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Impact of Corporate Governance on Capital Structure, Firm Performance, and Risk of Firms: Empirical Evidence of the Listed Cement Industry of Pakistan

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Abstract

The primary objective of this research is to examine corporate governance (CG), capital structure, financial performance (FP), and risk within the context of Pakistani cement companies. The scholarly discourse has mostly overlooked the correlation between corporate governance (CG) and solvency risk, despite prior research on CG and FP (FP), as well as capital structure. There is a lack of academic research that has explored the role of capital structure in mediating credit risk, financial risk, and solvency risk. This research uses descriptive and explanatory methodologies. This research used panel data analysis to examine annual reports of cement companies in Pakistan, as well as reports from the Pakistan State Bank and the Securities and Exchange Commission. The data set covers the time from 2015 to 2020. The current investigation employs descriptive and explanatory methodologies due to limitations in the existing literature. On the basis of the findings of the research, there exists a correlation between certain computer graphics (CG) features and the use of a first-person (FP) viewpoint. The present research investigates the influence of insider directors, institutional shareholdings (IS), board independence (BI), audit committee size (AC), and board size (BS). In contrast, it may be shown that the solvency risk (SRP) remained unaffected by corporate governance (CG). Research also shows that capital structure (CS) has a positive impact on FP (FP). There was no substantial decrease in SRP. According to several studies, the capital structure plays a crucial role in facilitating capital growth, enhancing FP, and mitigating solvency risks. This research provides empirical evidence in favor of agency theory and offers insight into the interplay of corporate governance, capital structure, FP, and risk within the cement sector. These findings have the potential to provide valuable information for business policymakers and professionals, helping them make informed decisions. The research highlights the importance of corporate governance practices, such as board size, representation of insiders and independent directors, and the effectiveness of the audit committee. These practices have been shown to enhance FP, mitigate solvency risk, and reduce the level of debt in the capital structure. Practises such as the establishment of an audit committee, the determination of an optimal board size, and the inclusion of a balanced composition of both insider and independent directors are often observed in corporate governance.

Keywords: *Corporate Governance, FP, Capital Structure, Solvency Risk Protection, Agency Theory*.

Introduction

The success of a firm is intricately tied to its ability to control and direct operations effectively, with past evidence indicating that companies implementing corporate governance (CG) strategies have seen improvements in performance (Feng, Hassan & Elamer, 2020). Corporate governance encompasses laws and regulations crucial to enhancing operational efficiency and financial performance (FP), especially for investors and stakeholders. Transparency and fairness, facilitated by CG, contribute to the fulfilment of stakeholder interests and instil investor confidence.

In the context of the cement industry in Pakistan, a significant contributor to the country's GDP, this study aims to investigate the relationship between CG, solvency risk protection, FP, and capital structure (CS) from 2015 to 2020. The choice of the cement industry is strategic, given its potential to illustrate associations between these key factors, and annual disclosures affirm the adherence to CG practices.

Despite the extensive literature on the relationship between CG and FP or CG and CS, the link between CG and solvency risk has been largely overlooked. Furthermore, the absence of evidence on CS as a mediator between CG, solvency risk protection, and FP underscores a significant research gap. This study seeks to fill this void by investigating the interaction between CG, solvency risk protection, FP, and the mediating role of CS in the context of listed cement industry firms in Pakistan.

The study addresses the following research questions:

- What is the association between CG and FP?
- What is the relationship between CG and solvency risk protection?
- Is there any association between CG and CS?
- What is the association between CS, solvency risk protection, and FP?
- Is CS a mediator between CG, FP, and the protection of solvency risk?

The research aims to achieve the following objectives:

- Investigate the relationship between CG and FP.
- Investigate the relationship between CG and the protection of solvency risks.
- Explore the relationship between CG and CS.
- Explore the relationship between CS, solvency risk protection, and FP.
- Explore the mediating role of CS between CG, FP, and the protection of solvency risk.

The significance of the study lies in its examination of the performance and CG practices of cement industry firms in Pakistan, offering insight into unbiased decisions, optimal CS, and solving risk prevention. Given the historical financial scandals, the study emphasizes the critical role of effective governance in preventing such occurrences.

Review of the Literature

Corporate Governance and Firm Performance

In recent years, there has been a heightened interest in corporate governance (CG) because of its significant influence on businesses' financial success. Extensive research has explored the link between effective CG and positive financial performance (FP) in various industries and economies. Tricker (2015) defines CG as a set of techniques and procedures aimed at ensuring accountability, transparency, and fairness in company management. The complex interaction between good CG and positive FP is fundamental to agency theory,

which suggests that conflicts of interest between shareholders and management can lead to agency problems that affect FP.

