The Role of Corporate Governance and Company Specific Characteristics on Environmental Disclosure Practices in India

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Purpose-The purpose of this paper is to investigate the determinants of corporate governance factors and company specific characteristics of environmental disclosure in a developing country, namely, India.

Design / Methodology/ Approach-A static and GMM-based dynamic panel data regression analysis is used to measure the ecological practices by considering the sample size of 100 non-financial listed companies taken from the National Stock Exchange between 2010 to 2021.

Findings-Using two-step dynamic panel data GMM-based estimation, the study finds that governance factors like board size and board meetings are showing a positive effect on disclosure practices. whereas, in the case of an independent director a negative influence can be seen. But in the case of the squared term of independent director, there remains a positive effect on environmental activities. However, in the case of company specific characteristics firm age and the debt-equity ratio are positively influencing environmental activities where as firm size is found to influence negatively on disclosure practices.

Originality/value-This study improves the mounting literature on the association between corporate governance factors, company specific characteristics, and environmental practices from an emerging economy standpoint. Specifically, the study inspects the dynamism and endogeneity effect along with the non-linear effect of different independent factors on environmental disclosure.

Keywords: *Corporate Governance, Company Specific Characteristics, Environmenta lDisclosure, Dynamic Panel Data Analysis.*

1. INTRODUCTION

One of the crucial resources of a country is the eminence of its ecology but due to the negative processes of the corporations, there has been major anxiety about the conditions of the climate, social lives, and ozone layers. Researchers like Ajibolade & Uwuigbe (2013) reports, "ecological problem has become a major area for the reason how the harmful impact affects the steadiness of the environment". The biosphere is harmfully pretentious. It is an outcome of the uncaring management of corporate organizations with what the earth is blessed with (Onyali & Okafor, 2018, pp.854-863). This initiates the research, on how the ecosystem can be salvaged from its devasted state by upsurging sustainable development and education which has been shifting the route of companies' attention towards disclosure practices.

This amplified consciousness among numerous components of the community made the business house decrease the adverse effect of manufacturing activities on the natural environment and made them report the same in their annual reports. Therefore, to meet the rising interest of the investors, some companies have started connecting themselves in ecological doings and divulging the same to legitimise their corporate processes. The firms are facing provocation in ascertaining true environmental profit as there are no specific accounting standards that are designed to deal with ecological problems (Ezhilarasi&Kabra, 2017, pp.24-43). Subsequently, several studies have shown attention to developing strategies for reporting ecological information. These firms have implemented these strategies to portray their positive and favourable information in their financial reports.

Corporate entities are an upsurging vital engine for wealth creation globally, and they affect the well-being of the community as a whole. Corporates are attentive to their purpose and responsibilities for serving this wealth creating function with an agenda. In other words, corporates need to set up a reliable and adequate arrangement of corporate governance. Organizations identify that there are financial benefits to be achieved from a well-planned disclosure policy. "A system of governance management needs a virtuous level of the disclosure along with suitable information to eradicate asymmetries information among the stakeholders who are making corporate accountable internally for their doings", (Madhani, 2014, pp.27-41). Corporate governance and environmental doings of companies are influenced by several parameters including board size, frequency of meetings, independent directors, etc because it acts as a vital and integral part in implementing financial reporting and disclosure activities (Nursimloo, Ramdhony & Mooneeapen, 2020). According to agency theory, Bueno, Marcon, Pruner & Ribeirete (2018) suggest, "boards that are bigger in size, force companies to reveal the information for decreasing agency costs and information asymmetry voluntarily". Similarly, bigger boards are found to bear better diversity and experience in contributing to the problem which is related

to the disclosure activities (Al Amosh, 2022, pp.1229-1253). In the same way, the regularity of the board meetings contributes towards improving the organisation's legitimacy (Dienes & Velte, 2016, p.63) along with, playing a vital in environmental-related disclosure (Hu & Loh, 2018, p.2578). However, larger independent directors on the board motivate the organization to disclose voluntarily better information (Akhtaruddin, Hossain & Hossain, 2021). Likewise, a board that is independent in nature is likely to provide better executives with motivation in the form of appreciation towards environmental disclosure (Jahid, Rashid, Hossain, Haryono & Jatmoko, 2020).

Apart from corporate governance activities, companies may differ in several ways like companies' specific characteristics which are presently a developing task in today's robust activities and processes, with companies making an effort to re-structure their overall performance pointers which consists of ecological challenges as a vital part of the companies' normal tactical purpose (Ezekwesili & Ezejiofor, 2022, pp.69-82).The study byKansal, Joshi & Batra (2014) reports that bigger firms obtain superior consideration from the community, and therefore it tends to legitimise their environmental actions. Also, bigger companies are disclosed to have better investor scrutiny than smaller firms (Muttakin, Khan & Mihret, 2018). The profitability firms will propagate companies' contribution towards ecological activities better by gaining society's attention (Naseer & Rashid, 2018). In regards to the age of the company, mature firms are found to reinforce their standings by improving voluntary disclosure (Chakroun, Matoussi & Mbirki, 2017). According to agency theory, firms with higher leverage are found to adopt ecological practices to decrease agency costs (Abdul Rahman & Alsayegh, 2021, p.167).

