

FACTORS AFFECTING CORPORATE SUSTAINABLE DEVELOPMENT: THE CASE OF INDIAN CEMENT SECTOR

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Abstract *The increased awareness of contemporary consumers towards environmental issues has led to a proliferation of regulations that companies must comply with. In such a dynamic business environment, companies must look beyond the profit-maximisation paradigm, and move towards a sustainable development model for their survival in the long run. The concept of corporate sustainable development (CSD) encompasses the dimensions of environmental integrity, social equity, and economic prosperity.*

The present study analyses the extent of CSD and its driving factors in the Indian cement industry. The study finds that CSD has been increasing in importance in the Indian cement sector; in terms of increased emphasis on environmental integrity and on economic prosperity. However, there is no significant change in emphasis on social equity, particularly in large companies, though profitability does not play much of a role. The study also finds that media exposure related to environmental issues and liquidity was the significant determinant of CSD in the Indian cement sector. Each CSD dimension was found to have distinct determinants: environmental integrity was determined by incurrence of fines/penalties/court cases; economic prosperity by media attention and liquidity; and social equity by diversity of exposure, media attention, and capital intensity.

Keywords *Profit-Maximisation Paradigm, Corporate Sustainable Development (CSD), Environmental Integrity, Social Equity, Economic Prosperity.*

INTRODUCTION

There is an increased pressure on corporations from several different stakeholders to examine the environmental, social, and economic implications of their business operations as well as adopt strategies, which integrate these aspects in order to ensure their long-run sustainability. Globally, communities have become increasingly aware of the potential adverse impacts business can have on the ecosystem and social system. This has led, on the one hand, to norms that are more stringent by governments on businesses, and, on the other, to increased demands from consumers for more environment- and society-friendly products and services. Thus, corporate sustainable development (CSD) is increasingly becoming a necessity for corporate survival in the long run.

The concept of CSD was proposed by Bansal (2005). It encompasses the application of three essential principles for sustainability: environmental integrity through corporate environmental management, social equity through corporate social responsibility (CSR), and economic prosperity through value creation.

Corporate environmental management represents an effort by firms to reduce the size and extent of their 'ecological footprint'. This ranges from pollution control, which is mere compliance to environmental norms imposed by

governments, to pollution prevention, which involves waste reduction or elimination through redesigned processes or the use of innovative technology. Pollution prevention is driven by the cycle of continuous incremental improvement, whereby the firm identifies inefficiencies, and accordingly improves processes, leading to better resource utilization and greater capabilities (Russo & Fouts, 1997).

CSR advocates that firms act in accordance with the socio-cultural expectations of all its stakeholders. Wood (1991) argued that CSR comprises three processes: (1) environmental assessment through which firms identify social, economic, and environmental issues and respond to them accordingly; (2) stakeholder management through which firms respond to individuals and external organizations that have a stake in the organization and strengthen these stakeholder relationships through transparent operations and by representing different stakeholders' interests in their decision-making; and (3) social issues management through which firms address social issues with which they come into contact.

Value creation by firms occurs through the production of goods and services. They increase the value created by improving the effectiveness of these goods and services efficiently – for example, by producing new and different products desired by customers, lowering the costs of inputs, or realizing production efficiencies (Porter, 1985), although

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high value creation does not always guarantee good financial performance. When a firm is able to create and capture value, it distributes this value to consumers through its goods and services, its shareholders through equity and dividends, and its employees through salaries and benefits.

LITERATURE

The relationship between corporate social development and firm performance has been the subject of study in the recent literature. Some of the pertinent studies are reviewed in the following.

The Committee for Economic Development (1971) introduced the discourse on social responsibility with the 'three-concentric circles' approach. The inner circle represented responsibilities related to economic aspects of business; the intermediate circle represented responsibilities emerging from changing social values and priorities, such as environmental conservation and race relations; finally, the outer circle represented responsibilities for actively improving the social environment. Sethi (1975) further suggested a three-fold classification for CSR: social obligation, i.e., corporate behaviour, which is dictated by market forces or legal constraints; social responsibility, i.e., bringing corporate behaviour on par with social norms, values, and expectations; and social responsiveness, i.e., the role of corporates in a dynamic social system. Carroll (1979) proposed a model for corporate social performance in terms of three inter-related dimensions: the categories of CSR, the issues at the focus of corporate social responsibility, and the philosophy of social responsiveness.

