

Does corporate governance affect the environmental, social and governance disclosure? A cross-country study

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Jamel Eddine Mkadmi and Wifak Daafous
*Higher Institute of Business Administration of Gafsa, University of Gafsa,
Gafsa, Tunisia*

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Abstract

Purpose – This study aims to explore whether corporate governance mechanisms affect environmental, social and governance (ESG) disclosure by firms across countries. It investigates whether board cultural diversity affects ESG disclosure.

Design/methodology/approach – The proposed methodology draws on multidimensional scaling as a multivariate assessment tool to evaluate and prioritize the effect of corporate governance on environmental, social and governance disclosure. This study uses a cross-country sample of 672 listed firms located in 40 countries for the period between 2014 and 2022. We used a panel regression to test the hypotheses. Moreover, we conducted a two-stage least squares regression analysis as an additional robustness check.

Findings – The results show that companies can have high-quality ESG disclosure when they have good corporate governance. Interestingly, this study found that board composition and some criteria of corporate social responsibility (CSR) positively affect ESG disclosure for firms.

Originality/value – This study adds to the existing body of accounting knowledge in several dimensions. Indeed, to the best of our knowledge, this is one of the few studies that investigate the effect of corporate governance on the environmental, social and governance disclosure of firms across 40 countries. This study also has important implications for the board of directors' characteristics and CSR, which strive to improve the index of ESG disclosure.

Keywords Environmental, social and governance disclosure, Board of directors, Corporate governance, Corporate social responsibility, Panel data

Paper type Research paper

Introduction

Corporate social responsibility (CSR) has burst into economic, political, and social life. Initially, many companies refused to communicate their responsibility to the outside world, either because they saw no advantage in it or because they feared communicating so-called confidential and sensitive information (Wu, Zhang, & Wei, 2021). The new context pushed them to think about more open and transparent communication. More than a defensive method against social pressures, communication on CSR in particular and ethical strategy in general offers market opportunities to companies (Liu, Li, & Luo, 2023). As the first response, many companies extended the communication policy on the theme of their CSR (Guo, Kim, Yu, & Kim, 2021). The concept of CSR only appeared in this debate in the early 1990s on the occasion of the Earth Summit in Rio.

The last world summit, held in September 2002 in Johannesburg, finally emphasized the need for companies to commit to the path of progress that constitutes sustainable development. This notion has sparked much debate regarding its definition and the development of its foundations. Many researchers have seen it as a fad that companies follow, a simple marketing

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tool to disguise corporate communication with a social complexion “greenwashing or whitewashing” (Wolak-Tuzimek & Duda, 2021). Other researchers see CSR as a groundswell, “an essential strategy” to adapt to the new data of the modern economy and to continue to exist on the market. It is an evolving and multidimensional concept that affects the economic, environmental, and social dimensions.

Indeed, the CSR approach is calculated according to certain predefined criteria. These involve environmental, social, and governance (ESG) criteria, which are analytical criteria that allow us to assess the consideration of sustainable development and long-term issues in corporate strategy. The ESG analysis dates back to the 1960s when some organizations adopted ethical filters to identify and possibly exclude from their portfolios companies that did not respect their moral values. The term “corporate governance” only appeared late, in the 1980s. Today, corporate governance is in constant evolution with an interest carried by the companies themselves, but also by the states and financial market organizations that see it as a means of regulating companies to “avoid resounding bankruptcies” (Zgarni & Fedhila, 2021; Mkadmi, Say, & Saida, 2022).

According to Aderemi Moses and Olubunmi (2020), fundamentally, there is a level of trust associated with a company known to have good corporate governance. An active group of independent directors on the board goes a long way to ensuring confidence in the market. Moreover, scholars have identified corporate governance as the criterion that foreign institutional investors increasingly depend on when making investment decisions (Li, Wang, & Wu, 2021; Xiang, Chen, Jones, & Xia, 2021; Mkadmi, Ben Ali, & Alouani, 2023).

The goal is to acquire an improved knowledge of how corporate governance influences ESG practices in these regions and provide policymakers with guidance while considering Asia, America, and Europe’s unique economic characteristics. This study aims to close substantial knowledge gaps in the effects of corporate governance on ESG practices in Asian, American, and European countries. The research will thoroughly examine the relationship between ESG dimensions and corporate governance in the diverse economies of Asia, America, and Europe. One notable gap is a scarcity of empirical research on the individual and collective effects of corporate governance on ESG dimensions in these regions. Furthermore, given the diversity of the Asian, American, and European economies, the effects of corporate governance are likely to vary by region.

Therefore, the study adopted actions to bridge the research gap by examining the theoretical and empirical link between corporate governance and ESG disclosure, particularly in the context of Asian, American, and European companies. Earlier studies on corporate governance and ESG disclosure have yielded conflicting results. Antonio, Federica, and Silvio (2020), Albertina, Cláudia, and Francisco (2021), Nicolò, Zampone, Sannino, and Tiron-Tudor (2023), and Nicolo’ and Andrades-Peña (2024) found a positive relationship between corporate governance and voluntary environmental disclosure; Jizi (2017) found no association; and Mohammad, Osman, and Rani (2023), Agarwala, Pareek, and Sahu (2023), and Nicolo’ and Andrades-Peña (2024) found a negative correlation. Indeed, this research seeks to close this gap by examining the specific economic countryside of Asia, America, and Europe, which includes a variety of sustainability reporting models and varying levels of governmental maturation.

We will investigate the various effects of corporate governance on ESG practices across countries. Furthermore, a single theoretical perspective has heavily influenced sustainability studies. To address this limitation, we will investigate the complex relationship between corporate governance and ESG disclosure using a variety of theoretical perspectives. This study contributes significantly to the existing literature by investigating the complex relationship between corporate governance and ESG disclosure in the Asian, American, and European contexts.

