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Aluchna, Maria; Roszkowska-Menkes, Maria; Khan, Sana

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REVIEW ARTICLE

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Corporate governance perspective on environmental reporting: Literature review and future research agenda

Maria Aluchna[1] | Maria Roszkowska-Menkes[2] | Sana Khan[3,4]

[1]Department of Management Theory, SGH Warsaw School of Economics, Warszawa, Poland

[2]Department of Management, Tilburg University, Tilburg, The Netherlands

[3]Business School, The Lyon Catholic University, Lyon, France

[4]Department of Marketing and Digital Business, EDES Business School, Lyon, France

Correspondence
Maria Aluchna, Department of Management Theory, SGH Warsaw School of Economics, al. Niepodległości 162 02-554 Warszawa, Poland.
Email: maria.aluchna@sgh.waw.pl

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Abstract

The last three decades have witnessed substantial growth in the literature exploring the motives and drivers of corporate greening. Extant research analyzing the governance determinants of corporate environmental disclosure provides competing and contrasting results; despite the growing sustainability challenges create an urgent need for effective monitoring and incentive mechanisms to promote corporate transparency and accountability. This warrants further inquiry in the field, yet very few comprehensive reviews have been presented on governance determinants of corporate environmental disclosure. To fill this gap we conduct a systematic review of 121 published papers and distinguish the governance mechanisms fostering corporate environmental disclosure. Our paper identifies factors influencing the adoption, extant, and quality of environmental disclosure, and provides useful future research directions.

KEYWORDS

corporate governance, environmental disclosure, external governance, internal governance, reporting

1 | INTRODUCTION

The growing institutional push towards sustainability is exerting pressure on companies to incorporate environmental considerations into their strategies. Companies that adopt an environmental stance based on the "do no significant harm" principle can facilitate this process by reporting their impact on climate, air quality, biodiversity and ecosystems, water and marine resources (Agyei & Yankey, 2019; Grauel & Gotthardt, 2016; Liu & Anbumozhi, 2009; Walker et al., 2014; Zhou et al., 2021). Environmental reporting (ER) refers to the process of communicating the environmental effects of company activity through annual reports that fulfill the expectations of the firm's stakeholders (Cormier & Magnan, 2015). Specifically, ER pertains to a company's relationship with the natural environment and includes information about actions taken by managers (Gerged, 2021) to identify environmental threats, propose solutions to mitigate these risks, and highlight the effects of environmental performance on financial results (Saida, 2009).

Given the growing concerns about the business impact on the natural environment (Lima Ribeiro & Aibar-Guzmán, 2010), how a company responds to the principles of green production and the increasing pressures on transparency (Cui et al., 2020) now plays a critical role in determining its financial performance, reputation, and growth potential. D'Amico et al. (2016) e emphasize that information on environmental performance has an impact on the costs of firm operation and that sustainable practices are valued by stakeholders. Hence, ER continues to hold a central position in the minds of organizational decision-makers, emerging as a pivotal topic in corporate governance considerations. Corporate governance (CG) relates to the "structure of rights and responsibilities among the parties with a stake in the firm" (Aoki, 2001, p. 11). With studies embedded in the control and monitoring perspective (Fama & Jensen, 1983), the existing literature distinguishes between two major types of corporate governance mechanisms: internal and external (Walsh & Seward, 1990). The former include monitoring mechanisms, such as the board of directors, shareholders, the role of financial intermediaries and stock markets, as well as the role of executive remuneration (Matten & Moon, 2008; Tricker, 2019). Furthermore, as argued by Aguilera et al. (2015), corporate governance is an increasingly complex puzzle that consists not only of internal governance practices, but also a broad spectrum of external mechanisms preventing managers from engaging in activities detrimental to stakeholders. These include the cultural system (Griffin et al., 2017), the legal and political system, the market for corporate control, external auditors, stakeholder activism, rating organizations, and the media (Aguilera et al., 2015).

Transparency constitutes the fundamental stakeholder right to information concerning a firm's activities. The role of CG, in turn, is to "ensure that executives respect the rights and interests of company stakeholders, as well as guarantee that stakeholders act responsibly with regard to the generation, protection, and distribution of wealth invested in the firm" (Aguilera et al., 2015, p. 3). CG serves as a platform for cooperation between different stakeholders involving "a set of relationships between a company's management, its board, its shareholders and other stakeholders" (OECD, 2015, p. 9). This cooperation, structured within governance mechanisms and institutions, is expected to result in a broader scope and higher quality of ER (Fernandes et al., 2019; Peters & Romi, 2014; Solikhah & Maulina, 2021).

