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Exploring the Attributes of Corporate Governance and Compliance with Corporate Laws to ESG Disclosure: Evidence from Construction & Engineering Sectors in India

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ABSTRACT: The study aims to investigate the impact of board characteristics on environmental, social and governance (ESG) disclosure in the Construction & Engineering Sectors in India of emerging economies. The findings indicate that governance variables have varying degrees of influence on ESG performance and financial outcomes, with board size showing the strongest positive association with ESG, while CEO Board Member strongly correlates with financial performance. The regression model provides a moderately strong explanatory power for ESG scores, but the lower Adjusted R Square suggests that additional variables or a refined model may improve its predictive ability. Among the independent variables, only Board Size (BS) has a statistically significant positive impact on ESG scores. Other variables, including gender diversity, board meetings, CEO characteristics, and financial performance, do not show significant effects. The study recommends that increasing board size may enhance ESG performance, but further research or a larger sample may be needed to confirm the effects of other governance factors. The study concludes that the importance of board characteristics in influencing ESG performance, with board size emerging as the most significant factor. Other governance variables, including gender diversity, CEO leadership roles, and board meetings, do not show a strong statistical impact on ESG.

KEYWORDS: ESG, Board Size, Board Meetings, Board Members, Corporate governance

I. INTRODUCTION

There are number of regulations exist in India to oversee corporate disclosure practices, including the Chartered Accountants Act of 1949, the Companies Act of 2013, the Securities and Exchange Board of India (SEBI) (Amendment) Act of 2002, and the Indian Accounting Standards. The SEBI (Amendment) Act of 2002 established principles of corporate governance and introduced a new clause 49 in the Listing Agreement of the Stock Exchanges, which mandates the disclosure of both financial and non-financial information to prevent fraudulent accounting practices. However, there are currently no obligatory provisions requiring corporations to adequately disclose relevant environmental information.

Initially, environmental reporting was regarded as a subset of corporate social reporting (Hackston & Milne, 1996; Sahay, 2004). Various theoretical frameworks have been employed to elucidate the motivations behind companies' disclosure of social responsibility information (Gray, Kouhy, & Lavers, 1995), with a significant portion of the literature supporting agency theory and legitimacy theory. Agency theory offers a framework that connects disclosure practices to corporate governance, positing that monitoring or agency costs emerge from the conflicts of interest between shareholders and managers (Jensen & Meckling, 1976). Typically, shareholders depend on their agents due to their limited financial expertise. The study aims to investigate the impact of board characteristics on environmental, social and governance (ESG) disclosure in the Construction & Engineering Sectors in India of emerging economies.

II. CONSTRUCTION & ENGINEERING IN INDIA

The equipment construction industry is central to India's economic growth and infrastructure development. As the country undertakes varied projects—ranging from urban growth to rural revitalization—incorporating Environmental, Social, and Governance (ESG) values into this sector becomes imperative. Adopting ESG not only resolves environmental issues but also upgrades social responsibility and governance practices, making India an investment hub appealing to global investors.

The environmental Initiatives in construction and engineering industry is shifting towards sustainability by developing energy-efficient machinery and adopting renewable energy sources. This transition aims to reduce the carbon footprint of construction activities, aligning with global efforts to combat climate change. Notably, over 80% of emissions in the construction equipment value chain are generated during the operational lifespan of products, underscoring the urgency for innovative solutions. The

Indian Construction Equipment industry is proactively expanding its adoption of renewable energy sources, blending solar, wind, and other green solutions into operations and supply chains. This aligns with the policy of the Government of India for renewable energy as well as the future development of the Indian carbon market (ICM) with a view to decarbonizing the economy by putting a price on greenhouse gas emissions through the trading of carbon credit certificates. Whereas, the social and Governance initiatives adoption of ESG principles also entails enhancing labor practices, protecting workers, and promoting transparency in operations.

These actions build stakeholder trust and ensure the sustainability of the industry in the long term. The Confederation of Indian Industry (CII) has played a key role in advancing sustainable business practices, urging firms to adopt ESG models that are aligned with international standards. Through the incorporation of these principles, firms not only become compliant but also become more competitive in the international market. By adopting ESG factors, India's construction equipment sector not only supports sustainable development but also acquires a competitive advantage in the international market. The industry's focus on environmental sustainability, social responsibility, and sound governance practices places it in a favorable position among global investors and partners, setting the stage for a resilient and inclusive growth path.

