance (PICG) in 2004. These efforts aim to improve transparency, accountability, and the quality of corporate governance, which are essential for attracting investment and fostering economic growth.

Despite these advancements, challenges persist in the business environment, particularly within the cement sector. Issues like the agency problem—where management may prioritize its interests over those of shareholders—continue to affect the financial performance of firms (Adhikary, 2024; Imbabi, Carrigan, & McKenna, 2012). Effective corporate governance mechanisms are seen as essential for improving market confidence, protecting shareholders' interests, and enhancing financial performance, particularly in emerging economies like Pakistan.

Research on corporate governance dimensions and their impact on firm financial performance has been widely explored in developed countries, where robust corporate governance practices and detailed financial data are more readily available (Ahmed, Ali, & Hágen, 2023; Gupta, Kennedy, & Weaver, 2009; Judge, Naoumova, & Koutzevol, 2003). However, in developing countries, particularly in Pakistan, there is a limited body of research on this topic, especially concerning specific sectors such as the cement industry. Despite the significant role that the cement sector plays in Pakistan's economy, there remains a noticeable gap in updated research examining how corporate governance practices influence the financial performance indicators of firms in this sector.

The choice of the cement sector for this research is purposeful, as it is one of the key industries contributing to economic development in Pakistan, providing essential infrastructure materials and generating substantial employment (Adhikary, 2024). However, the governance practices within this sector are under-researched, and there is limited empirical evidence on how governance dimensions like board independence, CEO duality, managerial ownership, and institutional ownership affect financial indicators such as Return on Equity (ROE) and Return on Assets (ROA).

Filling this research gap is important for several reasons. First, cement companies in Pakistan face unique challenges such as regulatory issues, market volatility, and the need for significant capital investment. Corporate governance practices in this sector may directly influence how well companies navigate these challenges and achieve financial success. Second, there is a growing call for improved corporate governance in emerging markets, particularly in sectors that have a substantial impact on national development. This research aims to provide valuable insights into how governance structures in the cement sector of Pakistan can enhance firm performance, contributing to better decision-making, resource allocation, and long-term sustainability.

Given that updated research specifically focusing on corporate governance in the cement sector of Pakistan is scarce, this study will fill an important gap in the literature. By analyzing data from 2011 to 2023, the research will offer a comprehensive understanding of the evolving corporate governance practices within the sector and their impact on financial performance. This will not only contribute to the academic discourse but also offer practical implications for corporate leaders, policymakers, and investors in Pakistan, promoting more effective governance structures that could enhance the sector's overall competitiveness and profitability.

The paper is structured as follows: **Section 2** reviews previous research on corporate governance dimensions and financial performance, establishing the study's theoretical foundation. **Section 3** describes the data, sample selection, variables, and methodology used for hypothesis testing. **Section 4** presents the analysis results, including descriptive statistics, correlations, and regression outcomes, discussing their alignment with the hypotheses. **Section 5** summarizes the findings, their implications, and offers recommendations for future research based on study results and limitations.

Literature Review

This section reviews the literature on the theoretical and empirical evidence regarding corporate governance and its impact on firm financial performance in the cement sector of Pakistan for the period 2011–2023.

Theories of Corporate Governance

Agency Theory

Agency theory describes the relationship where a principal hires an agent to act on their behalf. However, a conflict of interest often arises, as agents (managers) may prioritize their own interests over the principal's (shareholders), potentially leading to issues like hidden information, sunk costs, and opportunism. Agency problems can result in agency costs, and effective corporate governance is necessary to reduce these costs and align the interests of managers and shareholders. This theory highlights the separation of ownership and control, and the role of boards in mitigating these conflicts (Bui & Krajcsák, 2023).

Stewardship Theory

Stewardship theory contrasts with agency theory by assuming that managers act in the best interest of the organization and its shareholders. It suggests that managers, as stewards, align their personal goals with the company's objectives, leading to collective success. This theory emphasizes trust and reliability in management, proposing that no agency problem arises due to the alignment of interests between management and shareholders (Steinfeld, 2023).

Stakeholder Theory

Stakeholder theory broadens the focus beyond shareholders to include other parties such as employees, suppliers, and the community (Keay, 2010). It asserts that organizations should consider the interests of all stakeholders to ensure long-term success. This approach emphasizes ethical governance and responsible business practices that benefit the company and society as a whole .

Resource Dependence Theory (RDT)

RDT focuses on how organizations rely on external resources (e.g., expertise, capital) for survival. It suggests that firms depend on their environment for essential resources, and boards of directors play a key role in managing these external relationships to improve the firm's performance and value (Coşkun & Öztürk, 2024).