The connection between corporate governance mechanism and environmental practices are well recognized in various past studies (Kumar, Kumari, Poonia & Kumar, 2021; Vig & Datta, 2021, etc) but very less research has been conducted to determine the relationship of corporate mechanisms including the non-linear effect of independent directors and companies' firm-specific characteristics directly on environmental activities using the two-step Generalized Method of Moment (GMM) of dynamic panel data in developing countries like 'India'. Thus, the current study tries to explore the in-depth effect of governance parameters (board size, number of board meetings, and independent directors) along with company specific characteristics (size, age, profitability, and leverage) on the environmental disclosure of non-financial Indian concerns.

2. THEORY, LITERATURE AND HYPOTHESES DEVELOPMENT

2.1. Theoretical Framework

The elementary viewpoint of agency relationship should be used to comprehend corporate governance (Muda, Maulana, Sakti Siregar & Indra, 2018). Jansen &

Meckling (1976), pointed out that "The Agency Theory is an agreement between the principal (stakeholders) and agents (managers)". The owners assume higher revenues from their investment in corporations, and at the same time the organization also assumes high execution and compensation for their psychological needs. It leads to contradictions between agents and principals as each of them will tend to satisfy their own welfare. This theory also postulates that the board is accountable to monitor the organizations ecological strategy, policies, ecological investment, and availability of information. Moreover, the management consists of people with diverse and different values, whereas, the members of the board are responsible for reporting, monitoring, and decision making for the investors even though they have inadequate power and scope (Chang, Oh, Park & Jang, 2017).

Thus, "the organization has to contemplate the cost related to the agency in decision-making process. Or else, it would send an inverse signal to the principal that will decrease the company's value", (Morris, 1987, pp.47-56). Furthermore, the agency contradictory upsurges the bonding costs and monitoring that can decrease by revealing non-financial and financial information (Morris, 1987, pp.47-56). Similarly, the conflicts in the agency can be decreased by external and internal shareholders that provoke them to look after the company's management simultaneously (De Villers, Naiker, Van Staden, 2011). Thus, effective governance encourages environmental practices and disclosure activities by enhancing the agents and principal organization's strategic leadership.

The voluntary disclosure of social and ecological matters is grounded on two protuberant theories as Stakeholder and Legitimacy theory (Saini & Singhania, 2018, pp.1845-1873).'Legitimacy Theory' inspects social and ecological disclosure in the system where the company operates (Parker, 2005; De Villiers & Van Staden, 2010, pp.227-240). The legitimacy theory is regulated and influenced by environmental goals on one hand to find any loopholes for avoiding penalized actions and on the other hand to get an award from the community. "In other words, companies' disclosure is the consequence of environmental values and better social and ecological disclosure model of this theory considers investors value of legitimacy theory must contemplate the investors value while considering any decision", (Tiling & Tilt, 2010, pp.55-81).

Hence, the investors' value of legitimacy theory leads towards 'Stakeholder Theory', where the investors of the firm try to gratify their attention by social and environmental scores. The disclosure of non-financial related firms with a better image in the eyes of the investors may also threaten the presence of the firms by retreating the financial and ecological investment from society (Mahadeo, Oogarah-Hausman & Soobaroyen, 2011). Investors have a direct impact on economic performance for the reason that firms with better ecological and social disclosure have an advantage over their complements for notifying customers and stakeholders related to their proactive

tactics towards environmental disclosure which in turn, decreases the companies' risk for longstanding disadvantageous doings and visibility of the investors (Jaggi & Freedman, 1992, pp. 697-713).

In distinction with stakeholder and legitimacy theory, the resource-dependency view theory also supports the importance of ecological disclosure. According to this theory, companies with financial and ecological performance have resources and incentives to communicate with investors with due respect to what they are (Saini & Singhania, 2018, pp.1845-1873).

2.2. Relevant literatures

There is a necessity for the firms to balance financial growth and ecological practices in order to gain overall community development. Therefore, it turns out to be crucial for them to set the factors that deal with corporate governance and company specific characteristics that will affect the propensity of the company towards improving environmental practices and disclosure activities. In determining the linkage between the variables, relevant studies have been conducted by prior researchers which are discussed below.