III. CORPORATE GOVERNANCE PROVISION FOR CONSTRUCTION & ENGINEERING IN INDIA

India's Engineering and Construction industries are increasingly adopting strong corporate governance and ESG practices, fueled by legislation such as the Companies Act, 2013, and SEBI guidelines. Provisions such as independent directors, audit committees, and nomination & remuneration committees encourage transparency and accountability. SEBI's Business Responsibility and Sustainability Reporting (BRSR) framework mandatory for listed companies further requires ESG performance disclosures, including environmental footprint, social responsibility, and governance frameworks. This regulation, combined with increasing sustainability consciousness, is inducing construction and engineering companies to mainstream ESG, with several pursuing decarbonization and ESG maturity actively. Cases such as Shree Cement's strong ESG scores illustrate the industry's increasing focus on good business practices, ultimately building corporate reputation and stakeholder confidence while complying.

The Indian construction and engineering industries function under a holistic corporate governance regime influenced by a mix of legislation and regulatory guidelines. The Companies Act, 2013, provides the basis for corporate governance practices, including board composition, independent directors, audit committees, and CSR mandatory obligations, as well as ESG-related disclosures for eligible companies. SEBI's LODR rules, specifically the BRSR framework, require listed companies to make comprehensive ESG disclosures, ensuring transparency in governance, risk management, and sustainability practices. In addition, SEBI regulations on insider trading establish strong foundations of ethical governance. Environmental sustainability is covered through legislations such as the Environment (Protection) Act, 1986, which regulates EIAs and pollution control, and the Air and Water Acts, which govern emissions and wastewater management. Social welfare and labor responsibility are promoted through legislation such as the Building and Other Construction Workers Act, the Equal Remuneration Act, and the Code on Social Security, 2020. The NGRBC of MCA issues guidelines on the conduct of business responsibly, in consonance with ESG principles. Lastly, green finance is promoted through RBI directives on green finance and the Energy Conservation Act, 2001. This varied regulatory environment indicates India's growing emphasis on the integration of ESG in construction and engineering business, with tightening enforcement and adoption of international norms expected in the future.

IV. OBJECTIVES OF THE PROPOSED RESEARCH

- To investigate the impact of corporate characteristics and corporate governance of selected companies on the level of ESG disclosures in compliance with relevant corporate laws.
- To examine the relationship between board independence and ESG disclosures in the context of applicable corporate governance regulations.
- To evaluate the correlation between gender diversity on boards and ESG disclosures, with reference to corporate law statutes and guidelines.

V. LITERATURE REVIEW

Corporate governance is a pillar of business sustainability, ethical adherence, and ESG reporting, with substantial research investigating the complex interlinks among governance institutions, disclosure quality, and performance of companies. This literature review integrates major research, integrating a clear understanding of corporate governance mechanisms, corporate law compliance, and ESG disclosure, specifically in India's engineering and construction industries. Theoretically, corporate governance is based on agency theory, stakeholder theory, legitimacy theory, and resource dependency theory, each providing distinctive views of the relationships between firms, their stakeholders, and the environment. Corporate social and environmental reporting research, from Gray et al. (1995) to the 2022 KPMG Global Sustainability Report, illustrates the development of

reporting practices driven by regulatory pressures, industry risk, and company size, with increasing focus on ESG integration for investor decision-making. There have been several studies, such as by Eccles et al. (2014), Friede et al. (2015), and Kukreja et al. (2022), that have proven a positive relationship between ESG disclosure and company performance, citing ESG integration's value-add potential. The efficiency of corporate governance is also attributed to board attributes, audit committees, and independent supervision, as evidenced by studies of Aljaaidi et al. (2021), Bebchuk & Weisbach (2010), and López-Iturriaga & Morros (2019), which assert that effective governance mechanisms improve financial monitoring, disclosure, and persistence. In the engineering and construction industries, research such as the CII Report (2023), Ghosh & Rajan (2021), and Deloitte's (2022) forecast identify the specific ESG issues and growing use of sustainable methods, propelled by regulatory environments, investment demands, and industry-specific issues. India's regulatory framework, including the Companies Act, 2013, SEBI LODR regulations, environmental protection laws, labor and safety codes, and the RERA Act, reflects a drive to enhance corporate governance and ESG compliance, although issues such as greenwashing and enforcement deficiencies remain Sharma et al. (2022). Notwithstanding the available literature, there are still gaps in sector-specific ESG implementation, with a comparison of Indian frameworks and international best practices, evaluation of the effect of ESG on investment choices, and consideration of the efficacy of regulatory compliance in the construction and engineering sectors, which offer rich areas for future research.