Institutional Theory

Institutional theory examines how organizations adapt to external pressures by conforming to societal norms, rules, and structures. It highlights the importance of internal and external governance mechanisms and suggests that organizational behavior is influenced by institutional forces, which can shape business practices and governance over time (M. I. Yousaf Khan & Khan, 2020).

Tokenism Theory

Tokenism theory explores how minority members in a group (e.g., women in male-dominated environments) face challenges due to their status. Tokens experience increased visibility, performance pressure, and exclusion from key decision-making, often leading to isolation and stereotyping. The theory also ties into social identity theory, which explains how demographic characteristics can influence group dynamics and perceptions (Kaur, Joshi, Sharma, & Singh, 2024).

Key Corporate governance Practices and Financial Performance

In this research paper, we explore the relationship between various dimensions of corporate governance and firm financial performance. Specifically, we examine how different corporate governance mechanisms affect key financial performance indicators like return on equity (ROE) and return on assets (ROA). This comprehensive analysis aims to provide insights into the role of effective governance practices in enhancing financial outcomes.

Nexus between Board Size and ROE:

Recent studies have continued to explore the nexus between board size and financial performance, specifically focusing on Return on Equity (ROE). The findings, however, remain mixed: Positive Relationships: Studies suggest that larger boards can improve ROE by providing diverse expertise, enhanced monitoring, and effective strategic decision-making. For example, research highlights the role of board size in positively influencing ROE through better governance practices and knowledge-sharing in complex firms. This is particularly evident in sectors where firm complexity demands extensive board oversight (Farooq & Ahmad, 2023; Khan, Rehman, Shah, & Khan, 2018).

In light of the reviewed literature, the following hypothesis has been formulated for empirical testing:

H_1: There is a significant relationship between board size and Return on Equity (ROE) in the cement sector of Pakistan.

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Nexus between Board Size and ROA:

Board size can impact a firm's financial performance, such as ROA, both positively and negatively. Larger boards bring diverse skills and perspectives, potentially improving decision-making, oversight, and profitability. However, they may also suffer from coordination problems, slow decision-making, and higher costs, which could reduce efficiency and ROA. The effect of board size varies by industry and firm characteristics, with larger boards being more beneficial in complex, high-risk industries (Kyereboah-Coleman & Biekpe, 2006; M. I. Yousaf Khan & Khan, 2020). Thus the following hypothesis has been formulated for empirical testing:

H_2: There is a significant relationship between board size and Return on Assets (ROA) in the cement sector of Pakistan.

Nexus between Board Independence and ROE:

Independent directors are considered to be more objective and less likely to be influenced by management. According to agency theory (Jensen, 2010; Meckling & Jensen, 1976), independent boards are better at monitoring management, reducing agency costs, and aligning the interests of shareholders and management. This improved monitoring is expected to enhance the efficiency of decision-making and the use of resources, leading to higher profitability and ROE (Khan, Ahmad, & Malik, 2022).

A higher proportion of independent directors can reduce the risk of managerial entrenchment, where management makes decisions that benefit themselves rather than shareholders. Independent boards are more likely to challenge management's decisions, promoting more shareholder-friendly policies, which can improve financial performance, including ROE (D. Yousaf Khan, Ahmad, & Malik, 2021).

Some studies suggest that a high proportion of independent directors may lead to conflicts with management or hinder decision-making efficiency. Independent directors, who may not have day-to-day involvement in the company, could struggle with the practicalities of business operations and may make decisions that are less informed, reducing their effectiveness. This can lead to inefficiencies that negatively impact ROE (Hanif, Khan, Jamal, Gul, & Zeeshan, 2023). In view of above literature, the following hypothesis has been developed for empirical testing:

H_3: There is a significant relationship between Board impendence and Return on equity (ROE) in the cement sector of Pakistan.

Nexus between Board Independence and ROA:

The literature on the nexus between board independence and ROA suggests that a higher proportion of independent directors can enhance firm performance by improving governance and operational efficiency. Independent boards help reduce agency costs, provide strategic oversight, and encourage better asset management, which can lead to higher ROA. However, the relationship is not always positive, as independent directors may lack operational knowledge, slow decision-making, or be merely symbolic in some firms. The impact of board independence on ROA is highly context-dependent, with firm size, industry characteristics, and the quality of governance playing important roles in

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determining the strength of the relationship (Habtoor, Alowaimer, Waked, & Alobaid, 2024). Thus the following hypothesis has been made for testing the analysis empirically:
H_4: There is a significant relationship between Board impendence and Return on Assets (ROA) in the cement sector of Pakistan.