In this paper, our aim is to analyze the associations between CG mechanisms and environmental reporting through a review of existing studies. The literature review enables the synthesis of research findings from various stakeholders, helping to "make sense of a mass of often-contradictory evidence" (Tranfield et al., 2003:207). Our motivation is the following. Firstly, we adopt the governance perspective, recognizing its substantial impact on sustainability strategy and related decision-making processes concerning disclosure and initiatives aimed at improving sustainability performance (Peng et al., 2023). Recent years have highlighted the role of specific governance mechanisms, such as board composition and practices (Cui et al., 2020; Pucheta-Martínez & López-Zamora, 2018), investor identity and investment horizon (Cheng et al., 2017; Gerged, 2021; Rupley et al., 2012), executive characteristics (Fernandes et al., 2019) and auditors, which can either stimulate or inhibit environmental disclosure. There is also a growing awareness of institutional determinants, such as legal and political systems (Antonini et al., 2021; Pan & Yao, 2021) and stakeholder pressure (D'Amico et al., 2016; Guenther et al., 2016), as factors that enhance environmental disclosure. In summary, firm-level (Cui et al., 2020; Peng et al., 2023) and country-level governance characteristics explain the presence, scope and quality of ER (Liu & Anbumozhi, 2009; Solikhah & Maulina, 2021). According to regulatory policies in the EU and US, investors and governance structures are expected to play essential roles in directing financing towards sustainable businesses (Moneva et al., 2022). Adding to the existing literature we offer a deterministic view on CG which is perceived as a structure that allows for a coordinated and planned process of introducing particular practice and leading to effective cooperation of a firm with its stakeholders and shareholders. Thus, balancing the economic and social interests of companies (Gerged, 2021) CG arrangements aim to achieve the goal of long-term sustainable value creation (Monks & Minow, 2011). Investors, represented by board directors (Pucheta-Martínez & García-Meca, 2014), decide about their investment in a particular company on the basis of its environmental performance as it implies company „future performance and position, risks and uncertainties, material items of income or expense" (Iatridis, 2013: p. 56). As the changing institutional dynamics requires additional information, CG offers strategies for best allocation of firm resources to implement and enhance ER (Cui et al., 2020; Gerged, 2021).

Secondly, we recognize the need for a literature review that integrates existing knowledge on the connections between governance and environmental reporting. Up to now, researchers have primarily examined internal and external governance determinants separately, which has resulted in the absence of a comprehensive conceptual framework (Hussain et al., 2021). Existing studies concerning the governance determinants of corporate environmental reporting lack a clear conceptual or empirical consensus, highlighting the need for further research in this field to address this deficiency. Furthermore, there is a notable scarcity of comprehensive reviews focusing on this topic. One of the most insightful exceptions is the study by Hahn and Kühnen (2013), which provides a comprehensive literature review examining the factors that influence the adoption, scope, and quality of sustainability reporting. However, while the authors reveal some evidence on both internal and external governance-related determinants for this type of disclosure, their focus is not primarily on the governance perspective itself and results of their study do not offer comprehensive understanding of the CG-ER link.

Additionally, they examine sustainability reporting as an aggregated concept, without accounting for its specific dimensions (Coelho et al., 2023; Zaman et al., 2022). Since the decision to disclose environmental information is not directly influenced by a firm's broader social and governance disclosure attitudes (Broadstock et al., 2018), there is a need to examine the determinants of environmental reporting in isolation from other dimensions of sustainability disclosure. Accordingly, we aim to add to the ongoing debate (Enciso-Alfaro & García-Sánchez, 2022; Iborra & Riera, 2022; Mio et al., 2022) and complement prior literature by conducting a systematic review of 173 published papers. In adopting the regime of the systematic literature review suggested by Aguilera et al. (2021), our analysis was conducted according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

In this study, we contribute to the existing literature in two ways. Firstly, we provide a synthesis of the current evidence regarding how CG characteristics influence decisions regarding the communication of a company's environmental impact. In other words, we explore how specific internal and external governance mechanisms can encourage environmental disclosure (Ben-Amar & McIlkenny, 2015), while also identifying structures and approaches that may hinder the enhancement of corporate transparency in this dimension (Gerged, 2021). Secondly, our literature review identifies gaps in the existing evidence regarding the links between CG and ER. Specifically, we provide guidelines for future research, calling for the following: (1) further research on governance mechanisms, considering both the mixed evidence (e.g., on board independence) and areas with limited existing research (e.g., on executive compensation); (2) multi-level studies that investigate the potential bundle effect or the interplay between company-level governance and the institutional determinants of ER; (3) the analysis of the impact of mandatory reporting legislation in the context of selected governance mechanisms. We argue that, given the increasing regulatory pressure, the literature on the CG-ER link holds significant potential for policy implications.

The remainder of this paper is organized as follows: first, we present our systematic literature review methodology. Next, we discuss our results, concluding by suggesting avenues for future studies to explore.

2 | METHODOLOGY

2.1 | Basic terminology

The study identifies the associations between environmental reporting (ER) and corporate governance (CG). Following the procedure by (Hahn & Kühnen, 2013) we started with the definitions of both concepts. ER is defined as the process of communicating the environmental performance and policies of a company and disseminating these effects to large society through the corporate annual reports (Cormier & Magnan, 2015; Fontana et al., 2015). As such, it lies in the center of CG (Iatridis, 2013), enabling a balance between shareholder interests and the broader society, contributing to greater transparency, and reducing information asymmetry (Cui et al., 2020; Gerged, 2021). ER is viewed as a tool to demonstrate company commitment to principles of sustainable development (Khizar et al., 2021) defined as an intergenerational responsibility and operationalized in the United Nations Sustainable Development Goals (SDGs) (Vinayavekhin et al., 2023). SD assumes meeting the "needs of the present without compromising the ability of future generations to meet their own needs" (Keeble, 1988: p. 41). Studies on ER include also information classified at corporate social responsibility (Jessop et al., 2019; Kim et al., 2020) defined as communication of environmental, social and governance (ESG) initiatives to stakeholders (Fahad & Nidheesh, 2020).

