How far corporate governance and firms' characteristics are relevant toward environmental sustainability? An empirical investigation

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Abstract

Purpose – The study aims to focus to ascertain the consequence of corporate management and different firms' characteristics on environmental sustainability.

Design/methodology/approach – The sample includes 78 non-financial NSE 100 listed companies from 2010 to 2020. Here, the static and Arellano–Bond dynamic panel data model is considered to determine the effect of corporate governance mechanisms and different firms' characteristics on environmental performance.

Findings – The empirical findings of this study indicate that board size is negatively related with environmental sustainability. Similarly a positive influence of age, size and market-based financial performance can be seen on sustainability of the firm.

Originality/value – The present study takes an initiative to determine endogeneity and the dynamism effect of corporate governance factors and specific firms' characteristics on environmental sustainability from an emergent nation.

Keywords Corporate governance, Firms'characteristics, Environmental sustainability, Panel data analysis

Paper type Research paper

1. Introduction

The current environmental circumstance is gradually worsening due to numerous unsustainable and degrading activities like global warming, climate change, tremendous pollution, land deprivation, etc., which affects society massively (Ray *et al.*, 2013; Mukherjee *et al.*, 2015). The hasty industrialization and technological uprising have contributed to the direction of growth in the extent of manufacture and thereby pollution from the environmentally sensitive industries like chemical, oil, production, etc. (Sharma and Khanna, 2014). However, the necessity for environmental protection is nowadays broadly recognized. At present, the concept of sustainable development program has become a matter of concern for firms in several countries. "With the growing alertness and demand for sustainability, sustainability has developed mainstream corporate practices" (Milne *et al.*, 2009). "Firms that ponders sustainability will reasonably use present resources to achieve social justice and eco-efficiency" (Martins *et al.*, 2019).

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This necessity for environmental development (Swain and Nayak, 2017) has forced governments to enact numerous policies and procedures like Environmental Protection Act (1986), etc. As the burden of sustainability lies not only on the shoulders of the government but especially on the concerns because not all companies consider their environmental-related problem seriously, or even if it is positively performed by them, then also they are incapable of generating a similar level of environmental sustainability like other countries; hence, certain regulations like corporate social responsibility (CSR), Business Responsibility Report (BRR), etc. have been incorporated into the business sector as well.

The decision in respect to environmental events initiates from the board and corporate governance (CG) structure of the corporations. Latterly, CG around the globe has gained incredible importance (Gray *et al.*, 2001) as it controls and helps in determining the performance of organizations (Xie *et al.*, 2003). Similarly, CG has been considered as appropriate and important in sustainability reporting because prior literature (Omer and Andrew, 2014) divulges that it is a parameter that impacts the level of environmental exposure. Thus, CG characteristics play a crucial role in elevating corporate sustainable performance (Zahra and Pearce, 1989) along with magnifying the enthusiasm and guarantee toward ethical practices in companies (Al-Malkawi *et al.*, 2014). It is well balanced that board plays a dynamic role in creating, monitoring and attaining the company's objective and analyzing activities of managers toward the validity claims by increasing the disclosures' quality (Amran *et al.*, 2014). The regularity of board meetings signifies the efficiency of board, which helps in enabling better supervision of companies' actions and increasing transparency while building a pollution-free environment (Lipton and Lorsch, 1992). Along with this, the board leads toward better monitoring of environmental disclosure (Alipour, 2013) and inspires corporations to divulge more environmental practices (Katmon *et al.*, 2017).

Furthermore certain specific firm characteristics (age, firm's size, Tobin's Q and debt-equity ratio) to be a vital important factor that affects a company's environmental practices, strategies and performance (Vijayvargy *et al.*, 2017; Shrivastava and Tamvada, 2019) along with, it influences the environmental activities of businesses (Liu and Anbumozhi, 2009). The older and larger organizations are more involved in achieving different discretionary activities like disclosure of environmental information and ingenuities for the community (Kipesha, 2013).

CG factors are the prime focus that researchers look into to recognize industries with better environmental performance (Walls *et al.*, 2012). Preceding studies did not consider the in-depth influence of CG parameters and impact of firm characteristics together on firms' environmental performance. Hence, this study tries to explore the association between CG factors and certain firms' characteristics with sustainability of Indian concerns.

