

GOVERNANCE AND SUSTAINABILITY: THE ROLE OF ENVIRONMENTAL DISCLOSURES AND BOARD CHARACTERISTICS IN ENVIRONMENTAL, SOCIAL, AND GOVERNANCE REPORTING

Tamer Elsheikh ^{*}, Faozi A. Almaqtari ^{**}, Najib H. S. Farhan ^{***},
Nandita Mishra ^{****}, Abdou Ahmed Ettish ^{*}

^{*} Faculty of Commerce, Kafrelsheikh University, Kafrelsheikh, Egypt

^{**} *Corresponding author*, College of Business Administration, A'Sharqiyah University (ASU), Ibra, Oman
Contact details: College of Business Administration, A'Sharqiyah University (ASU), P. O. Box 42, 400 Ibra, Oman

^{***} Arab Open University, Riyadh, Saudi Arabia

^{****} Department of Management and Engineering, Linköping University, Linköping, Sweden



Abstract

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The purpose of the study is to investigate how environmental disclosure affects environmental, social, and governance (ESG) reporting, specifically in relation to emissions, innovation, use of resources, environmental controversy, and environmental products. It also looks at how specific firm attributes and board characteristics affect ESG reporting in three different industries. The analysis uses data for 8094 enterprises sampled from Asia and Europe between 2016 and 2021 that was gathered from secondary sources and taken from the Refinitiv Eikon database. According to the findings, proactive environmental investments, fines, and environmental expenses associated with ESG reporting are positively correlated. The findings also show that European businesses disclose environmental information at a higher degree than Asian businesses, which benefits their sustainability initiatives. Furthermore, sustainability indices have an adverse relationship with ESG reporting in Asia but a positive relationship with ESG reporting in Europe. Crucially, the findings show that various industries have varied relationships between sustainability reporting and environmental indicators. The study provides valuable insights for policymakers by highlighting the extent to which enterprises disclose their emissions, innovations, and resource use. Additionally, the study offers evidence on the role of corporate board members and how certain board characteristics as important mechanisms can improve the quality of ESG reporting making environmental disclosures useful and relevant.

Keywords: Environmental Disclosure, Environmental Pillar, ESG Score, Sustainability Reporting, Board Characteristics, Firm Specifics

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1. INTRODUCTION

Environmental, social, and governance disclosures (ESGD) have become more important to publicly listed companies in recent decades (Khatib et al., 2023). The surge in demand for increased transparency from public companies globally has driven the push for more comprehensive disclosures regarding their operations, potentially impacting the environment, society, and economy positively or negatively (Liu et al., 2023). Additionally, numerous experts and professionals have stressed the need to disclose non-financial information (NFI) to a larger variety of stakeholders, which include the general public, regulators, society, lawmakers as well as shareholders (Awad et al., 2023).

Therefore, there is a need for this increase in ESG reports that companies produce to motivate and attract socially responsible investors. Lastly, reporting according to ESG is indispensable for corporate reputation, management orientation, transparency, and risk management, which all lead to higher value (Cahan et al., 2015). These reports, more often than not, encapsulate environmental performance (ENVP), worker security, community matters, and safety, as well as diversity issues (de Villiers et al., 2014). Consequently, ESGDs clearly propose that the company does not focus on only profit but is people, profit, and the environment as well (Balogh et al., 2022).

Numerous researchers looked at the relationship between environmental disclosure (ENVD) and ESG criteria (Arif et al., 2020; Balogh et al., 2022; Zhang & Wong, 2022; Deswanto & Siregar, 2018; Fontana et al., 2015; Mohammad & Wasiuzzaman, 2021; Khatib, 2023). Similarly, numerous studies tried to investigate the association between three ESG pillars and firm-level performance (Cohen & Tubb, 2018; Friede et al., 2015). Most of the conducted studies suggested that firm specifics and board attributes are significant factors influencing the extent of environmental and ESG reporting (Balogh et al., 2022; Qiu et al., 2016; Deswanto & Siregar, 2018; Fontana et al., 2015; Hong & Guo, 2019; Khan, 2022; Longoni & Cagliano, 2018; Mohammad & Wasiuzzaman, 2021). Nevertheless, neither of these researchers compared European and Asian companies in terms of how firm-specific factors and board characteristics impacted ESG reporting.

Hence, this work adds significantly to the corpus of knowledge in several key aspects. Firstly, the authors seek to examine the influence of ENVD levels on the extent of ESG reporting, utilizing a large sample of Asian and European firms. Secondly, the research provides a comprehensive assessment of the environmental pillar components, considering both their individual impact and their contribution to overall ESG reporting. This study surpasses previous research by thoroughly investigating the effects of non-financial disclosures pertaining to the environmental pillar on overall ESG reporting, thereby assessing the role of ENVD in conjunction with other ESG components (Albitar et al., 2020; Gerged et al., 2021; Arif et al., 2020; Arif et al., 2022; Kolsi & Attayah, 2018; Balogh et al., 2022; Deswanto & Siregar, 2018; Fontana et al., 2015; Litt et al., 2014; Mohammad & Wasiuzzaman, 2021; Olsen et al., 2021). Thirdly, this study evaluates how board characteristics and firm-

specific factors influence levels of ESG reporting, with a focus on differentiating this impact between European and Asian corporations based on continent segregation (Gerged et al., 2021; Kolsi & Attayah, 2018). Fourthly, this research is based on voluntary disclosure theory (Qiu et al., 2016), signaling theory (Balogh et al., 2022; Wong & Zhang, 2022; Siddique et al., 2021), legitimacy theory (Siddique et al., 2021; Arif et al., 2022; Balogh et al., 2022; Kolsi & Attayah, 2018), stakeholder theory (Siddique et al., 2021; Wong & Zhang, 2022), and asymmetry information theory (Wong & Zhang, 2022). Finally, the study evaluates the results obtained from a sector-specific analysis, dividing the sample into three distinct categories for examination: services, trade, and production sectors. Both parameter and human judgment should be implemented to identify firms operating in sensitive sectors, so the level of ESGD provided in their reports across these sectors (Balogh et al., 2022; Gerged et al., 2021; Khlif et al., 2015) could be calculated.

A sample of 8,400 listed firms from Europe and Asia between 2016 and 2021 are analyzed for this study. Fixed effect models were employed in the analysis of panel data to ascertain the outcomes. The findings reveal that corporations in Europe tend to demonstrate higher levels of disclosures compared to their counterparts in Asia. Additionally, firms throughout both Europe and Asia face challenges in adequately disclosing information related to emissions and innovations. The study further accentuates the significant influence that board characteristics and company-specific factors have on the rates of disclosure and the attainment of sustainability objectives. Notably, disclosure levels vary significantly among different sectors, with the service, trading, and industrial sectors all vital yet with their patterns differing. Furthermore, ENVD within industrial and service sectors as well as ESG reporting both require improvement.