Noteworthy, this is one of the first articles to assess the relationship between corporate governance and ESG disclosure. The findings demonstrate its usefulness for decision-making and efficiency in providing information to investors and stakeholders. Thus, the interaction of

CSR practices and board characteristics is an important tool for informing stakeholders about CSR and sustainability issues. Corporate governance is a firm's decision-making body that is in charge of defining strategic priorities and objectives in a variety of areas (Camilleri, 2022). The board of directors is becoming an increasingly important tool in the eyes of investors. Moreover, our findings bring implications and new motivations for practitioners, particularly CEOs and high-level corporate governance bodies. Businesses are consequently motivated to redesign their boards of directors in ways that promote moral behavior, including CSR practices. Our findings have important implications for global regulators and policymakers.

Our research aims to investigate the impact of board characteristics and CSR in environmental, social, and governance disclosure and which governance mechanisms shape the environmental and social disclosure index, and governance. This study evaluates the impact associated with the characteristics of the board of directors, such as its size, type, independence, duality of functions, gender diversity, the aspect of sustainable development, creation of the remuneration committee, and environmental innovations of each company on the levels of ESG disclosure.

The remainder of this study is structured as follows. First, we will provide a literature review and research hypotheses. Then, we will describe the methodology and discuss the results. We will end the article with conclusions.

Literature review and research hypotheses

Information, data, and research are the basis of any investment decision (Aprayuda, Misra, & Kartika, 2021). Gradually, with the emergence and development of new types of information, investors have found innovative solutions to fully exploit this data and integrate it into their decision-making process. Today, some forward-looking investors are taking a deeper interest in ESG factor analysis to supplement their research efforts with other perspectives (Pozzoli, Pagani, & Paolone, 2022; Al Amosh, Khatib, & Ananzeh, 2023).

The ESG reporting refers to the disclosure of data covering company operations in three areas: environmental, social, and corporate governance. It provides insight into the company's impact in these three investor areas. Analyzing performance across these ESG factors summarizes quantitative and qualitative information and helps filter investments (Chen & Xie, 2022).

Growing public awareness and corporate recognition have led to an increase in the number of companies using sustainability strategies and disclosing their ESG information globally. The 2018 Global Reporting Initiative report showed that 12,964 companies around the world published 50,197 voluntary sustainability reports on various dimensions of ESG reporting. While the ESG focus has been on the agenda for some time in Europe, it is now playing a bigger role in Asia. In China, 80% of companies published ESG reports in 2009, compared to only 4% in 2005 (Sumritsakun, 2022).

Several studies, e.g. Zuraida, Houqe, and Van Zijl (2018), Salehi, Lari DashtBayaz, and Khorashadizadeh (2018), and Melinda and Wardhani (2020), also examined the combined effect of ESG disclosure on firm performance. However, few, if any, have focused on examining the impact of the ESG set on the environmental, economic, and social sustainable performance in a single setting, particularly in Asia. Therefore, other studies explored the impact of all these factors, the ESG disclosure practices on the components of environmental, economic, and social performance among different contexts companies (Alsayegh, Abdul Rahman, & Homayoun, 2020; Rajesh, Rajeev, & Rajendran, 2022).

The topic of CSR and its disclosure by international companies has attracted growing interest worldwide. Companies are increasingly aware of their social responsibility and are more motivated to integrate CSR aspects into their business. The reasons why companies disclose CSR information vary (Chouaibi & Affes, 2021; Gholami, Sands, & Rahman, 2022).

Another reason for disclosing CSR information stems from a feeling of obligation to do so due to various types of institutional pressure. Companies are economic units that operate in the

context of various institutions that have an impact on their behaviors and weigh them with certain expectations. This explains why companies working in countries with institutions adopt similar behaviors. Focusing on these institutions can help understand CSR disclosure not only as a voluntary report, but also as a requirement imposed by the corporate context (Arraiano & Hategan, 2019; Taneja, Jain, Joshi, & Kansal, 2021; Ren, Huang, Liu, & Yan, 2022).

Board characteristics are key attributes that could influence not only CSR disclosure but also would be associated with audit committee attributes, leading to various board decisions (Salehi, Moradi, & Paiydarmanesh, 2017; Salehi, Mohammad Sadegh, Zakiyeh, & Ehsan, 2021). When board size, independence, gender, meetings, and duality of the Chairman of the Board of Directors are the characteristics most widely used to discuss the associations between the board of directors and the social responsibility of businesses (Cucari, Esposito de Falco, & Orlando, 2018; Amorelli & García-Sánchez, 2021; Albertina *et al.*, 2021; Gull, Abid, Hussainey, Ahsan, & Haque, 2023; Toukabri & Mohamed Youssef, 2023).

In this sense, the association between board size and firm performance has received the most attention. We may divide studies into two groups: those supporting smaller councils and those advocating larger councils. On the one hand, smaller boards are expected to be more effective at monitoring and controlling corporate governance than larger boards that are better able to mitigate opportunistic corporate behaviors managers at the expense of shareholders, considering group dynamics and collective decision-making processes as well as the agency perspective (Faysal, Salehi, & Moradi, 2021; Huang, 2022).

In particular, smaller boards promote good cohesion, coordination, and communication between directors. Therefore, they increase individual members' responsibility and commitment. However, the results remain mixed and ambiguous. Several surveys (Worokinasih & Zaini, 2020) claim that larger boards have greater knowledge and experience, which improves the board's ability to oversee and control corporate disclosures. In turn, this improves CSR. Moreover, others (Yasser, Al Mamun, & Ahmed, 2017) find an inverse relationship, and they argue that larger boards increase conflict of interest and are difficult to manage. Thus, a smaller board would often be more active in an oversight and control role than a larger board (Ding, Levine, Lin, & Xie, 2021). Hence, hypothesized:

H1. Board size negatively affects the corporate ESG disclosure.

Consistent with the shareholder perspective, resource-based view, and upper-echelon theory, we support how the effectiveness of board diversity with respect to CSR may differ for different board structures. Previous studies (Beji, Yousfi, Loukil, & Omri, 2021) have recognized board diversity as dissimilarities assessed by structural features of boards, such as size, board independence, board of directors, the meeting of the board of directors, the duality of chairman of the board of directors and the ownership structure. On the other hand, shareholder–stakeholder demand for CSR depends on the association between ownership structure and CSR (Sahasranamam, Arya, & Sud, 2020; Martínez-Ferrero & Lozano, 2021; Toukabri & Mohamed Youssef, 2023).