2. Review of former literature and development of hypotheses

2.1 Corporate governance and environmental performance

Corporate management is a concept envisaged by the industrialists in 20th century as a mechanism that amends the nature of stakeholders' expectations and business environment are likely to operate in an effectual and comprehensive manner. It acts as a vital step in meeting the present environmental sustainability treats (Ortiz-de-Mandojana *et al.*, 2010) Various literature (Amran *et al.*, 2014; Katmon *et al.*, 2017) finds that a strong and effective board leads toward a better environment and social performance. Cooke (1991) finds that "a larger board involves the compulsory expertise required for making serious decisions about environmental tactics and compliance, therefore improving environmental performance." Similarly, larger boards are found to be proficient of affecting the level to which business entities reveal their action related to environmental sustainability (Ntim and Osei, 2011). The increase in frequency of meetings facilitates the concerns to increase transparency in

direction of disclosing environmental activities (Masud *et al.,* 2018) and acts as a symbolic depiction of an enhanced environmental performance (Van Staden and Chen, 2010). Moreover, Shrivastava and Addas (2014) reports that an increase in independent directors provides them with more power to inspire the management toward disclosing environmental-related information to various stakeholders. Besides, Slawinski (2010) finds that, "large number of independent directors assumes long-term prospects and therefore, willing more to develop sustainable behaviour."

Contradictory to the above findings, Rodrigue *et al.* (2013) find that boards that are larger in size are found to be controlled and deluded by the chief executive officer (CEO) in comparison to smaller businesses. The increase in board size results in ineffective harmonization and communication in decision-making purposes toward the protection of environment (Barako *et al.*, 2006). Besides this, past studies (Daub, 2007; Kakabadse, 2007; Rodrigue *et al.*, 2013) find that if the board meetings are conducted regularly, then they will lack the foremost impression on sustainability and disclosure practices. Muttakin *et al.* (2018) reveal that an independent director is not effective in environmental practices because of political networks, lack of knowledge and family control, and is supposed to be a cost-effective replacement for information disclosure and other practices (Eng and Mak, 2003). Walls *et al.* (2012) find that boards that are larger, independent and less diverse in nature disclose fewer environmental performance. In this backdrop, the study hypothesizes underneath:

H0. There is no association amongst CG variables (board size, board independence, board meetings) and environmental sustainability practices.

2.2 Firm's characteristics and environmental sustainability

Firms' characteristics are regarded as the attributes that impact the level and standard of sustainability disclosures presented by the corporation. Numerous studies (Brammer and Pavelin, 2008; Da Silva Monteiro and Guzmán, 2010) show that "larger firms have a propensity to avail more attention and community pressure to practice environmental sustainability." Similarly, Younis and Sundarakani (2020) report that "larger companies allow capital and better accessibility of manpower to obtain environmentally friendly machinery and equipment." Furthermore, companies with higher debt ratios have superior endeavors and higher inspiration for developing a company's environmental sustainability (Andrikopoulos and Kriklani, 2013). Researchers (Roberts, 1992; Nguyen *et al.,* 2015) also predict that larger firms increase their reputation by indulging in better environmental sustainability by utilizing their better sales margin. Rini and Adhariani (2020) report that firms with better financial performance are found to engage themselves in environmental actions because they distribute their expenditure to various environmental information and aspects. Also, a firm's age specifies its experience, which has an inspiring influence on sustainability and efficiency (Kipesha, 2013).

Contradictorily to this, Ezhilarasi and Kabra (2017) report that larger businesses spend less amount towards the protection of environment and other disclosure practices. Also, firms with a higher debt-equity ratio report fewer environmental issues in their corporations' reports (Walls *et al.*, 2012; Al-Tuwaijri *et al.*, 2004). Shadbegian and Gray (2006) predict that older businesses are having less capacity to acceptance of fluctuations of environment, which finally leads toward incurring higher cost than younger ones. However, Ehsan and Kaleem (2012) document that profitable businesses find compliance with environmental procedures due to higher agency costs.

Various studies have been already conducted by researchers in the fields of environmental (sustainability and disclosure practices), but still there remain certain loopholes in the studies. Numerous studies considered certain parameters of CG, but the combined effect of CG factors

along with firms' characteristics has not been taken into deliberation. Additionally, other studies (Loderer *et al.*, 2009; Walls *et al.*, 2012) have considered smaller sample size and sample tenure in interpreting CG mechanisms and firms' characteristics on environmental (performance and disclosure practices). Lastly, some researchers (Ezhilarasi and Kabra, 2017) have considered only static panel data, and the issues of endogeneity and dynamism consequence of association have not been considered in the previous research studies. Taking cues from the following, the study frames the said hypothesis:

H1. Various other firms' characteristics (age, Tobin's Q, debt-equity ratio, size) have no influence on environmental sustainability.

