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Management of Environmental Q

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Journal:	*Management of Environmental Quality*
Manuscript ID	MEQ-08-2021-0196.R2
Manuscript Type:	Research Paper
Keywords:	corporate governance, corporate sustainability, India, ownership structures, sustainability reporting

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Purpose

Based on the essence of the legitimacy and agency theories, this study empirically investigates the influence of corporate governance attributes and ownership structures on sustainability reporting of companies listed on the National Stock Exchange (NSE), India.

Design/methodology/approach

The study is based on panel data regression analysis of sustainability reporting practices of fifty-three environmentally sensitive companies drawn from NIFTY100 Index at NSE. All data pertaining to sustainability information disclosure, ownership structure and corporate governance characteristics were sourced from sustainability report, business responsibility report, annual report and Centre for Monitoring Indian Economy (CMIE) database for the years 2015 to 2019.

Findings

The empirical result reveals that sustainability reporting scenario has been consistently improving in India. This study documents that government ownership and frequency of board meetings are the two most important factors significantly influencing the extent of sustainability information disclosure of companies. However, the present study failed to find any significant impact of board size and big4 auditing on sustainability reporting practices. Unexpectedly, a higher number of independent directors does not improve sustainability disclosure of companies in India.

Originality

This study is one of the first studies to investigate how the nature of ownership and corporate governance characteristics contribute to or impede sustainability reporting practices of companies in India. This study offers important insights to regulators, practitioners and investors to analyze whether sustainability disclosure of companies is influenced by corporate governance attributes. It also provides a perspective for regulators and corporate strategists to assess the impact of recent corporate governance reforms in India and consider how corporate governance mechanism can be used to improve sustainability reporting practices.

Keywords: corporate governance; corporate sustainability; developing countries; India; ownership structures; sustainability reporting.

1. Introduction

The growing significance of corporate sustainability has propelled the environmental and social performance disclosure of companies through nonfinancial reporting. Increasing attention of many stakeholder groups on how companies address sustainability issues has also created a huge pressure on companies to adopt sustainability reporting practices (Hahn and Kuhnen, 2013; El-Bassiouny and El-Bassiouny, 2019; Khan et al., 2021). Thus, sustainability performance disclosure has become imperative for companies to meet the expectations of all the stakeholders. Corporate sustainability reporting is about the disclosure of the impact of business activities on the environment and people to maintain business viability (Roca and Searcy, 2012; Crowther and Aras, 2014; Garcia *et al*., 2020). There is a growing body of research on corporate sustainability reporting and the influence of various firm-specific factors on sustainability disclosure of organisations. Alshbili *et al*. (2019) noted that the level of sustainability performance disclosure is largely determined by the manner in which the organisation is governed. Although the literature on corporate governance is vast, of late it has also attempted to investigate the influence of corporate governance on sustainability reporting of companies. The corporate governance could play a critical role in the adoption of economic, environmental and social performance reporting systems in the organization (Shamil et al., 2014; Hahn and Kuhnen, 2013). Dam and Scholtens (2013) stressed that corporate governance attributes significantly influence socially responsible behaviour of the firm. Previous studies indicate that effective corporate governance mechanism enhances transparency, accountability and consequently lead to better reporting practices (Said et al., 2009; Rao et al., 2012; Crifo et al., 2019).

The review of extant literature suggests that, although prior studies have empirically examined the link between corporate governance and sustainability reporting in the context of developed countries (Jizi et al., 2014; Figueira et al., 2018; Garcia et al., 2020), the studies exploring the same based on developing countries are limited (Mahmood and Orazalin, 2017; Alshbili et al., 2019). Sustainability reporting domain is still in the formative stage in developing country like India (Kumar *et al.,* 2021) and only few studies have examined the sustainability reporting practices of companies operating in India (Kumar and Prakash, 2020). Moreover, a study providing empirical evidence about the impact of governance attributes on sustainability reporting of companies operating in India is nonexistent, to the best of authors' knowledge. Against this backdrop, this study aims to investigate the extent of sustainability reporting practices of companies and the role of ownership and corporate governance attributes on sustainability information disclosure of companies in India.

The choice of India for conducting this study is motivated by the number of reasons. Various recent institutional and regulatory developments regarding corporate governance and sustainability in India make it a unique and interesting environment to explore sustainability reporting of companies and the link between corporate governance and sustainability reporting. India, one of the fastest growing major economies in the world has taken a number of significant steps to promote corporate sustainability and sustainability reporting of the companies. The Ministry of Corporate Affairs (MCA), Government of India in the year 2011 introduced national voluntary guidelines (NVGs) for the companies to encourage responsible corporate behavior. Then, Securities Exchange Board of India (SEBI) also mandated a nonfinancial reporting in the form of Business Responsibility Report (BRR) for the top 100 NSE/BSE listed companies in India (Kumar, 2020). India is also one of the foremost countries in the world to stipulate

mandatory CSR rule for companies with the inclusion of schedule VII and section 135 in the Companies Act, 2013. This rule requires companies to spend at least 2% of their average net profits of the last three consecutive financial years on social development activities in India. In 2015, SEBI extended BRR requirements and mandated it for top 500 listed companies. It also recommended the adoption of Integrated Reporting (IR) for nonfinancial reporting by top 500 NSE/BSE listed companies. These initiatives have considerably improved sustainability disclosure scenario in India (Dharmapala and Khanna, 2018).