Corporate Governance and Environmental Disclosure

"The corporate governance (CG) problems can trace to the parting of the organization from the broadly disseminated the necessity for monitoring mechanism and ownership of current organizations that bring into line the interest of owners and managers", (Bearle & Mean, 1932). Subsequently, corporate governance has been described as the procedure and mechanisms intended to align the interest of managers and owners of organizations (Jensen and Meckling, 1976, pp, 305-360). Therefore, CG comprises of several mechanisms and ways by which the board of directors guide the activities and processes of the firm from within and also control externally the way in which firms can create an impact on outsiders. Various prior literature (Ezhilarasi & Kabra, 2017; Gerged, 2021) found a positive impact of board size on disclosure activities because larger boards may lead to better companies' engagement with voluntary disclosure practices. From an agency theory perspective, boards that are larger in size are found to include more directors with an accounting background, which would create a positive impact on disclosure practices (Akbas, 2016). Opposing this, Mgbame & Onoyase (2015), reports that a board that is bigger in size can interrupt decision-making procedure which ultimately influences the willingness of disclosing ecological report at the end of the financial period. However, bigger boards due to communication, decision making, and coordination hinder the performance of the environment (Lipton & Lorsch, 1992, pp.59-77). The regularity of board meetings point towards having a better active board that can monitor the actions of the organization related to the environment (Bunianin, Alrazi & Abd Rahman, 2011)
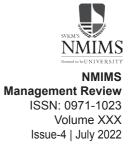
along with, allowing directors to reveal better information and enhance their decision-making (Odoemelam & Okafor, 2018, pp.25-49). But on the other hand, Kakabadse (2007) reports that conducting regular board meetings will create a major impact on social and environmental practices. In the case of board, independence researchers got mixed results like Jizi (2017) reveals that due to less reliance on the CEO and having variety in the background can motivate independent directors on board to be more disposing towards ecological practices and disclosure activities. Similarly, according to agency theory, a large number of independent directors on the board can act as a vital monitoring mechanism that impacts the decision-making process of the organization regarding the revealing of ecological information (Agyemang, Yusheng, Ayamba, Twum, Chengpeng & Saibu, 2020; Olanrewaju, Yunusa & Mahmoud, 2021). But, researchers like Yahaya, Bamigbad & Ajiboye (2022), found a negative and significant effect of independent director on environmental information because more independent directors on the board can dishearten the organization from disclosing environmental activities in order to evade reputation risk. Moreover, due to the lack of firm-specific information independent directors in the organization have more impact on the tactical direction of the company rather than environmental sustainability (Nadeem, Gyapong & Ahmed, 2020). However, some researcher like Garcia-Sanchez& Martinez (2018), reports that initially, independent directors show a negative influence on the environmental performance but later on it reinforce the positive direction towards the environment and disclosure practices because a larger number of directors can evade initial reputation risk that is connected with misleading information in the long run and thus, creating non-linear effect between the two. Therefore, in this framework, the study hypothesis the following:

H_0: There is no linkage between the factors related to corporate governance practices (board size, board meetings, independent directors) and the environmental disclosure of the companies.

Company Specific Characteristics and Environmental Disclosure

In addition to the company's governance factors, the vital elements for the occurrence of ecological activities that are worth exploring are the company specific characteristics. There are diverse elements of companies' attributes like structural characteristics, performance characteristics, monitoring characteristics (Olowokure, Tanko, &Nyor, 2016), and demographic characteristics (Al-Dmour, Abbod, & Al- Qadi, 2018). Structural characteristics are companies' unique factors like a large firm fascinates extra community attention in order to reveal better environmental information and maintain legitimacy over smaller companies (Ayu, 2017, pp.2362-2391).Similarly, bigger firms tend to reveal better information in their financial reports than smaller ones because of their competitive cost benefits (Akhtaruddin, 2005, pp.399-422). Contradictory to this, a prior researcher like Ezhilarasi & Kabra (2017) found that,

"bigger concern spend less amount in protecting the environment and social activities". Besides this, the matured firms with better experience are likely to incorporate extra information in their financial report so that they can improve their reputation and image in the market (Owusu-Ansah, 1998, pp.605-631). However, researchers like Sahehi & Rezanzezhad (2019) also justified the same outcome by indicating that matured firms are found to receive extra advantages from the community throughout the financial years, which ultimately develop a bigger sense of environmental responsibility. But on the other hand, long-lived firms are found incapable to adapt themselves to the changes in the study and therefore disclosing less voluntary information (Younis & Sundarakani, 2020, pp.319-346). Also, firms with better profitability are found to reveal better ecological information than low profitability firms (Hossain, 1998). Similarly, according to agency theory, better profitability companies are found to reveal complete voluntary information, in order to justify their position in the society (Singhvi & Desai, 1971, pp. 129-138). Opposing to this, Rini & Adhariani (2021) in their study found that highly profitable companies are not found to motivate industries towards increasing environmental performance and disclosure activities. Correspondingly, firms with better leverage have the propensity to reveal complete environmental information in order to build a good image in front of their investors and shareholders (Ezekwwsili & Ezejiofor, 2022). However, Muttakin, Khan & Mihret (2016) finds a negative effect of leverage on ecological practices because companies with high debt-equity ratios are found to be engrossed more with creditors rather than spending on ecological doings.