3. Data and methodology

3.1 Sample design

The firms selected for analysis are those listed in NSE 100 Index in India. The sample comprises 78 non-financial corporations for tenure of consecutive 11 years, i.e. ranging from 2010 to 2020. Regarding the source of secondary data, the study uses financial database like Capitaline Plus, which is marketed and powered by Capital Market Publishers Pvt Ltd., Mumbai, and as well as database like "Prowess," which is marketed by the Center for Monitoring Indian Economy (CMIE) Analytics for corporate data and environmental disclosure score. Out of 100 companies, 78 companies comprise the ultimate sample because balance 22 financial and service sector companies were omitted from the total sample due to maintaining diverse rules and guidelines while preparing their accounts in their annual reports. Further, companies' sustainability reports and other different annexure reports were also used for data collection purposes.

3.2 Explanation of variables

3.2.1 Regressand variable. In this study, environmental sustainability performance, the regressand variable, is measured with Environmental Disclosure Score (EDS), a composite indexed score developed as the indicator for environmental sustainability and disclosures made by the corporations in range between minimum amount [0.1] and maximum amount [100] (Shrivastava and Addas, 2014; Van Hoang *et al.*, 2021). The score has been derived through the data point that Bloomberg gathers, reflecting mostly GRI4 guidelines, which is weighted respecting to importance, with data such as greenhouse gas emissions, toxic waste, etc., carrying larger weight than other disclosures.

3.3 Regressor variables

The study considers certain CG parameters (board size, number of board meetings and proportion of independent directors) and firms' characteristics (age, Tobin's Q, firm size, debt-equity ratio) as its regressor variables.

Board size is computed by considering maximum directors accessible on company's board (Chen and Hsu, 2007; Mohapatra, 2017). The number of board meetings is estimated on the basis of maximum corporate meetings conducted in financial year of the respective concerns (Sahu and Manna, 2013; Juliet, 2015). The directors, which are independent in nature, are appointed in the corporation's board divided by the total number of directors, described as board independence (Barako and Brown, 2008; Pareek *et al.*, 2019).

The duration of firm since its incorporation denotes the age (Akbas, 2014). Tobin's Q is characteristically employed as a representation of financial performance in the environmental performance literature (Karim *et al.*, 2016). It is basically an indicator of market prospects about forthcoming profitability. Therefore, market-based financial

performance, i.e. Tobin's Q (Pandey and Sahu, 2017), is calculated as the total assets measured in book value by subtracting equity measured in book value plus equity measured in market value divided by the total assets measured in book value. The debt-equity ratio of an organization is determined by dividing the debt made for more than a year by shareholders' fund (Gul and Tsui, 1998). Firm size is determined by taking the log value of total assets for a specific year (Haniffa and Cooke, 2005; Alipour, 2013).

3.4 Methodology

The study first integrates static panel data to build an association among various CG factors, different firms' characteristics and control variables on sustainability. The static panel data deal with finding out the best-fitted model from the comparison of the three regression models like pooled ordinary least squares regression (OLSR) model, fixed effects model (FEM), and as well as random effects model (REM). For picking the best regression model among the three models, the study has incorporated the restricted *F*-test for making a comparison between pooled OLSR model and FEM, Breusch and Pagan's (1980) recommended a test, i.e. Breusch–Pagan Lagrange multiplier, which is used is to make a comparison between pooled OLSR model and REM, and last but not the least, Hausman (1978) suggested a test name Hausman, which is used to make a comparison between FEM and REM. The estimated model would be in a subsequent form as below:

$$EDS_{it} = \alpha + \gamma_1(BSZ) + \gamma_2(NBMY) + \gamma_3(PER\_ID) + \beta_1(AGE) + \beta_2(TQ) + \beta_3(DE) + \beta_4(Size) + \varepsilon_{it}$$

Here, EDS_{it} refers to environmental disclosure score of ith concern at time period t, α embodies the constant term, γ_1 to γ_3 denote the coefficients of CG parameters, β_1 to β_4 epitomize the coefficients of the different firms' characteristics and ε_{it} signifies the error term.