The corporate governance regulatory framework in India also witnessed major changes with the enactment of the new Companies Act, 2013. This new act provides a formal structure to corporate governance in India by enhancing transparency and disclosures through new compliance norms. The new norms under the act include important issues like composition and appointment of the board of directors, mandatory appointment of a one women director and resident director and performance evaluation of board committees (Singh, 2020). In 2013, SEBI also amended Clause 49 of listing agreement in line with the new Companies Act, 2013 to promote effective corporate governance in listed companies in India. The issues addressed under revised Clause 49 are the role of audit committee, code of conduct for the board, disclosure norms, transparency and role of stakeholders in corporate governance (Ministry of Corporate Affairs GOI, 2013). These new reforms in the corporate governance framework as the result of changes in the Companies Act, 2013 and SEBI regulation have strengthened the corporate governance mechanism of listed companies in India (Bansal and Sharma, 2019).

The impact of these aforementioned monumental reforms in the direction of improving sustainability reporting and corporate governance in India is still unknown and research in this field remains in its infancy. Thus, investigating the current state of sustainability reporting in

India and how it is impacted by the corporate governance is worthy of being examined. Further, this study also contributes to the extant literature by empirically investigating the link between corporate governance and sustainability disclosure of companies in a developing country like India

Essentially, the empirical findings of the present study make several important contributions. It is the first study to investigate the linkage between corporate governance attributes, ownership and sustainability disclosure of companies in the unique setting of India. This study incorporates board size, board independence, frequency of board meeting and auditor type along with promoter and government ownership. The results should be very useful for policymakers, practitioners, regulators and investors to understand the impact of recent reforms in terms of the role of ownership and good governance on sustainability disclosure practices of companies. This study adopts a multi-theory approach to understand and explain the influence of ownership and corporate governance attributes on the sustainability disclosure rather than a single theory approach. This study also significantly contributes to the sustainability reporting and corporate governance literature in the context of a developing country like India.

The structure of this paper is as follows. The second section provides explanation of theoretical background of the study, review of relevant literature and development of hypotheses. Section 3 describes sample, measurement of variables and research methodology. Section 4 provides empirical results and discussion. In the final section, conclusion and implications of the study have been discussed.

2. Background

Prior studies in the field of sustainability reporting have used various theories to explore the notion and motives of sustainability reporting of companies. Hahn *et al*. (2015) stressed that

understanding corporate sustainability disclosure is a complex phenomenon and therefore multi-theory approach is required to examine the sustainability reporting of companies. In the present study, the essence of agency theory and legitimacy theory are adopted to empirically investigate the impact of ownership type and CG on sustainability reporting. The Agency theory explains the principal-agent relationship between management and owner that results in agency cost and information asymmetry problem (Brammer and Pavelin, 2008). Corporate governance mechanism monitors managers' performance and encourages them to provide full information disclosure (Shamil *et al*., 2014). According to Agency theory perspective, managers improve the quality of sustainability disclosure to mitigate agency cost and information asymmetries. In this respect, sustainability disclosure of the companies increases the strength of the relationship with other stakeholders and address agency problem (Reverte, 2009; Karaman *et al*., 2018).

Another most widely used theory to describe sustainability reporting is Legitimacy theory which posits a 'social contract' between a firm and society. The companies are required to meet socially constructed norms and social needs to ensure their legitimacy in society (Kılıc and Kuzey, 2019). Orazalin and Mahmood (2019) highlighted that failure to fulfil these social needs and expectations may threaten the existence of the firm. Arena *et al*. (2018) emphasized that sustainability reporting serves as a tool to legitimize business operations and communicate to the various stakeholders that the firm is operating within the socially acceptable norms. The legitimacy theory advocates that sustainability disclosure can be used to influence the stakeholders view about the firm and demonstrate their commitment to environmental and social issues (Reverte, 2009; Ching and Gerab, 2017; Atan *et al*., 2018). In this regard, companies have strong incentives to disclose more sustainability information through sustainability reporting. The legitimacy theory extends the notion of principal-agent relationship and address a diverse set

of stakeholders and their societal interests (Crowther and Aras, 2014). Grounded on the essence of Agency theory and Legitimacy theory, the present study investigates the impact of ownership structure and corporate governance attributes on the sustainability reporting of companies in India.

2.1 Development of hypotheses

2.1.1 Board size

Board of director is one of the most crucial aspects of corporate governance mechanism to ensure responsible business conduct. Prior studies present conflicting views on board size. Small board is considered efficient as it mitigates agency problem between managers and shareholders (Shamil *et al*., 2014; Kılıc and Kuzey, 2019). The same argument can be countered by stating that the small board is more likely to be influenced by management. Jensen (1993) noted that large board size results in ineffective coordination and increase agency cost. Similarly, large size of the board also increases communication problems, delay in decision making and lead to weaker control over management (Eisenberg *et al*., 1998; Said *et al*., 2009). Various researchers investigating the impact of board size on sustainability disclosure have found a positive relationship between the two (Said *et al*., 2009; Rao *et al*., 2012; Shamil *et al*., 2014). According to legitimacy theory perspective, large number of members in board brings more expertise and ensures better sustainability reporting to address accountability and legitimacy issues (Mahmood and Orazalin, 2017). However, some studies also reported insignificant relationship between board size and sustainability disclosure (Sufian and Zahan, 2013). In line with the findings of most prior studies, this study assumed that board size positively influence sustainability disclosure of companies in India. Consequently, the following hypothesis is proposed:

H_1. There is a positive and significant relationship between board size and the extent of sustainability information disclosure of companies.