The structure of the study is as follows. Section 2 entails an examination of the existing literature, while Section 3 delves into the research methodology. Section 4 presents the findings and discussions, followed by Section 5 which outlines the additional analysis. Section 6 serves as a conclusion to the study.

2. LITERATURE REVIEW

Previous studies indicate that the rationale behind high-quality disclosure aligns with voluntary disclosure theory (Wang et al., 2021; Siddique et al., 2021; Fontana et al., 2015) where companies demonstrate their performance (Fontana et al., 2015; Wang et al., 2021; Mohammad & Wasiuzzaman, 2021; Wang et al., 2020). Zeng et al. (2011) proposed that companies with a focus on environmental sustainability and a solid reputation are inclined to offer greater ENVD. This aligns with signaling theory, which serves as a means for firms to communicate essential environmental concerns and their overall ESGP to stakeholders (Siddique et al., 2021; Balogh et al., 2022; Wong & Zhang, 2022). Similarly, adverse ESG media coverage may send investors conflicting messages regarding a company's standing, implying a failure to meet societal norms. This could lead to increased implicit

or explicit contractual expenses, such as operational disruptions financial penalties, or public reaction, which in turn lead to lower demand for the company's core products (Wong & Zhang, 2022).

The European Union (EU) and other nations including Denmark, China, Malaysia, and South Africa have passed NFI reporting laws that serve as mandatory standards for businesses' NFI disclosure (Arif et al., 2022). In Asia, Ioannou and Serafeim (2017) showed that more ESGD has been made after certain Asian nations, notably China and Malaysia, implemented mandatory NFI disclosure legislation. China has been developing a formal mechanism for listed companies to report on their social responsibility since 2006, although it has been rather hesitant to adopt the information disclosure system. Nearly 74.31 percent of China's 4418 publicly traded businesses have not released environmental, social, or sustainable development reports as of 2020 (Meng & Zhang, 2022).

In addition to the issuance of laws that mandate disclosure, researchers argue that establishing excellent governance procedures may assist firms in meeting stakeholder accountability and transparency requirements while also enabling them to gain a competitive edge (Ntim et al., 2017; Adams et al., 2016). Many researchers have conducted studies on the association between corporate governance mechanisms and ESGD (Birindelli et al., 2018; Disli et al., 2022; Giannarakis et al., 2014; Khatib et al., 2023; Kolsi & Attayah, 2018; Kumari et al., 2022). Kathy Rao et al. (2012) reported a positive association between board size and corporate social responsibility (CSR) disclosures in Australian companies. Gerged et al. (2021) conclude that board size has a moderating effect on corporate ENVD in Jordanian-listed companies. In the same vein, Kolsi and Attayah (2018) report that larger boards have a significant positive effect on the level of CSR disclosures. Suttipun (2021) also reveals a strong positive effect of board size on ESGD. Ellili (2022) reports that there is a positive relationship between ESGD and the composite governance score including board independence, size, gender, and diligence. In the same respect, Baalouch et al. (2019) examine the impact of several factors on the quality of environmental disclosure including independence of the board, and environmental factors (ENVP, degree of pollution of the company) in the context of French corporates. The quality of disclosure has been determined to be relatively substandard. Moreover, the results uncover that board independence, along with ENVP, plays a significant role in explaining the variances in the quality of environmental reporting (ENVR). In the same context, Verbeeten et al. (2016) posit that the structure of corporate boards may exert influence over the extent and caliber of ESGD. Concurrently, Rupley et al. (2012) contend that the degree of board independence is a determinant in a firm's propensity to disseminate comprehensive environmental data to a broad spectrum of interested parties.

Another aspect of the governance mechanism is appointing women to the board of directors. In this regard, many studies have been carried out (Al-Shaer & Zaman, 2016; Awad et al., 2023; Baalouch et al., 2019; Khalaf, 2022; Khan, 2022; Laurens, 2022; Setó-Pamies, 2013). Setó-Pamies (2013)

asserted that the presence of female directors correlates with more rigorous ENVD norms. Moreover, entities with a substantial proportion of female board members tend to demonstrate elevated socially responsible behaviors. Khan (2022), through a comprehensive review, deduces that a preponderance of research categorizes under the rubric of determinants influencing corporate ESG performance, highlighting that female directors are instrumental in advancing the social dimension within board deliberations. The consensus among scholars is that female board members amplify the focus on social imperatives within boardroom discussions and drive sustainable conduct. Al-Shaer and Zaman (2016) advocate that the inclusion of women on corporate boards is significantly correlated with enhanced quality in sustainability disclosures. Baalouch et al. (2019) find that gender diversity is critical in understanding variations in ENVD quality. Ben-Amar et al. (2017) reveal that female board members' involvement increases the adoption of sustainability activities connected to climate change reporting. Suttipun (2021) reports that ESGD is significantly affected by the presence of female members on the board.

Previous studies have attempted to examine the relationship between firm-specific characteristics and sustainability reporting (Geerts et al., 2021; Kolsi & Attayah, 2018). Yuan et al. (2022) found mixed evidence regarding the impact of revenue growth on ESGD. Similarly, Geerts et al. (2021) observed that companies with higher sales tend to have a significant environmental footprint due to their increased resource usage. Fontana et al. (2015) suggest a correlation between firm size and ENVP, positing that companies with higher levels of pollution may disclose more information to stakeholders. Likewise, Kolsi and Attayah (2018) argue that larger firms, equipped with greater financial and human resources, are better positioned to compile, assess, and disclose information, potentially to demonstrate compliance with social and environmental regulations. Qiu et al. (2016) also found that larger firms are more inclined to provide extensive environmental and social disclosures.

Firm size is a key determinant of ESGD (Balogh et al., 2022; Fontana et al., 2015; Khelif et al., 2015; Kolsi & Attayah, 2018; Wong & Zhang, 2022). Further, Deswanto and Siregar (2018) indicate that there is a positive association between market value and ESGD. Similarly, Balogh et al. (2022) and Huang et al. (2022) indicate that companies with high revenue are associated with greater ESG reporting. In the same vein, profitability is found to be a crucial factor that affects the level of ESGD (Balogh et al., 2022; Kolsi & Attayah, 2018).

Based on the above discussion, there is a clear need for studies that investigate the effect of ENVD levels on the extent of ESG reporting, particularly with a focus on a large sample of Asian and European corporates, which has been overlooked in prior research. Additionally, there is a call for comprehensive evaluations of the environmental pillar components, considering their individual impact as well as their contribution to overall ESG reporting. Furthermore, the literature presents a gap concerning the thorough investigation of non-financial disclosures pertaining to the environmental pillar and their influence on overall ESG reporting.