The study delves into the composition and mechanisms of CG, focusing on board characteristics, ownership structure, and institutional investors. Research on board composition highlights the importance of factors such as board independence, CEO duality, and board size in influencing FP. The ownership structure, including concentrated ownership and institutional ownership, is explored for its impact on strategic decision making and FP. The study emphasizes the relevance of effective CG in mitigating sector-specific risks and fostering long-term value creation, especially in Pakistan's cement industry. Despite extensive literature, the relationship between CG and FP remains a topic of ongoing debate, with mixed findings reported by various studies. The study proposes a hypothesis (H1) to investigate the significant impact of CG on FP in cement industry firms.

H_1: To investigate the significant impact of CG on FP in cement industry firms.

Corporate Governance and Solvency Risk Protection

CG plays a crucial role in achieving the primary goal of maximizing profits for business organizations, ensuring stakeholders' confidence by implementing sound governance practices. The agency theory addresses the principal-agent problem, where shareholders entrust managers to act in the best interest of the corporation. Ownership separation and control issues can be overcome through managerial shareholdings, as analysed by Morck, Shleifer, and Vishny (1988). CG systems significantly impact FP by influencing the returns on investments for finance suppliers, as highlighted by Edwards and Nibler (2000). These systems are categorized into the Anglo-Saxon model, which relies on managers' compensation for control, and the Continental model, which considers the stakes of various stakeholders. The Anglo-Saxon model, prevalent in countries like the UK, US, Australia, and Canada, features an independent board of directors monitoring management activities to maximize shareholder wealth. In contrast, the Continental Model focuses on stakeholder interests and fosters innovation and competition. CG codes have emerged around the world to protect the interests of stakeholders, ensure accountability, and bring transparency to corporations, ultimately influencing FP. FP indicators such as return on assets, earnings per share, sales growth, market capitalization, and dividend earnings are commonly used to measure organizational efficiency and evaluate firms within the same industry or sector. Insider directors have been found to directly impact firm FP (Barbosa and Louri, 2005; Davies, Hillier, and McClogan, 2005; Kapopoulos and Lazaretou, 2009).

In recent years, the link between CG practices and the risk of business bankruptcy has emerged as a prominent field of academic investigation, particularly in sectors that need considerable capital and face severe financial duress. Solvency risk, often known as the risk of insolvency or bankruptcy, refers to a company's inability to meet its long-term financial commitments. The possible implications of such risk may have a major influence on the stakeholders of a firm, including shareholders and creditors, as well as on the broader stability of the financial system. The adoption of good CG processes has a significant influence on minimizing a business's solvency risk, supporting the judicious use of its resources, and increasing the trust of the company's stakeholders in the organization's financial well-being. CG practices must be implemented to match management activities with the interests of stakeholders such as shareholders and creditors. The agency hypothesis, which focuses on inherent conflicts of interest between shareholders (as principals) and administrators (as agents), may explain the influence of CG on solvency risk. These tensions may manifest themselves in the form of risky behavior that prioritizes short-term profitability above long-term sustainability. As a result, the installation of strong CG processes has the potential to act as a disincentive to excessive risk taking and mismanagement, lowering the likelihood of a corporation facing a financial crisis. The makeup and effectiveness of a company's board of directors have a major impact on the likelihood of corporate bankruptcy, making it an important component of CG. According to Adams and Mehran (2003)'s study, a board distinguished by diversity and independence may considerably contribute to the monitoring of management's decision-making and risk-management

practices. Independent directors who do not engage in the organization's day-to-day activities may give an impartial viewpoint during strategic talks, challenge management choices, and oversee the thorough application of risk assessment and mitigation methods. The deployment of monitoring methods has the potential to reduce the accumulation of extravagant debt and dissuade the undertaking of risky projects that may imperil the organization's financial stability. On the basis of the above stated literature, the following hypothesis is developed.

H_2: There is a significant impact of CG on the protection of the solvency risk of companies operating in the cement industry.

Capital Structure and Firm Performance

CS, which refers to the composition of debt and equity financing sources, significantly impacts a firm's performance and value. Sheikh and Wang (2010) studied Pakistani textile firms and found that an increase in the amount of debt in the CS negatively affects profitability. Mirza and Javed (2013) investigated the determinants of FP in Pakistan and found that the return on equity (ROE) is positively influenced by the debt-to-equity ratio (DER), but negatively affected by long-term debt to total assets (LTDTA) and short-term debt to total assets (STDTA). Raheman et al. (2007) analyzed nonfinancial firms and revealed that equity and firm size have a positive effect, while leverage has a negative effect on profitability. Khan et al. (2013) studied Pakistani textile firms and found that leverage, ROE, earnings per share (EPS), and cash flow ratio positively impact stock returns. Various studies have highlighted the relationship between CS and profitability, with some factors like firm size and industry nature playing significant roles (Abor, 2005; TITMAN & WESSELS, 1988; Singapurwoko & Mustofa El-Wahid, 2011). The findings suggest that the CS of firms can influence their FP and stock returns, with the specific effects varying between industries and contexts.