2.1.2 Board independence

Prior literature on corporate governance suggests that higher proportion of independent directors in the board improve corporate governance mechanism and board effectiveness. According to the agency theory perspective, independent directors help in monitoring managers' social behaviour and mitigate agency problems (Barako *et al*., 2006; Rao *et al*., 2012; Shamil *et al*., 2014; Al Farooque and Ahulu, 2017). The nonfinancial nature of the position of independent director encourages them to advocate the social needs of the outside stakeholders. Boards with more independent directors focus on ESG issues to improve corporate image and also exert influence on managers to report better sustainability information (Brooks *et al*., 2019; Liu and Zang, 2017). However, empirical studies on the influence of board independence on sustainability disclosure present inconclusive results. Eng and Mak (2003) and Chau and Gray (2010) provided evidence of a positive relationship between board independence and sustainability reporting. Whilst Amran *et al*. (2014), Shamil *et al*. (2014) and Mahmood and Orazalin (2017) found no influence of board independence on sustainability reporting. To review this issue, the following hypothesis is proposed:

H_2. There is a positive and significant relationship between the proportion of independent directors and the extent of sustainability reporting of companies.

2.1.3 Frequency of board meetings

Proponents of agency theory perspective suggest that higher frequency of board meetings is associated with better monitoring and therefore may positively influence the sustainability

disclosure of the companies (Shamil *et al.,* 2014). The frequency of board meetings is an important indicator of board activeness and the extent of managerial monitoring. Frequent board meeting is perceived to enhance the involvement of board in business activities and encourages managers to consider the interest of all stakeholders rather than only shareholders (Liu and Zang, 2017). It is widely accepted that frequent board meeting increase coordination, communication and reduce agency cost (Jizi *et al*., 2014). The frequency of board meeting variable has not been investigated at all for its potential impact on the extent of sustainability reporting in prior studies except by Haji (2013), Jizi *et al*. (2014) and Alshbili *et al*. (2019). Jizi *et al*. (2014) and Alshbili *et al*. (2019) reported a significant positive impact of number of board meetings on sustainability reporting. Haji (2013) revealed insignificant impact on the sustainability information disclosure of companies. In line with the theoretical argument, this study anticipates a positive influence of the number of board meetings on sustainability information disclosure of companies in India. Thus, the following hypothesis is proposed:

H_3. There is a positive and significant relationship between the number of board meetings and the extent of sustainability reporting of companies.

2.1.4 Promoter ownership

Promoter refers to the individual or group of individuals responsible for incorporation and organization of the firm. Theoretically, from legitimacy theory perspective, promoters may provide more sustainability information for public accountability and organizational legitimacy. Fifka and Drabble (2012) concluded that promoter positively influence sustainability performance of the organization. However, most prior studies suggest a negative influence of promoter ownership on sustainability reporting practices. Concentrated ownership companies, where promoter have large holding tend to report less sustainability information disclosure

(Ghazali, 2007; Dam and Scholtens, 2012). Chau and Gray (2002) highlighted that promoter are less interested in public disclosure of information as they already have easy access to all the relevant financial and nonfinancial information of the firm. Promoters wield significant influence on the managers in key policies pertaining to environmental and social performance of the firm (Ho and Wong, 2001). So, the managers may not heavily invest in sustainability performance as the potential benefits of such investments are not realized in the short-run. Thus, companies tend to disclose less sustainability information in case of high promoter ownership (Block and Wagner, 2014; Muttakin and Khan, 2014). Based on empirical findings, the following hypothesis is developed:

H_4. There is a negative and significant relationship between promoter ownership and the extent of sustainability reporting.

2.1.5 Government ownership

Prior empirical studies based on the relationship between ownership type and the extent of sustainability disclosure revealed that government companies are more likely to disclose higher sustainability information as they are subject to critical public scrutiny (Alshbili *et al*., 2019). According to the legitimacy theory perspective, state-owned companies are more concerned about public image and organizational legitimacy. Therefore, they are more inclined to report sustainability information (Said *et al*., 2009; Khan *et al*., 2013; Dissanayake *et al*., 2016; Aggarwal and Singh, 2019). Empirical findings of the many previous studies (Eng and Mak, 2003; Muttakin and Subramaniam, 2015; Jain and Winner, 2016; Figueira *et al*., 2018) also support a positive relationship between government ownership and sustainability reporting. Conversely, Dam and Scholtens (2012) found a negative impact of government ownership on sustainability practices. Based on theoretical arguments and empirical findings of previous

studies, this study assumes that government ownership positively influences the extent of sustainability reporting. To review this, following hypothesis is developed.

H_5. There is a positive and significant relationship between government ownership and the extent of sustainability reporting of companies.

2.1.6 Auditor type and sustainability reporting

Prior literature suggests that external audit plays a significant role in providing transparent and high-quality corporate disclosure. Large auditing firms are more exposed to litigation risks than smaller firms therefore, they encourage clients to provide comprehensive disclosure and comply with all reporting norms (Haniffa and Cooke, 2002). From the perspective of agency theory, external audit of accounts by the large auditing companies is an effective governance mechanism to examine managers' performance and improve the credibility of corporate reporting practices (Al Farooque and Ahulu, 2017; Hammami and Hendijani Zadeh, 2020). Brown *et al*. (2010) emphasized that large auditing firms are more diligent and conservative in their audit services in order to maintain their reputation of high-quality audit service provider. However, the influence of the type of auditor on sustainability reporting disclosure of companies has been investigated relatively less in the prior literature (Orazalin and Mahmood, 2018). El-Halabay and Hussainey (2015) and Orazalin and Mahmood, (2018) concluded that companies audited by big4 international audit firms (KPMG, Deloitte, EY and PwC) disclose higher sustainability information. Based on the theoretical discussion and empirical findings of the previous studies, this study assumed that clients of big4 audit firms disclose higher sustainability information. To analyse this in the Indian context, the following hypothesis is proposed:

H_6. External auditing by big4 is positively and significantly related to the extent of sustainability reporting of companies.