The relations between CG and ER are studied within various theoretical frameworks (agency theory, stakeholder theory, institutional theory, legitimacy theory) indicating different company motivations for increased transparency. According to agency theory firm level CG arrangements focus on mitigating conflicts between shareholder and stakeholders (Kilincarslan et al., 2020; Nuskiya et al., 2021; Rao et al., 2012) to maximize firm value. ER balances economic and social interests (Gerged, 2021), lowers information asymmetry (Hamrouni et al., 2021) and reduces agency costs enhancing investment by outside investors (Cui et al., 2020). Stakeholder theory focuses on the analysis of powers exerted by various stakeholder groups on firms (Huang & Kung, 2010; Pucheta-Martínez, Bel-Oms, & Olcina-Sempere, 2019). As a consequence of stakeholders' demands for greater transparency, companies are now required to include information about their impact on the natural environment (Lu & Abeysekera, 2014). Within institutional theory scholars offer explanations to why companies behave in a particular way responding to institutional pressures (de Grosbois & Fennell, 2022; Pucheta-Martínez, Gallego-Álvarez, & Bel-Oms, 2019). From an institutional perspective, companies incorporate ER into their practices and routines in response to stakeholder and regulatory pressures on transparency and accountability. Further, legitimacy theory (Antonini et al., 2021) suggests that companies engage in ER to reduce their exposure to social and political environment (Ben Ismail et al., 2021) and gain legitimacy among their constituencies (Chelli et al., 2014; Cormier & Magnan, 2004). Finally, according to signaling theory ER may be used to decrease information asymmetry and send signal to investors about firm's superior environmental performance (Shwairef et al., 2021; Wichianrak et al., 2022). Managers engage in ER to "enhance positive corporate images" (Sun et al., 2010: p. 683).

2.2 | Sample selection

Adopting PRISMA guidelines, we conducted a literature review to identify the relevant academic papers in a series of steps, as presented in Figure 1.

Firstly, we searched for articles published in peer-reviewed journals. We focused on articles written in English between 1990 and 2021 (articles published within this timeframe and early access papers). Following prior literature in sustainability (Bartolacci et al., 2020) and other fields (Pereira & Franco, 2020; Schmitz et al., 2017; Vojíř & Rusek, 2019; Zhang et al., 2017), we used the Web of Science Core Collection database, which is generally considered the most comprehensive source for scholarly work and includes only publications that demonstrate high levels of editorial rigor (Qiu & Lv, 2014; Web of Science Group, 2021), including all impact factor journals (Hahn & Kühnen, 2013). The search was limited to the Social Sciences Citation Index (SSCI) and Emerging Sources Citation Index (ESCI). SSCI allows us to identify the most influential and recognized studies within social sciences. However, given the emerging nature of the field of environmental reporting, we complemented it with ESCI and included journals that do not currently have an impact factor, but which contribute citations to the calculation of other journals' impact factors.

In order to cover the research field exhaustively, we conducted a broad search within the topic field for the following terms: "environment* disclosure*" OR "environment* report*" OR "biodiversity* disclosure*" OR "biodiversity* report*" OR "carbon* disclosure*" OR "carbon* report*" OR "climate* disclosure*" OR "climate* report*" OR "climate change* disclosure*" OR "climate change* report*" OR "energy* disclosure*" OR "energy* report*" OR "emission* report*" OR "emission* disclosure*" OR "GHG* disclosure*" OR "GHG* report*" OR "waste* disclosure*" OR "waste* report*" OR "water* disclosure*" OR "water* report*". Given that, to the best of the authors' knowledge, the literature provides no systematic literature review that would focus solely on ER, the keywords used for the search were defined following two major environmental reporting standards: Global Reporting Initiative (GRI) 300 Series Standards and the Carbon Disclosure Project (CDP). Our aim was to cover overall environmental reporting practice, as well as disclosure on specific topics related to this dimension. Our search yielded 1533 articles.