VI. HYPOTHESES:

- H_{01}: Board size is positive associated with the extent of ESG disclosures in selected companies, within the context of relevant corporate laws.
- H_{02}: Gender Diversity is positively associated with the extent of ESG disclosures, in line with applicable corporate governance regulations.
- H_{03}: Board Meeting on boards is positively associated with the extent of ESG disclosures, as per corporate law statutes and guidelines.
- H_{04}: CEO on boards is positively associated with the extent of ESG disclosures, as per corporate law statutes and guidelines.

VII. RESEARCH METHODS

The study is based on secondary data, where the researcher considered all (28) the listed construction companies in the Indian stock markets. Data for the study has been collected from the LSEG database, covering a period of five years from 2019 to 2023. For data analysis, various statistical methods, including descriptive statistics, correlations, and regression analysis, have been utilized. The study employs Microsoft Excel and SPSS software for processing and analyzing the data.

The research examines multiple variables. The dependent variables in the study include the ESG Score and Corporate Governance Score. The independent variables consist of Board Size, Board Gender Diversity, and Board Independence. Additionally, ROA (Return on Assets) in percentage has been included as a control variable to account for variations in financial performance. This structured approach enables a comprehensive understanding of the relationship between corporate governance factors and ESG performance in the construction sector.

VIII. MODEL

$$\text{ESG Score} = \beta_0 + \beta_1 \text{BS} + \beta_2 \text{GD} + \beta_3 \text{BM} + \beta_4 \text{CEO\_BM} + \beta_5 \text{CEO\_D} + \text{ROA}$$

Table 1 : List of Variables

Variables	Description
Dependent Variable	
ESG	Environmental, Social and Governance (ESG)
Independent Variables	
BS	Board Size
GD	Gender Diversity
BM	Board Meeting
CEO_BM	CEO Board Member
CEO_D	CEO Duality
ROA	Return on Assets

IX. RESULT AND DISCUSSION

Table: 2 shows the descriptive statistics provide an overview of the dataset used in the study. The mean ESG score is 36.88, with a standard deviation of 13.67, indicating considerable variability among the companies. The board size (BS) has an average of 9.21 members, ranging from a minimum of 6 to a maximum of 19.2, suggesting significant differences in board composition across firms. Gender diversity (GD) averages 15.43%, with a maximum of 33.33% and a minimum of 5%, indicating a variation in the representation of women on boards. The board meeting frequency (BM) shows an average of 7.14, ranging from 4.5 to 20, reflecting differences in governance practices.

Table 2 : Descriptive statistics

Variable	Count	Mean	Std Dev	Min
ESG	22	36.88	13.67	21.42
BS	22	9.21	2.82	6
GD	22	15.43	7.96	5
BM	22	7.14	3.22	4.5
CEO_BM	22	0.95	0.21	0
CEO_D	22	0.55	0.51	0
ROA	22	0.049	0.046	-0.1

The CEO being a board member (CEO_BM) is prevalent, with a mean of 0.95, indicating that most CEOs also hold board positions. CEO duality (where the CEO also serves as the board chair) has a mean of 0.55, suggesting that around 55% of firms follow this governance structure. The return on assets (ROA) has a mean of 4.91%, with a standard deviation of 4.65%, indicating profitability variations across firms. The ROA ranges from -10% to 12%, highlighting that some companies experience financial losses while others achieve strong financial performance.

These statistics provide insights into the governance and financial performance trends in the sampled construction firms, with notable variations in board structure, ESG performance, and financial profitability.

X. CORRELATION ANALYSIS

The correlation table 3 provides insights into the relationships between key variables in the study. ESG score shows a moderate positive correlation with board size (BS) at 0.561, indicating that companies with larger boards tend to have higher ESG scores. However, gender diversity (GD) has a weak negative correlation with ESG (-0.131), suggesting that increased female representation on boards does not necessarily translate into higher ESG scores in this sample. Board meetings (BM) have a negligible positive correlation with ESG (0.075), implying that meeting frequency has little direct impact on ESG performance.