Additionally, there is a need for further exploration into how board characteristics and company-specific factors contribute to enhancing disclosure levels, especially within the contexts of Europe and Asia. Finally, there is a notable gap in research that conducts analyses on a sectoral basis, specifically by classifying the sample into three distinct sectors: the service sector, the trading sector, and the industrial sector.

3. RESEARCH METHODOLOGY

3.1. Data collection and sampling

The current study employs secondary data sourced from the Refinitiv Eikon database. This dataset encompasses a dataset collected from Asia and Europe covering the timeframe from 2016 to 2021. Initially, data extraction encompassed 29,206 corporate entities. Subsequently, rigorous screening and application of various criteria were employed to

refine the sample. Firstly, a systematic process was implemented for sample selection, involving the retrieval of all listed companies on the respective countries' stock markets. Secondly, companies lacking data for the entire study period were excluded. Thirdly, data consistency across variables was ensured by verifying the availability of data for each variable within the same company, leading to the removal of entities with missing values in certain factors. The process resulted in a final sample consisting of 8,094 companies, with 5,141 originating from Asia and 2,953 based in Europe. The ESG scores within this dataset range from 0.1 to 100, reflecting a spectrum of ESG disclosure levels. Furthermore, the scoring framework incorporates binary indicators, marked as "Yes" and "No", to signify the disclosure or non-disclosure of specific items. Table 1 below offers a comprehensive depiction of the dataset and the characteristics of the sample.

Table 1. The sample of the study

Panel A: Country representation in the sample					
Country	Initial sample			Final sample	
China		4725		1357	
Japan		3974		830	
Hong Kong		2376		573	
South Korea		2364		412	
Taiwan		1979		411	
India		4160		328	
Thailand		816		237	
Singapore		627		177	
Malaysia		944		176	
Turkey		433		130	
Indonesia		757		93	
Philippines		256		89	
Saudi Arabia		239		71	
Pakistan		450		58	
Qatar		49		46	
United Arab Emirates		134		43	
Kuwait		151		37	
Egypt		218		30	
Oman		110		29	
Bahrain		40		14	
United Kingdom		1441		906	
Germany		718		401	
France		744		348	
Italy		374		220	
Switzerland		235		210	
Poland		732		175	
Norway		362		119	
Spain		190		110	
Denmark		171		107	
Finland		175		97	
Netherlands		109		82	
Greece		151		69	
Romania		113		31	
Portugal		45		25	
Cyprus		61		23	
Croatia		78		22	
Bulgaria		146		8	
Total		29206		8094	
Panel B: Sectors of the final sample					
Area	Trading	Industrials	Service	Total	%
Europe	651	954	1348	2953	36%
Asia	1251	1689	2201	5141	64%
Total	1902	2643	3549	8094	100%
Percentage (%)	23%	33%	44%	100%	

3.2. Measurements of the variables

Table 2 delineates the metrics and conceptualizations of the variables employed in

the current research. The research schema of this study encompasses a singular dependent variable, namely ESG reporting.

Table 2. Operational definition of the variables of the study

Variable	Symbol	Formula
Dependent variables		
ESG reporting scope	ESGREP	The percentage of the company's activities covered in its environmental and social reporting
Independent variables		
<i>Environmental dimensions variables</i>		
Emission score	EM	"An index of 105 emission items related to environmental issues"
Innovation score	INN	"An index of 35 innovation items related to environmental issues"
Resource use score	RU	"An index of 41 resource use items related to environmental issues"
Environmental controversy score	ENVCON	"Is the company under the spotlight of the media because of a controversy linked to the environmental impact of its operations on natural resources or local communities?"
Environmental products score	ENVPR	"Does the company report on at least one product line or service that is designed to have positive effects on the environment or which is environmentally labeled and marketed?"
<i>Financial environmental variables</i>		
Environmental expenditures investment	ENVINV	"Does the company report on its environmental expenditures or does the company report to make proactive environmental investments to reduce future risks or increase future opportunities?"
Environmental expenditures	ENVEXP	"Total amount of environmental expenditures. All environmental investment and expenditures for environmental protection or to prevent, reduce, and control environmental aspects, impacts, and hazards. It also includes disposal, treatment, sanitation, and clean-up expenditure"
Self-reported environmental fines	FINE	"Environmental fines as reported by the company divided by net sales or revenue in million"
Emissions to revenues	EMREV	"The total flaring gases, NOx emissions, SOx emissions, total CO2 equivalent Emissions, total Waste and total Hazardous Waste to million revenues USD"
<i>Board characteristics variables</i>		
Board size	BSize	"The total number of board members at the end of the fiscal year"
Board independent	BIND	"Percentage of independent board members as reported by the company"
Board expertise	BEXP	"Percentage of board expertise members in accounting and finance areas"
Board diversity	BDIV	"Percentage of females on the board"
Board meeting	BMET	"The average overall attendance percentage of board meetings as reported by the company. Overall board members conduct regular meetings during the year, board meeting average is the attendance average provided details of members attended versus the total number of board meetings held"
Board tenure score	BTEN	"Average number of years each board member has been on the board"
Control variables		
Firm size	SIZE	Total assets of a firm
Market capitalization	MCAP	The market capitalization of a firm at the end of a year
Revenue growth	REVGR	The year-over-year change in revenue
Firms' profitability	REVGR	The net profit after tax of a firm

In this analysis, ESG reporting serves as the dependent variable and is analyzed through regression with three distinct categories of independent and control variables. The first set of independent variables addresses aspects related to environmental issues, comprising innovation score, resource use score, emissions score, environmental controversy score, and environmental product score. The subsequent set includes independent variables linked to financial environmental aspects, such as environmental expenditures, investments in environmental initiatives, self-reported environmental fines, and the ratio of emissions to total revenue. The third set focuses on corporate governance metrics, delineating board characteristics like board diversity, tenure, size, meeting frequency, expertise, and independence. The control variables utilized in this investigation are delineated by firm size, as measured by total assets and market capitalization, in addition to revenue growth and profitability of the firms.