On the other hand, the orientation of shareholders and stakeholders toward CSR depends on whether the board of directors respects and meets their expectations (Amor-Esteban, Galindo-Villardón, & García-Sánchez, 2018). Therefore, we refer to the one-tier (two-tier) board model as shareholder (stakeholder) oriented. Explicitly, Shahbaz, Karaman, Kilic, and Uyar (2020), showed significant effects of board size, the propensity to advice and CEO duality on CSR under a one-tier board model. However, Beji *et al.* (2021) found no unanimous association between these attributes and CSR in a two-tier board context. Regarding the composition of the board of directors, the study by Uyar, Kilic, Koseoglu, Kuzey, and Karaman (2020) in countries with a one-tier board model has highlighted the significantly positive impact of independent directors (outsiders) on CSR. Thus, we hypothesized:

H2. Board type negatively affects the corporate ESG disclosure.

Independent directors bring added value and optimize the board's proper functioning. Thus, director independence is one of the most important notions in corporate governance systems worldwide (Al Amosh *et al.*, 2023). Moreover, the literature mentions other arguments justifying the positive link between the independence of the board of directors and CSR. The first consists in invoking a greater sensitivity of independent directors to the needs of the company (Ebrahim & Fattah, 2015) and their more supported ethical sense compared to inside directors. The second argument relates to the ability of independent directors to adopt a more prudent attitude so that the company complies with regulations (Qa'dan & Suwaidan, 2018), with the dual concern of preserving their reputation and their human capital in the market for directors (Naciti, 2019; Amorelli & García-Sánchez, 2020).

In this regard, the majority of flows from previous studies revealed that the existence of an independent board member positively affects CSR (Fernández-Gago, Cabeza-García, & Nieto, 2018; Pucheta-Martínez & Gallego-Álvarez, 2019). On the other hand, few studies (Rashid & Hossain, 2021) indicate a negative association between board independence and CSR disclosure, while others find a significant association (Godos-Díez, Cabeza-García, Alonso-Martínez, & Fernández-Gago, 2018; Cucari *et al.*, 2018; Toukabri & Mohamed Youssef, 2023). Thus, we assumed that:

H3. Board independence positively affects corporate ESG disclosure.

Duality is another form of board diversity. According to Beji *et al.* (2021), duality leads to a concentration of management and control functions when the chairman of the board of directors (CEO) is also the president. However, there is a concentration of power that does not benefit the investments of the company's CSR. For example, the CEO-president may pursue opportunistic strategies to gain more short-term private benefits at the expense of long-term, less profitable pursuits such as those of CSR. Mubeen, Han, Abbas, Álvarez-Otero, and Sial (2021) indicate that CEO duality contributes positively to the level of CSR disclosure. They argue that powerful CEOs tend to use CSR as a tool to improve their image and be more successful. However, other authors (Antonio *et al.*, 2020; Hsu, Lin, Chen, & Huang, 2021) find no relationship between the two. Furthermore, they indicate that a company with an active board of directors would be more interested in providing information on CSR. Therefore, we hypothesized:

H4. CEO duality negatively affects the corporate ESG disclosure.

Board diversity means heterogeneity among board members (Chouaibi, Belhouchet, Almallah, & Chouaibi, 2021). It has many dimensions that cover task-related diversity, such as educational or functional background, and non-task-related diversity, such as gender, age, race or nationality, as well as diversities, i.e. board size, board independence, and CEO's non-duality (Nasr & Ntim, 2018). Below, we have incorporated a comprehensive set of dimensions of board demographic diversity encompassing gender, tenure, education level, nationality, and ideology. Several competing views are advanced with respect to these results by later researchers. First, women generally have a higher perception of risk and have been socialized to meet the needs of others, thus representing the qualities that encompass CSR (Chouaibi *et al.*, 2021). Second, women directors are characterized by their empathy, communication skills, participation, and cooperation, which leads them to be more concerned about social and environmental issues, which can have a positive impact on CSR (Li, Wang, Zhang, & Cao, 2019; Albertina *et al.*, 2021). Third, women are less likely to engage in unethical business behavior and are more socially oriented than men, which could mean they are less likely to engage in unethical behavior and to be more effective in decision-making related to CSR (Furlotti, Tatiana, Veronica, & Silvia, 2019; Costa & Fonseca, 2022). Martínez-Ferrero, Lozano, and Vivas (2021) found a positive relationship between gender diversity and board effectiveness as measured by strategic CSR strategies. Hence, we hypothesized:

H5. Board gender diversity positively affects corporate ESG disclosure.

According to stakeholder theory, companies have increasingly chosen to set up a CSR committee to manage important sustainability tasks. These committees typically assist the board of directors in overseeing corporate responsibility practices, but they can also play a key role in monitoring and evaluating CSR performance by ensuring compliance with regulations that manage sustainability risks (Helfaya & Moussa, 2017).

Indeed, the board of directors can design and implement CSR projects through a CSR committee, increasing the stakeholders' participation in the company's ethical culture and ensuring that potentially dangerous risks for the company's reputation receive correct assessment (Birindelli, Dell'Atti, Iannuzzi, & Savioli, 2018). Moreover, the CSR committee is responsible for the procedures regarding reporting environmental and social information. It periodically reports to the board of directors on sustainability issues affecting the company while also managing public disclosure on sustainable development issues. Thus, scholars consider the creation of a CSR committee an important mechanism for an organization to maximize sustainable development opportunities (Moon, 2007; Camilleri, 2022; Rathore, Biswas, Gupta, & Biswas, 2022; Toukabri & Mohamed Youssef, 2023). Therefore, we hypothesized:

H6. The establishment of a CSR committee positively affects corporate ESG disclosure.

From a theoretical perspective, two perspectives predominate in explaining the different interactions between CSR and executive compensation. On the one hand, the CSR report makes it possible to reduce agency costs and, on the other hand, to increase user confidence in the accuracy of the information provided by the company (Simnett, Vanstraelen, & Chua, 2009; García-Sánchez, Hussain, Khan, & Martínez-Ferrero, 2022).