Furthermore, the study moves toward dynamic panel data analysis in view of lagged value of the regressand variable as the regressor variable, while analysis as the dynamic regression undertakes the lagged value of the regressand variable and the random disruption term to be correlated, which results into dynamic impact (Wintoki *et al.*, 2012). Previous research (Dezso and Ross, 2012; Wellalage *et al.*, 2018) has made an effort, in a few cases, to tackle the endogeneity issue connected with CG and environmental practices. This study also goes for both one- and two-step estimator versions of the generalized method of moment estimator model. The one-step estimation is unable to produce Sargan statistics, notwithstanding of controlling for heteroskedasticity; thus, the study goes for coefficients of one-step estimation with robust standard error for implications, and Sargan statistic of two-step estimation for testing the over-identification restriction. The significance of the study is assessed by the Wald chi^2 statistic, and the first- and second-order autocorrelation is assessed by the Arellano–Bond (AB) test.

4. Data analysis and results

4.1 Summary statistics

Table 1 expresses descriptive statistics of both dependent and independent parameters. The descriptive statistics consists of mean value, standard deviation, minimum and maximum value of all variables. The mean value of environmental sustainability practices of businesses, which are calculated with the help of EDS score, is found to be 23.89, and the maximum value is 62.79. This score is moderate in nature. The board size of Indian firms ranges between 4 and 20 members every year. The average number of meetings of board members is held seven times in a year, and the maximum number of meetings does not exceed

15. The average value of board independence is found to be 51.39%, with a minimum of 20 and maximum value of 81.82%.

The sampled non-financial Indian companies in this study are originally established after independence. So, when the generating capability of the firm is concerned, the mean value of profitability, which is measured in terms of Tobin's Q, is 2.95 with SD of 2.31. It infers that, however, the value of creating capability of non-financial Indian firms is different on average, and the values of non-financial Indian corporations are twice their book value. The mean value of debt-equity ratio on an average is 7.16. This indicates that on an average, non-financial Indian companies, which are used for this study, are moderately geared because the maximum value of debt-equity ratio is 51.73. The SD of 1.47 interprets that there exists a great variation in companies' size, as demonstrated by the fact that the minimum value of firm size is 8.13, and the maximum value of firm is 15.92.

4.2 Test of multicollinearity

The occurrence of multicollinearity issue in the dataset can construct incorrect outcomes and lead to bogus inferences. So, before going to the panel data analysis, it is very much vital to validate the presence of such data property among the variables (Pandey and Sahu, 2019). To validate the multicollinearity problem, the study introduces the variance inflation factor (VIF) test (Table 2), in which maximum value of VIF is 2.23, followed by 1.92 and so on. In case of multicollinearity, property is concerned, there is no definite rule of thumb for defining the benchmark of tolerance value of VIF, but in accordance with Gujarati (2004), the regressor parameters can be highly collinear if VIF values beat 10. As all the values in the study are found to be less than 10, it can be concluded that variables that are explanatory in nature are really free from any multicollinearity property. To verify such issue, the study once more includes a pair-wise correlation matrix (Table 2) and reveals no such serious multicollinearity issue among the explanatory variables.

4.3 Empirical evidence of static panel data analysis

The study finally proceeds toward the panel data regression approach, which inhabits the selection of the best-fitted model for the study out of three models like OLSR, FEM and REM. The suitability of FEM for panel data analysis can be specified with the help of Hausman specification (Hausman *et al.*, 1984).

The FEM (Table 3) suggests the presence of negative connection between board size (−0.012) and environmental performance of companies statistically significant at 5% level. Also, there exists a positive association of independent directors' proportion (0.172) and firm's age (0.756), with its environmental performance statistically significant at 1% level for both the parameters. Moreover, the R^2 value of 0.35 shows that the model can explain 35% of variance in environmental performance of companies.

Table 1.
Summary statistics for all variables

Variable	Mean	Standard deviation (SD)	Minimum value	Maximum value
EDS	23.89	17.09	2.33	62.79
BS	11.18	2.92	4	20
NMBY	6.78	2.57	3	15
PER_ID	51.39	8.52	20	81.82
AGE	44.72	21.09	2	108
TQ	2.95	2.31	0.31	12.17
DE	7.16	10.98	0	51.73
SIZE	12.24	1.47	8.13	15.92

Source(s): Calculated by authors

Independent variables	EDS	BS	NBMY	ROA	CR	DE	ATR	FS	VIF
EDS	1.00								2.23
BS	0.2107***	1.00							1.92
NMBY	0.0725	0.3153*	1.00						1.40
PER_ID	0.0085*	−0.0664*	−0.1719***	1.00					1.15
AGE	0.2273***	0.1185***	0.1406***	0.0377**	1.00				1.11
TQ	−880.1702***	−0.1976***	−0.2418***	0.1260***	0.1354***	1.00			1.07
DE	0.0712*	0.0765**	−0.0247	0.0181	0.0418	−0.0562	1.00		1.36
Size	0.3703***	0.3653***	0.4921***	−0.0484	0.1298***	−0.5472***	−0.0144	1.00	1.06