Table 3 : Corelation Matrix

	ESG	*BS*	*GD*	*BM*	*CEO_BM*	*CEO_D*	*ROA*
ESG	1.000						
BS	0.561	1.000					
GD	-0.131	-0.515	1.000				
BM	0.075	0.140	-0.094	1.000			
CEO_BM	-0.158	0.175	-0.151	-0.025	1.000		
CEO_D	-0.150	0.153	0.236	0.138	0.239	1.000	
ROA	-0.332	-0.153	0.218	-0.212	0.717	0.270	1.000

CEO being a board member (CEO_BM) exhibits a weak negative correlation with ESG (-0.158), indicating that firms where the CEO is also a board member may have slightly lower ESG scores. Similarly, CEO duality (CEO_D) has a weak negative correlation with ESG (-0.150), suggesting that when the CEO also serves as the board chair, ESG scores might be slightly lower.

The relationship between ROA and ESG is negative (-0.332), indicating that higher ESG scores are associated with slightly lower financial performance, which may be due to the costs of sustainability initiatives. ROA also shows a strong positive correlation with CEO_BM (0.717), suggesting that firms where the CEO is also a board member tend to have higher financial performance. Additionally, CEO duality (CEO_D) has a weak positive correlation with ROA (0.270), implying that companies where the CEO is also the chair may experience slightly better financial performance.

XI. MODEL SUMMARY

Table 4 the regression model provides insights into the relationship between the independent variables and the ESG score. The Multiple R value of 0.707 indicates a strong positive correlation between the predictors and ESG, suggesting that the model explains a significant portion of the variation in ESG scores. The R Square value of 0.499 implies that approximately 49.9% of the variation in ESG scores is explained by the independent variables included in the model.

Table 4 : Regression Statistics

Regression Statistics	
Multiple R	0.707
R Square	0.499
Adjusted R Square	0.299
Standard Error	11.448
Observations	22

However, the Adjusted R Square value is 0.299, which is lower than R Square, suggesting that some independent variables may not contribute significantly to explaining ESG variation. This adjusted value accounts for the number of predictors in the model and indicates that only 29.9% of the variance in ESG is reliably explained when considering the sample size and the number of variables. The Standard Error of 11.448 represents the average deviation of the observed ESG values from the predicted values, indicating the model's accuracy in making predictions.

With 22 observations, the model provides a moderately strong explanatory power for ESG scores, but the lower Adjusted R Square suggests that additional variables or a refined model may improve its predictive ability. Further analysis, such as significance testing of individual coefficients, is necessary to determine the most influential factors in ESG performance.

XII. ANALYSIS OF VARIANCE (ANOVA)

The ANOVA table 5 provides insights into the overall significance of the regression model. The Regression Sum of Squares (SS) is 1961.25, representing the variation in ESG scores explained by the independent variables. The Residual Sum of Squares (SS) is 1965.79, indicating the unexplained variation due to other factors not included in the model. The Total Sum of Squares (SS) is 3927.04, which represents the total variation in the ESG scores.

Table 5 : ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	1961.2538	326.8756	2.4942	0.0707
Residual	15	1965.7907	131.0527		
Total	21	3927.0445			

The Mean Square (MS) for regression is 326.88, obtained by dividing the regression SS by its degrees of freedom (df = 6). The Mean Square for Residuals is 131.05, calculated by dividing the residual SS by its degrees of freedom (df = 15). The F-statistic (F = 2.4942) measures the overall significance of the model by comparing the variance explained by the regression to the unexplained variance. A higher F-value suggests that the model explains a significant portion of the variance in ESG scores.

The Significance F (p-value) is 0.0707, which is slightly above the conventional significance level of 0.05. This suggests that the model is marginally insignificant at the 5% level but significant at the 10% level, indicating that while the independent variables collectively have some influence on ESG scores, there is not strong statistical evidence to confirm their overall impact at the 5% significance threshold. To improve model significance, refining the selection of independent variables or increasing the sample size may be necessary.