By going beyond the stage of simple reporting, the disclosure of social and environmental information encourages the manager to present the results of his decisions and his actions to the stakeholders. Thus, through CSR activities and social dialogue, the manager undertakes to bring control back into the hands of the various risk-takers to increase legitimacy, develop a positive reputation, and effectively manage the firm's risks (Salehi, Bahman, & Shayan, 2018; Salehi, Hossein, & Samaneh, 2018; Landi, Iandolo, Renzi, & Rey, 2022). A company involved in irresponsible actions may face serious difficulties with its stakeholders. For example, the announcement of the boycott of certain products by customers can result in a reduction in shareholder value (Tomlin, 2019). Consequently, we hypothesized:

H7. The level of executive compensation positively affects the corporate ESG disclosure.

Disclosing information has substantial implications for the perceived environmental performance of the disclosing company, depending on the extent of the company's strategic behavior in the form of symbolism and opportunism usually manifest in the form of disclosure of procedure rather than results, or in the form of selective results' disclosure (Modi & Cantor, 2021). Such strategic behavior may well lead to discrepancies between the information available to the firm and the information disclosed by the firm (Bellamy, Dhanorkar, & Subramanian, 2020). Thus, the availability of richer environmental information from information systems that are an integral part of administrative environmental innovations (Bellamy *et al.*, 2020) does not imply tautologically a more extensive disclosure by the firm.

Administrative environmental innovations involve all staff on an ongoing basis through the setting of environmental objectives, training, and auditing (Bellamy *et al.*, 2020). Moreover, the consistent communication of environmental policies can significantly impact employees' willingness to act on their value skills and adopt environmental initiatives (Modi & Cantor, 2021). In summary, we may associate the implementation of administrative environmental innovations with an increased availability and willingness to disclose environmental information, thus leading to more extensive environmental disclosure by the company (Cho & Patten, 2007; Bellamy *et al.*, 2020). Therefore, we hypothesized:

H8. Environmental innovation positively affects corporate ESG disclosure.

Research methodology

Sample

We based our initial sample on the data availability regarding environmental, social, and governance disclosure, CSR, and governance data in the Thomson Reuters Asset4 and Thomson Reuters Eikon databases. We started with the entire available sample of 6,048 observations per firm-year listed on the stock exchanges of 40 countries included in Containers A, B, and C of Table 1. We removed 300 observations with missing firm-level data on the dependent or independent variables used in our explanatory models.

We based our final sample on a panel data set consisting of 6,048 observations per company-year from 672 listed companies, covering a 9-year period (2014–2022). Table 1 shows the distribution of the sample by number of observations and by percentage for each country. We used the Asset4 and Thomson Reuters Eikon data set to collect data for the environmental, social, and governance disclosure index, CSR criteria, and governance mechanisms related to the board composition. The final sample consisted of 6,048 company-years belonging to 40 countries. We used the Thomson Reuters ASSET4 database because it is readily available to many investors and academics. The distribution of the sample according to the geographical areas was as follows: the majority of the population was composed of 44.64 and 32% successively of European and American companies, and 23.07% of Asian American firms.

Model

$$\text{ESGDiscl}_{it} = \beta_0 + \beta_1 \text{BoardSZ}_{it} + \beta_2 \text{BoardTp}_{it} + \beta_3 \text{IndepB}_{it} + \beta_4 \text{Duality}_{it} \\ + \beta_5 \text{GenderDiv}_{it} + \beta_6 \text{CSRSust}_{it} + \beta_7 \text{BoardComp}_{it} + \beta_8 \text{EnvInnov}_{it} + \varepsilon_{it}$$

With:

- (1) **ESGDiscl_{it}** Is equal to a ranking of percentile scores that considers ESG information on one of the environmental, social, and governance topics published by company “i” for a year “t.”
- (2) **BoardSZ_{it}** Measured by the total number of directors who sit on the board of directors of the company “i” for the year “t.”
- (3) **BoardTp_{it}** Measured by the type of the board structure and it takes the value 1 for a unitary structure, 2 for a two-level structure, and 3 for mixed structures and which published by the company “i” for year “t.”
- (4) **IndepB_{it}** Equal to the proportion of independent directors on the board of directors. It is expressed in percentages and standardized between 0 and 100% of the company “i” for the year “t.”
- (5) **Duality_{it}** a dummy variable that takes the value 1 if there is an accumulation of the functions of the chairman of the board of directors and the general manager of the company “i” and 0 otherwise for the year “t”
- (6) **GenderDiv_{it}** Equal to the proportion of female gender on the board of directors. It is expressed in percentages and standardized between 0 and 100% of the company “i” for the year “t.”
- (7) **CSRSust_{it}** Is a binary variable equal to 1 if the company “i” has a CSR Sustainable Development aspect for the year “t” and 0 otherwise.
- (8) **BoardComp_{it}** Equal to the total of the remuneration of the members of the board of directors of the company “i” for the year “t”

Table 1. Sample distribution

Country	Number of observations	Percentage
<i>A. Container Europe</i>		
Austria	54	2.00%
Belgium	81	4.15%
Bermuda	45	2.30%
Cyprus	9	0.46%
Czech Republic	9	0.46%
Denmark	72	3.69%
Spain	180	9.22%
Finland	135	6.91%
France	360	18.43%
Germany	270	13.82%
Greece	18	0.92%
Britain	495	25.35%
Ireland	63	3.23%
Italy	117	5.99%
Luxemburg	18	0.92%
Netherlands	171	8.76%
New Zealand	27	1.38%
Norway	63	3.23%
Poland	63	2.23%
Portugal	27	1.28%
Sweden	225	8.45%
Switzerland	189	6.98%
Turkey	9	0.07%
Total	2,700	100%
Percentage on the final sample		44.64%
<i>B. Container America</i>		
Canada	414	21.20%
USA	1,539	78.80%
Total	1,953	100.00%
Percentage on the final sample		32%
<i>C. Container Asia</i>		
China	153	10.97%
Hong Kong	162	11.61%
India	198	14.19%
Indonesia	72	5.16%
Japan	450	32.26%
Jordan	9	0.65%
Kuwait	9	0.65%
Malaysia	90	6.45%
Qatar	9	0.65%
Singapore	72	5.16%
South Korea	9	0.65%
Sri Lanka	9	0.65%
Taiwan	36	2.58%
Thailand	108	7.74%
United Emirates	9	0.65%
Total	1,395	100.00%
Percentage on the final sample		23.07%
Final sample firm-observations	6,048	100.00%

Source(s): Authors' own elaboration

(9) $EnvInnov_{it}$ Is a binary variable equal to 1 if the company “i” has an aspect of environmental innovation and 0 otherwise for the year “t.” ε_{it} : Error term.

