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Uncovering the Role of Social and Environmental score on Market value of Cement firms of India

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Purpose: This study investigates the mediating influence of social and environmental score on the relationship between Total assets, proportion of women on boards, and market value of Indian cement Companies.

Methodology: We analysed data from Top 7 cement firms of India over a 4-year period using panel data analysis**.** Environmental disclosure scores (EDS), social disclosure scores (SDS), total assets (TA), and the proportion of women on boards (WOB) are utilized as independent variables to examine their impact on the relationships studied. Market value (MV) is the outcome variable that is influenced by the other variables in the study. Partial Least Squares Structural Equation Modelling (PLS-SEM) is employed to test the hypothesized relationships.

Results: The findings reveal significant positive relationships of social disclosure and both environmental core and market value. While no direct correlation between women on boards and market value was found, a positive association exists between women on boards and social disclosure scores((β:0.196; P<0.003).Additionally, it was found that social disclosure mediates the positive influence of total assets on environmental disclosure((β:0.126,P<0.002).

Contribution: This study contributes to the literature on ESG factors and Cement firms performance by highlighting the mediating role of social disclosure in the Indian context. It challenges the traditional view of social and environmental factors as separate entities and suggests a potential positive influence of social factors on environmental aspects.

Implications: The findings indicate that policymakers can foster sustainable practices by promoting social disclosure and enhancing gender diversity on boards. Investors may use social disclosure information to make more informed choices about firms committed to social responsibility. Cement companies can boost their market value by focusing on social and environmental initiatives and transparently sharing these efforts through social disclosure platforms.

Keywords: Environmental; Social disclosure; Market Value; Indian Cement Resources; Structural Equation Modelling.

Introduction: -

The cement manufacturing business is significant to the whole world because it focus on a major role in the development of infrastructures and urbanization. Nonetheless, cement manufacturing is one of the significant pollutants globally and is amongst the largest emission sources of Green House Gases (GHGs). The IEA weights that cement industry alone is responsible for emissions of about 7–8 % of total global CO2 emissions (IEA, 2020). Today, there is an increasingly well-defined balance between the economic need for cement and the negative impact it has on the environment, which has positioned the cement industry as a key player in the global sustainability debate. Due to pressure from regulators, investors, and civil society the case for embracing ESG principles has never been stronger.

It has unique set of challenges and opportunities for achieving sustainability. This paper examines the critical potential of ESG for driving performance in the cement industry worldwide and focuses on how the integration of ESG values offers both tangible returns and sustainable value creation. Consequently, we will examine the environmental impact of cement manufacturing, why 'social and governance' risks matter, and how firms can leverage the ESG frameworks to enhance financial performance despite the global demand for sustainable business practices.

Q1.How does social & environmental score mediate the link between total assets & market worth?

Q2. How do social & environmental factors related with proportion of women on boards and market worth ?

The study aims to Investigate the link between social and environmental variables, market value. The study includes a literature review, identification of research gaps, establishment of specific research objectives, and explanation of the methodology.

Objective 1: The study aims to investigate the impact of social and environmental factors on the correlation between Total assets and Market worth.
Objective 2: To investigate how social and environmental score influence the connection between the proportion of women on boards and Market value. Our exploratory and interpretive study uses panel data from 7 Indian cement companies over a 4-year period. By analysing social and environmental disclosures, we aim to shed light on the complex relationship between ESG practices and market value in the Indian market.

This study not only adds to the existing discussion over ESG's influence on cement companies, but it also offers useful information for stakeholders in the Indian cement industry. By investigating how ESG practices affect corporate value, we want to gain a better understanding of the importance of sustainability. The study is organized as follows: a detailed literature review, introduction of hypotheses, methodological explanation, data analysis, and presentation of results. The document concludes with the study's final remarks and findings.

Review of Literature: -

This section provides an overview of the existing literature and a systematic review of the three main research gaps. It focuses on internal factors like market value, social and environmental disclosure, and external factors