Nexus between Board Gender Diversity and ROE:
Different Studies (Khan, Ahmad, et al., 2022; D. Yousaf Khan et al., 2021) indicate that gender-diverse boards are associated with higher ROE due to enhanced decision-making and risk management. Firms in the S & P 500 have steadily increased female representation on boards, reaching 32% in 2023, a change that correlates with improved financial outcomes (Mensah & Onumah, 2023). A study examining 1,990 publicly listed Japanese companies (2006-2023) found that increased board gender diversity was negatively associated with ROE. This negative effect was more pronounced in smaller firms(Wang, Ma, Xue, & Zhang, 2024). The following hypothesis has been formulated In light of the reviewed literature for empirical testing:
H_5: There is a significant relationship between Board Gender Diversity and Return on Equality (ROE) in the cement sector of Pakistan.

Nexus between Board Gender Diversity and ROA:
Research involving firms in multiple countries demonstrates that gender-diverse boards improve ROA by enhancing decision-making, innovation, and governance. In Asian economies like India and China, companies with higher female representation on boards report better financial performance, as diverse perspectives foster effective strategies and risk management (Bristy, How, & Verhoeven, 2021). In light of the above literature the hypothesis for empirical testing is:
H_6: There is a significant relationship between Board Gender Diversity and Return on Assets (ROA) in the cement sector of Pakistan.

Nexus between CEO Duality and ROE:
The relationship between CEO duality and Return on Equity (ROE) is debated, with varying findings depending on contextual factors: CEO duality can enhance ROE by enabling swift decision-making and clear strategic direction. This is often supported by stewardship theory, especially in dynamic industries requiring strong leadership (Batool, Khan, Arshad, & Bashir, 2024; Shrivastav & Kalsie, 2016).
Agency theory highlights risks like reduced board oversight and potential conflicts of interest, which can harm firm performance and ROE. These negative impacts are more pronounced in smaller firms and less regulated environments. In light of the above literature the hypothesis of this study is:
H_7: There is a significant relationship between CEO Duality and Return on Assets (ROA) in the cement sector of Pakistan.

Nexus between CEO Duality and ROA:
CEO duality can enhance ROA by streamlining decision-making and aligning strategic goals. This is particularly beneficial in large firms and industries

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requiring swift responses to market changes. Stewardship theory supports this view, emphasizing cohesive leadership. These dynamics suggest that the effectiveness of CEO duality depends on firm-specific contexts and external conditions (Hanif et al., 2023; Yu & Xiao, 2022). The following hypothesis has been made in light of studying previous studies of different authors of the same field:

H_8: There is a significant relationship between CEO duality and Return on Assets (ROA) in the cement sector of Pakistan.

Nexus between Board Activity and ROE:

Several studies highlight a positive relationship between board activity and ROE. Active boards, characterized by frequent meetings, are more likely to engage in rigorous oversight, strategic planning, and timely decision-making, which can enhance financial performance. Reeb and Upadhyay (2010) found that increased board activity improves monitoring effectiveness, leading to better resource allocation and higher profitability.

Contrarily, few studies suggest that excessive board activity may be counterproductive. Too many meetings might indicate organizational inefficiencies or reactive governance, which can strain managerial focus and resources. M. I. Yousaf Khan and Khan (2020) argued that overly active boards might micromanage, diminishing managerial autonomy and negatively impacting firm performance. The following hypothesis has been formulated based on a review of previous studies conducted by various authors in the same field:

H_9: There is a significant relationship between Board Activity and Return on Equity (ROE) in the cement sector of Pakistan.

Nexus between Board Activity and ROA:

Frequent board meetings are positively associated with better financial performance (ROA). They reflect proactive governance, enabling boards to address challenges effectively and implement strategic decisions promptly (Dincer, Keskin, & Dincer, 2023; D. Yousaf Khan et al., 2021). The following hypothesis is based on a review of prior studies in the field:

H_{10}: There is a significant relationship between Board Activity and Return on Assets (ROA) in the cement sector of Pakistan.

Nexus between Managerial Ownership and ROE:

Managerial ownership aligns management's interests with shareholders, leading to enhanced performance and improved ROE. This relationship is observed in firms with moderate levels of managerial ownership where managers are motivated to maximize shareholder value (Boshnak, 2024). Some studies find a non-linear effect, where increased managerial ownership initially improves ROE but diminishes beyond a certain threshold due to entrenchment risks. At high levels of ownership, managers may prioritize personal interests over broader performance goals. Based on the reviewed literature, the following hypothesis is proposed for empirical testing:

H_{11}: There is a significant relationship between Managerial Ownership and

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Return on Equality (ROE) in the cement sector of Pakistan.