Results and interpretations

Descriptive statistics

Table 2 summarizes the trend of each environmental, social, and governance disclosure model variable for containers (A, B, and C). A containing Europe; the values of the average and the maximum of the variable ESGDiscl were respectively 93.57, and 100, such values imply that European companies disseminate the majority of environmental, social, and governance information on average 93% and even manage to disseminate 100% of the items of the ESG Disclosure Composite Index. B containing America; the average and maximum values of the ESGDiscl variable were respectively 96.0121 and 100, such values imply that companies in this region disseminate the majority of environmental, social, and governance information on average 96% and even manage to disclose 100 % of items in the composite ESG disclosure index.

C containing Asia; the average and maximum values of the ESGDiscl variable were respectively 83.51 and 100, such values imply that Asian companies disseminate the majority of environmental, social, and governance information on average 83% and even manage to disseminate 100% of the items of the ESG Disclosure Composite Index.

Table 2. I Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
<i>A I Container Europe</i>					
ESGDISCL	2,700	93.57989	15.23256	3	100
BoardSZ	2,700	11.94185	4.132121	2	31
BoardTp	2,700	1.658519	0.7382911	1	3
IndepB	2,700	47.71574	28.73823	0	100
Duality	2,700	0.7388889	0.4393217	0	1
Genderdiv	2,700	21.37416	12.59209	0	66.66666
CSRSust	2,700	0.8785185	0.3267465	0	1
BoardComp	2,700	3,190,255	4.15e+07	0	1.90e+09
EnvInnov	2,700	66.22772	25.05416	0.4504505	99.83871
<i>B I Container America</i>					
ESGDISCL	1,953	96.0121	12.76068	3.1	100
BoardSZ	1,953	11.19355	2.285785	5	19
BoardTp	1,953	1.00512	0.1010924	1	3
IndepB	1,953	83.82299	10.3974	16.66667	100
Duality	1,953	19.18319	10.03661	0	1
Genderdiv	1,953	0.6231439	0.4847225	0	66.66666
CSRSust	1,953	0.8960573	0.3052643	0	1
BoardComp	1,953	2,616,667	1,770,120	11561.6	3.62e+07
EnvInnov	1,953	61.44384	26.58695	0.3048781	99.62547
<i>C I Container Asia</i>					
ESGDISCL	1,395	83.51459	29.00051	3	100
BoardSZ	1,395	11.45337	3.536444	4	27
BoardTp	1,395	1.91033	0.9887346	1	3
IndepB	1,395	39.51124	17.97293	0	90.90909
Duality	1,395	0.3364419	0.4726616	0	1
Genderdiv	1,395	7.730386	7.835845	0	37.5
CSRSust	1,395	0.8723099	0.3338642	0	1
BoardComp	1,395	1,636,450	1.18e+07	0	3.57e+08
EnvInnov	1,395	61.56357	26.59808	0.25	99.83498

Source(s): Authors’ own elaboration

With regard to the variable CSRSust, for the container of Europe, this variable takes on average 0.8785185, which implies that on average 87% of European companies adopt an aspect of the development of environmental social responsibility and governance, which is justified by the low value of the standard deviation, i.e. 0.3267465. For the container of America, this variable took on an average of 0.8960573, which implies that on average, 89% of the companies of the sample of American companies adopt an aspect of the development of environmental social responsibility and governance, this is also justified by the low value of the standard deviation, ie 0.3052643. Concerning Asia, this variable took on an average of 0.8723099, which implies that on average, 87% of Asian companies adopt an aspect of the development of environmental social responsibility and governance, which is justified by the low value of the standard deviation, i.e. 0.3338642.

The average of the BoardSZ variable for European containers marked an average of 11.94185, meaning that corporate boards had an average of 11 members, and the average of 11.19355 for American containers, it means that corporate boards have an average of 11 members. Even if for the Asian container (11.45337).

For the BoardTP variable, the average was 1.658519; this average indicates that the majority of companies had a single board of directors in the European container. For the American container, this variable had the structure type of a single board specified with an average of 1.00512. For the Asian container, 1.91033 meant that this value was very close to the fact that companies had two board levels.

About the Europe container, the average variable IndepB was 47.71574, which implies that on average, 47% of the boards of directors were represented by independent members with a maximum of 100%, for the American container, 83.82299, which implies that, on average, 83% presence of independent members in the boards of directors for American companies. The average of this variable for the Asian container was 39.51124, which implies that on average, 39% of boards of directors were represented by independent members with a maximum of 100%.

Regarding the GenderDiv variable for the European container, this variable implied that women constituted an average of 21% of the members of the board of directors. For the American container, 62% of company board members were women For the Asian container, the percentage of the presence of female genders on the boards of directors was 7%, which was the lowest proportion among the containers.

The means of the duality variable for the three containers; Europe, America, and Asia were respectively 0.7388889, 19.18319, and 0.3364419. This means that for 7% of European companies, the general manager was the same as the chairman of the board; for 19% of American companies, the general manager was the same as the chairman of the board of directors; and for 3% of Asian companies the general manager was the same as the chairman of the board of directors.

According to the BoardComp variable, 3,190,255 was the average sum of board member compensation for European companies, 2,616,667 was the average sum of board member compensation for US companies, and 1,636,450 was the average amount of board member compensation for Asian companies.

We found that the average 61.56357 of the variable EnvInnov means that 61% of European companies had an aspect of environmental innovation. This implies an average of 61% (61.44384) for American companies and 61.56357, which implies an average of 61% for Asian companies that displayed an environmental innovation aspect.