2.1.7 Control variables

As discussed in the literature, certain firm-specific characteristics also influence the extent of sustainability disclosure of the companies. Therefore, the present study also takes into consideration firm's size (SZ), age (AGE), level of leverage (LEV) and profitability (ROA) as control variables in the research model. Many prior studies have reported that large companies disclose more sustainability information than other companies (i.e., Artiach *et al*., 2010; Orazalin and Mahmood, 2018). Similarly, a significant number of studies have also provided empirical evidence regarding the positive relationship between firm age and sustainability reporting. Dissanayake *et al*. (2016) denoted that old and established companies have a greater tendency to disclosure more sustainability information due to their improved organizational structure and extensive reporting experiences.

The level of leverage has been consistently used in the prior research based on the determinants of sustainability reporting. However, findings also present inconclusive results regarding the impact of leverage on sustainability reporting. Some studies have reported a positive relationship between leverage and sustainability reporting (Ho and Taylor, 2007; Karaman *et al*., 2018) whereas other studies have also reported a negative relationship (Orazalin and Mahmood, 2018; Kouloukoui *et al*., 2019). Many prior studies have also investigated the impact of profitability on sustainability disclosure of companies. While the theoretical argument posits that profitable companies tend to provide more sustainability information to legitimize their higher profit margins, the empirical results present contradictory results. For instance, Artiach *et al*. (2010) and Andrikopoulos *et al*. (2014) reported positive impact of profitability on

sustainability reporting. Conversely, Coffie *et al*. (2018) concluded negative relationship and a few studies have also noted an insignificant relationship between profitability and the extent of sustainability reporting (Reverte, 2009; Dissanayake *et al*., 2016).

3. Data and methodology

3.1 Sample selection and data collection

This study analyzed that data of large environmentally sensitive companies operating in India for the period 2015 to 2019. The research population is based on the NIFTY100 Index companies listed at National Stock Exchange of India (NSE). The NIFTY100 Index represents the top 100 companies based on market capitalization and more than 76.89% of total turnover on NSE (NSE, 2020). Overall, fifty-three companies from seven environmentally sensitive industries (ESI) were selected using purposive sampling method. Table I below shows the sample distribution by industry. The final sample consists of 265 firm-year observations, forming a balanced panel to be used for hypotheses testing. The companies from ESI are chosen as they face much stringent public scrutiny due to the negative impact of their business activities on the society and environment and are expected to provide higher sustainability information. Environmentally sensitive companies are central to the sustainable development debate. It is therefore important to understand the current state of sustainability information disclosure and which factors impact their disclosure. In India, it is mandatory for top 500 listed companies to report BRR and besides this some companies also voluntarily publish a standalone sustainability report. Hence, data pertaining to the sustainability disclosure were collected from BRR, CSR report, SR and official website of the companies. While ownership and corporate governance data were directly collected from corporate governance reports and CMIE database (Centre for Monitoring Indian Economy) was used to obtain financial data of companies.

Table I. Shows the sample distribution by industry type

3.2 Measurement of variables

Content analysis was performed to measure the extent of sustainability disclosure practices of companies. This technique has been consistently used in prior studies based on nonfinancial reporting of companies (Dong and Buritt, 2010; Vaurvachis and Woodward, 2015; Kumar and Prakash, 2019). In the present study, environment, social and governance (ESG) parameters of sustainability reporting were taken into consideration to assess sustainability reporting of the companies. A non-weighted binary disclosure index was constructed using forty-two ESG performance indicators disclosed by the companies in their BRR, CSR report, SR and official websites. These forty-two indicators were derived from prior SR literature, sustainability code of conduct (i.e. GRI, UNGC principles etc.) and NVGs, particularly relevant in the context of developing countries. Based on a binary approach, if the company reported a particular indicator at least once, value of 1 was allotted and otherwise 0. The sustainability disclosure score of each company was calculated as the number of items reported divided by the total number of sustainability indicators (42) used in the study. The score of each company was expressed in percentages ranging from 0 to 100. Vaurvachis and Woodward (2015) stressed that reliability and validity issues can be addressed through coding and search by independent researchers. Besides authors, two independent researchers (Doctoral scholar from GLA University, India) also performed a content analysis of the various reports of seven companies (12.7%) from the sample companies used in the study. Further, Inter-coder reliability was also checked using Krippendorff's alpha test to examine the consistency of content analysis process. The value was found to be 0.918, suggesting strong inter-coder reliability (Hayes and Krippendorff, 2007).

The independent variables used in the study were frequency of board meetings, board independence, big4 audit, board size, promoter shareholding and government ownership in companies. Board size (BS) was measured by the number of members in the board and board independence (BI) was measured by the proportion of independent directors in the board. The frequency of board meeting (FBM) was measured by the number of board meetings held every financial year. Promoter shareholding (PS) was measured by the percentage of promoter's shareholding in the total shares. For audit (AD), dummy variable with a value of 1 was allotted if the company was audited by big 4 audit firms and 0 otherwise. Government ownership (GO) was also a dummy variable, allotted a value of 1 if 51% or more paid up share capital held by the government and 0 otherwise. A new corporate regime with implementation of the new Companies Act, 2013 and subsequent change in the federal government in the year 2014, major policy implications were expected for companies operating in India. To incorporate all such economic and political interventions, year dummies were included in this analysis. The result shows that year effects are significant and positive as sustainability disclosure of companies substantially increased in the subsequent years using year 2015 as base. The operationalisation details of all the variables are provided in Table II below.