The cost of capital is a critical element that influences a company's financial success. The CS decision has consequences for calculating the weighted average cost of capital (WACC). The weighted average cost of capital (WACC) is the average rate of return required by investors to supply funds for a company's operational operations. The tax deductibility of interest payments gives debt finance a competitive advantage as a mode of capital acquisition, making it more economically effective than equity investments. However, excessive debt accumulation can intensify financial stress and increase the cost of loan service, thus negating any tax savings. As a result, firms aim to achieve an equilibrium between debt and equity in order to reduce the weighted average cost of capital (WACC) and improve FP. Empirical research was conducted to investigate the link between CS and FP. Rajan and Zingales (1995) discovered an important discovery that showed that enterprises with tangible assets are more likely to employ debt financing. This pattern might be ascribed to the use of these assets as collateral, lowering agency costs, and minimizing the risk of financial catastrophes. Sectors with intangible assets may be more likely to use equity financing due to a decreased dependence on collateral and the need to maintain operational agility. The preceding finding emphasizes the importance of sector-specific variables in influencing CS preferences and the subsequent impact of these decisions on a firm's FP.

Studies revealed the positive relationship between CS and FP. Financing through debt can be beneficial sometimes because of its tax cover; however, there are certain drawbacks of it such as the payment of interests according to the trade-off theory (Abdullah & Tursoy, 2021). Companies trade off their bankruptcy cost and tax advantages via the ratio of debt to equity to increase their value of the firm (Nguyen & Nguyen, 2020). In this regard, document the relationship between CS and FP to be positive (Ayaz, Zabri, & Ahmad, 2021; Ankamah-Yeboah et al., 2021). Therefore, based on the above-stated literature, the following hypothesis is developed for this study:

H_3: There is a significant impact of CS on FP of companies operating in the cement industry of Pakistan

Capital Structure and Solvency Risk Protection

The primary objective of a company is to maximize its value and the wealth of its shareholders, which can be achieved through effective performance measures and risk management strategies (Madura & Fox, 2007). Shareholders and investors consider risk and its measurement as important factors in evaluating a company's performance and making investment decisions (Lofthouse, 1994; IFA, 1999). Risk refers to the uncertainty of future events that can impact a company's strategic, operational, and financial objectives (Harvey, 2008). Rational shareholders aim to minimize risk while achieving their expected return, and understanding and quantifying the nature of risks is crucial for creating a less risky portfolio (Watson & Head, 2016). Quantification of risk is essential to determine the dispersion of possible returns and to measure the total risk faced by the company, which can be assessed using the standard deviation (Quiry et al., 2011). Companies' shares are influenced by both systematic (broad-market) factors and unsystematic (firm-specific) factors, and managing unsystematic risk requires diversification of investments across different companies and industries (Lofthouse, 1994; Watson & Head, 2016). By effectively managing risk and considering performance measures, companies can enhance shareholder value and attract investors.

Firms usually calculate their costs and benefits while deciding the optimal level for CS. The benefits taken from the debt are in the form of tax shields, while the debt cost is considered to be the financial distress. Decisions related to CS influence the risk since firms having a higher level of debt generally suffer financial distress. Decision related to CS management is important for firms, as it helps to reduce capital cost (Ullah et al., 2019). The optimal level of CS is expected to increase the value of a firm and decrease the capital cost. Firms utilize a different mix of financing to safeguard themselves from solvency risk, increase their FP and decrease their risks. The findings of Horobet et al. (2021) revealed that there is a negative relationship between solvency risk protection and CS in the context of an Indonesian listed firm. Firms that have a high level of debt are mostly exposed to more risk than those having a low level of debt, and thus solvency is reduced because of the higher interest charges.

CG practices influence the firm risk, as good governing firms improve investor confidence, thus increasing FP and decreasing associated risks (Kazakova et al., 2019). Effective governance ensures a reduction in investments in risk projects and a lower level of debt during decisions related to CS (Kazakova et al., 2019). Firms with good governance usually acquire funds at a lower cost in foreign and domestic markets (Ullah et al., 2019). Horobet et al. (2021) revealed a negative relationship between CS and solvency risk protection. The authors measured CS using debt-to-assets and debt-to-equity while solvency risk protection via times interest earned. The authors further revealed that with the increase in debt level, firms usually face the risk of solvency, and thus solvency risk is substantially correlated with the decisions related to CS that eventually influence the trust level of investors. Based on the literature described above related to CS and solvency risk protection, the following hypothesis is developed:

H_4: There is a significant impact of CS on the protection of solvency risk for firms operating in the cement industry.