Note(s): ***denotes 1% level of significance, **denotes 5% level of significance, *denotes 10% level of significance
Source(s): Prepared by authors

Table 2.
Pair-wise correlation matrix with VIF

	Dependent variable (EDS)
BS	−0.0116159** (−2.56)
NMBY	−0.1327929 (−0.47)
PER_ID	0.1719996*** (3.16)
AGE	0.7564075*** (3.24)
TQ	0.0430951 (0.11)
DE	0.0900421 (1.38)
Size	2.571154 (1.58)
Intercept	−34.64321 (−2.52)
R^2	0.3484
Restricted F test	18.33***
BP-LM test	822.03***
Hausman Test	24.61***
Hettest	9.51***
Imtest	68.68***

Table 3. Panel data regression results

Note(s): Figures in brackets are *t*-values; ***denotes 1% level of significance, **denotes 5% level of significance
Source(s): Calculated by authors

4.4 Empirical evidence from dynamic panel data analysis: Arellano–Bond generalized method of moments estimation

Now, the study moves toward the generalized method of moments (GMM) estimator, which is Arellano and Bond (1991) dynamic panel estimation including one- and two-step estimations, as divulged in Table 4. The Sargan test static is insignificant [10.111 ($p = 0.18$)], representing that the model does not undergo the over-identification restrictions issue. Likewise, the Arellano–Bond estimator for AR (1) for both one- and two-step estimation is significant, whereas the AR (2) for both versions of the GMM model is found insignificant. Therefore, we can conclude that our models do not suffer from second-order autocorrelation and are fit to draw consequential inferences. The significance of both models can be assessed from the highly significant Wald chi^2 statistics.

Variables	One-step estimates Coefficient	*z*-stat	Two-step estimates Coefficient	*z*-stat
EDS_{it-1}	0.7204573***	6.99	0.7800097***	7.17
BS	−0.212339**	−2.68	−0.0538881**	−2.25
NMBY	−0.0504178	−0.20	−0.0697902	−0.31
PER_ID	0.0247655***	2.86	0.0015405**	2.02
AGE	0.4520843**	2.34	0.5822013*	1.92
TQ	0.9386958**	2.14	1.244277***	3.00
DE	−0.1315994	−1.03	−0.0988232	−0.88
Size	2.991312**	1.99	2.947044**	2.03
Intercept	−2.597271	−0.17	2.735653	0.22
Wald Chi^2	49.89***		104.83***	
Sargan test for over-identification			10.11064 ($p = 0.1824$)	
Arellano–Bond test for AR (1)	−2.7875*** ($p = 0.0053$)		−2.9253*** ($p = 0.0034$)	
Arellano–Bond Test for AR (2)	−0.76374 ($p = 0.4450$)		−0.73237 ($p = 0.4639$)	

Table 4. Results of Arellano–Bond dynamic panel data model

Note(s): ***denotes 1% level of significance, **denotes 5% level of significance, *denotes 10% level of significance
Source(s): Calculated by authors

From the one-step estimates, the study concludes a negative association between board size and environmental performance of industries (coefficient −0.212 significant statistically at 5% level), whereas a robust and significant relationship is seen between the proportion of independent directors (0.025 significant statistically at 1% level), firm's age and environmental performance (coefficient 0.452 significant statistically at 5% level). Also, there exists a positive association between profitability (0.939 significant statistically at 5% level) and firm size (2.991 significant statistically at 5% level) with its environmental performance.

5. Results and discussion

The study from static panel data reveals that there exists a positive connection between board independence and firms' age with their environmental performance. Moreover, board size has negative influence on disclosure level. Further, to attain robust results by considering endogeneity bias, the study goes for Arellano–Bond dynamic GMM findings. The one-step GMM estimator results are similar with static analysis, revealing an indirect effect of board size on environmental practices of corporations and positive influence of board independence, age, size and profitability of industries on environmental practices. The findings are similar with Rodrigue *et al.* (2013), which also shows that bigger boards tend to be restrained and exploited by the CEO in comparison to smaller ones. Furthermore, it is seen that corporations with larger board size are more inclined toward illegal acts leading to lesser disclosure of environmental activities (Adams and Ferreira, 2009). In regard to most of the prior literature like Akbas (2016) from Turkey and Nuskiya *et al.* (2021) from Sri Lanka, it is found that board size is significantly and positively influencing environmental-related disclosure. But less literature like Ahmed *et al.* (2006) from New Zealand reports that "larger boards are incapable of reducing agency conflicts and thus leads to lower environmental performance." However, board independence, a vital CG mechanism, inspires the firm and paves the way toward better participation and monitoring of social activities (Alipour, 2013), along with boosting corporations toward disclosing more such practices (Katmon *et al.*, 2017). The results of this study are in consonance with prior research like Mudiyanselage (2018) from Sri Lanka and Gerged (2021) from Jordon, which report similar positive results between independent directors and environmental practices.