3.3. Econometric tools and model specification

Building upon previous that utilized panel structures or cross-country and time-series datasets (Abdou et al., 2024; Sahi et al., 2021), the current investigation implements panel data analysis incorporating both fixed and random effect models. The analysis commenced with pooled and panel data evaluations, succeeded by the determination of the most fitting analytical framework through the application of redundant fixed effects model tests. These preliminary assessments revealed that panel data when analyzed through both fixed and random effect models, offer a more precise framework for the estimation of this study's outcomes. The subsequent choice of fixed and random effect models for panel data analysis was validated by the Hausman Test, which identified the fixed effect model as the optimal approach for this dataset, indicated by a p-value less than 0.05. To elucidate the impacts of environmental disclosure, governance mechanisms, and firm-specific factors, the research is structured around the development of the following model.

$$ESGREP_{it} = \alpha + \beta_1 \sum_{j=1}^5 C_{it} + \beta_2 \sum_{j=1}^4 X_{it} + \beta_3 \sum_{j=1}^6 Y_{it} + \beta_4 \sum_{j=1}^4 Control_{it} + \varepsilon_{it} \tag{1}$$

In the model, C_{it} denotes the environmental dimensions, X_{it} represents the financial environmental variables, and Y_{it} signifies the corporate governance variables. The indices i and t correspond to

the individual effect and the temporal effect, respectively, while ε_{it} captures the stochastic error term in the analysis, where:

$$\sum_{j=1}^5 C_{it} = \alpha + \beta_1 INN_{it} + \beta_2 RU_{it} + \beta_3 EM_{it} + \beta_4 ENVCON_{it} + \beta_5 ENVPR_{it} + \varepsilon_{it} \tag{2}$$

$$\sum_{j=1}^4 X_{it} = \alpha + \beta_1 INVEXP_{it} + \beta_2 INVEXPINV_{it} + \beta_3 ENVFIN_{it} + \beta_4 EMMREV_{it} + \varepsilon_{it} \tag{3}$$

$$\sum_{j=1}^6 Y_{it} = \alpha + \beta_1 BSIZE_{it} + \beta_2 BIND_{it} + \beta_3 BEXP_{it} + \beta_4 BDIV_{it} + \beta_5 BMEET_{it} + \beta_6 BTEN_{it} + \varepsilon_{it} \tag{4}$$

Accordingly, *SusDis* is functioned by $\sum_{j=1}^5 C_{it}$ as an indicator of environmental dimensions, $\sum_{j=1}^4 X_{it}$ as a metric of financial environmental variables, and

$\sum_{k=1}^6 Y_{it} + \varepsilon_{it}$ as some metrics of board characteristics. Drawing from the aforementioned equations, the principal model is thus constructed:

$$ESGREP_{it} = \alpha + \beta_1 INN_{it} + \beta_2 RU_{it} + \beta_3 EM_{it} + \beta_4 ENVCON_{it} + \beta_5 ENVPR_{it} + \beta_6 INVEXP_{it} + \beta_7 INVEXPINV_{it} + \beta_8 ENVFIN_{it} + \beta_9 EMMREV_{it} + \beta_{10} BSIZE_{it} + \beta_{11} BIND_{it} + \beta_{12} BEXP_{it} + \beta_{13} BDIV_{it} + \beta_{14} BMEET_{it} + \beta_{15} BTEN_{it} + \beta_{16} FSIZE_{it} + \beta_{17} MCAP_{it} + \beta_{18} REVGR_{it} + \beta_{19} PROF_{it} + \varepsilon_{it} \tag{5}$$

4. ANALYSIS AND DISCUSSION

4.1. Descriptive statistics

The analytical outcomes presented in Table 3 furnish descriptive statistics for the variables engaged in the study. Predominantly, the variable *ESGREP* displays an average value of 26, elucidating that on average, corporations disclose approximately 26% of ESG requirements. Furthermore, the variables *RU* and *ENVPR* manifest the lowest mean values among the environmental variables, recording figures of 13 and 14, respectively. This denotes a relatively lower level of disclosure in these specific

areas. *INN* and *EM* exhibit mean values of 21 and 18, correspondingly. This reflects that firms, on average, report around 21% and 18% of the issues related to innovations and emissions, respectively. *ENVCON*, with an average score of 20, demonstrates that about 20% of the firms face environmental controversies and garner social media coverage regarding environmental issues. In parallel, *INVEXP* maintains an average value of 0.10 billion dollars, suggesting the financial commitment companies are making toward environmental sustainability efforts. This comprehensive statistical overview encapsulates the varying degrees of ESG reporting and environmental engagement among the studied companies.

Table 3. Descriptive statistics

Variables	Mean	Maximum	Minimum	Std. dev.
<i>INN</i>	21	67	0	15
<i>RU</i>	13	84	0	19
<i>EM</i>	18	56	0	19
<i>ENVCON</i>	20	56	0	26
<i>ENVPRO</i>	14	99	0	30
<i>INVINV</i>	9	98	0	26
<i>INVEXP</i>	0.10	80.20	0	1.45
<i>FINE</i>	2	16.919	0	130
<i>EMMREV</i>	0.14	1.60	0	1.97
<i>BSIZE</i>	4	41	0	5
<i>BIND</i>	18	100	0	29
<i>BDIV</i>	19	100	0	30
<i>BMEET</i>	26	100	0	43
<i>BTEN</i>	17	4	0	9
<i>FSIZE</i>	0.269	111	21.500	1.550
<i>MCAP</i>	0.3700	431	9.090	14.100
<i>REVGR</i>	18.900	5620	1.156	140
<i>PROF</i>	61.300	31800	-188	582
Dummy	0	1	0	0

Note: Values for *INVEXP*, *EMMREV*, *FSIZE*, *MCAP*, *REVGR*, and *PROF* are in billions.

However, *ENVINV* stands at 9, suggesting that certain companies have made proactive environmental investments to mitigate future risks and seize potential opportunities. Similarly, the average value of, *FINE* is two, indicating that some companies face penalties from authorities for breaching environmental regulations and instructions. Regarding the characteristics of corporate boards, the findings reveal that the *BDIV* variable holds an average value of 19, signifying that, in certain companies, 19% of board members are female. This statistic underscores the representation of women on corporate boards within the studied sample.

BTEN has an average value of 17, which illustrates that the tenure of most of the members of the board is around 17 years. Furthermore, the *BSIZE* average shows that most of the selected companies have four members on their boards. If further checked for the independent directors (*BIND*) then the result shows that on average 18% of the board structure represents independent board members. This implies that numerous companies maintain a minimal proportion of independent board members. Lastly, *SIZE*, *MCAP*, *REVGR*, and *PROF* show values of 0.269, 0.37, 18.90, and 61.30, respectively.

4.2. Correlation analysis

The findings depicted (see Table A.1, Appendix) offer a correlation analysis for the study's selected variables, indicating that the majority of both control and independent variables are positively and significantly correlated with the dependent variable, *ESGREP*. The independent variables exhibit positive and significant association (p-values < 0.01) with all the dependent variables, except for *INN*, which demonstrates an insignificant association. The highest recorded correlation value is 0.71, observed between *BDIV* and *BIND*, with all other association coefficients being lower. This indicates that multicollinearity does not pose a concern for this study.