Corporate Governance, Capital Structure, and Firm Performance

The complex and diverse link between CG, CS, and FP influences organizational strategic choices, risk management practices, and the overall level of success. CG influences CS decisions within a corporation, which, in turn, influences the organization's financial success. This holistic viewpoint underlines the need to successfully coordinate numerous components in order to stimulate the production of long-term value and reduce risks. The evaluation of CG systems is critical in evaluating a firm's CS. The application of CG practices can serve as a foundation for the construction of sensible CS strategies, as these practices align with the values of transparency, accountability, and efficient supervision. The board of directors is critical to good CG because it oversees management's financial plans and ensures that choices impacting the firm's CS are consistent with the company's long-term goals. The board of directors plays an important role in

making educated and prudent CS choices by performing due diligence and providing strategic recommendations.

When seen through the lens of agency theory, the influence of CG on CS becomes clear. The competing interests of principals (shareholders) and agents (management) may possibly impact financial structure choices. According to Jensen and Mecklenburg (1976), the implementation of effective CG mechanisms, such as the formation of independent committees and the provision of financial incentives based on performance metrics, has the potential to reduce agency conflicts by fostering greater alignment between managerial actions and shareholder interests. The alignment outlined in the following may also encompass CS decisions, with the goal of minimizing the acceptance of excessive risks and avoiding actions that result in value loss. Furthermore, the application of CG practices may have an impact on a company's capacity to access various kinds of financial resources. Credible CG practices are critical in improving a company's image among external stakeholders such as creditors and investors, as well as acting as a communication signal to these stakeholders. According to Gillan (2006), the availability of signals may result in more favorable financing agreements, lower borrowing costs, and greater access to financial markets. Poor CG practices, on the other hand, can raise concerns among creditors and investors, resulting in greater capital expenditures and possible financial resource limits. As a result, it may be claimed that a strong governance system may have an indirect influence on a firm's CS choices by altering the organization's ability to get finance at advantageous terms.

The intricate interrelationship concerns the influence of the CS on the organization's FP. The relationship between debt and equity in a company's CS may have an impact on its financial risk, cost of capital, and FP. Because interest is tax-deductible, debt financing provides several tax advantages, such as lowering the cost of capital. Debt financing is emerging as an attractive method to improve FP. However, excessive leverage can increase the chance of experiencing financial difficulties and increase the weight of debt, possibly leading to a loss in overall FP. As a core part of CS theory, Myluf and Majluf (1984) present the precedence order theory, which states that corporations prefer internal funding above external finance. The fundamental cause for this phenomenon is the existence of knowledge asymmetry between the two types of finance. This viewpoint underlines the critical relevance of internal financial activities in defining an organization's CS. Investor trust may be increased by implementing good CG practices that emphasize openness, accurate financial reporting, and ethical conduct. This tendency may increase the availability of internal financial resources. Due to this phenomenon, firms can maintain an appropriate CS, minimizing their dependence on external borrowing and improving overall FP. The study of the link between CG, CS and FP is especially important in businesses with large capital needs and volatile markets. The research focuses on the cement business in Pakistan and investigates how the adoption of strong CG practices can impact CS decision making. These options may aid companies in handling industry problems. The cement business undergoes swings in demand as a consequence of the cyclical patterns of the economy and ever-changing regulatory frameworks. The preceding criteria emphasize the importance of CS choices that attempt to establish a harmonic balance of financial risk and flexibility. Therefore, based on the above discussion, the following hypothesis is stated:

H_5: There is a significant impact of CG on FP with the mediating role of CS of companies operating in the cement industry. of Pakistan.

Corporate Governance, Capital Structure, and Solvency Risk Protection

Several studies documented that the relationship between CG and CS is negative (Feng et al., 2019). Hakimah et al. (2019) conducted a study to investigate the relationship between CG and CS in the context of listed Malaysian companies. The findings reported a negative relationship between the variables. The authors also reported that good governance decreased the level of debt in CS. Ayuba et al. (2019) also verified the relationship between CG and CS and FP. The authors measured CG using BI, institutional shareholding, and insider directors, CS using the debt-to-asset ratio and FP using operating income, ROA

and ROE in the context of Rwanda, Tanzania, Burundi, Kenya and Uganda. The findings of their study revealed that CG was positively related to FP, while negatively related to CS. The authors reported that the positive relationship between the variables is due to the good governance that CS associates with. Moreover, because of good governance, the firms of these economies have sufficient funds, hence utilizing their equity funds to fulfil their requirements.