Correlation analysis: bivariate analysis

Correlation analysis aimed to identify relationships between variables. [Table 3](#) (Containers A, B, and C) summarizes the correlation coefficients between the variables of the ESG disclosure evaluation model that we investigated by applying the Pearson test.

Concerning the model of European companies, the correlation coefficients of the variables BoardSZ, BoardTp, duality, and EnvInnov were all negative. This implies that European

Table 3. I Correlation matrix of variables relating to containers A, B, and C

	ESGDISCL	BoardSZ	BoardTp	IndepB	Duality	GenderDv	CsrSust	BoardComp	EnvInnov
<i>Container A. correlation test</i>									
ESGDISCL	1.0000								
BoardSZ	-0.8090	1.0000							
BoardTp	-0.0044	0.0014	1.0000						
IndepB	0.6698	-0.5641	-0.0069	1.0000					
Duality	-0.2506	0.6496	0.0037	-0.7096	1.0000				
GenderDv	0.6336	-0.9549	-0.0039	0.3801	-0.7668	1.0000			
CsrSust	0.0294	0.0052	0.0138	-0.0190	0.0112	-0.0135	1.0000		
BoardComp	0.0530	0.0382	0.0170	-0.0273	0.0090	-0.0279	0.0137	1.0000	
EnvInnov	-0.0047	0.0475	0.0860	-0.0640	0.0362	-0.0556	0.0794	0.0271	1.0000
<i>Container B. correlation test</i>									
ESGDISCL	1.0000								
BoardSZ	-0.6510	1.0000							
BoardTp	-0.3435	0.1686	1.0000						
IndepB	0.8350	-0.5514	-0.2641	1.0000					
Duality	-0.5561	-0.6320	-0.0969	0.5647	1.0000				
GenderDv	0.0424	-0.1510	-0.0233	0.0742	0.0595	1.0000			
CsrSust	0.5655	-0.6312	-0.1488	0.5324	0.5714	0.0467	1.0000		
BoardComp	0.3355	-0.5177	-0.0720	0.5754	0.2815	0.0581	0.3401	1.0000	
EnvInnov	-0.5925	-0.4695	-0.1163	0.4194	0.4747	0.1959	0.5967	0.4532	1.0000
<i>Container C. correlation test</i>									
ESGDISCL	1.0000								
BoardSZ	-0.8710	1.0000							
BoardTp	-0.6267	0.4872	1.0000						
IndepB	0.7529	-0.3957	-0.5657	1.0000					
Duality	-0.5473	0.5726	0.3324	-0.5519	1.0000				
GenderDv	0.5610	-0.5435	-0.5087	0.9493	-0.5644	1.0000			
CsrSust	0.8574	-0.3145	-0.4210	0.5848	-0.3029	0.3768	1.0000		
BoardComp	0.0185	-0.0118	-0.0279	0.0003	0.0188	-0.0074	0.0125	1.0000	
EnvInnov	-0.0984	0.0854	-0.0085	-0.0965	0.0975	-0.0766	-0.1017	0.0209	1.0000

Source(s): Authos' own elaboration

companies, with large boards of directors and duality, may suffer from a low level of ESG disclosure.

Regarding the variables *IndepB*, *GenderDv*, *CSRSust*, and *BoardComp*, the coefficients of the correlations associated with these variables with the *ESGDISCL* were all positive. The presence of such correlations means that these variables contribute to the improvement of ESG disclosure. This reflects well that good corporate governance in general, and the characteristics of the board of directors in particular *IndepB*, *GenderDv*, and *BoardComp* give companies a better opportunity to improve ESG disclosure. Regarding the correlations between the independent variables, the results show the existence of strong negative correlations between *IndepB* and *GenderDv* on the one hand and the other variables on the other hand; the correlation coefficients with the majority of the other variables had a negative sign. We may explain this by the convergence and the conflict of interest between the *IndepB* and *GenderDv* on the one hand and the other variables on the other hand. Furthermore, we detected that the correlations between the variables present a positive and statistically significant sign. We may explain this by the capacity of these governance actors to interact positively.

Regarding the model of American companies, the correlation coefficients of the variables *BoardSZ*, *BoardTp*, *duality* and *EnvInnov* take negative signs, this implies that for companies with large boards of directors and which verify the cumulation roles of chairman and chief executive, a two-tier or mixed structure and those investing in environmental innovation can suffer from low levels of ESG disclosure.

Concerning the variables *IndepB*, *GenderDv*, *CSRSust*, and *BoardComp*, the coefficients associated with these variables with the *ESGDISCL* were all positive. The presence of such correlations means that these variables contributed to the improvement of ESG disclosure. This reflects well that good corporate governance in general, and the characteristics of the board of directors, in particular *IndepB*, *GenderDv* and *BoardComp*, give companies a better opportunity to improve ESG disclosure.

Similarly, we noticed the existence of positive correlations between the variable *IndepB* and all the rest of the independent variables; *duality*, *GenderDv*, *CSRSust*, *BoardComp*, and *EnvInnov* were respectively 0.8647, 0.0742, 0.7824, 0.5754 and 0.8194. It is more likely that a higher proportion of independent members in the boards of directors improves ESG disclosure.

Regarding the correlations between the independent variables, the results show the existence of strong negative correlations between *BoardSZ* and *BoardTp* and the other variables. The correlation coefficients with the majority of the other variables had a negative sign. We may explain this by the convergence and the conflict of interest between the *BoardSZ*, *BoardTp*, and the combination of the functions of the chairman of the board of directors on the one hand and the other variables on the other hand. This can be motivated by the attraction between *duality* functions of a company and the other governance actors. Moreover, we detected the presence of positive and statistically significant correlations between the variables *IndepB*, *GenderDv*, *CSRSust*, *BoardComp*, and environmental innovation. We can explain this by the ability of these governance actors to interact positively.