Literatures on environmental practices have gained worldwide attention, but still, certain drawbacks remain in the studies. Several studies considered governance factors, but the consideration of corporate governance mechanism along with company specific characteristics has taken less into deliberation in developing nations like 'India'. Most researchers (Hasnan, Mohd Razali & Mohamed Hussain, 2020; Ezekwesili&Ezejiofor, 2022) took a small sample size and time period to determine the impact of governance as well as companies' specific factors on ecological activities. The final problem is that many literatures (Nuber & Velte, 2021; Githaiga & Kosegei, 2022) have attempted to dynamic panel data of ecological activities, but very less literature (Alhazaimah, Palaniappan & Almsafir, 2014) have considered the two-step Arellano Bond result of GMM method of dynamic panel data in their study. Therefore, taking these loopholes together, the study frames the given hypothesis.

H_0: Company specific characteristics (size, profitability, age, leverage) have no influence on the environmental disclosure practices of the corporation.

3. DATA AND METHODOLOGY

3.1. Sample Design

To evaluate the effect of corporate management and company specific characteristics on environmental practices, the study considered NSE-200 listed companies as the target population. Regarding the final sample selection, it comprises all non-financial 100 corporations for the fiscal years 2010 to 2021, because it is the most current period, and covering eleven years makes the approach more statistically robust and reliable. Balance 100 companies which comprise service and financial sector firms were excluded from the final sample because they are found to maintain varied regulations and procedures while preparing their financial statement in their annual reports.

The secondary data has been gathered from financial databases like Prowess which is powered and marketed by 'The Centre for Monitoring Indian Economy' (CIME) Analytics and 'Capitaline Plus' which is powered and marketed by 'Capital Market Publishers Pvt. Ltd', Mumbai. Besides this, some sustainability reports, websites, and different annexure reports have been included for collecting the final dataset.

3.2. Selection and description of variables

Regressand Variable

The 'Environmental Disclosure Score' [EDS] embodies the dependent variable in the study. To evaluate the amount of environmental disclosure in financial reports, a composite score which varies between the minimum amount of 0.1 and the maximum amount of 100, has been developed as an indicator to signify ecological practices and activities which are performed by the various corporations (Kilincarslan, Elmagrhi & Li, 2020; Van Hoang, Przychodzen, Przychodzen & Segbotangni, 2021; Riberio, Santos, Fregonesi & Cunha, 2022). According to the Bloomberg database, this score is the outcome of certain data points that are collected from Global Reporting Initiatives 4 (GRI) 34 guidelines, which are based on terms of importance, with data like material consumption, carbon emission, water withdrawal, hazardous waste, etc; carrying larger weightage than other disclosure.

Regressor Variables

Regressor variables would be able to calculate the value with which forecasts are made in the framework referred to, that are the quotas which are segregated into two broad dimensions that is factors of corporate governance and company specific characteristics. So, firstly the corporate governance factors include board size which is calculated as the entire number of directors that are present on the board (Ezhilarasi & Kabra, 2017; Hasnan, Razali & Hussain, 2020). The board meeting signifies a prime
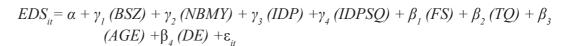
factor in calculating the board's assiduousness (Issa, 2021, pp.603-630). Therefore, this parameter has been calculated as the maximum number of board meetings that are conducted in a particular financial year (Hassanein & Kokel, 2022; Abuhijleh & Zaid,2022). The board independence is calculated as the proportion of directors who are independent in the meeting room to the entire number of directors (Akbas, 2016; Zaid, Adib, Sahyouni & Abuhijleh, 2020b; Olanrewaju, Yunusa & Mahmoud, 2021). On the other hand, the company specific characteristics like firm size are calculated as the log value of total assets (Hassan, Elem, Fletcher & Sobhan, 2020; Githaiga & Kosgai, 2022). The market-based measure of financial performance that is Tobin's q, reflects the markets' potential of forthcoming earnings and is calculated as Book value of assets plus the market value of common equity subtracts book value of common equity whole divided by total assets (Yang & Basaandroj, 2017; Ting, 2021). The age of the company is measured as the number of years from its establishment (Amosh, Khatib& Hussainey, 2021). The leverage of the firm which is proxied by the debt-equity ratio is measured as total debt divided by the total equity of the firm (Nadeem, 2021; Alkayed & Omar, 2022).