like WOB and total assets. We provide an overview of the relevant literature. A recent systematic review examines the relevant data and findings.The paper concludes that environmental accounting is necessary for organizations to address and mitigate environmental challenges because it integrates environmental variables into financial and managerial accounting processes, providing information about the real financial worth and sustainability performance of companies(Khaneja & Mishra, 2023).The results imply that the Indian cement industry is advancing towards sustainability by lowering the environmental effect of its operations through the use of EMP (Dasgupta & Das, 2021).This study shows a positive and statistically significant association between business size and social responsibility disclosure, implying that larger organizations are more likely to engage and disclose their corporate social responsibility efforts.(Mohammed Lawal Danrimi, PhD & Umar Aliyu, 2023).The research found three route types that influence the Environmental, Social, and Governance (ESG) score, with integrated reporting being a key factor in achieving a high score (Abdullah et al., 2016).The investigation found that female directors had a complicated influence on business performance, positively affecting accounting but negatively influencing market performance. This shows that investors might underestimate women's efforts in leading jobs.(Santamaria et al., 2021) .The study found that having female board members improves a company's market efficiency, supporting the "business case" for diversity on corporate boards. It shows that having women on boards can result in better financial outcomes for organizations.(Shah, 2024).In India, enterprises like Ambuja Cement have been recognized for their rigorous environmental disclosure procedures, including precise quantitative information in their annual reports(Khaneja & Mishra, 2023)A research that compared sustainability reporting across Indian cement businesses discovered variances in disclosure procedures, with some companies ranking higher on sustainability indices than others (Deshpande & Memon, 2023).

Hypothesis

H1: Environmental disclosure evaluations link positively with corporate value.

H2: Social disclosure variables have a favorable influence on improving the environmental disclosure score.

H3: There is a positive association between overall assets and the environmental disclosure score for Indian cement businesses.

H4 : For Indian cement firms, total assets and market value correlate positively.

H5: There is an excellent association between overall assets and the social disclosure score for Indian cement businesses.

H6: There is a good association between women on boards and social disclosure scores in Indian cement businesses.

H7: There is a favorable association between women on the board and market value for Indian cement firms.

H8: For Indian cement businesses, there is a positive association between total assets and environmental disclosure score, which is mediated by social disclosure score

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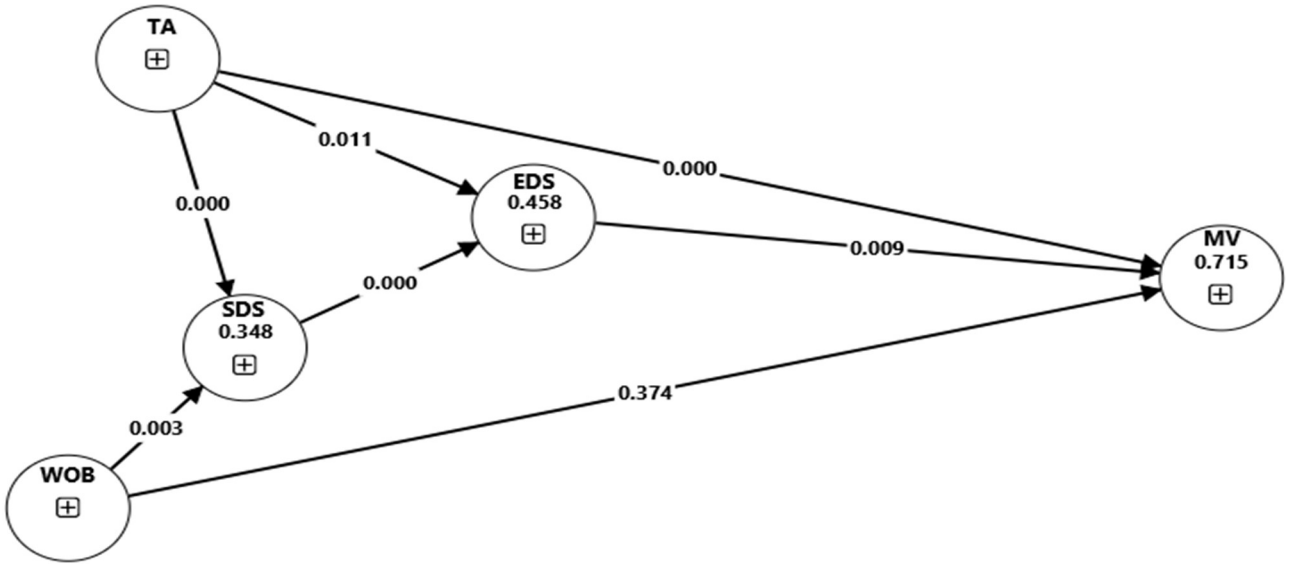
Tentative model



Methodology

Data Collection and Sampling

Our analysis is based on a detailed dataset of India's top seven cement businesses over a four-year period, derived completely from secondary data obtained via the Bloomberg platform. Significant findings were achieved by Structural Equation route modelling utilising the bootstrapping approach with 5000 resamples of the original sample data. Bootstrapping has the advantage of allowing researchers to draw conclusions without making significant distributional assumptions, which strengthens the reliability and validity of our findings. This method enabled the determination of standard errors and confidence intervals for model coefficients. This tailored strategy focusses solely on the dynamic Indian market, allowing for in-depth research of its specific drivers and problems.