Regarding Asian companies, the correlation coefficients of the variables *BoardSZ*, *BoardTp*, *duality* and *EnvInnov* take negative signs. This reveals that companies with large boards of directors and which verify the *duality* functions may suffer from a low level of ESG disclosure. However, the variables *IndepB*, *GenderDv*, *CSRSust*, and *BoardComp* had coefficients of positive correlations associated with these variables with the *ESGDISCL*. The presence of such correlations means that these variables contribute to the improvement of ESG disclosure. However, the variables *IndepB*, *GenderDv*, *CSRSust*, and *BoardComp* had coefficients of positive correlations associated with these variables with the *ESGDISCL*. The presence of such correlations means that these variables contribute to the improvement of ESG disclosure. This reflects well that good corporate governance in general and the characteristics of the board of directors, in particular, *IndepB*, *GenderDv* and *BoardComp*, give companies a better opportunity to improve ESG disclosure.

Regarding the correlations between the independent variables, the results show the existence of strong negative correlations between BoardSZ, BoardTp, duality, and GenderDv and the other variables. The correlation coefficients with the majority of the other variables showed a negative sign. We can explain this by the convergence and the conflict of interest between the BoardSZ, BoardTp, duality and GenderDv, and the other variables.

Moreover, we detected the presence of the majority of correlations between the variables IndepB, GenderDv, and BoardComp. The other variables present a positive and statistically significant sign. We may explain this by the ability of these governance actors to interact positively.

Multivariate analysis: results and interpretations

The results interpretation in the table below allowed us to conduct some analyses concerning the general characteristics of the empirical models and validate the research hypotheses using multivariate analysis. Indeed, the value taken by the explanatory power of the first containing $R2_{adjusted} = 0.8912$ reflects a good quality for Europe. The adjusted pseudo R^2 for the second model, related to the America container, was 0.9026, and for the third model, related to the Asia container, it was 0.9252. The Fisher statistic result confirmed our hypothesis. It confirmed the ability of the independent variables of our econometric model to explain the variation in ESG disclosure. For the three containers A, B, and C ($F1 = 2756.01$; $F2 = 2252.06$; and $F3 = 2152.81$), it reached a significance level of 1%.

Discussion

The regression coefficients of the variable BoardSZ, designating the variable size of the board of directors, were all negative, and significant at the 1% level for the three-container models. This result supports hypothesis H1 and is consistent with the stakeholder-agency theory and prior studies (Agarwala *et al.*, 2023). This finding indicates that the smaller the boards, the more effective they are. This results from the ease of coordination in the face of ESG disclosure issues that arise during the course of a company's exercise and benefit all stakeholders.

We noted a negative and significant regression coefficient of the variable BoardTp, designating the board structure, i.e. a unitary structure, a two-level structure, and the mixed structure for a company "i" for year "t." First models were: t-student = -1.66 ; $p = 0.098$; t-student = -4.30 ; $p = 0.002$. This result confirms hypothesis H2 and aligns with the agency theory and prior research (Uyar *et al.*, 2020). Indeed, this theory predicts that organizations with a two-level or mixed structure will reveal less information (Jensen & Meckling, 1976). Companies with a two-level structure and mixed structure are required to disclose less information than those with a unitary structure due to the agency problem. In other words, this postulate implies that a two-tier structure or a mixed structure contributes to the reduction of ESG information disclosure levels in the context of our study. However, not in a way that would be significant for the model of Asian companies.

The results highlight the importance of the IndepB variable's effect on the ESG disclosure of companies in the three containers. In fact, an expected sign of coefficient and significance of this variable leads to the conclusion that the percentage of independent directors significantly increases the ESG disclosure of the sample of our study, which is the ranking of scores in percentile, which considers ESG information concerning one of the environmental, societal, and governance topics and published by the company during the financial year as an ESG disclosure index (t-student = 14.45 ; $p = 0.005$) and (t-student = 41.53 ; $p = 0.000$) and (student = 24.72 ; $p = 0.000$) at the 1% significance level. This association confirms hypothesis H3 and is in line with stakeholder-agency theory and prior studies (Nicolò *et al.*, 2023). This finding confirms that more independent directors would be viewed as a mechanism for accountability that allows the board of directors to consider all stakeholders when developing ESG disclosure policies.

The results of the evaluation model confirm the hypothesis that duality in the roles of president and general manager has a negative and significant impact on ESG disclosure at a 1% significance level. This is supported by the coefficients, with t -values of -16.56 , -28.21 , and -17.25 , all with p -values of 0.000 . This relationship is consistent with hypothesis H4 and extends prior empirical evidence (Nicolò *et al.*, 2023). Consequently, consistent with stakeholder-agency theory, separating the CEO and board's chair roles is conducive to upper ESG transparency and improves accountability toward the different stakeholders.

The regression coefficients of the variable GenderDv, denoting gender diversity on the board of directors, were positive but not significant for container companies in America and Europe (t -student = 22.61 ; $p = 0.253$); (t -student = 1.22 ; $p = 0.222$). However, this variable presents a positive and significant impact at the 1% level (t -student = 21.28 ; $p = 0.000$) in Asia. This result is coherent with hypothesis H5 and extends prior ESG literature (Li *et al.*, 2019; Martínez-Ferrero *et al.*, 2021; Albertina *et al.*, 2021; Costa & Fonseca, 2022; García-Sánchez *et al.*, 2022). This discovery implies that the existence of a significant proportion of women on the board promotes the disclosure of ESG information related to one of the environmental, social, and governance topics of the companies in our study samples.

The CsrSust variable, which represents the creation of a sustainable development aspect in CSR, was positively and significantly related to ESG disclosure across all three models. The t -student values were 2.41 ($p = 0.016$), 29.89 ($p = 0.000$), and 23.67 ($p = 0.000$), all showing significance at the 1% level. This result is coherent with hypothesis H6 and extends prior ESG literature (Pucheta-Martínez & Gallego-Álvarez, 2019; Nicolò *et al.*, 2023; Nicolo' & Andrades-Peña, 2024). Accordingly, in line with stakeholder-agency theory, implementing specific sub-committees such as a CSR committee ensures the adequacy of the organization's plans and strategies for corporate social and environmental sustainability, playing an essential role in managing ESG disclosure practices.