4.3. Results and discussion

Table 4 offers an inference of the effect of corporate ENV D practices on ESG reporting. The results show

that both *EM* and *INN* have a statistically insignificant negative influence on *ESGREP*. This is indicated by a negative coefficient ($-\beta$) as well as an insignificant p-value (> 0.10). Furthermore, the results imply that *RU* has a positive ($+\beta$) and significant (p-value < 0.01) influence on *ESGREP*. This is in line with Luo et al. (2022) and Xia and Wang (2021) who revealed that ENV D improves firms' innovation. Further, these disclosures vary across the trading, service, and industrial sectors where the trading sector shows better disclosures than service and industrial sectors. The results are constant (El Ghouli et al., 2018) indicating that the environmental costs of a company are determined by emissions that include, for example, greenhouse gases, pollution, and natural resource consumption. A decrease in these costs demonstrates how effectively the company manages its resources in terms of *EP*.

Table 4. Impact of corporate environmental disclosure practices, board characteristics, and firms' specifics on ESG reporting

Variable	ESGREP-5 (1)	ESGREP-5 (2)	ESGREP-5 (3)	ESGREP-5 (4)	ESGREP-5 (5)	ESGREP-5 (6)
β	-4.611*** (-27.222)	-5.119*** (-16.568)	-4.958*** (-28.392)	-5.440*** (-17.491)	-4.416*** (-20.549)	-5.511*** (-16.829)
<i>EM</i>	0.017 (2.502)	-0.012* (-2.493)	-0.010*** (-6.181)	-0.121** (-8.210)	-0.064*** (-0.332)	-0.062*** (-0.322)
<i>INN</i>	-0.011 (-0.052)	-0.008 (-0.044)	-0.281 (-13.755)	-0.238 (-12.398)	-0.059 (-1.621)	-0.057 (-1.591)
<i>RU</i>	0.501*** (31.110)	0.502*** (31.125)	0.482*** (29.904)	0.482*** (29.918)	1.015*** (66.480)	0.483*** (29.937)
<i>ENVCON</i>	0.505*** (63.878)	0.505*** (63.869)	0.235*** (12.235)	0.235*** (12.243)	0.281*** (13.755)	0.238*** (12.398)
<i>ENVPRO</i>	-0.068*** (-9.515)	-0.068*** (-9.532)	-0.073*** (-10.145)	-0.073*** (-10.161)	-0.139*** (-19.983)	-0.073*** (-10.226)
<i>INVINV</i>	0.012 (1.582)	0.012 (1.571)	-0.006 (-0.916)	-0.006 (-0.922)	-0.081 (-11.156)	-0.007 (-1.016)
<i>INVEXP</i>	0.050*** (6.779)	0.050*** (6.787)	0.004** (0.549)	0.001** (0.110)	0.118*** (15.728)	0.071*** (10.343)
<i>FINE</i>	0.442*** (6.268)	0.442*** (6.262)	0.081*** (11.156)	0.007** (1.016)	0.059*** (6.657)	0.020** (2.448)
<i>EMMREV</i>	0.034*** (7.838)	0.034*** (7.835)	0.004* (0.549)	0.001*** (0.110)	0.095*** (10.929)	0.028*** (3.470)
<i>BSIZE</i>			0.442*** (6.268)	0.442*** (6.262)	0.622*** (8.306)	0.442*** (6.268)
<i>BIND</i>			0.001*** (0.176)	0.001*** (0.182)	0.196*** (28.193)	0.021*** (3.109)
<i>BEXP</i>			0.148*** (7.970)	0.148*** (7.959)	0.132*** (0.469)	0.128*** (0.455)
<i>BDIV</i>			0.021*** (6.772)	0.036*** (16.456)	0.031*** (3.822)	0.012** (1.554)
<i>BMET</i>			0.034*** (7.838)	0.034*** (7.835)	0.063*** (13.686)	0.034*** (7.794)
<i>BTEN</i>			0.050*** (6.779)	0.050*** (6.787)	0.058*** (7.388)	0.050** (6.763)
<i>REV</i>		0.374** (1.966)		0.355*** (1.875)	-0.172*** (-23.945)	0.085** (11.771)
<i>SIZE</i>	0.899*** (74.278)	0.862*** (71.268)	0.879*** (72.373)	0.880*** (72.309)	0.324** (15.208)	-0.251*** (-12.833)
<i>MCAP</i>					-0.703** (-9.015)	-0.456** (-6.375)
<i>PROF</i>					-0.109*** (-14.372)	-0.101** (-12.130)
<i>CD</i>						-0.352** (-1.856)
<i>ENVP</i>						0.880*** (72.309)
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
N	48564	48564	48564	48564	48564	48564
r ²	0.536	0.536	0.540	0.540	0.480	0.540
r ² _a	0.443	0.443	0.447	0.447	0.376	0.448
F	4675.465	4251.075	2962.127	2788.264	1967.746	2259.754
p	0.000	0.000	0.000	0.000	0.000	0.000

Note: ***, **, and * indicate a significance level at 0.01, 0.05, and 0.10.

The results also show that *ENVCON* has a positive ($+\beta$) and significant ($p\text{-value} < 0.01$) influence on *ESGREP*. This clearly depicts that the media claims and arguments on how companies are contributing towards the environment contribute substantially and positively to the *ESGREP* of those companies. This is in line with Chouaibi and Chouaibi (2021), Luo et al. (2022), and Wong and Zhang (2022). Furthermore, the results offer that the disclosure of *ENVPR* has a statistically substantial negative effect on *ESGREP*. This could be due to the level of disclosures on *ENVPR* being less compared to the proportion of the firm's activities covered in its *ESGR*. Further, taking into consideration the company's Global activities with different scopes including revenues covered, operations, and social issues; the disclosures made by these companies on its environmental products still are not at the level of ESG reporting. This is in line with Braam et al. (2016). This finding is consistent with González-Benito and González-Benito's (2005) claims that a company should focus on developing and designing products that are more inclined toward the environment. Companies must commit to providing long-term replacement of polluting products and replace them with green alternatives like getting more green suppliers on board or trying to have more responsible consumption. The emergence of destructive coverage of ESG matters by media is expected to feed investors mixed signals about the reputation of companies (Wong & Zhang, 2022).