The intricate relationship between CG, CS, and solvency risk mitigation illuminates the importance of these interconnected components in determining a firm's financial stability, risk management strategies, and long-term viability. The determination of a firm's CS is significantly impacted by the implementation of CG practices, which subsequently impact the firm's ability to effectively address solvency issues. This link highlights the need for a comprehensive strategy that encompasses decisions related to CS, CG practices, and risk mitigation strategies. The mechanisms of CG are crucial in influencing a business's decisions about its CS, which may have significant consequences for safeguarding the company from the potential hazards of bankruptcy. CG practices promote the principles of openness, accountability, and responsible oversight, providing a framework for decision-making about a company's CS that aligns with its risk tolerance and long-term objectives. Competent and independent people who make up effective boards of directors have the capacity to provide valuable perspectives on the optimal combination of debt and equity financing. This delicate equilibrium effectively addresses the company's development aspirations while mitigating risk considerations.

Several studies provided evidence related to the relationship between solvency risk protection, CS and FP. From the literature it can be observed that CS substantially correlates with solvency risk protection and FP (Puni & Alexinia, 2020; Mehmood et al., 2019; Iqbal et al., 2019). Additionally, some studies documented that CS act as a mediator between CG, solvency risk protection, and FP. Although previous research evaluated the relationship with confined facets, therefore, to explore the relationship further, especially in the context of the cement industry of Pakistan, the following hypotheses developed aimed to verify the impact and relationship between the variables stated above.

H_6: There is a significant impact of CG on the protection of the solvency risk with the mediating role of CS of the companies operating in the cement industry. of Pakistan.

Conceptual Framework

The following figure shows the Conceptual framework of the study.

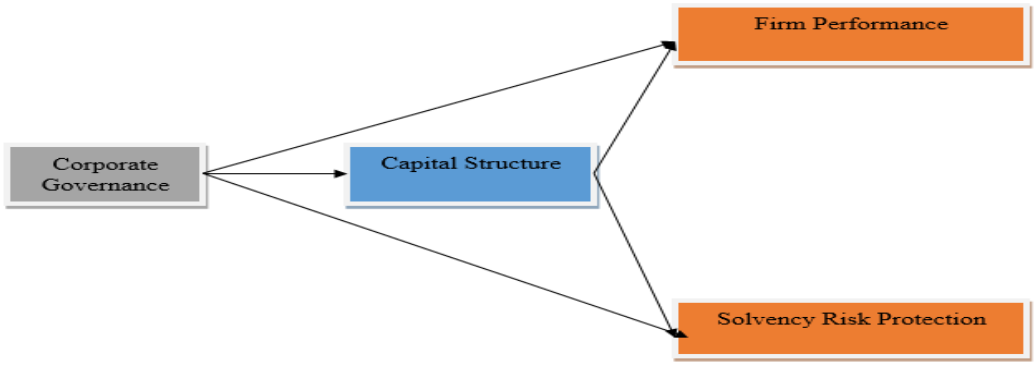

Figure 1**:** Conceptuel Framework

Research Methodology

The research methodology encompassed a descriptive and explanatory research design that addressed the study's inquiries regarding the impact of corporate governance (CG) on solvency risk protection and financial performance (FP), with the mediating role of corporate social responsibility (CS). The study focused on Pakistan's listed cement firms within the period 2015 to 2020. The population consisted of all firms in the cement industry listed on the Pakistan Stock Exchange (PSX). Data collection involved extracting relevant variables from annual reports of the respective cement firms, as well as utilizing information from published reports by the State Bank of Pakistan (SBP) and the Securities and Exchange Commission of Pakistan (SECP). The gathered data were analyzed employing panel data models, specifically the Fixed Effect Model or Random Effect Model, using EViews. This approach was designed to provide comprehensive insights into the relationships among the variables under consideration.

Findings and Discussion

Descriptive Statistics

Table 1 shows descriptive statistics for a variety of variables, including CG (specifically, CEO Duality, Board Size and Composition, BI and AC), FP (measured by ROA, ROE, NIM, OIM and TASSETT), CS (represented by DTA and DTE) and Solvency Risk Protection. Many statistical indicators, such as the lowest, highest, mean and standard deviation, are included in descriptive measures. The observed standard deviation range of -177 to 9.99, as well as the mean value range of 0.15 to 55.09, demonstrate that all the instruments underwent thorough calibration and control processes.