3.3. Methodology

The estimation of this study is grounded on static as well as dynamic panel data regression approach. It is the benefit of panel data that it deliberates variations in the corporation of time in time-series and cross-section dimensions. "It decreases the probabilities of temporal errors in the dataset while specifying the outcomes", (Bell, Bryman & Harley, 2018). First, in the case of the static panel data analysis technique, the best-fitted model is been chosen by applying three different approaches like Pooled Ordinary Least Square method (POLS) which yields biased and predictable outcomes if time-invariant covariates are deleted from the model, for the reason that unnoticed error term is highly connected with error term; then Fixed Effect Model (FEM) which yields with unbiased and consistent variables; however, if deleted parameters are not covariate with regress and parameter, then Random Effect Model (REM) will provide unbiased and reliable estimates.

Thus, to identify the appropriate or best-suitable model, F-test has been used to make a comparison between Pooled OLS method and FEM; the Breusch-Pagan Lagrange multiplier (BP-LM) test advised by Breusch & Pagan's (1980) denotes a comparison between Pooled (OLS) method and REM; and finally, Hausman test proposed by Hausman (1978) is conducted to make a comparison between FEM and REM. Accordingly, the main empirical model for the study is been identified below:

$$EDS_{it} = \alpha + \gamma_1\,(BSZ) + \gamma_2\,(NBMY) + \gamma_3\,(IDP) + \gamma_4\,(IDPSQ) + \beta_1\,(FS) + \beta_2\,(TQ) + \beta_3\,(AGE) + \beta_4\,(DE) + \varepsilon_{it}$$

Where, EDS_{it} denotes to environmental disclosure score of i_{th} corporations at time

period t, α symbolizes the constant term,γ_1 to γ_4 signifies the coefficients of corporate governance factors including squared terms respectively, β_1 to β_4 represents several companies' specific characteristics, and ε_{it} points to the error term.

In addition to the static panel data technique, the study also tests for dynamic impact in the model by simply incorporating a lagged regress and parameter. It is well recognised that the incorporation of lagged regress and parameter will normally indicate that the standard estimator is inconsistent. Consistent estimators are found to use the 'Generalized Method of Moments' (GMM) approach by Arellano & Bond (1991), who encompasses the transformation of the equation into first differences and after that considering the lagged values of the endogenous parameters as instruments, the number of instruments is unalike in the individual time period. The study used in this technique is to obtain estimates for the dynamic panel data, using Stata, version 15.0. The 'Generalized Method of Moments' (GMM) estimates will be inconsistent in the nonappearance of serial correlation. Evidence of this issue would be demonstrated in the model by the model by the absence of second-order auto-correlation in the first differenced model. Therefore, the study reports a diagnostic test for the first and second-order auto-correlation along with the sargan test of instrumental validity.

4. DATA ANALYSIS AND RESULTS

4.1. Summary Statistics

Table 2 represents summary statistics for all the research parameters in India, which include maximum, minimum, mean, and standard deviation. Where mean is the most frequently used measure of central tendency. The standard deviation displays the variation or dispersion from the mean and it calculates the risk. Thus, SD is the measurement that precisely is the amount by which value within a dataset diverges from the mean. The environmental disclosure score (EDS) on an average is found to be 22.33 which indicates that around 22 percent of the observation are disclosing their environmental-related information in their annual reports. The mean value of board size is nearly 11 members. The minimum number of members on the board is found to be 6, while the maximum number is found to be 16, signifying that all firms in the sample of the study have at least 6 board members. Furthermore, the frequency of the board meetings, on an average is found to be 6 indicating that on an average the directors of the board conduct meetings every two months during the financial year. The percentage of independent directors is found to be 50.66, signifying that approximately 51 percent of independent directors exist in Indian firms. The minimum percentage of board independence is 27.27, whereas the maximum percentage of independent directors is 72.73 indicating a significant difference in the composition of the board of non-financial Indian firms.

The mean value of firm size is found to be 12.57 with a standard deviation (SD) of 1.95, and minimum and maximum values to be 8.68 to 16.68. This infers that the size of the company in terms of natural log value is around 12.6. Subsequently, the mean value of Tobin's q is 2.64 which indicates, that the sampled companies are more profitable than the growth firms because Tobin's q value has doubled its book value. On an average the age of the sampled companies in the study includes companies with more than 45 years of involvement in the industry. Concerning the leverage, the mean value of the company is found to be 7.54 with SD 10.67. The minimum and maximum value lies between 0 to 47.18. This indicates a significant deviation of data from the average because SD is greater.
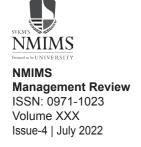
4.2. Test of Multicollinearity

In statistics, a 'Multicollinearity' is a condition in which two or more regressor parameters in a multiple regression model are highly connected, which means that one can be linearly forecasted from others with a 'non-trivial degree of accuracy'. This test deals with the Variance Inflation Factor (VIF) along with tolerance level which is regarded as the reciprocal of VIF. In the Variance Inflation Factor (VIF) method, the higher the VIF value, the parameters are highly correlated to each other. So, according to the expert suggestions, the accepted minimum VIF value is less than 10 and the tolerance value is less than 0.25 (Tebachnick & Fidell, 1996; Grewal, Cote & Baumgartner, 2004). As shown in Table 3, all the values are less than 10, which indicates that the level of correlation between regressor parameters is very minor and does not upsurge the standard error significantly. Thus, the problem of multicollinearity is not a factor in the estimation of the model.