While *ENVINV* exhibits an insignificantly and positive association with *ESGREP*. The results signify that *ENVINV* significantly contributes to the level of *ESGREP*. This suggests that companies exhibit lower disclosure levels regarding their proactive environmental investments aimed at lowering upcoming risks or capitalizing on forthcoming opportunities. This discrepancy may be attributed to differences between Asian and European companies, as indicated by the dummy variable, which reflects superior disclosure and sustainability performance among European firms. This aligns with the findings of González-Benito and González-Benito (2005). They propose that in certain cases, the costs associated with establishing environmental standards may not be immediately offset by marketing and operational upgrades. This reflection indicates that the profitability influences the environmental policies may manifest later after initial expenditures have been recouped. Furthermore, the outcome shows that *FINE* and *ENVEXP* have positive and significant effects on *ESGREP*. This indicates that fines imposed by regulatory authorities for environmental infractions significantly influence *ESGREP*. Also, the level of *EMREV* has a positive and significant impact on the level of *ESGREP* of these firms. This suggests that companies with higher revenues report a greater level of emissions in comparison to other firms with lower revenues. This is in line with Wang et al. (2020). Particularly, the negative effect with regard to *ESGREP* shows a substantial difference between Asian and European firms on the grounds of *FINE*, and *EMREV* on *ESGREP*, showing that Asian firms are lagging behind the European companies on these issues. This is implied by the conclusions of the dummy which demonstrates affect significantly throughout the models. Lastly, the outcome shows

that the *ENVP* has a positive and significant impact on the level of *ESGREP*. This is in line with Chouaibi and Chouaibi (2021) and Wong et al. (2021).

Interpreting the influence of board characteristics, the findings show that *BEXP*, *BTEN*, *BSIZE*, and *BMET* affect significantly *ESGREP*. This reveals that a larger proportion of the board expertise, with long tenure and bigger board size, is related to higher levels of *ESGREP*. Some of the possible reasons for this may be because of the larger size of the board, firms have greater diversity and more independent directors which brings better brains in the board room. This in turn contributes positively to the levels of disclosures related to sustainability. This is in agreement with Ellili (2022), Gerged et al. (2021) and Meng and Zhang (2022).

Similarly, the board meetings have affected positively and significantly sustainability disclosures. A possible reason behind this can be that the larger number of meetings will bring better input and the sustainability issues discussed and then disclosed in the annual report. This is consistent with Ellili (2022). Importantly, the results show that *BDIV* has a significant and positive impact on *ESGREP*. This indicates that *BDIV* contributes positively to *ESGREP*. This is in agreement with the findings of Baalouch et al. (2019), Khan (2022) and Qureshi et al. (2020). Furthermore, the results indicate that the *ENVP* contributes positively and significantly to *ESGREP*. Lastly, the disparity between Asian and European companies demonstrates a significant and positive contrast, indicating that European firms demonstrate higher levels of disclosure, and board characteristics play a constructive role in enhancing ESG reporting compared to their Asian counterparts. The study illustrates a robust positive impact of board size and compensation on ESGD, although chief executive officer (CEO) compensation exerts a negative influence. Additionally, Verbeeten et al. (2016) suggest that the composition of the board can also affect ESGD. Furthermore, Rupley et al. (2012) highlight that the inclusion of independent directors on corporate boards aids organizations in realizing their strategic goals and offers insights that can impact a firm's propensity to furnish transparent environmental information accessible to a wide array of stakeholders.

Concerning, the impact of firms' specifics, the results show that revenue growth, firms' size, corporate market capitalization, and corporates' profitability are associated negatively and significantly with *ESGREP*. This observation suggests that corporations experiencing higher revenue growth, possessing larger sizes and market capitalizations, and demonstrating superior performance exhibit lower levels of *ESGREP*. This pattern highlights a potential discrepancy between financial success and the extent of engagement with ESGD practices. This is consistent with Nor et al. (2016) and Yuan et al. (2022), however, contradicts Balogh et al. (2022), Huang et al. (2022) and Kolsi and Attayah (2018). Further, the results indicate that both the environmental pillar and country dummy have the same results compared with earlier models. Our findings align with those of Nor et al. (2016), who identified a negative correlation between revenue growth and the extent of environmental information

disclosure. Nonetheless, these results diverge from the conclusions drawn by Magali et al. (2020), who posited that firms with elevated sales volumes have a pronounced environmental impact due to their increased resource utilization. In a similar vein, Huang et al. (2022) inferred that corporations with larger revenues are more apt to possess the necessary resources for the monitoring and reporting of ESG matters. This discrepancy underscores the complexity of the association between financial performance and ESGD practices, highlighting the need for further research in this area.

Fontana et al. (2015) justified that larger companies can afford to make significant investments. In fact, many corporations have sophisticated internal control systems that give integrated data analysis in their yearly financial reports. Further, large corporations with branches and plants can gain some advantages by disclosing more information

about their impact on some issues including the effect on *EP* in order to have a social and general appreciation of their operations.

5. ADDITIONAL ANALYSIS

The sector-specific analysis detailed in Table 5 reveals significant findings. Sustainability metrics predominantly show positive results in the trading sector but tend to manifest more negative impacts within the industrial sector, in comparison to the service sector. Additionally, board characteristics, including diversity, size, and independence, have a pronounced negative influence on ESG reporting and ENVD in both the service and industrial sectors. On the contrary, factors such as board expertise, tenure, and participation in board meetings have a positive correlation with ESG and ENVR metrics.

Table 5. Sectors-wise analysis

Variable	ESGREP	Service ESGREP	Trading ESGREP	Industrial ESGREP
β	-2.835*** (-7.173)	-5.046*** (-9.856)	-6.129*** (-8.055)	-6.177*** (-10.985)
EM	-0.069*** (-24.145)	-0.023*** (6.280)	0.028 (6.716)	-0.011* (3.269)
INN	-0.149 (-19.785)	-0.059 (16.513)	-0.041 (9.004)	-0.047 (13.925)
RU	0.432*** (27.117)	-0.592*** (22.931)	0.444*** (13.064)	-0.377*** (14.489)
ENVCON	0.281*** (14.754)	0.222*** (6.552)	0.300*** (7.325)	-0.235 (8.397)
ENVPRO	-0.084*** (-14.513)	-0.051*** (-4.799)	-0.095*** (-6.272)	-0.105*** (-8.252)
INVINV	-0.046*** (-8.744)	-0.018 (-1.505)	-0.028* (-1.883)	-0.026** (-2.482)
INVEXP	-0.016** (-2.112)	-0.001 (-0.170)	-0.026*** (-6.464)	-0.031*** (-9.133)
FINE	0.094** (28.732)	-0.228** (-1.468)	-0.017 (-1.561)	-0.001 (-1.531)
EMMREV	0.078*** (8.968)	-0.042*** (20.068)	-0.034*** (13.510)	0.022*** (11.920)
BSIZE	0.448*** (8.673)	0.364*** (3.255)	0.307** (1.987)	-0.588*** (-5.207)
BIND	0.058*** (8.923)	0.023** (1.992)	-0.005 (-0.298)	-0.028** (-2.266)
BEXP	0.186*** (9.788)	0.086*** (2.898)	0.160*** (3.708)	0.208*** (7.208)
BDIV	0.021*** (3.268)	0.007 (0.582)	0.014 (0.862)	-0.021* (-1.708)
BMET	0.161*** (38.296)	0.058* (8.444)	0.024** (2.541)	0.011 (1.623)
BTEN	0.013** (2.175)	0.047*** (3.963)	0.061*** (3.930)	0.048*** (3.926)
REV	-0.408** (-107.296)	-0.057*** (-6.221)	0.008 (0.656)	0.048*** (6.222)
SIZE	-0.770*** (-17.327)	-0.043*** (-12.063)	-0.036*** (-8.233)	-0.022*** (-6.480)
MCAP	-0.05** (-14.287)	0.023*** (6.280)	0.028*** (6.716)	0.011*** (3.269)
PROF	0.149* (19.735)	-0.006 (-1.550)	0.012*** (2.945)	-0.008*** (-2.774)
CD	1.944*** (8.642)	0.467 (1.578)	0.265 (0.665)	0.300 (0.963)
ENVP	0.609*** (54.638)	-0.828*** (-45.402)	0.832** (31.935)	-0.988*** (-46.677)
Trad. sec.	1.516*** (5.010)			
Ind. sec.	-1.022*** (-3.490)			
Industry dummy	Yes	Yes	Yes	Yes
N	48564	21294	11412	15858
r2	0.677	0.515	0.580	0.554
r2_a	0.677	0.417	0.495	0.464
F	4432.266	895.256	537.581	857.399
p	0.000	0.000	0.000	0.000