Nexus between Managerial Ownership and ROA:
Managerial ownership aligns managers' interests with shareholders, encouraging decisions that maximize firm performance, which reflects positively on ROA. This effect is particularly pronounced in firms with strong governance frameworks and a balanced ownership structure. Beyond certain ownership levels, the positive impact may decline due to entrenchment risks where managers prioritize personal control over firm efficiency (Karim, Naeem, & Ismail, 2023). Drawing on insights from the reviewed literature, the following hypothesis has been carefully formulated to serve as the foundation for empirical testing and to address key research objectives within the field.
H_{12}: There is a significant relationship between Managerial Ownership and Return on Assets (ROA) in the cement sector of Pakistan.

Nexus between Institutional Ownership and ROE:
Recent literature on institutional ownership and Return on Equity (ROE) suggests a generally positive relationship. Institutional investors, with their expertise and influence, often push for higher performance, leading to improved ROE. This effect is particularly prominent in firms with strong governance and accountability structures. However, the relationship can be complex, with factors like ownership concentration and type of institutional investors playing a moderating role. Studies have highlighted that certain institutional investors drive better corporate governance, which can, in turn, enhance financial performance (Liu & Suzuki, 2024). The following hypothesis has been formulated to serve as the foundation for empirical testing and to address research objectives of this study:
H_{13}: There is a significant relationship between Institutional Ownership and Return on Assets (ROA) in the cement sector of Pakistan.

Nexus between Institutional Ownership and ROA:
The relationship between institutional ownership and Return on Assets (ROA) has been explored in various studies, and the findings generally indicate a positive connection, though the nature of this relationship can depend on several factors. Institutional ownership can improve ROA through enhanced monitoring of management and better strategic decision-making. Institutional investors typically have the resources and expertise to ensure efficient resource allocation and reduce agency problems between managers and shareholders. The relationship between institutional ownership and firm performance, such as ROA, is complex. Ownership concentration and the type of institutional investors play significant moderating roles. In some cases, institutional investors contribute to better corporate governance, enhancing financial performance. This positive impact is stronger when investors actively engage in firm decisions, promoting transparency and efficiency (Saleh, Eleyan, & Maigoshi, 2024). The following hypothesis has been formulated for empirical testing to address the objectives of this paper::
H_{14}: There is a significant relationship between Institutional Ownership and Return on Assets (ROA) in the cement sector of Pakistan.

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Theoretical Frame work

This theoretical framework investigates the relationship between corporate governance dimensions and financial performance indicators (ROE and ROA) within the cement sector firms listed on the Pakistan Stock Exchange (PSX) from 2011 to 2023. The framework integrates various governance mechanisms and theories to understand how these dimensions influence the financial performance of companies in the cement sector. Below is the Theoretical frame work of this research study:

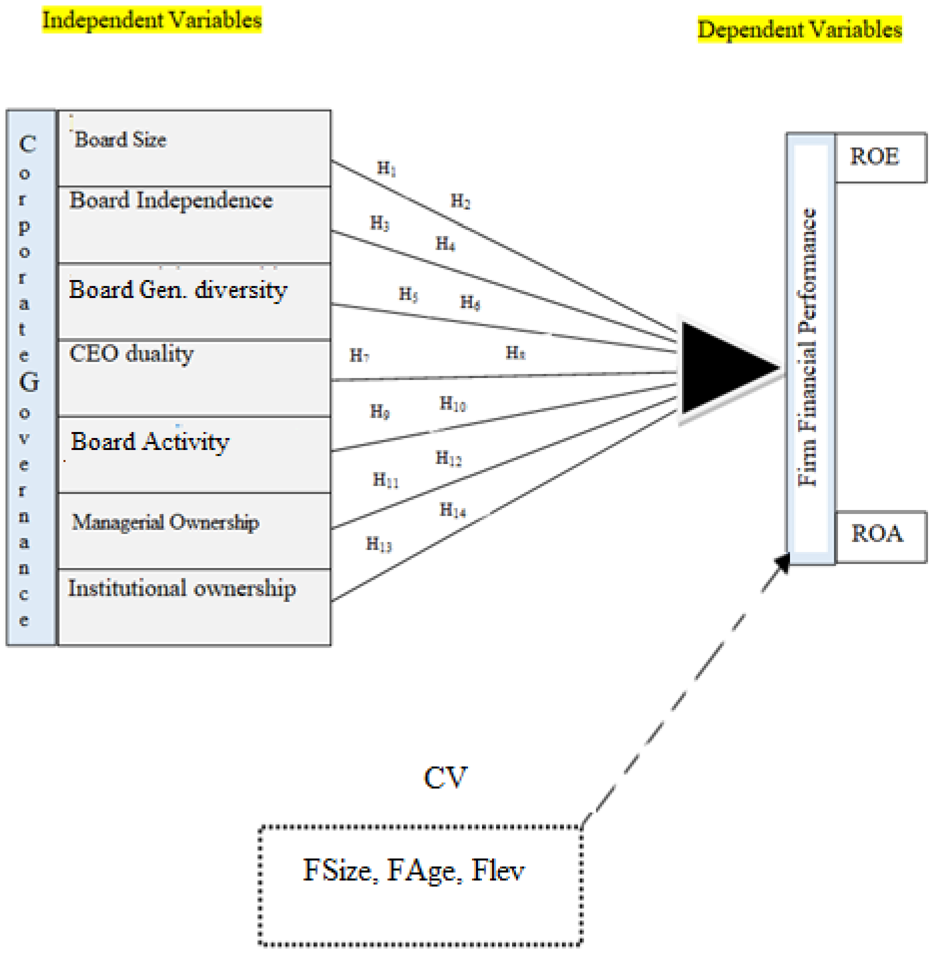

Fig 1: Theoretical Framework of the Study

Research methodology

Data Collection and Sample Selection

This study utilizes secondary data gathered from the annual reports of cement sector firms listed on the Pakistan Stock Exchange (PSX) for the period from 2011 to 2023. The population for this research consists of all cement companies listed on the Pakistan Stock Exchange (PSX) during the study period. This includes every firm operating within the cement sector that meets the study's criteria. The sample consists of all cement companies listed on the Pakistan Stock Exchange (PSX) during the specified period. This ensures a diverse and balanced

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representation, accurately reflecting the population, and allowing for valid conclusions regarding the cement sector in Pakistan.

Operational definitions alongwith Measurement of relevant Variables

Board Size

Board Size is the total number of directors on a company's board (Jenter, Schmid, & Urban, 2023).

Board Independence

It refers to the proportion of non-executive directors on its board, particularly independent ones without material or financial ties to the company. It ensures unbiased oversight, strengthens corporate governance, and protects shareholder interests (Mai, Djuwarsa, & Setiawan, 2023).

Board Gen. Diversity

It representing of diff genders especially women, on the board of Firm (Karim et al., 2023).

CEO Duality

It is a dichotomous variable indicating whether the roles of Chief Executive Officer (CEO) and Chairperson of the Board are held by the same individual. It is coded as '1' If the same person holds both roles (duality) or '0' if the roles are separated (Mai et al., 2023).

Board Activity

It refers to the frequency of board meetings during a financial year, indicating the board's engagement in overseeing management and strategic decision-making. Managerial Ownership: Fraction of shares held by directors, managers, and their immediate family members (Affes & Jarboui, 2023).

Institutional Ownership

It refers to the percentage of a company's shares held by large institutional investors, such as mutual funds, pension funds, and insurance companies. It is a key indicator of shareholder structure and can influence corporate governance and firm performance (Affes & Jarboui, 2023).

Firm Size

It is measured by the natural logarithm of a company's total assets (Alam & Tariq, 2023).

Firm Age

It is calculated as the difference between the incorporation year of the firm and the current year. This measure reflects the length of time a firm has been in operation and can provide insights into its experience, stability, and growth trajectory (Alam & Tariq, 2023).

Firm Leverage

It is a financial metric used to assess the proportion of debt used by a company relative to its total assets (Khan et al., 2018) i.e.,

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$$\text{Firm Leverage} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

Research Model of the Study

This research aims to investigate the relationship between corporate governance and firm financial performance. Two models are employed to examine the interaction between financial performance indicators (dependent variable) and corporate governance dimensions (independent variable), while also accounting for control variables that may influence the outcomes.

Model 1: Relationship between CG dimension and ROE

The following model is made to investigate direct effect of CG dimension on ROE.

$ROE = \beta_0 + \beta_1 BS + \beta_2 Bind + \beta_3 BDiv + \beta_4 CEOD + \beta_5 BActiv + \beta_6 MgrlOwn + \beta_7 InstOwn + \beta_8 FSize + \beta_9 FAge + \beta_{10} Flev + \varepsilon$

Model 2: Relationship between CG dimension and ROA

The following model is established to examine direct influence of CG dimension on ROA.

$ROA = \beta_0 + \beta_1 BS + \beta_2 BInd + \beta_3 BGD + \beta_4 CEOD + \beta_5 BActiv + \beta_6 MgrlOwn + \beta_7 InstOwn + \beta_8 FSize + \beta_9 FAge + \beta_{10} Flev + \varepsilon$

Where:

ROE = Return on Equity
ROA = Return on Asset
BS = Board Size
BInd = Board Independence
BGD = Board Gender Diversity
CEOD = CEO Duality
BActiv = Board Activity
MgrlOwn = Managerial Ownership
InstOwn = Institutional Ownership
FSize = Firm Size
FAge = Firm Age
Flev = Firm Leverage
ε = Error term

Results and Discussion

Descriptive Statistics

It summarize key characteristics of a dataset, including measures like mean, median, standard deviation, minimum, maximum, Skewness, and kurtosis, offering insights into the distribution and variability of variables (Batool et al., 2024; Hanif et al., 2023).