Table 3, again signifies the pair wise correlation matrix analysis among the parameters where it interprets that if the correlation between two parameters is bigger then the multi collinearity property will be higher. Normally, if the absolute value of the correlation is higher than 0.8 then the outcome can be termed as having the problem of multicollinearity. In this study, as shown in Table 3 interprets that all the values are less than (0.45), indicating a weak correlation among the parameters.

4.3. Empirical Evidence of Static Panel Data Analysis

After solving the problem of heteroskedasticity and multi collinearity in the previous part, the study finally moves to the static panel data regression approach to find the appropriate model for the study among the three models (OLSR, FEM, and REM). The Chow test and Hausman test result in Table 4 predicts that the fixed effect model is the best-suited model for the dataset which is collected for the study.

The result of the fixed effect model suggests that corporate governance parameters like board size (0.7113502) positively affecting environmental activities at the level
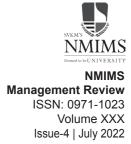
of 1 percent is significant and the number of board meetings (-0.9593561) is found to create a negative impact on ecological activities at the level of 1 percent significantly. Similarly, the proportion of independent directors (-0.9275724) is creating a negative influence on environmental doings at the level of 10 percent. But, with the squared term of independent directors (0.0125401) there exists a positive and significant effect with sustainability practices at the level of 5 percent.

But in the case of company specific characteristics, only the age of the firm is found to create a positive and significant effect on environmental activities at the level of 1 percent. More importantly, the adjusted R^2 is found to be 0.26. This percentage interprets that the model in the study is found to explain 26 per cent variance in the environmental disclosure practices of the company.

4.4. Empirical Evidence from Dynamic Panel Data Analysis: Arellano-Bond GMM Estimation

It is well recognised in empirical and theoretical studies that endogeneity is a critical issue in the business economic field. In this framework, certain tests have been already applied to choose the most suitable model. More precisely, the study begins with the starting point of estimation using a (POLS) model. After that, the study performed FEM and REM. The findings signify FEM to be an ideal estimator. Though fixed effect model can capture the potential error caused by unobserved heterogeneity and partially eliminates the endogeneity problem (Wooldridge, 2010). Therefore, the study re-examines the linkage between independent variables and dependent variable by using the dynamic panel data regression approach regarded as the Generalized Method of Moment (GMM) estimator to rheostat for the endogeneity problem. The Generalized Method of Moment (GMM) estimator was developed by Blundell & Bond (1998), and Arellano & Bond (1991) for dealing with heteroskedasticity and endogeneity issues and giving robust results. Therefore, Table 5 represents dynamic panel data using Arellano & Bond (1991) two-step GMM estimation, which encompasses the transformation of the equation into the first difference and after that considering lagged value of the endogenous parameters as an instrument. Therefore, the outcome of the specification test that is the Sargan test [52.84612 (p=0.5189)] is found not to be significant, which indicates that the model is free from over-identification restriction issues. But the AR (1) for testing of auto-correlation is to be significant and AR (2) is found not to be significant. This interprets that there is no autocorrelation, and the instruments used in the model are appropriate.

From the empirical result of GMM two-step estimation, the study finds that corporate factors like board size (0.4258874), and the number of board meetings (0.4592059) are positively related to disclosure practices at the significance level of 1 percent. Whereas, the independent director (-0.3861256) is creating a negative impact on

ecological activities at the level of 1 percent significance. But, the squared term of independent directors (0.0043642) is found to create a positive and significant impact on environmental practices at the level of 1 percent.

In the case of company specific characteristics, there exists a positive effect of age (1.076722) and debt-equity (0.0898739) with environmental doings which is statistically significant at the level of 1 percent. But the firm size is found to create a negative linkage with ecological activities which is significant statistically at the level of 1 percent.