Table II. Shows operationalisation details of all variables used in the study

3.3 Research model

This study used panel data regression model to investigate the impact of ownership and corporate governance attributes on the extent of sustainability reporting of the companies. The proposed research model is set out below:

$$SRI_{it} = \beta_0 + \beta_1*BS_{it} + \beta_2*BI_{it}* + \beta_3*FBM_{it} + \beta_4*PS_{it} + \beta_5*SZ + \beta_6*AGE_{it} + \beta_7*LEV_{it} + \beta_8*ROA_{it} + \beta_9*GO_l + \beta_{10}*AD_l + \beta_{11}*YR_l + u_{it}$$

Where,

SRI_{it}	Sustainability reporting index
BS_{it}	Board size
BI_{it}	Board independence
FBM_{it}	Frequency of board meetings
PS_{it}	Promoter shareholding
AGE_{it}	Age
LEV_{it}	Level of leverage
ROA_{it}	Return on assets
GO_l	Government ownership
AD_l	Audit
YR_l	Year dummy
u_{it}	Specific error term

The panel data used in this analysis is short and balanced. Breusch-Pagan (LM) test was applied to choose between Ordinary Least Square (OLS) and Random Effects (RE) model. The test reported a significant result (P=0.000), indicating highly heterogenous data. Thus, OLS was not

an appropriate model for given dataset. F-test was used to choose between Fixed Effects (FE) and OLS and result was found to be significant (P=0.0029), suggesting OLS was not an adequate model to move forward. The Hausman test was performed to decide whether to use FE or RE and result was found to be significant (P=0.000). All the estimated results suggested the use of FE model. The Bruesch-Godfrey test was performed to check for serial correlation and Breusch-Pagan test was applied to check the presence of heteroskedasticity in the data. Test results suggested the presence of significant level of serial correlation (P=0.000) and heteroskedasticity (P=0.000). According to Driscoll and Kraay (1998) panel data suffers high spatial correlation as cross section units are not randomly selected, Pesaran test was performed to check for the presence of cross correlation and found to be insignificant (P=0.736). Test results with their corresponding p-value have been reported in Table III.

Table III. Test results

Since it was found that data suffers the problem of serial correlation and heterogeneity which can affect the efficiency of an estimators. The cleaning of data is one solution to get rid of the problem of heterogeneity. Using boxplot, extreme values were removed and new estimates were calculated. However, results did not show any improvement except for minimal changes in some values and the direction of the estimators were also remained the same. Further, Newey- West Estimators were applied to solve this problem. These estimators are based on Newey-West (1987) standard errors and are corrected for heteroskedasticity and serial correlation (Millo, 2017). These estimates have been reported in results.

4. Results and discussion

Figure 1 presents the average sustainability disclosure of various environmentally sensitive industries in India for the year 2015 to 2019. Results indicate that metal and mining companies reported the highest sustainability disclosure (88.10%), followed by the energy companies (84.92%). This high disclosure rate is due to the fact that majorities of energy (8) and mining (6) companies published a separate sustainability report in accordance with GRI standards and UNGC principles. Three companies from industrial manufacturing and construction industry were included in the sample and all three adhere to GRI and UNGC principles with the disclosure rate of 84% of sustainability indicators. Chemicals, fertilizer and pesticides companies reported the lowest number of indicators with only 64.28% disclosure and only 1 company publish sustainability report based on GRI. The results suggest two important insights about sustainability reporting in India. First, overall sustainability reporting scenario has been significantly improved from 2014-15 to 2018-19 due to mandatory disclosure developments in India in recent years. Second, finding clearly indicate that although there is uniform disclosure guideline in the form of BRR for companies in India, the disclosure practices highly differ between the industries. It was found that companies reporting based on GRI standards reported higher sustainability information than other companies.

Figure 1. Sustainability disclosure of various environmentally sensitive industries in India for the year 2014-15 to 2018-19

Table IV presents the descriptive statistics of all the dependent and independent variables. Sustainability reporting a dependent variable has a mean of 0.709 suggesting considerably better sustainability disclosures of the top listed companies in India. The average sustainability disclosure of 71% of total indicators can be attributed to mandatory disclosure norms in India. The improvement in sustainability reporting climate was also noted by Poddar and Narula

(2018). In case of independent variables, board size ranges between 4 to 21 members with an average of about 12 members. This is relatively large in comparison to average board size (7-9) of other developing countries in Asia (Shamil *et al*., 2014). Result shows that most of the companies have board size of more than 13 members, probably to include diversified expertise and knowledge in the board. The average of board meetings is 4.69 with a range of 3 to 10 meeting in a year. This average is more than the minimum requirement of 4 board meeting in a year prescribed by SEBI. The mean of board independence is 0.503, suggesting independent board directors represents about 50% of the total directors in the sample companies. The highest promoter shareholding is 91.36% and the mean is 54.31. The average size of the companies is 9.63 and age is 45 years with a relatively wide range of 0 to 112 years. The sample includes eight (15.06%) government companies and twenty-seven (50.94%) companies in the sample are audited by big4 audit firms.

Table IV. Descriptive statistics of dependent and independent variables

Table V shows correlation among the variables. Results indicate SRI score is negatively correlated with promoter shareholding (-0.263) and board independence (-0.103). However, SRI score is positively correlated with the frequency of board meetings (0.132), board size (0.231) and firm size (0.435).

Table V. Pearson correlation among variables

4.1 Results of hypotheses testing

Table VI presents a summary of the estimated results of panel regression analysis. The first hypothesis (H_1) predicted that board size is positively and significantly impact sustainability information disclosure of companies. The reported coefficient of BS found to be positively

associated (though not significant) with the extent of sustainability reporting. Therefore, H_1 is partially supported. This implies that the number of members in the board does not play a significant role in sustainability disclosure policies of the companies. Similar evidence was also provided by the Sufian and Zahan (2013), Ben-Amar *et al*. (2017) and Alshbili *et al*. (2019). Coefficient of BI suggests a negative relationship between board independence and sustainability disclosure of companies. This result indicates that the proportion of independent directors in the board is not positively and significantly related to the sustainability disclosure performance of companies. Thus, proposed H_2 is not empirically supported. This result corroborate the findings of Amran *et al*. (2014) and Mahmood and Orazalin (2017), who reported lack of evidence on the relationship between board independence and sustainability information disclosure. This finding does not support agency theory perspective and is also inconsistent with the notion that higher proportion of the independent director has a strong positive influence on sustainability disclosure practices of the companies. One possible justification for this negative relationship could be that independent directors may attach less importance to sustainability performance and disclosure of companies in India. The appointment of independent directors under CG mechanism only seems to fulfill the regulatory obligations but does not improve sustainability disclosure practices of companies in India.