Using Bloomberg's comprehensive archive of financial and operational data, we can study changes in production capacity, pricing dynamics, market share, and regulatory frameworks relevant to the Indian environment. By focussing just on cement firms. The study sought to give a thorough and context-specific examination of the cement sector in the Indian economic environment.

Measures

Measures Our study employs a Structural Equation Modelling (SEM) inner model with Quantitative Continuous data and Partial Least Squares Structural Equation Modelling (PLS-SEM) analysis to investigate the complex relationships between women on board, Total Assets, Firm Value, Social Score, and Environmental Score. Econometric models, also known as structural equation models, were developed in the beginning to explain economic data. Exogenous variables derive their variability from sources outside the model, whereas endogenous variables derive it from inside the model or other variables. We chose this strategy because of its effectiveness with non-normal data, formative conceptions, and mediation effects.

This comprehensive approach illuminates the complex interplay of environmental initiatives, resource allocation, and financial performance within the Indian cement industry and provides valuable insights for both academic discourse and industry practice.

PLS-SEM Analysis

Our study was analyzed using PLS-SEM, which was the best method for this study due to a number of important features. First and foremost, PLS-SEM is a particularly suitable technique for performing analysing complex research models and doing causal-predictive analyses (Henseler et al., 2009; Sarstedt et al., 2017).In this instance, we employed a sophisticated research model with four constructs that form six hypotheses. Using a "soft-modelling" methodology(Wold et al., 1984) .we aimed to examine how environmental and financial factors

interact in the particular setting of the cement industry in India through our PLS-SEM analysis. The best method for our research was PLS-SEM because of its suitability for theory-building and exploratory projects (Richter, Sinkovics, Ringle, & Schlägel, 2016).

Table 1:-

Measurement	Factor	Variable	Data Source
Social factors	Social Disclosure Score (SDS)	Mediator	Bloomberg Lab
Environmental Factors	Environmental Disclosure Score (EDS)	Mediator	Bloomberg Lab
Firm Market Value	Market Value (MV)	Endogenous	Bloomberg Lab
Governance Factor	% Women On Board(WOB)	Independent (exogenous)	Bloomberg Lab
Resources	Log Assets (TA)	Independent (exogenous)	Bloomberg Lab

Analysis & Results:-

Table 2:-

Correlation: -

	EDS	SDS	LTA	PWB	TMV
EDS	1.000	0.000	0.000	0.000	0.000
SDS	0.616	1.000	0.000	0.000	0.000
LTA	0.509	0.413	1.000	0.000	0.000
PWB	0.059	-0.079	0.613	1.000	0.000
TMV	0.254	0.228	0.823	0.538	1.000

From Table 2, correlation with respective variables as follows as, There is a substantial positive connection (0.616) with SDS 7 EDS, indicating that as SDS grow with EDS.LTA have have positive relationship with SDS with (0.413) ,PWB have positively relationship with LTA,& it's have very less relationship with SDS .TMV have positive relationship with LTA comparing to EDS & SDS .

Table 3:-

R square value: -

	R-square	R-square adjusted
EDS	0.458	0.419
MV	0.715	0.683
SDS	0.348	0.301

The results presented in Table 3 indicate that the with R-squared values, EDS with 45.8 %, Market value (71.5%), and social disclosure score (34.8%), possess moderate to strong in-sample predictive power.

Table 4:-

VIF inner Model :-

	EDS	MV	PWB	SDS	TA
EDS		1.565			
MV					
PWB		1.858		1.601	
SDS	1.206				
TA	1.206	2.497		1.601	

Multicollinearity of all sets of predictor constructs in the structural equation model has to be acknowledged and handled in order to guarantee the validity and reliability of the structural path model(SEM) results. VIF is one metric that can help achieve this. When the VIF is 3 to 5, collinearity issues do not arise. Here

for this study there are no issues with multicollinearity.