5. RESULTS AND DISCUSSION

It is worth mentioning that the outcomes from the static panel data concerning board size is positively and significantly connected with environmental actions. However, there exists a negative influence of board meetings on sustainability activities. But in case of independent directors, there remains a negative association with environmental practices initially, but with the squared term of independent directors, there exists a significant and positive impact on environmental doings. Moreover, the age of the company is only significant and positively connected with ecological practices. In order to account for the heterogeneity and endogeneity, the study again goes to Arellano Bond suggested by GMM, which reveals a similar but better finding in the study. So, according to AR (1) of the Generalized Method of Moment two-step estimator, the study reveals that board size and board meetings are showing a positive and significant impact on disclosure practices. The findings are similar to (Jizi, Salama, Dixon & Stratling, 2014) who also interprets that bigger boards have lower workload, which motivates them to improve the environmental activities along with enhancing the communication power related to the disclosure with the investors. Similarly, frequent board meetings are found to activate the board towards disclosing environmental and social information (Buniamin, Alrazi & AbdRahman, 2011). However, in the case of board independence, a negative relationship of independent directors can be seen initially with environmental disclosure, but with the squared term of independent directors, the study finds a positive impact on environmental practices. This result is consistent with (Garcia-Sanchez & Martinez-Ferrero, 2018) who also reports that independent directors were showing a negative impact on ecological practices initially, but afterwards by controlling the reputation risk that is related to misleading the information, the negative impact of independent directors turned into positive one towards disclosure activities, and thereby, showing a non-linear effect.

Whereas, the company specific characteristics like age and debt-equity ratio is showing a positive impact on environmental doings. The reason behind this is that long-lived firms with better experience are found to reveal additional voluntary information in

their financial reports so that they can improve their image and position in society (Owusu-Ansah, 1998, pp. 605-631). Similarly, highly leveraged companies can bear the expenses which are related to environmental doings (Ezekwesili & Ezejiofor, 2022, p.69). But, in the case of firm size, the study reveals a negative influence on disclosure activities. This result is in line with (Ezhilarasi & Kabra, 2017) who also reports a similar negative impact between firm size and environmental practices because bigger concerns are found to spend very less time on the protection of social and environmental doings.

6. CONCLUSION AND RECOMMENDATIONS

This study emphasizes on the empirical evidence for the association between some corporate governance parameters like board size, board meetings, and independent directors along with, company specific characteristics, namely, firm size, age, profitability, and leverage on environmental disclosure practices in the context of India. The study has shown static and dynamic panel data estimation by using a dataset of 100 non-financial Indian firms that are listed on the National Stock Exchange between 2010 to 2021. The static panel data estimation suggests a positive impact of board size, squared terms of independent directors, and age towards disclosure activities; and a negative impact of board meetings and independent directors on ecological practices. Further, the dynamic panel data using two-step GMM estimations reveal a positive influence of board size and board meetings on environmental activities and both negative as well as a positive effect of independent directors on ecological doings. According to the agency theory perspective, larger boards upsurge the board in monitoring competencies, which as result discloses more ecological practices. The board meeting throughout the financial year allows the directors to disclose better voluntary information and enhance their decision-making process. The initial opposition of independent directors towards environmental activities can be seen, but later on, after reducing reputational risk related to misleading environmental information; the negative impact of board independence towards ecological activities turns into a positive one, and thus creating a non-linear effect between the two. Under company specific characteristics the study finds that age and debt-equity ratio is showing a positive and significant impact on disclosure practices and a negative impact of firm size on ecological doings. The older companies are found to strengthen their position by improving environmental and social activities. According to the perspective of agency theory, highly leveraged companies are found to incorporate environmental-related activities in order to reduce agency problems. However, big business is found to show less attention towards spending any amount related to voluntary disclosure.

In line with the conclusion, the study has certain policy implications for management and organization. The study first suggests that even though the independent directors

have passed the one-third requirement of the Companies Act, 2013, then also the organization should increase the number of directors to more than half which will guarantee the efficiency of environmental disclosure in the long run. Secondly, the study recommends the management to be more aware while increasing the company size for environmental protection and preservation.

Finally, the study can assist as a basis for forthcoming research related to governance and company specific characteristics on the sustainability of financial and service sectors, particularly in developed and developing nations. Additionally, in brief, this study inspires the researchers in upcoming future studies to hypothetically examine other significant governance parameters like compensation committee, audit committee, board duration, qualification, etc. Given that the current study only covers as far as 2021, and taking into account the disclosure score of environmental activities, it is suggested to consider other dimensions of ecological practices with a more updated dataset in upcoming research work.