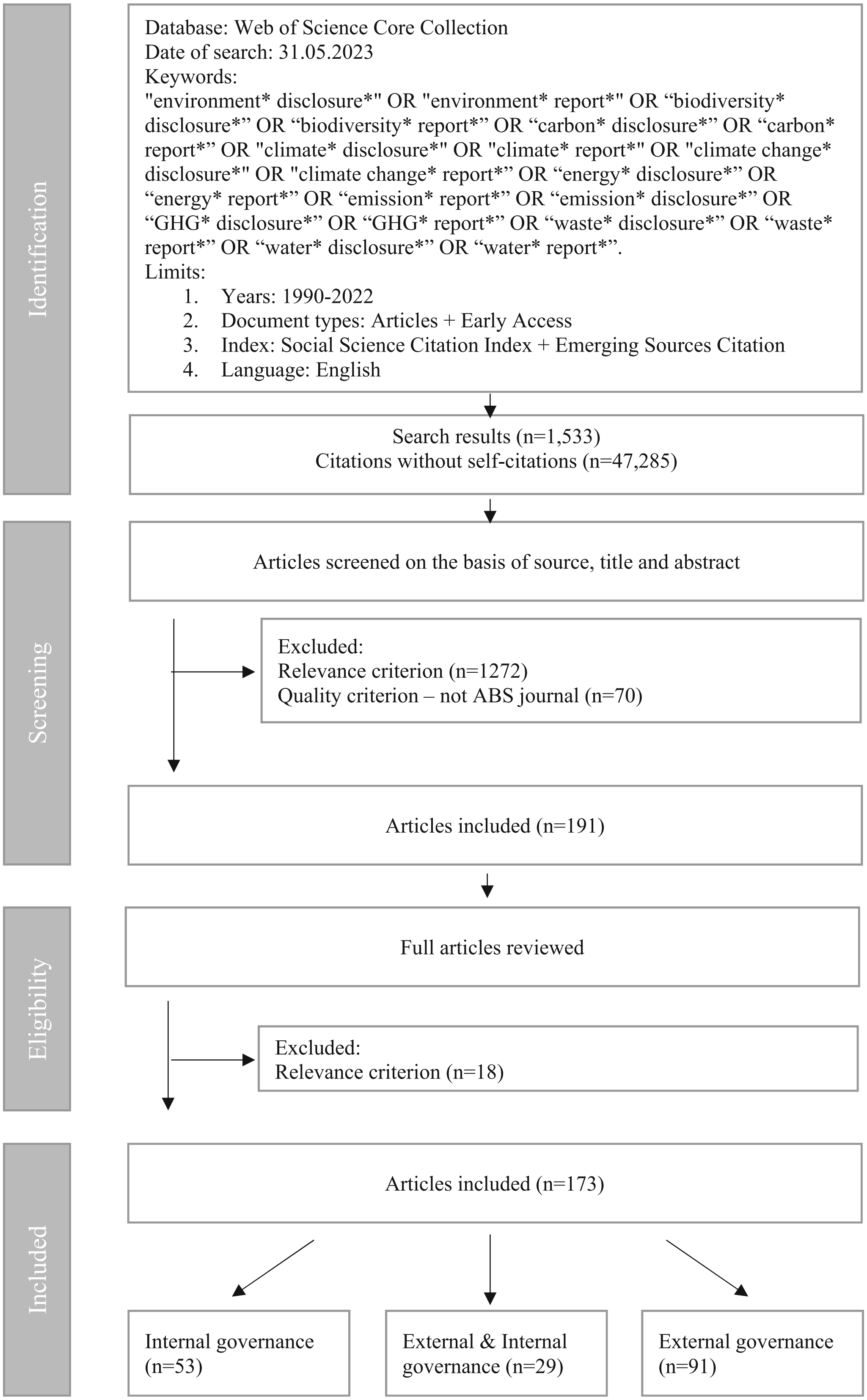

FIGURE 1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram study selection.

Secondly, we focused on screening the articles retrieved in the first step by adopting relevance and quality criteria (Thorpe et al., 2005). The title and abstracts of the articles were reviewed. If the article was found to be unrelated to the topic of this study, i.e. governance determinants of

ER at the organizational level, it was excluded from the sample (relevance criterion). We focused solely on articles on ER and excluded studies on the determinants of CSR, social and environmental and sustainability reporting. We included papers presenting separate results for the environmental dimension. Our second exclusion criterion (quality criterion) referred to the academic quality of the journal in which a particular study was published. To ensure the highest academic standards, we included only journals listed in the Chartered ABS Academic Journal Guide. While assessing the quality of the journal, we considered the year of the publications and the corresponding edition of the ranking. Thirdly, 191 articles identified in the screening were reviewed (Thorpe et al., 2005). In this process we excluded an additional 18 non-relevant articles. The sample used for the subsequent analysis included 173 papers.

The final 173 articles were coded according to a directed content analysis approach (Hsieh & Shannon, 2005), with codes predetermined on the basis of corporate governance literature. Adopting deductive reasoning for the literature review (Neuman, 2014), we use internal and external corporate governance as the two main categories. Within internal governance we distinguish the following subcategories: board of directors, ownership structure, creditors, need for capital, and stock exchange listing (Tricker, 2019). External governance encompasses: legal and political system, external auditors, stakeholder activism, rating organizations, media (Aguilera et al., 2015), and cultural system (Griffin et al., 2017). The coding was conducted independently by two of the co-authors. We achieved an inter-coder reliability score of 97%. In this process we identified 53 articles on the internal governance determinants of ER, 91 on external governance and 29 analyzing both types of governance.

Table 1 presents the exclusion criteria used for selection of the sample articles.

3 | RESULTS

3.1 | Bibliometric analysis

Our sample covers 70 different journals. While most of the articles were published in journals either in the field of (79 articles) or accounting and finance (56 articles), studies in this topic have also been breaking into the mainstream debate in management and business literature. Table 2 presents the breakdown of the sample articles by journal's field.

Only seven journals published six or more articles, and these include *Business Strategy and the Environment* (18 articles), *Journal of Cleaner Production* (15 articles), *Journal of Business Ethics* (13), *Corporate Social Responsibility and Environmental Management* (12), *Social Responsibility Journal* (9 articles), *Accounting, Auditing and Accountability Journal* (seven articles), *Meditari Accountancy Research* (six articles). The sample articles were authored by 386 individuals affiliated in 46 countries. Notably, Australia, the USA, Canada, China, England, and Spain accounted for over 65% of the publications. Interestingly, the three most prolific authors, namely Gallego-Alvarez, Gerged, and Pucheta-Martinez, each contributed only five articles. This dispersion in authorship suggests that the topic is widely explored across the academic community.