Table 5:-

Synopsis of evidence supporting the studies hypothesis :-

Hypothesis	**Relation**	β	**T statistics**	**P values**	**Decision**
H1	**EDS -> MV**	0.100	2.375	0.009	S***
H2	**SDS -> EDS**	0.099	4.967	0.000	S***
H3	**TA -> EDS**	0.133	2.308	0.011	S**
H4	**TA -> MV**	0.126	7.660	0.000	S***
H5	**TA -> SDS**	0.184	4.027	0.000	S***
H6	**WOB -> MV**	0.128	0.320	0.374	NS
H7	**WOB -> SDS**	0.196	2.710	0.003	S***
H8	**TA -> SDS -> EDS**	0.126	2.877	0.002	S***

Note: ***P<0.001, **P<0.01 *P<0.05, S: supported, NS: not supported

The structural equation method is utilized in conjunction with non-parametric and time series analysis to achieve the analysis's results. The results show that EDS to market value have positive significance (β = 0.100, t = 2.375 , p = 0.009). Furthermore, there is positive significance indicated by the SDS to EDS (β = -0.099, t = 4.967, p = <0.000). The Total assets to EDS Value (β = 0.133, t = 2.308, p = 0.011), showing positive significance. Conversely, the total assets and Market value (β = 0.126, t = 7.660, p = 0.000), showing positive significance. Total assets to SDS (β = 0.184, t = 4.027, p = <0.000) shows a positive significance; Women on board to Markt value (β = 0.128, t = 0.320, p = 0.374) shows a positive insignificance; and women on board to social disclosure score (β = 0.196, t = 2.710, p = <0.003) shows a positive significance. Total assets to eds with mediation of women on boards shows positive significance (β = 0.126, t = 2.877, p = <0.002),

Table 6:-

Model Fit Indices: -

	Saturated model	**Estimated model**
SRMR	0.000	0.025
d_ULS	0.000	0.009
d_G	0.000	0.007
Chi-square	0.000	1.091
NFI	1.000	0.987

As shown in Table 6, the measures of discrepancy for each of our models were below the corresponding saturated and estimated model from the reference distribution. This suggests that at the 5% and 1% significance levels, the model was not rejected, and all are accepted. In addition, we used 5000 resamples for full bootstrapping, which produced an SRMR of 0.025. This value shows that the model fits well because it is less than the suggested cutoff of 0.080

Discussion :-

In reviewing the literature, no data was found on how ESG factors, like social and environmental disclosure and the number of women on boards, affect the market value . In contrast to prior studies that reported mixed or

negative outcomes (Hoepner et al., 2016), the current study presents a distinct perspective. Some studies found a negative relationship, which could be because of the costs and risks of environmental management and regulation (Delmas & Blass, 2010). Our study found that a cement firms size can influence its social disclosure practices, considering financial and social variables. Large firms have more resources to participate in social initiatives and effectively communicate them to stakeholders, enhancing their standing and fostering stronger connections with stakeholders like shareholders.

Finally, on the correlation between the market value and the proportion of women on the board produced conflicting findings with regard to gender diversity. Some studies found a positive significant effect because of better governance and competitive factors (Adams & Ferreira, 2009a), while others found a negative significant relationship because of the small number of women on board (Carter et al., 2010). Nevertheless, our research has revealed no significant correlation between female board members' market valuation and board strategy involvement, specifically in providing strategic guidance and making market positioning decisions.

In contrast, studies show that companies with more women on their boards tend to have higher market valuations, partly due to their increased focus on social and environmental disclosure. (Adams & Ferreira, 2009). There is a link between the number of women on a board and its market value. This shows that Indian cement firms are following stakeholder goals and social norms.

Conclusion :-

The study explores the influence of environmental, social, and governance (ESG) factors on Indian cement firm's market value from 2019-2022. It reveals that total assets positively impact social factors, but not environmental ones. The study suggests that selected cement firms can improve their market value by implementing effective strategies and addressing risks and opportunities. It also highlights the importance of social and environmental factors in social interactions. The study suggests that respective firms needs to engage in effective social engagement and CSR communication to enhance stakeholder well-being.

6.1 Limitations and future research directions

Bloomberg's data considers financial, social, governance, and environmental aspects. However, a more comprehensive examination of the environment, society, governance, and specific countries is needed. The study's findings may not be generalizable due to India's unique cultural, historical, and financial institutional factors. Comparative multi-group analysis can yield insights into the Cement industry in both developed and emerging Asian nations.

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Data Availability

Data supporting the reported results from Bloomberg Financial Lab.

Conflicts of Interest

The authors declare that there is no conflict of interest.

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