Table 1: Descriptive Statistics

Variable	Obs	Mini	Max	Mean	Std Dev
ROE	260	-10.367	10.343	0.121	0.414
ROA	260	-0.934	4.314	0.06	0.141
BS	260	7	14	6.232	2.34

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BInd	260	0.431	0.26	0.045	0.469
BGD	260	0.00	0.342	0.31	0.21
CEOD	260	0.000	1	0.18	0.242
BActiv	260	4.308	2.431	4	14
MgrlOwn	260	0.304	0.32	0.00	0.489
InstOwn	260	0.045	0.0745	0.00	0.33
Fsize	260	12.424	24.345	20.273	12.072
FAge	260	4	120	32.344	18.624
Flev	260	0.000	2.454	0.654	0.276

The data shows significant variability across key variables, particularly in board activity, firm size, and age. Profitability measures (ROE and ROA) are modest, with considerable deviations. Governance practices, such as board size, independence, and gender diversity, vary widely among firms. CEO duality is uncommon, and board activity is inconsistent. Ownership structures are generally low, with substantial variation in managerial and institutional ownership. Firm leverage is moderate on average but also varies notably. Overall, the sample reflects diverse practices in governance, ownership, and financial performance.

Correlation Analysis

Correlation is a statistical measure that quantifies the strength and direction of the relationship between two variables. It indicates how changes in one variable are associated with changes in another. The correlation coefficient, typically denoted by r, ranges from -1 to +1. There are three types of correlation between variables: positive correlation, where both variables move in the same direction; negative correlation, where the variables move in opposite directions; and zero correlation, where there is no discernible relationship between the variables (Khan & Arshad, 2023; D. Yousaf Khan et al., 2021).

Table 2: Correlation Analysis: ROE and CG Dimension

Variables	ROE	BS	BInd	BGD	CEOD	BActiv	MgrlOwn	InstOwn	FSize	FA
ROE	1.00									
BS	-0.40	1.00								
BInd	0.46	0.30	1.00							
BGD	0.36	0.09	0.26	1.00						
CEOD	0.35	0.34	0.22	0.22	1.00					
BActiv	0.45	0.30	0.28	-0.12	0.18	1.00				
MgrlOwn	0.25	0.06	-0.26	0.14	-0.19	0.15	1.00			
InstOwn	0.28	0.20	0.27	0.16	0.15	0.16	0.41	1.00		
Fsize	0.44	0.33	0.21	-0.20	0.14	0.21	-0.21	0.24	1.00	
FAge	0.30	0.36	0.21	0.16	-0.14	0.15	-0.07	0.26	0.20	1.0
Flev	-0.27	0.13	-0.27	0.12	0.14	-0.12	0.23	-0.23	0.27	-0

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Return on Equity (ROE) is positively influenced by factors such as board independence, board activity, firm size, and board gender diversity, while negatively impacted by larger board size and higher financial leverage suggesting that larger boards and higher debt levels might negatively i.e., adversely impact ROE. Board independence and activity emerge as strong predictors of firm performance, whereas larger boards and excessive debt seem inefficient. CEO duality, managerial ownership, and institutional ownership show weak but positive associations with ROE, with institutional ownership favoring better-performing firms. Firm size and age also contribute positively to performance, indicating that larger, older firms tend to be more stable, while high financial leverage undermines performance. Overall, governance and firm-specific characteristics significantly influence ROE, emphasizing the importance of balanced board structure and financial strategy.

Table 3: Correlation Analysis: ROA and CG Dimension

Variables	**ROA**	**BS**	**BInd**	**BGD**	**CEOD**	**BActiv**	**MgrlOwn**	**InstOwn**	**FSize**	**FAge**	**Flev**
ROA	1.00										
BS	-0.38	1.00									
BInd	0.40	0.31	1.00								
BGD	0.33	0.06	0.20	1.00							
CEOD	0.34	0.30	0.20	0.20	1.00						
BActiv	0.46	0.29	0.21	-0.13	0.13	1.00					
MgrlOwn	0.27	0.08	-0.21	0.12	-0.17	0.13	1.00				
InstOwn	0.22	0.21	0.22	0.14	0.10	0.12	0.40	1.00			
FSize	0.45	0.32	0.20	-0.22	0.10	0.23	-0.20	0.23	1.00		
FAge	0.35	0.23	0.22	0.14	-0.19	0.12	-0.09	0.23	0.20	1.00	
Flev	-0.20	0.19	-0.23	0.14	0.12	-0.10	0.29	-0.20	0.29	-0.28	1.00