Note: *t*-statistics in parentheses and * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

This differentiation underscores the nuanced effects of board composition and sectoral influences on sustainability practices and reporting. Furthermore, it is noticeable of the fact that the small number of firms' characteristics is associated with a negatively significant association with ESG reporting across all three sectors, which indicates various levels of environmental and sustainability disclosures among the industries. The correlation observed between the present and the other studies (Deswanto & Siregar, 2018; Kolsi & Attayah, 2018; Wong & Zhang, 2022) is also consistent with our research.

Table 6 shows the results for three sectors — Asia and Europe. Data analysis brings about

the understanding that these sustainability indicators act as the drivers of the ENVR in Europe for the service sector. While in the case of Asian countries, the board factors are related to environmental and sustainability disclosures in a negative way, in the United States (US) the existence of corporate boards and the sustainability factors are linked to environmental and sustainability disclosures positively. Therefore, it is evident that the trend of sustainability indicators disclosure in Europe goes higher, while Europeans just slightly notice a positive impact of the ESG reporting in Asia. Furthermore, the firms' thesis also impounds positively on the extent of ESGREP in most cases for both Asia and Europe, respectively.

Table 6. Sectors and continent-wise analysis

Variable	Service sector		Trading sector		Industrial sector	
	Asia	Europe	Asia	Europe	Asia	Europe
β	1.462*** (0.175)	3.005*** (0.834)	1.836*** (1.304)	2.395*** (0.968)	-2.003*** (-0.555)	-1.476*** (-0.473)
EM	-3.823** (-0.641)	1.350* (0.074)	-2.423 (-0.433)	1.892*** (0.400)	-0.785** (-0.595)	-7.015*** (-5.623)
INN	-0.124** (-0.198)	-4.610 (-0.558)	1.463 (1.687)	1.282** (0.914)	-0.117*** (-0.222)	-0.009 (-0.023)
RU	-0.168** (-0.494)	0.680 (0.390)	-0.136 (-0.454)	0.154*** (0.270)	-0.037*** (-0.182)	-0.182* (-1.241)
ENVCON	0.335 (1.392)	0.841* (0.599)	0.190 (0.789)	-0.916 (-1.040)	-0.044* (-0.318)	0.059** (0.483)
ENVPRO	2.151* (1.522)	-3.188 (-0.413)	-0.199** (-2.963)	8.878** (0.896)	-0.127*** (-1.031)	-0.173** (-2.308)
INVINV	-0.415*** (-1.967)	-0.447* (-0.582)	-0.062** (-0.356)	-1.788 (-0.383)	0.061 (0.375)	0.699*** (0.980)
INVEXP	-5.847** (-0.819)	-5.006 (-0.276)	7.495*** (1.916)	-17.522* (-0.903)	2.050** (0.723)	-3.429** (-1.213)
FINE	0.074*** (0.123)	26.571** (0.744)	-1.648 (-1.243)	2.735* (0.879)	-0.002** (-0.131)	0.024** (1.363)
EMMREV	-1.074** (-1.265)	9.729* (1.584)	0.354 (0.436)	-4.594** (0.959)	-0.421*** (-0.570)	-0.569** (-0.800)
BSIZE	2.179* (0.945)	-2.990** (-0.298)	1.430*** (0.986)	0.934** (0.189)	-1.576*** (-1.568)	-2.188* (-2.290)
BIND	-0.139** (0.662)	0.636 (0.784)	-0.249* (-1.788)	0.166*** (0.220)	-0.103** (0.912)	-0.017 (0.181)
BEXP	-1.037** (-3.085)	17.504*** (1.250)	-9.816* (-2.418)	-6.344** (-1.030)	-0.087*** (-0.565)	-0.173 (-0.659)
BDIV	0.041 (0.257)	1.672*** (0.830)	0.047** (0.222)	0.925*** (1.475)	0.059 (0.558)	0.001 (0.019)
BMET	0.052 (0.818)	0.203* (0.342)	-0.137** (-1.820)	-0.043 (-0.311)	-0.040*** (-0.939)	-0.033 (-0.950)
BTEN	0.598** (2.396)	0.207** (0.124)	0.456* (1.703)	0.371** (0.617)	0.011** (0.094)	0.131*** (1.256)
REV	19.464** (0.928)	184.231* (0.799)	-16.227* (-0.488)	-33.986*** (-0.528)	-10.625*** (-1.160)	-2.996*** (-0.488)
SIZE	-51.624*** (-1.916)	58.228** (0.320)	59.217* (1.627)	84.589*** (1.502)	24.603 (1.170)	-1.142*** (-0.338)
MCAP	20.268** (0.459)	36.578 (0.294)	-179.908*** (-4.258)	-108.541 (-0.953)	-7.389** (-0.357)	11.894*** (1.378)
PROF	9.072** (1.413)	11.698** (0.352)	-9.032* (-1.665)	8.544 (0.635)	7.544* (1.913)	-0.573*** (-0.340)
ENVP	-0.055** (-0.108)	-0.945 (-0.485)	0.450* (1.674)	-3.400 (-1.741)	-1.202*** (-4.301)	-0.456*** (-2.804)
N	13,260	8,088	7,506	3,906	10,134	5,724
r ²	0.66	0.68	0.763	0.602	0.741	0.684
r ² _a	0.65	.65	0.722	0.588	0.702	0.654
F	342.368	376.033	241.249	129.682	305.908	243.471
p	0.000	0.000	0.000	0.000	0.000	0.000

Note: ***, **, and * indicate a significance level at 0.01, 0.05, and 0.10.