The third hypothesis (H_3) predicted that the number of board meetings have a positive and significant relationship with the sustainability disclosure of companies. The result shows that FBM has a positive and significant relationship with the sustainability reporting companies. Therefore, H_3 stands fully supported. This implies that more board meeting lead to higher sustainability information disclosure of companies in India. Alshbili *et al*. (2019) noted that board meetings help in managing the organization sustainability performance through continuous

monitoring of managerial performance. Higher number of board meetings encourages managers to meet the social expectations of all stakeholders. It is interesting to note that average board meeting from the sample was found to be more than the mandatory requirement of four meeting in a year under SEBI regulation. The implication of this finding supports that higher number of board meetings by companies in India lead to more sustainability information disclosure. This empirical result of positive and significant relationship between frequency of board meetings and sustainability reporting also corroborates the evidence provided by Jizi *et al*. (2014) and Alshbili *et al*. (2019). With regard to H_4, the empirical result shows that promoter shareholding has a negative and significant relationship with the extent of sustainability reporting of companies. Thus, H_4 stands fully supported. This suggests that promoters do not attribute value to the sustainability information disclosure of companies in India. Most prior studies also reported similar findings (Ghazali, 2007; Muttakin and Khan, 2014; Block and Wagner, 2014). Muttakin and Khan (2014) considered the explanation for this negative relationship might be that the promoters are less concerned with organizational legitimacy and public accountability issues. Therefore, they pay less attention to the sustainability information disclosure of companies.

In line with the expectation, the empirical result shows that there is a positive and significant relationship between government ownership and sustainability disclosure of companies. Thus, H_5 stands fully supported. Consistent with the legitimacy theory perspective, this positive relationship can be explained by the tendency of government companies to disclose higher sustainability information to improve their public image and legitimize their existence in society. In fact, the government companies in developing countries might be more sensitive to increased pressure for socially responsible behaviour of the business. This result is also in congruence with findings of the prior studies especially in the context of developing countries

(Said *et al*., 2009; Muttakin and Subramaniam, 2015; Dissanayake *et al*., 2016; Kumar and Prakash, 2019). The implication of this finding clearly suggests that government companies have a better understanding of their public responsibility and accountability and need for social actions. Therefore, managers of government companies disclose higher sustainability information to meet the social expectations of the other stakeholders. With regard to auditor type, this study predicted that companies audited by big4 audit firms disclose higher sustainability information than other companies. The empirical result of the study does not provide any evidence on the significant relationship between big4 auditing and sustainability information disclosure of companies. It is inconsistent with the notion that auditing by big4 leads to higher sustainability information disclosure. This is surprising given most of the prior studies reported that big4 audit significantly influence sustainability reporting practices of companies (El-Halabay and Hussainey, 2015; Al Farooque and Ahulu, 2017; Orazalin and Mahmood, 2018). The implication of this empirical result suggests that auditing by big4 audit firm may not influence sustainability reporting of companies in India. Therefore, the theoretical argument based on agency theory perspective that big4 audit firms encourage their clients for more sustainability reporting may not be applicable in the Indian context.

Table VI. Regression model results summary

4.2 Robustness checks

In the present study, additional analyses were conducted to check the robustness of the results. The regression model was performed again using a logarithm of total assets instead of total sales, as earlier studies have also used total assets to measure the size of the firm (Elsayih *et al*., 2018). The results were found to be consistent with findings shown in Table VI. Prior studies have also used ordinary least square (OLS) regressions models to examine the determinants of

sustainability reporting. Therefore, OLS regression was employed to confirm the main results of the study. The results obtained from OLS regression analysis (available upon request) were similar to the coefficient estimates reported in the main analysis from FE model (Table VI). Further, variance inflation factor analysis (VIF) was conducted to test the multicollinearity issue in the study. A VIF value of 10 or above indicates multicollinearity issues in the regression analysis (Chatterjee, *et al*., 2000; Gujarati, 2003). As shown in Table V, reported VIF values of all the variables fall well below the minimum threshold value of 10, indicating the absence of a potential multicollinearity problem in the estimated model. The Durbin-Wu-Hausman test was conducted to test potential endogeneity issue in the model (Ullah *et al*., 2018). An insignificant test static and insignificant coefficients (available upon request) indicated that the findings of the study were not affected by the endogeneity issue.