Return on Assets (ROA) shows positive correlations with board independence, board activity, firm size, and board gender diversity, indicating that these governance factors and firm-specific characteristics contribute to better asset utilization. However, it is negatively associated with board size and financial

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leverage, suggesting inefficiencies with larger boards and higher debt levels. While CEO duality, managerial ownership, and institutional ownership have weak positive correlations with ROA, their influence remains limited. Larger and older firms exhibit better ROA, reflecting stability and efficiency. Overall, governance quality, active boards, and optimal financial strategies are essential for enhancing ROA, while controlling for board size and leverage can mitigate inefficiencies.

Regression Analysis

In this study of research, two (2) Regression models have been developed in order to examine the Influence of Various Corporate Governance Dimensions on Financial Performance Indicators.

Table 4: Regression results of Influence of CG Dimension on ROE & ROE

Variable	Model-I			Model-II		
	Coefficient.	**Robust St. Err.**	**p-value**	**Coefficient**	**Robust St. Err.**	**p-value**
BS	0.01454	0.009987	0.843	0.01523	0.07886	0.568
BInd	0.013476	0.096769	0.000***	0.012311	0.056814	0.044**
BGDiv	0.054545	0.057432	0.047**	0.034232	0.045445	0.0521**
CEOD	0.054644	0.034233	0.000***	0.064623	0.043345	0.0000***
BActi	0.019824	0.088456	0.000***	0.018239	0.072441	0.000***
MgrlOwn	0.08643	0.091134	0.045**	0.09134	0.053453	0.000***
InstOwn	0.032044	0.013549	0.035**	0.045022	0.016457	0.027**
Fsize	0.018445	0.090134	0.036**	0.014678	0.061345	0.035**
FAge	0.194532	0.014454	0.043**	0.106789	0.033561	0.054*
Flev	-0.03457	0.034506	0.0521*	-0.046781	0.054501	0.0545*
Constant	0.313834	0.087933	0.026**	0.351234	0.076584	0.026**
R-Value		0.412		0.351		
Adjusted R2		0.352		0.33		
F-Statistics		114.451		111.132		
Prob > F		0.000		0.000		

**** p<1%, ** p< 5%, * p < 10%*

The regression analysis investigates how various dimensions of corporate governance affect financial performance, measured through Return on Equity (ROE) and Return on Assets (ROA), using two distinct models.

The regression results for Board Size (BS) in both models show a positive coefficient, suggesting a potential relationship with financial performance. However, the high p-values (0.8430 and 0.5680) indicate that this relationship is statistically insignificant, meaning board size does not significantly impact ROE or ROA in this study (Kyere & Ausloos, 2021; Lawal & Yahaya, 2024; D. Yousaf Khan et al., 2021).

The results reveal that board independence, board activity, CEO duality, managerial ownership, and institutional ownership significantly enhance both ROE and ROA. These findings suggest that a well-structured board, active oversight, dual leadership roles, and alignment of managerial and institutional interests with the company's goals play crucial roles in driving performance (Lei, 2007).

Additional governance factors such as board gender diversity, firm size, and firm age also positively influence financial outcomes. The presence of diverse perspectives on the board may improve decision-making and innovation, while larger and more established firms benefit from greater resources and stability. However, financial leverage shows a weakly significant negative effect on performance, indicating that excessive reliance on debt might hinder a firm's profitability and operational efficiency (Akhtar, Yusheng, Haris, Ain, & Javaid, 2022).

The models exhibit moderate explanatory power, with R-values of 0.412 and 0.351, and Adjusted R^2 values of 0.352 and 0.33, suggesting that a substantial portion of the variation in ROE and ROA is attributable to corporate governance dimensions. The robustness of the models is further supported by high F-statistics and significant p-values (<0.000), confirming that the selected governance variables collectively have a meaningful impact on financial performance (Arshad, Bashir, Khan, Usman, & Batool; Khan, Arshad, Bashir, Nadeem, & Gujjar, 2022). These findings underscore the importance of adopting sound governance practices to optimize firm performance.

Summary of Findings of Hypothesis Testing

The results of hypothesis testing in this study provide comprehensive insights into the relationship between corporate governance dimensions and financial performance indicators (ROE and ROA) in the cement sector of Pakistan. The findings can be summarized in the following table 5.