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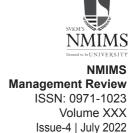
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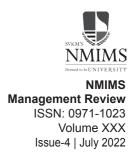
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Tables:

Table 1: Description of Variables used in the study

Key Variables	Name	Abbreviation	Definitions
	Regressor Variable		
Environmental Disclosure	Environmental Disclosure Score	**EDS**	A composite score taken from Bloomberg, which varies between the minimum amount of 0.1 and the maximum amount of 100, has been developed as an indicator to signify ecological practices and activities like (material consumption, carbon emission, water withdrawal, hazardous waste, etc).
	Regressand Variables		
Corporate Governance	Board Size	**BS**	The entire number of directors that are present on the board
	Number of Board Meetings	**NBMY**	The maximum number of board meetings which are conducted in a particular financial year
	Number of Independent Directors	**IDP**	The proportion of directors who are independent on the meeting room to the entire number of directors
Company Specific Characteristics	Firm Size	**FS**	The log value of total assets
	Tobin's Q	**TQ**	Book value of assets plus market value of common equity subtracts book value of common equity whole divided by Total assets
	Age of the Company	**AGE**	Number of years from its establishment
	Debt-Equity Ratio	**DE**	Total debt divided by total equity

Source: Prepared by Researchers

Table 2: Summary Statistics of regressand and regressor variables

Variable	Mean	Standard Deviation	Minimum Value	Maximum Value
EDS	22.23	16.56	0	57.96
BS	10.48	2.36	6	16
NMBY	5.88	1.81	2	11
IDP	50.66	8.48	27.27	72.73
FS	12.57	1.95	8.68	16.58
TQ	2.64	1.77	0.27	8.55
AGE	44.94	21.20	1	105
DE	7.54	10.57	0	47.18

Source: Calculated by Researchers

Table 3: Pair-Wise Correlation Matrix with Variance Inflation Factor

Regressor Variables	EDS	BS	NBMY	IDP	FS	TQ	AGE	DE	VIF
EDS	1.00								1.13
BS	0.1392***	1.00							0.97
NMBY	0.0848***	0.0836***	1.00						0.90
IDP	0.0114	-0.0013	-0.0123	1.00					0.98
FS	0.2468***	-0.0812***	-0.0762**	0.1125***	1.00				0.75
TQ	0.0562*	0.0483	-0.0809**	-0.4495***	-0.4444***	1.00			0.76
AGE	0.0969***	0.0262	0.1096***	0.1034***	0.0017	-0.0301	1.00		0.94
DE	0.0193	-0.0186	0.0493	0.0467	-0.1424***	-0.1184***	0.0404	1.00	0.95

Note: *** Significant at 1 per cent level,**Significant at 5 per cent level,*Significant at 10 per cent level
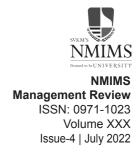
Source: Calculated by Researchers

Table 4: Panel Data Regression Results

	Regressand Variable (EDS)
BS	0.7113502***
NMBY	-0.9593561***
IDP	-0.9275724*
IDPSQ	0.0125401**
FS	0.1451278
TQ	-0.0197213
AGE	1.530467***
DE	0.0003914
Intercept	-37.01861***
R²	0.2570
Restricted F test	15.39***
BP-LM test	637.11***
Hausman Test	32.31***
Hettest	0.623
Imtest	80.52***

i.   Figures in brackets are t-values

ii.   Restricted F test is the test for selection between OLS and FEM

$$F = \frac{R^2_{UR} - R^2_R \; / \; d-1}{1- R^2_{UR} \; / \; n-(d+k)} \sim F_{[(d-1),\,(n-d-k)]1}$$

Here, R^2_{UR} stands for goodness-of-fit of the FEM, R^2_R for goodness-of-fit of the OLS, d for the number of groups, n represents the total number of observations, and k represents the number of explanatory variables.

iii.   LM test is the Breusch and Pagan's (1980) Lagrange Multiplier test which provides selection between OLS and REM

iv.   Hausman test is the Hausman (1978) specification test for selection between FEM and REM

v.   Hettest is the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity.

vi.   Imtest is the Information Matrix test for heteroskedasticity (White, 1980)

Notes: *** Denotes 1 percent level of significance, ** Denotes 5 percent level of significance,

*Denotes 10 percent level of significance
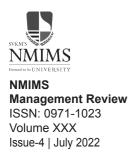
Source: Calculated by Researchers

Table 5: Results of Arellano Bond Dynamic Panel Data Model using Two-Step Estimation

Variables	Two-Step Estimates	
	Coefficient	z-Stat
EDS_{it-1}	0.4717498***	37.16
BS	0.4258874***	5.33
NMBY	0.4592059***	7.12
IDP	-0.3861256***	-3.99
IDPSQ	0.0043642***	4.85
FS	-0.3512367***	-3.52
TQ	-0.0240831	-0.17
AGE	1.076722***	17.41
DE	0.0898739***	6.08
Intercept	-31.63466***	-7.96
Wald–Chi²	9289.71***	
Sargan Test for over-identification	52.84612	0.5189
Arellano Bond Test for AR (1)	-2.443** (p=0.0146)	
Arellano Bond Test for AR (2)	0.33893 (p=0.7347)	

Note: i. *** Significant at 1 per cent level, ** Significant at 5 per cent level

ii. z-statistics in one step estimation are based on the robust-standard error to control for heteroskedasticity and autocorrelation

Source: Calculated by Researchers