Table 1: Descriptive Statistics

Descriptive Statistics	Mean	Maximum	Minimum	Std. Dev.
CG				
CEODU	0.15	0.00	1.00	0.00
BSC	7.44	7.00	10.00	4.00
BI	2.25	2.00	4.00	1.00
AC	2.86	3.00	4.00	1.00
FP				
ROE	10.89	13.31	39.87	-117.82
ROA	6.86	7.84	24.22	-17.68
NIM	0.50	0.51	1.23	0.00
OIM	0.15	0.20	0.48	-0.84
TASSETT	0.50	0.51	1.23	0.00
CS				
DTA	0.47	0.43	1.78	0.03
DTE	0.78	0.73	6.91	-4.26
Solvency Risk Protection				
TIE	55.09	10.45	54.00	-15.67
Control Variable				
LNMCAP	16.18	16.49	18.97	9.99

Correlation Analysis

Pearson's product moment correlation analysis was used in the research to explore the relationship between CEO Duality, Board Size and Composition, BI, and AC; FP (ROA, ROE, NIM, OIM, and TASSETT); CS

(DTA, DTE); and solvency risk protection. According to the Pearson correlation matrix (Table 2), there is a positive relationship between the elements of CG, the aspects of FP, and the protection of the solvency risk. The relationship found is statistically significant. The many components of CG (CG) and the various measures of protection against solvency risk have a favourable link. However, it should be emphasised that there is a negative association between CG characteristics and CS measures, as well as between CS measures and solvency risk protection. The findings reveal a possible link between two variables, implying that changes in one variable may impact the other. All results obtained are statistically significant at the significance level of 0.05.

Table 2: Correlation Analysis

Variables	CEODUA	BSC	BI	AC	ROE	ROA	NIM	OEM	TASSETT	DTA	DTE	TIE	LNMCAP
CEODUA	1												
BSC	-0.332**	1											
BI	0.437**	0.342**	1										
AC	0.246**	-0.204**	-0.437**	1									
ROE	0.064	0.115	0.03	-0.118	1								
ROA	0.052	0.093	0.006	-0.159	0.492**	1							
NIM	0.074	0.248**	0.229**	-0.189*	0.466**	0.567**	1						
OIM	0.015	0.096	-0.006	-0.139	0.494**	0.873**	0.469**	1					
TASSETT	0.074	0.248**	0.229**	-0.189**	0.466**	0.567**	0.999**	0.469**	1				
DTA	-0.075	-0.011	-0.112	0.341**	-0.15	-0.578**	-0.28**	-0.456**	-0.283**	1			
DTE	0.008	-0.084	-0.046	-0.016	-0.676**	0.061	-0.278**	-0.017	-0.278**	-0.142	1		
TIE	-0.042	0.112	0.165	-0.232**	0.051	0.123	0.224**	0.03	0.224**	-0.111	-0.041	1	
LNMCAP	-0.05	-0.095	-0.054	-0.094	0.293**	0.485**	0.429**	0.44**	0.429**	-0.121	-0.006	-0.016	1

CG, FP, Solvency Risk Protection and CS

Table 2 shows that there is no significant relationship between factors of CG (CG), such as board size and composition, CEO duality, and AC and FP (FP) measures such as return on assets (ROA), return on equity (ROE) and operating income margin (OIM). However, it is worth noting that there are exceptions to this pattern. The variables turnover asset turnover (TAT) and net interest margin (NIM) in particular show that Table 2 also shows that there is no significant relationship between CG (CG) and FP (FP) metrics such as return on assets (ROA), return on equity (ROE) and operating income margin (OIM). Similarly to earlier research, there is a positive association between net interest margin (NIM) and turnaround time (TAT). Based on the data, it is possible to infer that none of the values exceed 0.90, indicating that there is no multicollinearity among the variables.

Additionally, DTA is only positively associated with AC while DTE of the CS measures is negatively associated with CEO duality. Furthermore, there is no correlation between solvency risk protection and CG measures. Finally, market capitalization is negatively associated with CEO duality and positively associated with board size and composition.

Regression Analysis

The current study investigated the research hypotheses using panel data analysis and a fixed-effects or random-effects model. The main objective was to determine the influence of CG (CG) on the CS, FP (FP)

and the protection of the solvency risk of the companies listed on the Pakistan Stock Exchange (PSX). The research investigates the relationship between firm size, CG (CG), CS as a moderator, and the dependent variables of FP and solvency risk protection. Furthermore, CS is identified as the independent variable that mediates this link in the investigation.

Diagnostic Tests

The Hausman test was used to assess the suitability of each model in the investigation, which compared a fixed-effects model versus a random-effects model.