Table 5: Summary of Findings of Hypothesis testing

Hypothesis	**Expected Relationship**	**P-Value**	**Findings**
H_1: There is a significant relationship between board size and Return on Equity (ROE) in the cement sector of Pakistan.	Positive	0.843	Rejected
H_2: There is a significant relationship between board size and Return on Assets (ROA) in the cement sector of Pakistan.	Positive	0.568	Rejected

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H_3: There is a significant relationship between Board impendence and Return on equity (ROE) in the cement sector of Pakistan.	Positive	0.000***	Supported
H_4: There is a significant relationship between Board impendence and Return on Assets (ROA) in the cement sector of Pakistan.	Positive	0.044**	Supported
H_5: There is a significant relationship between Board Gender Diversity and Return on Equality (ROE) in the cement sector of Pakistan.	Positive	0.047**	Supported
H_6: There is a significant relationship between Board Gender Diversity and Return on Assets (ROA) in the cement sector of Pakistan.	Positive	0.0521**	Supported
H_7: There is a significant relationship between CEO Duality and Return on Assets (ROA) in the cement sector of Pakistan.	Positive	0.000***	Supported
H_8: There is a significant relationship between CEO duality and Return on Assets (ROA) in the cement sector of Pakistan.	Positive	0.0000***	Supported
H_9: There is a significant relationship between Board Activity and Return on Equity (ROE) in the cement sector of Pakistan.	Positive	0.000***	Supported
H_{10}: There is a significant relationship between Board Activity and Return on Assets (ROA) in the cement sector of Pakistan.	Positive	0.000***	Supported
H_{11}: There is a significant relationship between Managerial Ownership and Return on Equality (ROE) in the cement sector of Pakistan.	Positive	0.045**	Supported
H_{12}: There is a significant relationship between Managerial Ownership and Return on Assets (ROA) in the cement sector of Pakistan.	Positive	0.000***	Supported
H_{13}: There is a significant relationship between Institutional Ownership and Return on Assets (ROA) in the cement sector of Pakistan.	Positive	0.035**	Supported
H_{14}: There is a significant relationship between Institutional Ownership and Return on Assets (ROA) in the cement sector of Pakistan.	Positive	0.027**	Supported

Conclusion And Recommendations

Section-5 summarizes the findings, discusses their implications, and provides recommendations for future research based on the study's results and limitations.

Main Findings

The study finds that several corporate governance dimensions significantly enhance financial performance, including board independence, board activity, CEO duality, and managerial and institutional ownership, all positively impacting ROE and ROA. Additionally, board gender diversity, firm size, and age contribute positively to financial outcomes, with larger and more established firms performing better. However, financial leverage weakly negatively impacts performance, suggesting that excessive debt hinders profitability. Board size, on the other hand, does not significantly affect financial performance. The study's models demonstrate moderate explanatory power, with Adjusted R^2 values of 0.352 and 0.33, indicating that corporate governance dimensions account for a significant portion of performance variations.

Implications

The study's implications highlight several key areas for improvement and future exploration. Corporate leaders and boards should prioritize board independence, activity, and diversity to drive innovation and align ownership structures with long-term goals. Policymakers and regulators should encourage independent boards, promote gender diversity, and manage financial leverage to ensure sustainable growth. Investors should consider strong governance structures when evaluating opportunities, especially in emerging markets. The cement sector can benefit from addressing governance inefficiencies to enhance performance. Future research could extend to other sectors and examine the role of external factors on governance-performance relationships. Lastly, enhanced governance promotes sustainable business practices, contributing to broader economic stability and ethical corporate behavior.

Future Recommendations

Future research could explore additional governance dimensions, such as executive compensation, ownership concentration, or board tenure, to enhance understanding of their impact on financial performance. It could also focus on industry-specific analyses to identify contextual variations in governance-performance relationships. A long-term study could examine the consistency of these relationships over time, considering economic, regulatory, and governance changes. Further exploration into the role of financial leverage in governance and performance could provide insights on optimal capital structures. Lastly, expanding the sample to include firms from different regions would help assess the generalizability of the findings across diverse governance practices and financial environments.

Limitations of the Study

This study has several limitations, including its sector-specific focus on the cement industry in Pakistan, limiting the generalizability of findings to other sectors or regions. The sample size of 20 companies may not fully capture the sector's diversity, and the analysis is confined to the period from 2011 to 2023, which may overlook governance or performance changes outside this timeframe. Additionally, the study excludes external factors like macroeconomic conditions and regulatory changes. Its single-country context may limit applicability to countries with different governance frameworks. The study also does not explore other governance dimensions such as board expertise or ESG factors. Methodologically, the reliance on secondary data and moderate explanatory power suggests potential biases and that other factors may influence financial performance.

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