Furthermore, our analysis reveals a growing interest in studies on corporate governance drivers of environmental reporting. Figure 2 presents the frequency of sample articles by year of publication, showing that the number of articles in this topic has been increasing since 2009, with the peak reached in 2022.

Additionally, we have analyzed our sample articles using their keywords with the use of VOSviewer. Figures 3, 4 reveal that ER reporting within a corporate governance concept is centered around five main terms: environmental disclosure, performance, determinants, legitimacy and corporate social responsibility.

3.2 | Internal governance and ER

3.2.1 | Board of directors

Board size

The size of the board may have a positive impact on the board's monitoring ability as well as the company's capabilities, bringing a variety of director competences and a pool of expertise (Baalouch et al., 2019; Nuskiya et al., 2021), in addition to allowing for a more balanced approach to corporate matters. However, large boards may be less effective in their work (Fernandes et al., 2019) due to problems related to coordination, diversity of opinions and slow decision making. Following contradictory theoretical concepts which assume that smaller boards are more effective (agency theory) versus arguments that larger boards allow for better monitoring (stakeholder theory), studies on the relationship between ER and board size remain inconclusive (Shwairef et al., 2021) – some studies reported a positive correlation (Gerged, 2021; Hamrouni et al., 2022; Khaireddine et al., 2020; Kilincarslan et al., 2020; Nuskiya et al., 2021; Ofoegbu et al., 2018; Rao et al., 2012; Rupley et al., 2012; Shwairef et al., 2021; Trireksani & Djajadikerta, 2016), while others have shown the association to be negative (Sun et al., 2010) or to have no relationship (Fernandes et al., 2019).

TABLE 1 Exclusion criteria.

Criterion	Explanation
Relevance	Studies not on governance determinants of ER Studies not on the organizational level Studies on determinants of CSR/social and environmental/ sustainability reporting with no separate findings for environmental dimension
Quality	Journals not listed in the Chartered ABS Academic Journal Guide

Board independence

Despite some criticism regarding how effective their contribution is, the principle of having independent directors remains at the center of corporate governance (Yeh et al., 2011). Independent directors are believed to add to the quality of monitoring (Nuskiya et al., 2021), to represent a wider group of shareholders and to bring in an objective, more balanced and effective assessment of executives' activity (Cui et al., 2020; Khaireddine et al., 2020). The majority of studies support these assumptions and reveal positive effects, viewing independent directors as a driver for greater environmental disclosure (Cui et al., 2020; Fernandes et al., 2019; Gerged, 2021; Khaireddine et al., 2020; Nuskiya et al., 2021; Ofoegbu et al., 2018; Shwairef et al., 2021) and a higher quality of environment reporting (Rao et al., 2012; Rupley et al., 2012). Beneficial effects have also been recorded for having an independent non-executive chair (Said et al., 2013) and external or outside directors, whose presence on the board is viewed as a remedy for countering opportunistically behaving managers and dominant shareholders (Rupley et al., 2012). Nevertheless, some studies report no relation (Trireksani & Djajadikerta, 2016) or a negative relation between independent directors and ER (Baalouch et al., 2019; Hamrouni et al., 2022; Kilincarslan et al., 2020; Osemene et al., 2021).

Adding to these studies on the effects of the board, Pucheta-Martínez and López-Zamora (2018) show that institutional directors are positively associated with the degree of environmental disclosure, thus supporting the concept of the monitoring role that these directors play, along with their long-term perspective and concern for reputation. Pressure-sensitive institutional directors (recruiting from banks and insurance firms) exert a negative influence on ER, while pressure-resistant institutional directors (from mutual funds, investment funds, pension funds, VC) are found to positively influence environmental disclosure (Pucheta-Martínez & López-Zamora, 2018).

TABLE 2 The breakdown of sample articles published by field.

Field	Number of articles
Business and society	79
Accounting and finance	56
General management	18
Economics	6
Corporate governance	6
Marketing	2
Other	6
Total	173

Board diversity

Best practice indicates the necessity of greater diversity in board directors. Diversity related to gender and ethnicity is viewed as a source for enriching human capital on the board (Charumathi & Rahman, 2019). Studies on corporate governance and ER assume a positive link between the number of female directors and disclosure, which is attributed to different leadership styles, better communication, and stronger stakeholder orientation of women. Female directors are driven by different values in relation to socioenvironmental responsibility and may complement their male peers, since they "take concerted action toward another pillar of sustainability, environmental performance" (Baalouch et al., 2019, p. 956). As a result, diverse boards have a more balanced collective experience (Fernandes et al., 2019). Positive relationships between the presence of female directors and environmental disclosure are revealed in Australia (Rao et al., 2012), USA (Rupley et al., 2012), Canada (Ben-Amar et al., 2017), France (Baalouch et al., 2019; Khaireddine et al., 2020), the Asset4 companies (Carvajal et al., 2022), in a large European sample (Haque & Jones, 2020), and the Middle East and Africa (Kilincarslan et al., 2020), as well as for controlled market economies