CG and FP

Table 3 shows the influence of CG on FP and contains the findings of the researcher's calculation of equation 1. The table also shows the results of his estimate. According to the findings, there is a solid association between factors of interest in computer graphics (CG) and FP (FP). According to the findings, the beta coefficients for BI have a negative connection of -3.128%. Furthermore, the AC coefficients show a 0.03017 positive connection, whereas the board size coefficients show a 2.296 positive correlation. Finally, the CEO duality coefficients show a 12.129 percent positive association. At a significance level of 5%, the p values linked to each variable are considered statistically significant. Furthermore, the choice of a random-effects model is based on Hausman's test, which acts as the underlying foundation for this decision.

Table 2: Regression analysis of CG and FP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BI	-3.128	1.475	-2.121	0.037
AC	-3.017	1.457	-2.071	0.041
BSC	2.296	0.740	3.103	0.003
CEODU	12.129	4.128	2.938	0.004
LNMCAP	2.729	0.489	5.584	0.000
C	-40.517	10.242	-3.956	0.000
Summary Statistics				
R-squared	0.301947	Hausman's	Chi-Sq. Statistic	6.3154
Adjusted R-squared	0.265590	Test	Chi-Sq. d.f.	5
F-statistic	8.305076	**Random Effect**	Prob.	0.2767
Prob(F-statistic)	0.0001			

CG and Solvency Risk Protection

The author did research to estimate equation 2. Table 4 summarises the conclusions of this research, which sheds light on the influence of CG on reducing the risk of solvency. The statistics in the chart below demonstrate that the independence of the AC and the board of directors is the only component of the CG that has a substantial effect on the degree of protection against solvency risk provided by the company. According to the study findings, the existence of CG components has no discernible effect on the amount of protection against solvency risk. The AC coefficient was determined to be -13213.3, while the BI coefficient was found to be 3682. The board size coefficient was calculated to be 1668, while the CEO duality coefficient was calculated to be 1647.64. In particular, all of these coefficients had p-values greater than the traditional cut-off of 5%, suggesting a lack of statistical significance. Furthermore, the random-effects model is chosen since it provides the best match based on the findings of Hausman's test.

Table 3: Regression Analysis of CG and Solvency Risk Protection

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AC	-13213.18	9831.86	-1.34	0.18
BI	3682.31	9813.94	0.38	0.71
BSC	1668.76	5474.52	0.30	0.76
CEODU	-1647.64	26692.68	-0.06	0.95
LNMCAP	-744.12	3106.96	-0.24	0.81
C	34993.16	70853.62	0.49	0.62
Summary Statistics				
R-squared	0.060614	Hausman's	Chi-Sq. Statistic	2.480103
Adjusted R-squared	0.011688	Test	Chi-Sq. d.f.	5.000
F-statistic	1.238884	**Random Effect**	Prob.	0.7795
Prob(F-statistic)	0.297035			

CG and CS

Table 5 displays the estimated results for the third equation. The following table illustrates the impact of CS on CG. The findings show that the p-values associated with the predicted coefficients for CEO duality (0.199), board size (0.024), BI (-0.092), AC (-0.030), and business intelligence (BI) are statistically significant. Furthermore, the random effect model is selected since it delivers the most accurate estimate based on the findings of the Hausman test.

Table 4: Regression analysis of CG and CS

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CEODU	0.199	0.135	1.471	0.145
BSC	0.024	0.022	1.092	0.278
BI	-0.092	0.050	-1.856	0.047
AC	-0.030	0.046	-0.647	0.520
LNMCAP	-0.005	0.016	-0.333	0.740
C	0.644	0.323	1.992	0.050
Summary Statistics				
R-squared	0.735833	**Fixed Effect**	Chi-Sq. Statistic	9.820481
Adjusted R-squared	0.666489		Chi-Sq. d.f.	5
F-statistic	10.61138		Prob.	0.0405
Prob(F-statistic)	0.000000			

CS and FP

The author calculated Equation 4, and the results of the calculation are reported in Table 6. This table shows how the composition of capital affects company performance. For the particular area of interest, CS, the findings show a coefficient value of 39.641 and a p-value less than the 5% significance threshold. Market capitalization has little effect on CS. Furthermore, the random effect model is chosen since it provides the best fit according to Hausman's test.

Table 5: Regression analysis of CS and FP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NIM	39.641	8.452	4.690	0.000
LNMCAP	1.253	1.207	1.038	0.302
C	-29.182	18.332	-1.592	0.115
Summary Statistics				
R-squared	0.073	Hausman's test	Chi-Sq. Statistic	11.809491
Adjusted R-squared	0.069	**Random Effect**	Chi-Sq. d.f.	2
F-statistic	17.641		Prob.	0.0027
Prob(F-statistic)	0.000			

CS and Solvency Risk Protection

The author made the estimate of Equation 5, and the results of this estimation are given in Table 7. The table illustrates the minimal influence of CS on the protection of solvency risk. The results show a beta coefficient of 0.000 and a p-value greater than 5%, suggesting that there is no significant link between the variables under consideration. Furthermore, the fixed-effects model was selected because it performed better in the Hausman test.