In regard to firms' characteristics like age, size and profitability of firm is showing a positive influence on the sustainability performance of organizations (Liu and Anbumozhi, 2009). The probable logic behind this might be that corporations that are older and larger in size comprise a better-skilled workforce and technical know-how than the newer firms, thus permitting them to involve more toward diverse discretionary activities like disclosure of environmental information and environmental protection initiatives (Kipesha, 2013). Corresponding to this, other researchers like Dissanayake *et al.* (2016) from Sri Lanka and Orazalin and Mahmud (2018) from Russia also reveal similar results that company age is positively affecting environmental sustainability. The reason behind this is matured firms are found to report better sustainability information because of their widespread reporting experience. In case of firm size, larger organizations are found to provide more information than smaller organizations because as the business size increases, their visibility and responsibility for environmental issues also increase, and they become answerable to a comparatively extensive range of stakeholders (Liu and Anbumozhi, 2009). In line with this outcome, other literature like Artiach *et al.* (2010) from the USA and Nkundabanyanga *et al.* (2021) from Uganda find that larger companies are significantly influencing sustainability reporting because big firms are found to give more weightage toward building a corporate image. Also, the positive and significant link between profitability and environmental activities may be due to the fact that profitable companies are in an improved position in terms of resources, workforce and financial ability to indulge in social activities in

comparison to less-profitable concerns (Hart and Ahuja, 1996). However, in regard to this, researchers like Khan *et al.* (2012) from Bangladesh and Nuskiya *et al.* (2021) from Sri Lanka predict similar result that companies' profitability is positively and significantly affecting environmental reporting because profitability allows an organization to divulge better social and environmental information to investors with flexibility and freedom.

6. Conclusion and policy implication

The study explicates the influence of CG factors along with certain firm characteristics factors on environmental sustainability of 78 manufacturing corporations. The study incorporates static plus dynamic panel data analysis to consider the endogeneity biases and reveals the negative association of board size, and positive association of board independence, age, firm size and profitability with environmental disclosure of sampled companies. The increase in board size is sometimes a negative change in the board structure because an increase may generate inefficacious collaboration and communication, leading to interruptions and conflicts in major decision-making. However, board independence brings a sense of ethical and socially responsible practices among the firms by their nature of appointment and non-pecuniary association with the firm. The age, size and profitability also shown a significant influence on environmental practices of a firm because of more resources, time and skilled workforce compared to younger, smaller and non-profitable ones.

The study therefore based on its results recommends certain significant policy implications to the policymakers regarding the vital role that CG and firm characteristics play toward environmental practices in the firm. The study suggests the board to consider the employment of additional independent directors to enjoy and utilize the positive impact of environmental performance. However, policymakers need to be watchful while increasing the members on board to avoid negativities. Thus, future researchers might scrutinize the optimum level of board size to fully utilize its impression on the environmental performance of firms. Also, the results recommend that presently, firms in India are driven through governing pressure and legitimacy tactics to sustainability reporting. The firms should relatively follow stakeholders' theory that addresses the requirements of all stakeholders fairly by creating suitable environmental-related disclosure. Additionally, the findings suggest that stakeholders like creditors, investors, shareholders and debtors should upsurge their information in sustainability reporting and also its importance in the organization, which will permit them toward making healthier investment choices. Lastly, the study recommends the CG regulations to identify the positive role that companies that are older and larger in size and drawn from non-financial sectors play in improving environmental sustainability at a country level like India.

The dimension of environmental sustainability can be used as an upcoming work to get detailed information as to which the nature and spending number of environmental practices are of chief prominence. Another noticeable extension of the study would be to examine the optimum level of board size and board independence toward determining their association with environmental disclosure level of firms. Furthermore, the upcoming researchers can also benefit from a thorough particular sector study of the association across various sectors.

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