The results interpretation in the Table 4 that concern the variable BoardComp allowed us to advance that we confirmed the hypothesis regarding this variable at a significance level of 1% and 10% for the first and the second models of ESG disclosure assessment. Indeed, values of (t -student = 1.95 ; $p = 0.051$) (t -student = 7.15 ; $p = 0.000$) allowed us to detect the implication of this postulate in improving ESG disclosure for European and American companies. This result supports hypothesis H7 and extends prior studies (Simnett *et al.*, 2009; Salehi, Bahman, *et al.*, 2018; Salehi, Hossein, *et al.*, 2018; Landi *et al.*, 2022; García-Sánchez *et al.*, 2022). Thus, in line with the agency theory, the manager has every interest in drawing up an environmental and social assessment of the company in order not to compromise the conditions for the company's future financial performance. Therefore, financial analysts are much more attentive to the disclosure of preventive measures taken by the company to limit environmental risks (Salehi, Bahman, *et al.*, 2018; Salehi, Hossein, *et al.*, 2018). The financial losses caused by these environmental risks impact the company's long-term financial performance, which penalizes the manager in terms of his long-term remuneration.

Regarding estimation results, we can emphasize that the regression coefficient relating to the EnvInnov variable, designating the CSR index, was negative and significant at the 1% level (t -student = -22.14 ; $p = 0.000$), and 10% (t -student = -1.81 ; $p = 0.071$) for the model. This result is incoherent with hypothesis H8 and rejects prior ESG literature (Cho & Paten, 2007; Bellamy *et al.*, 2020). Thus, this postulate implies that an increase in environmental innovation is worth the decrease in the disclosure index for the companies in our study sample. In other words, companies that investigate the environmental innovation aspect are more likely to have a bad quality of ESG Disclosure than companies that do not.

Conclusions and managerial implications

The integration of CSR into the company's strategy is gradually becoming a new responsibility that is necessary to meet societal challenges. A commitment to a CSR approach requires the company to adapt its management practices. It is also an opportunity for it to organize

Table 4. Regression results

Variables	Europe Coefficient	t-student	p-value	Amérique Coefficient	t-student	p-value	Asie Coefficient	t-student	p-value
Cons	231.0353	111.08	0.000***	67.9891	18.75	0.000***	42.36036	16.37	0.000***
BoardSZ	-8.68878	-90.87	0.000***	-4.331776	-21.41	0.000***	-2.101486	-14.06	0.000***
BoardTp	-0.2179736	-1.66	0.098*	-4.485371	-4.30	0.002***	-0.3885619	-0.98	0.328
IndepB	5.573021	14.45	0.005***	1.228617	41.53	0.000***	1.648707	24.72	0.000***
Duality	-0.3245701	-16.56	0.000***	-0.8765528	-28.21	0.000***	-11.05782	-17.25	0.000***
GenderDv	1.080382	22.61	0.253	0.2382556	1.22	0.222	2.815939	21.28	0.000***
CsrSust	0.7172776	2.41	0.016**	15.84368	29.89	0.000***	27.38729	23.67	0.000***
BoardComp	0.0076271	1.95	0.051*	6.52e-07	7.15	0.000***	2.23e-08	1.24	0.216
EnviInnov	-2.36e-09	-1.01	0.313	-0.3450993	-22.14	0.000***	0.0147027	1.81	0.071*
<i>F</i> (8, 2,691)	2756.01			<i>F</i> (8, 1,944) 2252.06			<i>F</i> (8, 1,384) 2152.81		
Prob > <i>F</i>	0.0000			0.0000			0.0000		
<i>R</i> ²	0.8912			0.9026			0.9256		
<i>R</i> ² adjusted	0.8909			0.9022			0.9252		

Note(s): ***: Significant at the level of 1 %; **: Significant at the level of 5 %; *: Significant at the level of 10%

Source(s): Authors' own elaboration

procedures such as the ESG report, which allows it to control its costs, better satisfy its customers, innovate, motivate employees in a new business dynamic, and improve its image with stakeholders.

The objective of our study was to investigate the impact of board characteristics and CSR in environmental, social, and governance disclosure and which governance mechanisms shape the environmental and social disclosure index, and governance. We particularly emphasized the characteristics of the board of directors, which we can summarize in size of the board of directors, board type, board independence, duality of functions, gender diversity, the aspect of sustainable development, creation of the remuneration committee, and administrative environmental innovations.

The results support the hypothesis related to the BoardSZ variable, which represents the size of the board of directors. The results highlight the importance BoardTp variable's effect. It implies that having a two-level structure or a mixed structure contributes to the reduction of the levels ESG information disclosure within the framework of our study, but in a way, this variable is not significant for the container of non-significant Asian companies.

The results highlight the importance of the effect that the IndepB variable designating the independence of advice has on ESG disclosure. Indeed, an expected and significant coefficient sign of this variable leads to the conclusion that the percentage of independent directors significantly reduces ESG disclosure. With regard to the result of the evaluation model's estimation, the results of the variable duality show that the duality of the functions of the chairman and general manager negatively and significantly affects the ESG disclosure level.

The regression coefficients of the variable GenderDv, designating gender diversity on the board of directors, were positive and significant only for Asian companies.

The CsrSust variable that designates the creation of a sustainable development aspect of CSR was positively and statistically significantly linked to the evaluation of ESG disclosure that facilitates the mitigation of the challenges faced by investigated companies.

Moreover, the regression coefficient relating to the variable EnvInnov, designating the index of environmental innovation, was negative and significant. This implies that an increase in environmental innovation is worth the decrease in the disclosure index of the companies in our study sample.

Concluding, this article has a series of managerial implications. Indeed, the outcome of this analysis enables the information user to better assess future growth opportunities in a context where corporate governance, corporate ESG disclosure, and CSR play a central role in business valuation. This work contributes to the interaction of corporate ESG and CSR practices. Our findings have implications and additional motivations for practitioners, especially CEOs and high-level corporate governance bodies. Thus, companies are encouraged to restructure their boards of directors to promote ethical behavior, including CSR practices and corporate ESG disclosure. This article's findings have implications for global regulators and policymakers. Our investigation provides the information user with a vision to better assess the company's financial performance and future growth opportunities in an environment where CSR and corporate ESG play a central role in business valuation.

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Corresponding author

Jamel Eddine Mkadmi can be contacted at: jmkadmi@yahoo.fr