Table 6: Regression Analysis of CS and Solvency Risk Protection

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TIE	0.000	0.000	-0.250	0.803
LNMCAP	-0.003	0.016	-0.164	0.870
C	0.512	0.266	1.923	0.058
Summary Statistics				
R-squared	0.721632	Hausman's Test	Chi-Sq. Statistic	11.9447
Adjusted R-squared	0.661263	**Fixed Effect Model**	Chi-Sq. d.f.	5.00
F-statistic	11.95370		Prob.	0.002
Prob(F-statistic)	0.000			

Since the direct relationship between the variables is insignificant, there is no need to perform a mediation analysis on the study variables.

Conclusions

The main goal of this research was to investigate the influence of CG (CG) on CS, FP, and solvency risk mitigation of cement companies listed on Pakistan's Pakistan Stock Exchange (PSX). This research looked at the importance of CS as a link between capital growth, FP, and protection of solvency risk. The current research examined a data set gathered from publicly traded companies active in the cement industry between 2015 and 2020 using panel data analysis. The study's findings supported the stated hypotheses by revealing a strong relationship between CG (CG) variables such as insider directors, institutional shareholdings, BI, AC, board size, and FP (FP). However, no significant association was found between CG and risk. Furthermore, statistics show that the single important factor influencing the level of protection against solvency risk is the board's autonomy. Furthermore, empirical research shows that CS has a beneficial influence on FP (FP), but has no significant impact on the reduction of bankruptcy risk. CS, according to research, has a role in mediating the links between capital growth, FP, and solvency risk protection. The findings are consistent with the theoretical framework of Agency Theory (Ullah et al., 2018; Ahmed & Hamdan, 2015; Cheema & Din 2014) and contribute to a better understanding of the relationship between CS, FP and solvency risk mitigation in the cement manufacturing sector.

Policy Implications

The report emphasizes the need to apply the CG Code (CG) within the Pakistani cement sector to improve FP (FP), minimize solvency risk, and lower levels of debt in CS. The aforementioned activities were carried out to improve FP, reduce solvency risk, and improve CS. The study makes a number of clear suggestions for CG practises. These include the recommendation to keep the board size at nine members, to have insider directors make up one-third of the board (with a preference for fewer), to increase independent director representation to one-third of the board (with a preference for a higher number), and to ensure the effective operation of an AC with at least three members. All of the previously suggested recommendations are within the scope of the investigation. The implications of these findings are especially important for managers and policy makers working in the cement manufacturing industry in developing countries. This is because they give critical points of view on the value of CG practices and their potential for optimisation in improving FP, alleviating solvency issues and lowering debt levels. Furthermore, the research adds to the academic literature by presenting a unique model that investigates the mediating role of CS on the link between CG (CG) and the outcome variables. Furthermore, it contributes to the theory of agency by providing useful information on the reduction of conflicts of interest in cement sector enterprises within the unique setting of Pakistan's CG Code (2014). Adopting the innovative model in research facilitates both of these contributions.

Limitations

Despite the constraint of using data solely from cement companies registered on the Pakistan Stock Exchange (PSX), the conclusions of this research have the potential for generalisation. Furthermore, several auxiliary firms in the cement sector were removed from the research sample due to a lack or insufficiency of data on these organisations.

Future Research Recommendations

The purpose of this investigation was to look at Pakistani cement firms that are publicly traded on the Karachi Stock Exchange (KSE). A further study could include a comparison of Pakistan's cement industry with other industrial sectors within the nation, as well as with established and emerging economies. This might perhaps give a more in-depth grasp of the issue. Furthermore, future studies should address numerous aspects of CG (CG), such as, but not limited to, CEO duality, board diversity, board meetings, disclosures, and reporting methodology. The CS analysis might be broadened to cover the total capitalization and the fixed assets to equity ratio. Furthermore, the usage of Tobin's Q and earnings per share may be used to evaluate financial success. Scholars may conduct more research on the relationship between CG (CG) and other factors such as non-FP (non-FP) and systemic risk. By integrating moderating elements and taking into account mediating variables, the assessment of the influence of CG (CG) on FP (FP) and protection against solvency risk can be improved. In conclusion, it is critical to investigate many interplaying components that may function as mediators of CG (CG), FP (FP), and solvency risk protection.

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