5. Conclusion

This study aimed to investigate something that had not been analyzed before in the Indian context; the extent of sustainability reporting practices and the impact of corporate governance attributes on sustainability disclosure of publicly listed companies in India. The results of the study clearly indicate that sustainability disclosure of companies has been considerably improved from 2015 to 2019. This might be due to the CSR regulatory development in India in the last decade. It is interesting to note that the most polluting companies (i.e., energy and metal & mining) reported highest sustainability disclosure in India. Grounded on agency and legitimacy theory perspective, this study empirically investigated the relationship between corporate governance and sustainability disclosure practices of companies in India. Contrary to the finding of prior studies, the result of the study provided no evidence of a significant relationship between board size and sustainability disclosure of companies in India. The result also contradicts the

notion that board independence significantly influences the sustainability information disclosure of companies. However, the present study supports the claim of agency theorists on sustainability information disclosure and frequency of board meetings. The study found that the frequency of board meeting is positively and significantly related to sustainability reporting of companies. As expected, the results also denoted a negative and significant relationship between promoter shareholding and the extent of sustainability reporting. This means that promoters in India are also less interested in sustainability disclosure practices of companies. The empirical result also revealed that government ownership has a positive and significant relationship with the sustainability disclosure of companies, confirming legitimacy theory perspective. This suggests that in a developing country like India, the government ownership induces socially responsible behaviour in the companies. However, this study failed to provide any significant relationship between auditing by big4 firm and sustainability disclosure of companies in India.

The present study has several implications for business organizations, policymakers, regulators and other stakeholders. A higher sustainability disclosure by most polluting industries shows that companies from these industries are more sensitive to sustainability issues. This study enables a better understanding of the extent of sustainability disclosure of organizations and provides empirical evidence on the relationship between ownership and corporate governance attributes and sustainability reporting in the Indian context. The empirical findings not only contribute to the growing body of sustainability reporting literature in the context of developing countries but also provide significant implications for corporate sustainability in India against the backdrop of mandatory CG norms and disclosure developments in recent years. These findings provide an assessment of these recent reforms undertaken by the government of India and understanding about how an improved corporate governance mechanism may lead to better

sustainability performance of the companies in India. It may also help the companies to invest in sustainable performance through increased emphasis on various corporate governance attributes. This study provides a perspective for promoters in India to consider how they can contribute towards the social expectations of the stakeholders. The research offers evidence that government ownership and board meeting significantly impact sustainability disclosure of companies in India. However, this study also denoted the underestimated role of independent directors and board with regard to sustainability performance disclosure as the empirical finding suggests insignificant impact of independent directors and board size on sustainability disclosure of companies. Therefore, policymakers and company strategists should also consider the role and competencies of board directors while asserting the possible benefits of corporate governance on sustainability performance. Further, this study also offers important insights into the application and effectiveness of agency and legitimacy theories with regard to CG and sustainability reporting from the Indian perspective. Although this study is based on listed companies operating in India, the findings of the study have implications for other developing economies with similar institutional settings facing similar sustainability challenges and issues.

The findings of the study are subject to certain limitations. Sustainability disclosure of companies was measured using a binary approach that ignores the degree and intensity of sustainability reporting practices. Only three CG attributes and two ownership variables have been taken into consideration in the present study that may not be comprehensive enough to fathom the role of CG and ownership on sustainability reporting performance of companies. Apart from agency and legitimacy theory, other theoretical perspectives may also be used in future studies to understand the role of ownership and CG on sustainability reporting.

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Table I. Shows the sample distribution by industry type

Type of Industry	No. of companies
Energy	10
Metals & Mining	7
Cement	5
Automobile	10
Chemicals, Fertilizer & Pesticides	2
Industrial manufacturing & Construction	3
Food manufacturing & Others	16

Table II. Shows operationalisation details of all variables used in the study

List of variable	Acronym	Operationalisation	Source
Dependent variable			
Sustainability reporting index	SRI	Value of 1 if the indicator was disclosed and otherwise 0. The total score was calculated by dividing sum of values to total number of (42) sustainability indicators and expressed in percentages	SR,CSR,BRR, AR & Authors compilation
Independent variables			
Board size	BS	Number of members in the board	CG report
Board independence	BI	Proportion of independent directors in the board	CG report
Frequency of board meetings	FBM	No. of board meetings held in the year.	CG report
Audit	AD	Dummy variable that received the value 1 if company is audited by big4 audit firms and 0 otherwise.	
Promoter shareholding	PS	Percentage of promoters shareholding in total shares	CMIE database
Government ownership	GO	Dummy variable that received value of 1, If 51% or more paid up share capital held by the government or otherwise 0.	CMIE database

Year	YR	Dummy variable	Authors compilation
Control variables			
Firms size	SZ	Logarithm of total sales	CMIE database
Age	AGE	No. of years since establishment	Authors compilation
Leverage	LEV	Ratio of total debt to total assets	CMIE database
Profitability (Return on assets)	ROA	Ratio of net earnings after tax to total assets	CMIE database