Hillman and Keim (2001) divided corporate social performance into two components: stakeholder management and social issue participation. They found that corporate social performance and environmental performance were negatively related to market-value capital. Wagner et al. (2002) and Wagner (2005) also found a negative relationship between environmental and financial performance. This negative relationship may reflect a lack of commitment of management to deploy resources outside the direct interest of the firm. Orlitzky et al. (2003) found a strong positive relationship between corporate social performance (and to a lesser extent, environmental performance) and accounting-based measures of financial performance. Laskar et al. (2017) found very high level of disclosure of corporate sustainability practices among Japanese companies, as compared to a very low level of the same among Indian companies. They also found significant positive impact of corporate social performance on financial performance; they found the environmental factor to be dominant among Japanese companies, while they found the social factor to be dominant in the case of Indian companies.

Bansal and Roth (2000) examined the motivations and contextual factors, which foster corporate ecological responsiveness using qualitative methods. They identified three motivations: competitiveness, legitimation, and ecological responsibility, influenced by three contextual conditions: field cohesion, issue salience, and individual concern. They proposed conditions that would likely result in high corporate ecological responsiveness.

Bansal (2005) proposed a scale for measuring CSD, based on the World Commission for Economic Development definition of sustainable development: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."¹ Her scale constructs CSD in terms of three dimensions: environmental integrity, economic prosperity, and social equity. She also developed resource-based and institution-based explanations for CSD. With these, she analysed CSD in the oil & gas, mining, and forestry industries in Canada. Her findings suggested that corporate social development increased in the study period, driven primarily by concern for social equity, and that international experience, media pressure, mimicry, and firm size were positively related to CSD, while return on equity, was negatively related to CSD, contrary to earlier findings, e.g., Hillman and Kiem (2001).

Some recent studies have examined sustainability issues in the cement industry. Rane (2009) examined energy-saving opportunities in the cement industry, and proposed demand-side management to reduce peak shortages with cost-effective measures. Ali et al. (2011) identified different sources of emissions in a cement industry. They proposed some techniques to reduce CO₂ emissions, including capture and storage of emissions, reducing clinker/cement ratio by replacing clinker with different of additives, and using alternative fuels instead of fossil fuels. Mikulčić et al. (2013) argued that some emission reduction techniques could simultaneously reduce the local environmental impact and improve the competitiveness of the cement industry.

Amrina and Vilsa (2015) proposed a set of key performance indicators for evaluating sustainable manufacturing in the cement industry based on the triple bottom line of sustainability, viz. economic, environmental, and social dimensions. They used the Analytic Hierarchy Process to derive weights for the criteria, as well as sub-criteria. They found that the most important criterion was the economic dimension (with weight 0.3985), followed by environmental (0.3059), and social (0.2956). Within the economic dimension, the most important sub-criteria were material cost (0.0995) and inventory cost (0.0917); within the

¹ World Commission for Economic Development. (1987). *Our common future*. Oxford, U.K: Oxford University Press.

environmental dimension, the most important sub-criteria were energy consumption (0.1013) and fuel consumption (0.0833); and within the social dimension, the most important sub-criterion was occupational health & safety (0.0961).

The concept of CSD is still at a nascent stage in emerging economies, and very few studies address the issues. The present study utilizes the methodology suggested by Bansal (2005) for analysing why firms commit to sustainable development for the cement industry in India.

METHODOLOGY

The objective of the present study is to analyse the determinants of CSD in the Indian cement industry. The study is based on three major players in the industry across three southern states, Nagarjuna Cements, based in Andhra Pradesh, Heidelberg Cements (formerly called Mysore Cements), based in Karnataka, and The India Cements, based in Tamil Nadu. The study period was 1995–2011. The scale used to measure CSD was adapted from Bansal's scale (2005), as follows:

Environmental Integrity
Manufactured products, which have a less environmentally harmful impact than in previous years or than its competitors
Mined/manufactured products having less environmentally damaging inputs than in previous years or than its competitors
Chose inputs from sources that are remediated or replenished
Reduced environmental impacts of production processes or eliminated environmentally damaging processes
Eliminated or reduced operations in environmentally sensitive locations
Attempted to reduce likelihood of environmental accidents through process improvements
Reduced waste by streamlining processes
Used waste as inputs for own processes
Disposed waste responsibly
Handled or stored toxic waste responsibly
Economic Prosperity
Worked with government officials to protect the company's interests
Reduced costs of inputs for same level of outputs
Reduced costs for waste management for same level of outputs
Differentiated the process or product based on the marketing efforts of the process/product's environmental performance
Sold waste product for revenue
Created spin-off technologies that could be profitably applied to other areas of the business
Social Equity
Considered interests of stakeholders in investment decisions by creating a formal dialogue
Communicated the firm's environmental impacts and risks to the general public
Improved employee or community health and safety
Protected claims and rights of aboriginal peoples or local community
Showed concern for the visual aspects of the firm's facilities and operations
Recognized and acted on the need to fund local community initiatives.

The independent variables taken for the study were:

- the number of states/countries the company operates in (representing the diversity of exposure of the company),
- the percentage of foreign revenue to total revenue (representing the foreign exposure of the company),
- its capital intensity (representing the company's capital management capabilities),
- its current ratio (representing excess liquidity or organizational slack),
- the incurrence of fines/penalties/court cases,

- the undertaking of environmental audit by the company,
- the number of times the company has appeared in the media related to environmental issues,
- the logarithm of the total assets of the company (to control for company size), and
- its rate of return on investment (to control for company's financial performance).

The impact of the independent variables on the CSD and its dimensions was analysed using a pooled regression without intercept (regression through the origin).

FINDINGS

The descriptive statistics of the CSD index and the independent variables for the sample are shown in Table 1. The regression analyses of CSD on the independent variables, with and without trend, are shown in Table 2.

There was a trend increase in the number of countries/states in which the firms operated. This reflected the expansion of the companies' operations; however, there was no trend increase in company size, capital intensity, liquidity, and profitability. There was a trend increase in environmental integrity, economic prosperity, and overall CSD over the research period, but no trend increase in social equity.

Environmental integrity was found in the first model to be significantly positively impacted by:

- the number of countries/states the firms operated in,
- the percentage of foreign revenue to total revenue, and
- log (total assets), i.e., by diversity of exposure and company size.

In the second model, however, environmental integrity was found to have a significant increasing trend, and was significantly positively impacted by company size, and significantly negatively impacted by incurred fines/penalties/court cases.

Economic prosperity was found in the first model to be significantly positively impacted by:

- the number of countries/states the firms operated in,
- capital intensity,
- current ratio, and
- media attention (environmental), i.e., by diversity of exposure, capital management capability, and media exposure.

In the second model, however, economic prosperity was found to have a significant increasing trend, and was significantly positively impacted by liquidity, media attention (environmental), and company size.

Social equity was found in the first model to be significantly positively impacted by the number of countries/states in which the firms operated and capital intensity, i.e., by diversity of exposure and capital management capability. In the second model, however, social equity was found not to have a significant increasing trend, and was significantly positively impacted by the number of countries/states in which the firms operated, capital intensity, media attention (environmental), and company size.

Overall, CSD was found in the first model to be significantly positively impacted by:

- the number of countries/states the firms operated in,
- capital intensity,
- media attention (environmental), and
- log (total assets), i.e., by diversity of exposure, capital management capability, media attention, and company size.

In the second model, however, CSD was found to have a significant increasing trend, and was significantly positively impacted by liquidity, media attention, and company size.

DISCUSSION

The results of the study indicate that CSD has been increasing in importance in the Indian cement sector, in terms of increased emphasis on environmental integrity and on economic prosperity, but no significant change in emphasis on social equity. In addition, company size was a significant control factor positively influencing CSD and all its dimensions, suggesting that as companies grow larger, they tend to make more tangible efforts towards CSD. On the other hand, company profitability as a control variable was not found to have a significant impact on CSD and its dimensions. These trends reflect increasing concern about the adverse environmental impact of the cement sector, particularly, as it is one of the primary producers of carbon dioxide gas (Rehan and Nehdi, 2005).

The results of the study also suggest that media exposure related to environmental issues and liquidity were the significant determinants of CSD in the Indian cement sector. Further, each of the dimensions of CSD was found to have distinct determinants: environmental integrity was determined by incurrence of fines/penalties/court cases, economic prosperity by media attention and liquidity, and social equity by diversity of exposure, media attention, and capital intensity.