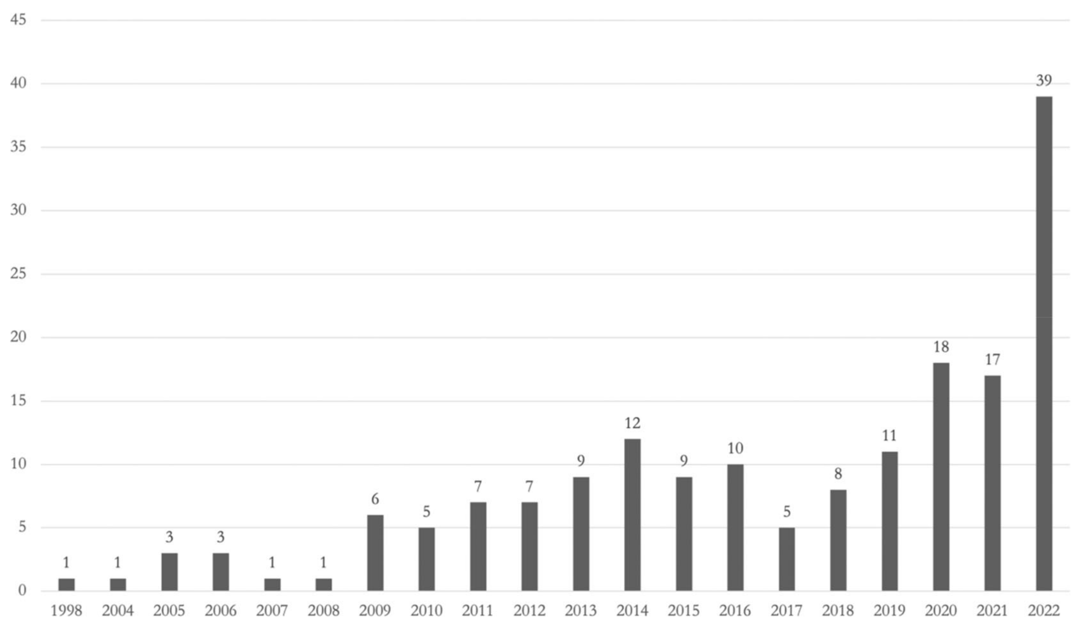

FIGURE 2 The breakdown of sample articles published by year.

(Gallego-Álvarez & Pucheta-Martínez, 2020a). In spite of this, the positive effect of board gender diversity may be negatively moderated by cultural constructs such as masculinity and uncertainty avoidance (Peng et al., 2023). Other research reveals no statistically significant relations in the case of Indonesian mining companies (Trireksani & Djajadikerta, 2016) or Brazilian firms (Fernandes et al., 2019), and a negative link in the case of France (Hamrouni et al., 2022). In addressing these inconsistent results, studies draw upon board capital theory and critical mass theory and emphasize that the positive effect of female directors is likely to be noted in the case of a meaningful number (at least more than one) of women on boards (Charumathi & Rahman, 2019; Hollindale et al., 2019).

CEO duality

CEO/Chair duality is understood as a sound governance principle, limiting the concentration of power and increasing board independence. It is found to be positively correlated with the Environmental Accounting Disclosure Index (EADI) in Chinese mining companies (Cheng et al., 2017) and environmental disclosure by companies in the Middle East and Africa (Kilincarslan et al., 2020), as well as for companies having higher ownership concentration (Gerged, 2021). In contrast to these findings, Nuskiya et al. (2021) observe a negative correlation between CEO/Chair duality and environmental disclosure, while several studies note no statistically significant effect (Fernandes et al., 2019; Rupley et al., 2012), although the effect may be dependent on the institutional context of the analyzed companies in general, and the ownership structure in particular.

Directors' age

Conceptually, younger directors are expected to show greater involvement in environmental activities. Fernandes et al. (2019) indicate an increase in ER for directors aged 60 or less, followed by a decrease in disclosure for older board members. However, Said et al. (2013), in their study on Malaysian public listed companies, find that the chair age is positively correlated with the level of environmental disclosure.

CSR and audit committees

The formation of a dedicated CSR or environmental committee within the board is perceived as a signal of a firm's engagement and dedication