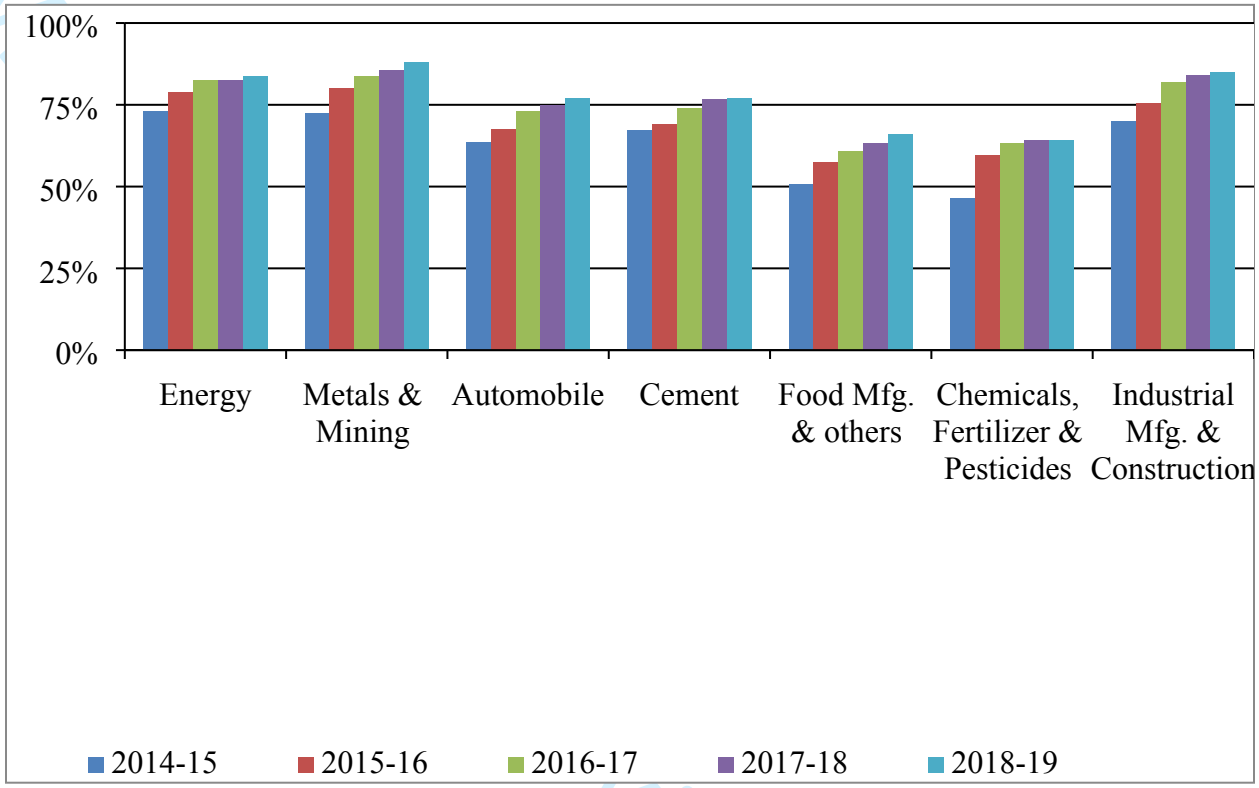

Figure 1. Sustainability disclosure of various environmentally sensitive industries in India for the year 2014-15 to 2018-19

Table III. Test results

Test of poolability (Breusch-Pagan) (LM test)	P=0.000***	χ^2= 358.56
F- test	P=0.0029	F= 4.134
Test for model selection (Hausman test)	P=0.000***	χ^2= 73.46
Test for cross section dependence (Pesaran's CD test)	P=0.736	Z= -0.337
Test for serial correlation (Breusch-Godfrey test)	P=0.000***	χ^2= 168.2
Test for heteroskedasticity (Breusch-Pagan test)	P=0.000***	BP = 48.96

Table III. Descriptive statistics of dependent and independent variables

	Obs.	Mean	Median	S.D.	Mini.	Max.
Dependent variable						
SRI	265	0.709	0.785	0.188	0.333	0.976
Independent variables						
BS	265	12.237	12	2.888	4	21
BI	265	0.503	0.5	0.095	0.230	0.750
FBM	265	4.690	4	1.056	3	10
PS	265	54.310	56.64	19.349	0	91.36
SZ	265	9.637	9.445	1.417	4.626	12.824
AGE	265	48.924	45	25.012	8	112
LEV	265	0.165	0.070	0.194	0	0.725
ROA	265	0.0911	0.007	0.363	0.0003	2.905
Dummy variables						
GO	265	15.09% (Government companies), 84.91% (Private companies)				
AD	265	50.94% (Companies audited by big4 audit firms)				
		49.05% (Companies audited by other than big4 audit firms)				

Table IV. Pearson correlation among variables

	SR	BS	BI	FBM	PS	SZ	AGE	LEV	ROA	VIF
SRI	1.000									
BS	0.231**	1.000								1.135
BI	-0.103	-0.156*	1.000							1.184
FBM	0.132*	0.147*	-0.095	1.000						1.096
PS	-0.263**	-0.208**	-0.368**	0.088	1.000					1.508
SZ	0.435**	0.114	0.073	-0.067	-0.365**	1.000				1.702
AGE	-0.130	-0.005	0.148*	-0.018	-0.293**	-0.010	1.000			1.267
LEV	-0.009	0.154*	0.078	0.159**	-0.141*	0.190**	-0.236**	1.000		1.233
ROA	-0.234**	-0.007	0.050	-0.077	0.001	-0.486**	-0.195**	0.045	1.000	1.476

Notes: **p<0.01; *p<0.05, (two tailed)

Table V. Regression model results summary

	Expected sign	Model with time dummy	Model without time dummy	Hypothesis status
Constant		0.257 (0.132)	0.239 (0.167)	
F-static		10.438	11.826	
		(0.000)***	(0.000)***	
R^2		36.00	31.769	
Adjusted R^2		32.614	29.21	
No. of observations		265	265	
Explanatory Variables				
BS	+	0.005 (0.192)	0.005 (0.161)	Partially supported
BI	+	(0.076) (0.510)	(0.004) (0.696)	Not supported
FBM	+	0.021 (0.022)*	0.020 (0.023)*	Supported
AD	+	0.055 (0.118)	0.058 (0.103)	Supported
GO	+	0.128 (0.004)**	0.130 (0.004)**	Supported
PS	-	(0.001) (0.012)*	(0.001) (0.027)*	Supported
SZ		0.035 (0.004)**	0.040 (0.001)**	
AGE		0.000 (0.994)	0.000 (0.911)	
LEV		(0.141) (0.018)*	(0.154)	
			(0.009)**	
ROA		(0.023) (0.363)	(0.009) (0.720)	
YR (2015-16)		0.032 (0.139)		
YR (2016-17)		0.076 (0.008)**		

YR (2017-18)	0.095 (0.001)**
YR (2018-19)	0.103 (0.000)***

Notes: ***p<0.001; **p<0.01; *p<0.05, (two tailed).