Table 6 : Coefficient Analysis

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.878	20.894	0.042	0.967	-43.656	45.412	-43.656	45.412
BS	3.757	1.126	3.335	0.005	1.356	6.158	1.356	6.158
GD	0.652	0.418	1.561	0.139	-0.238	1.542	-0.238	1.542
BM	0.002	0.825	0.002	0.998	-1.756	1.760	-1.756	1.760
CEO_BM	-1.411	19.738	-0.071	0.944	-43.481	40.660	-43.481	40.660

CEO_D	-8.026	5.663	-1.417	0.177	-20.097	4.045	-20.097	4.045
ROA	-58.953	94.053	-0.627	0.540	-259.423	141.516	-259.423	141.516

The regression coefficient table provides insights into the impact of independent variables on the ESG score. Below is the interpretation of the results:

XIII. HYPOTHESIS TESTING:

The intercept has a coefficient of 0.878, which means that when all independent variables are zero, the predicted ESG score would be 0.878. However, the high p-value (0.967) suggests that the intercept is not statistically significant.

H01: Board size is positive associated with the extent of ESG disclosures in selected companies, within the context of relevant corporate laws: **Accepted**

The coefficient for Board Size (BS) is 3.757, indicating that for each additional board member, the ESG score increases by 3.757 units, holding other variables constant. The p-value (0.005) is statistically significant at the 5% level, meaning board size has a strong and significant positive impact on ESG performance. The 95% confidence interval (1.356 to 6.158) confirms that the true effect of board size on ESG is positive. Since board size has a positive and significant impact on ESG, companies should consider expanding their boards to enhance governance and sustainability oversight.

H02: Gender Diversity is positively associated with the extent of ESG disclosures, in line with applicable corporate governance regulations: Not Accepted

The coefficient for Gender Diversity (GD) is 0.652, meaning that a 1% increase in gender diversity leads to a 0.652 increase in the ESG score. However, the p-value (0.139) is above 0.05, indicating that the relationship is not statistically significant. The confidence interval (-0.238 to 1.542) includes zero, suggesting that the effect could be either positive or negative.

While gender diversity is not statistically significant in this study, promoting diverse leadership may still contribute to better decision-making and long-term ESG improvements.

H03: Board Meeting on boards is positively associated with the extent of ESG disclosures, as per corporate law statutes and guidelines: **Not significant**

The coefficient for Board Meetings (BM) is 0.002, implying that the frequency of board meetings has an almost negligible effect on ESG. The p-value (0.998) shows that this variable is not significant, and its confidence interval (-1.756 to 1.760) includes zero, further confirming that board meeting frequency does not have a meaningful impact on ESG.

Since board meetings do not significantly impact ESG, companies should prioritize the quality and effectiveness of discussions rather than just increasing the number of meetings.

H04: CEO on boards is positively associated with the extent of ESG disclosures, as per corporate law statutes and guidelines: **Not significant**.

The coefficient for CEO_BM is -1.411, suggesting that when the CEO is a board member, the ESG score decreases slightly. However, the p-value (0.944) indicates that this effect is not statistically significant. The confidence interval (-43.481 to 40.660) is very wide, showing high uncertainty in this estimate.

The coefficient for CEO Duality (CEO_D) is -8.026, meaning that if the CEO also serves as the board chair, the ESG score is lower by 8.026 units. However, the p-value (0.177) suggests that this relationship is not statistically significant. The confidence interval (-20.097 to 4.045) includes zero, indicating that the effect is uncertain. However, the coefficient for ROA is -58.953, implying that higher financial performance (ROA) is associated with lower ESG scores. However, the p-value (0.540) is not significant, meaning there is no strong statistical evidence for this negative relationship. The confidence interval (-259.423 to 141.516) is very wide, indicating a high level of uncertainty in this estimate. The negative association between ROA and ESG suggests that firms should balance profitability with sustainability initiatives to create long-term value.

XIV. CONCLUSION

The study highlights the importance of board characteristics in influencing ESG performance, with board size emerging as the most significant factor. Other governance variables, including gender diversity, CEO leadership roles, and board meetings, do not show a strong statistical impact on ESG. Additionally, financial performance does not appear to be a major determinant of ESG scores. Among the independent variables, only Board Size (BS) has a statistically significant positive impact on ESG scores. Other variables, including gender diversity, board meetings, CEO characteristics, and financial performance, do not show significant effects. The results suggest that increasing board size may enhance ESG performance, but further research or a larger

sample may be needed to confirm the effects of other governance factors. Companies should focus on strengthening governance structures, enhancing diversity, and ensuring effective board operations to improve ESG performance while maintaining financial stability. Further research with a larger dataset may provide deeper insights into the governance-ESG relationship.

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