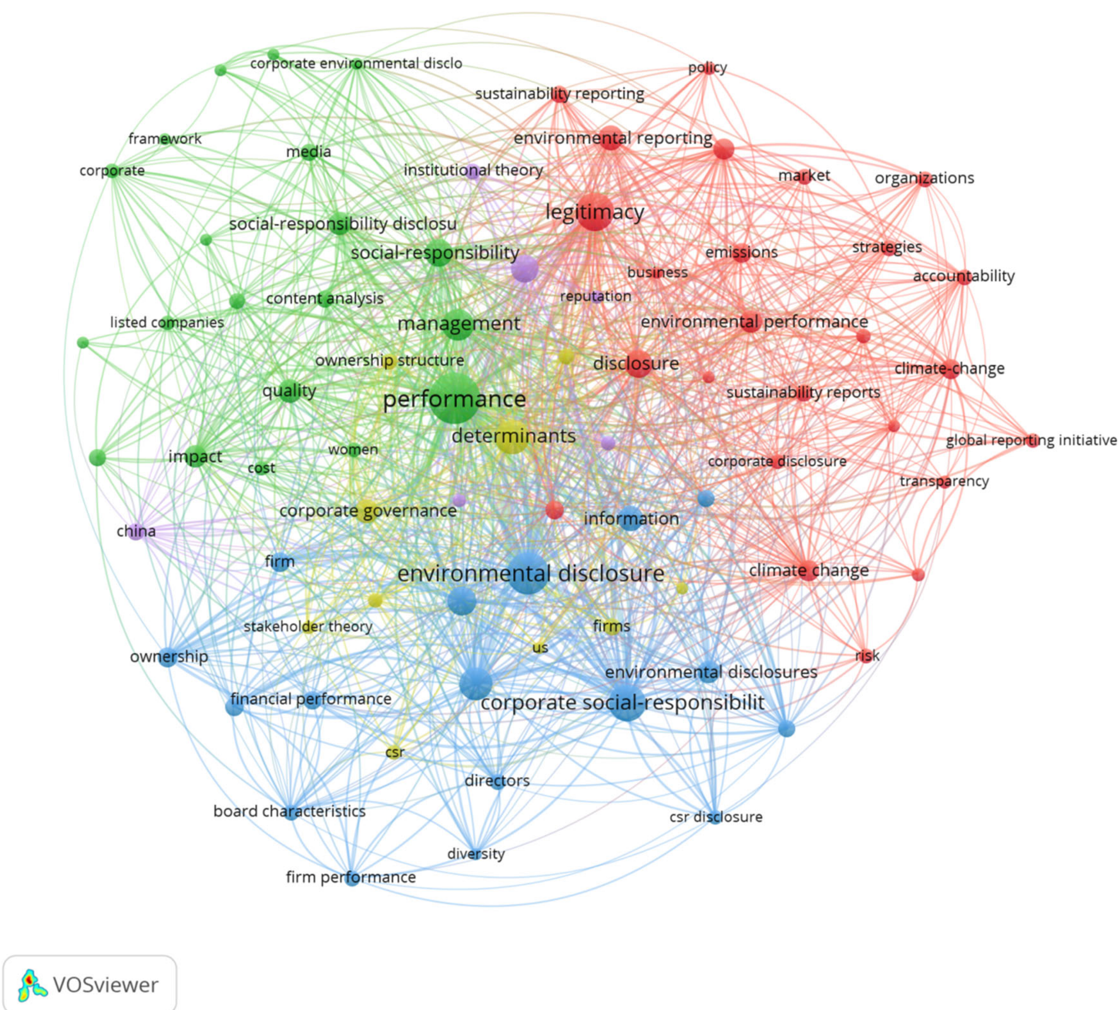

FIGURE 3 Map of keywords (VosViewer).

to bringing the topic of social responsibility or sustainability to the top decision-making levels (Peters & Romi, 2014; Shwairef et al., 2021), so that the "environmental committees facilitate ER by assisting them to comply with the rules and regulations keeping them in their social contract with the society" (Agyei & Yankey, 2019, p. 280). However, the existing evidence provides mixed results, ranging from no effect (Baalouch et al., 2019; Rupley et al., 2012) to an indirect positive link (with the mediating role of manager's strategic posture) or even a strong direct link (Cosma et al., 2022; Moalla et al., 2020; Ofoegbu et al., 2018; Shwairef et al., 2021). The presence of an environmental audit committee and CSR committee is positively associated with the timely delivery of environmental reports (Moalla et al., 2020), together with the likelihood of greenhouse gases (GHG) disclosure (Peters & Romi, 2014). To address the limitations between CG variables related to the separate analysis of board structure and composition, Gerged et al. (2022) show that the presence of an environmental committee can positively support the impact of female directors on corporate environmental disclosure.

As suggested by Al-Shaer et al. (2017), although audit committees are traditionally analyzed from the perspective of financial reporting quality, they may also serve as a tool for companies to respond to stakeholders' expectations by integrating disclosures, including non-financial disclosures, into corporate strategies. With the inclusion of environmental information, audit committee members are able to provide more effective monitoring (Trotman & Trotman, 2015). They may be able to see a broader perspective of a company's influence on the environment and society, which serves to enhance the reliability of risk assessment (Al-Shaer et al., 2017). The size of the audit committee is found to be positively associated with the extent of ER (Nurhayati et al., 2016), while its independence and activities increase the quality (but not the scope quantity) of ER (Al-Shaer et al., 2017).

Board effectiveness and activity

Since risk management and reporting fall under the board's responsibility, board effectiveness should be positively associated with a firm's