Table 6 shows the results of our research in the trading area. The findings suggest that sustainability indicators do not have a strong connection with ESG reporting in Asia and Europe, showing that the weakest is seen in the service sector. Nevertheless, board attributes, excluding the number of meetings, have a big and beneficial impact on the degree of ESG reporting even for the case of both regions. While the two industries

have opposite effects, the sustainability issues, board characteristics, and firm variables have the same significant negative correlation with the level of ESG reporting in Asia and Europe.

Our findings align with the results of Balogh et al. (2022), who also observed conflicting findings regarding the relationship between profitability and disclosures. Deswanto and Siregar (2018) conclude that ENVD does not act as a mediator between

financial and EP. However, the relationship the relationship between profitability and these disclosures remains uncertain (Qiu et al., 2016). Several studies have looked into the link between NFI disclosure and firm success; nevertheless, the results are mixed (Yuan et al., 2022). Siddique et al. (2021) indicate that, according to the legitimacy theory, profitability has both a positive and negative impact on ESGD, with profitable firms being more active in disclosures since they can absorb the expense of these disclosures and legitimize their presence. However, our results contradict with Balogh et al. (2022) and Kolsi and Attayah (2018) who opined that the success of a company impacts positively and significantly on its ESGD and performance.

6. CONCLUSION

This study aims to explore the impact of environmental disclosures, board characteristics, and firm-specific factors on ESG reporting. Drawing on secondary data obtained from the Refinitiv Eikon database, the research analyzes a sample of 8094 companies from Asia and Europe over the period from 2016 to 2021. Employing panel data analysis with fixed effect models, the results indicate a correlation between emissions and innovations. Prove that sustainability indicators are not significantly impacted by this phenomenon. However, disclosure of resources-related topics drives up the level of ESG reporting of companies in our sample in a meaningful and positive way. The findings reveal that environmental controversies highlighted by the media and disclosures regarding product lines or services positively contribute to ESG reporting. European firms exhibit higher levels of disclosure regarding environmental factors in comparison to Asian companies, which subsequently has a positive effect on sustainability metrics. Board diversity is identified as a factor that enhances ESG sustainability ratings, while characteristics like

tenure, independence, size, and meeting attendance are correlated with increased ESG reporting. Interestingly, environmental metrics have a more pronounced negative effect on industrial sectors compared to the service sector. Additionally, while certain board attributes exhibit negative effects on ESG reporting in the service and industrial sectors, others, such as expertise, tenure, and meetings, show positive associations. Similarly, most firms' specifics have a negative effect on ESG reporting across all sectors, indicating variations in environmental and sustainability reporting.

The aim of this study is to bridge the existing literature gap by examining the impact of environmental disclosures on the ESG reporting levels for both Asian and European firms. It assesses the role of a wide variety of board attributes and the peculiarities of specific firms with an extensive analysis of the environmental disclosure checklist.

The research sheds light on factors affecting disclosure levels and offers empirical insights for regulatory authorities to develop frameworks or guidelines for environmental disclosures and ESG reporting. By incorporating evidence from both European and Asian countries, this study provides a unique contribution based on a large sample and sector-wise analysis.

This research highlights various limitations that indicate potential directions for future investigation. Firstly, the omission of ownership and audit committee variables could be addressed in subsequent studies to explore their impact on sustainability issues. Secondly, while this study focuses on a sample from Asia and Europe, future research could expand its scope to include countries such as the US and Canada. Finally, although the study examines three main sectors, future investigations could further delve into sector and industry-specific differences to provide a more comprehensive understanding of ESG reporting across various sectors.

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APPENDIX

Table A.1. Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(1) INN	1																			
(2) RU	0.01**	1																		
(3) EM	0.00	0.00	1																	
(4) ENVCON	0.02***	0.61***	0.05	1																
(5) BDIV	0.06	0.51***	0.02	0.61***	1															
(6) BTEN	0.04	0.66***	0.08	0.57***	0.62***	1														
(7) BSIZE	0.05	0.62***	0.02	0.59***	0.66***	0.61***	1													
(8) BMET	0.02	0.68***	0.07	0.59***	0.67***	0.62***	0.56***	1												
(9) BIND	0.03	0.51***	0.05	0.60***	0.71***	0.62***	0.52***	0.68***	1											
(10) ENVPRO	0.02	0.58***	0.02	0.61***	0.53***	0.49***	0.63***	0.50***	0.55***	1										
(11) ENVEXP	0.07	0.14***	0.03	0.07***	0.08***	0.06***	0.13***	0.07***	0.09***	0.11***	1									
(12) ENVEXPINV	0.09	0.57***	0.04	0.43***	0.38***	0.34***	0.47***	0.37***	0.39***	0.43***	0.18***	1								
(13) ENVFIN	0.08***	0.02***	0.09	0.02***	0.02***	0.02***	0.01***	0.01	0.01**	0.08	0.04	0.03***	1							
(14) EMMREV	0.02	0.14***	0.07	0.07***	0.08***	0.06***	0.12***	0.07***	0.10***	0.11***	0.65***	0.18***	0.06	1						
(15) ESGREP	0.06	0.57***	0.08	0.55***	0.64***	0.60***	0.71***	0.68***	0.63***	0.57***	0.08***	0.43***	0.02***	0.08***	1					
(16) PROF	0.03	0.16***	0.03	0.11***	0.13***	0.09***	0.16***	0.12***	0.12***	0.15***	0.09***	0.10***	0.04***	0.12***	0.10***	1				
(17) REV	0.05	0.33***	0.02	0.20***	0.22***	0.19***	0.30***	0.21***	0.24***	0.27***	0.31***	0.26***	0.03	0.32***	0.22***	0.45***	1			
(18) SIZE	0.09	0.13***	0.05	0.10***	0.13***	0.05***	0.17***	0.11***	0.12***	0.16***	0.08***	0.07***	0.03	0.07***	0.09***	0.56***	0.18***	1		
(19) CAP	0.12**	0.12***	0.03	0.05***	0.07***	0.09***	0.12***	0.07***	0.08***	0.08***	0.05***	0.10***	0.07	0.07***	0.08***	0.23***	0.28***	0.13***	1	
(20) Dummy	0.09***	0.08***	0.01*	0.04***	0.05***	0.04***	0.02***	0.04***	0.04***	0.03***	0.01***	-0.01***	0.01**	0.01**	0.13***	-0.03***	0.05	0.09	0.08***	1

Note: ***, **, and * indicate a significance level at 0.01, 0.05, and 0.10.