Media exposure related to environmental issues was found to have a significant positive impact on economic prosperity, social equity, and overall CSD; paradoxically, it was found not to have a significant impact on environmental integrity. This reinforces the role of media in the sustainability discourse.

Liquidity was found to have a significant positive impact on economic prosperity and overall CSD. Capital management was found to have a significant positive impact on social equity, and on economic prosperity and overall CSD in the absence of trend. Thus, company resource–mobilisation capabilities play a pivotal role in fostering CSD.

Diversity of exposure was found to have a significant positive impact on CSD and its dimensions, but was insignificant in

the presence of trend, except in its impact on social equity. Thus, companies must be encouraged to expand their diversity of exposure in order to promote CSD. In particular, protectionist restrictions such as state taxes obstruct diversity of exposure, and thus inhibit corporate social development.

The incurrence of fines/penalties/court cases was found to have a significant negative impact on environmental integrity. A possible explanation may be that firms, which have faced environmental penalties, may be unable to deploy resources for corporate environmental management in the short term. In addition, the performance of environmental audit was found not to have a significant impact on CSD and its dimensions. Thus, the imposition and enforcement of statutory norms seems to have a counterproductive influence on CSD.

The study suffers from some limitations. The research period selected for the study contained two major global recessions (2001–02 and 2008–12)², which may have contaminated the results of the study. In addition, the study considered only three major southern players in the cement sector. There is thus wide scope for extending the study, considering a more diverse geographical spread, and including small and medium players. In fact, the role of resource mobilisation in CSD will be apparent when smaller players are also considered. There is also scope to include other determinant variables, which may play a role in CSD.

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² http://en.wikipedia.org/wiki/Global_recession

Table 1: Descriptive Statistics of the Study Variables

	Minimum	Maximum	Mean	Std. Dev.
Environmental Integrity	2	9	6.54	1.59
Economic Prosperity	4	6	5.12	0.75
Social Equity	4	6	4.94	0.77
Corporate Sustainable Development Index	11	20	16.60	2.27
Number of states/countries company operates in	1	7	2.80	1.29
Percentage of foreign revenue to total revenue	0.00	7.75	0.58	1.36
Capital Intensity	19.68	142.16	61.20	27.04
Current Ratio	.25	3.15	1.61	0.66
Incurred fines/penalties/court cases	0	1	0.42	0.50
Performed environmental audit	0	1	0.02	0.14
Media attention - environmental	0	1	0.64	0.49
Log (total assets)	8.47	22.10	11.68	3.51
Return on Investment	0.00	1.23	0.26	0.26

Table 2: Regression Analysis of Determinants of Corporate Sustainable Development and its Dimensions (with and without trend)

	Environmental Integrity		Economic Prosperity		Social Equity		Sustainable Development	
	w/o trend	with trend	w/o trend	with trend	w/o trend	with trend	w/o trend	with trend
Number of states/countries company operates in	0.769**	-0.145	0.500**	0.000	0.385**	0.398*	1.654**	0.252
Percentage of foreign revenue to total revenue	0.438*	0.315	0.138	0.070	0.100	0.102	0.676	0.487
Capital Intensity	0.011	0.004	0.013*	0.009	0.015*	0.015*	0.038*	0.028
Current Ratio	0.531	0.519	0.489*	0.482*	0.202	0.202	1.222	1.204*
Incurred fines/penalties/court cases	-0.901	-1.081*	0.299	0.201	-0.121	-0.119	-0.723	-0.999
Performed environmental audit	1.056	-0.503	-0.162	-1.016	0.269	0.291	1.164	-1.227
Media attention - environmental	1.012	0.649	1.413*	1.214**	0.885	0.891*	3.311**	2.753*
Log (total assets)	0.155*	0.264**	0.065	0.125**	0.157	0.155**	0.376**	0.544**
Return on Investment	1.312	0.651	0.596	0.234	0.323	0.332	2.231	1.217
Linear Trend		0.264**		0.145**		-0.004		0.405**
R ²	94.5%	96.4%	96.4%	97.4%	96.3%	96.3%	96.7%	97.4%
F Stat	78.89**	108.48**	121.62**	147.23**	118.04**	103.67**	134.28**	152.29**