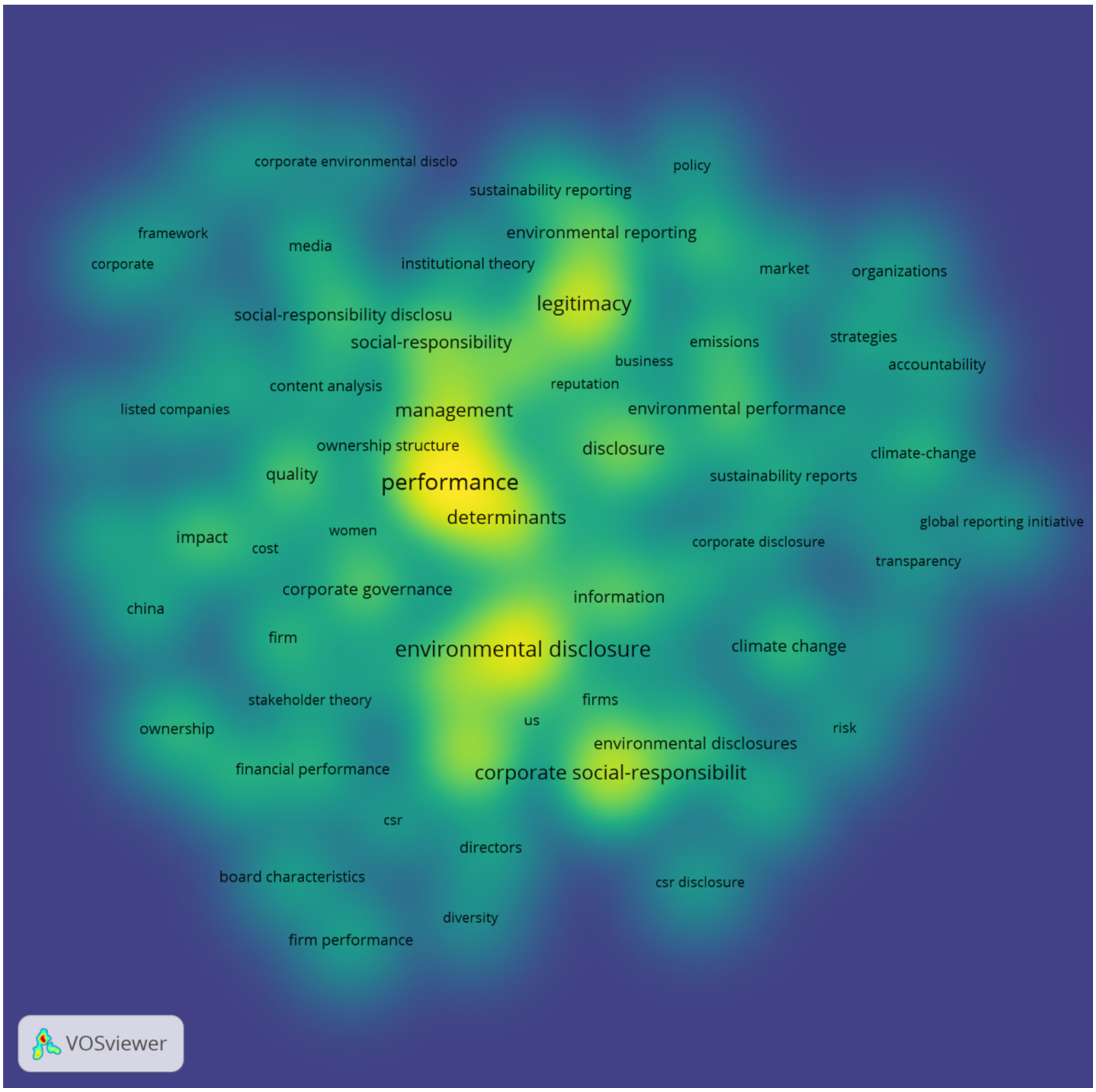

FIGURE 4 Density of keywords (VosViewer).

decision to voluntarily reports under the framework of the Carbon Disclosure Project (CDP). Board effectiveness, as measured by the Board Shareholder Confidence Index (BSCI) index, is positively associated with firms' decisions to answer the CDP questionnaire and the quality of their carbon-related disclosure (Ben-Amar & McIlkenny, 2015). With regards to board activity, more frequent meetings have a statistically significant positive relationship with corporate environmental disclosure (Khaireddine et al., 2020; Nuskiya et al., 2021).

Governance principles

The overall corporate governance quality covering key principles is expected to have a positive effect on environmental disclosure, as is supported by Solikhah and Maulina (2021) and Karim et al. (2021). Selected corporate governance characteristics (board size, meetings of the audit committee) may also have a mediating effect. Following agency theory, scholars note that earnings management has an effect on a firm's share price. To gain legitimacy and compensate for a decrease in company value, managers engaged in earnings management are expected to increase voluntary environmental disclosures, particularly in responding to the expectations of social and political stakeholders (Sun et al., 2010).

3.2.2 | Ownership structure

Ownership concentration

Ownership concentration is assumed to lower the scope of environmental disclosure (Burritt et al., 2016; Huang & Kung, 2010; Liu & Anbumozhi, 2009), due to the dominant shareholder preferences for private information. The empirical evidence in this field remains mixed, however, with evidence of a negative relationship between ownership concentration and ER in Taiwan (Huang & Kung, 2010) and Jordan (Gerged, 2021). Media exposure (Ananzeh, Bugshan, & Amayreh, 2023) and corporate political connections (Ananzeh, Al Shbail, et al., 2023) offset the negative effects of concentrated ownership. Consequently, companies with dispersed ownership are expected to be more sensitive to external pressure (D'Amico et al., 2016) and increase the level of voluntary ER (Brammer & Pavelin, 2006) driven by greater shareholder demand for a broader range of environmental information (Huang & Kung, 2010). However, contrasting evidence of a negative link between dispersed ownership and ER has been reported in Italy (D'Amico et al., 2016). Similarly, Qosasi et al. (2022), drawing on stewardship theory, find that firms with concentrated and family ownership tend to disclose more carbon-related information. The recent analysis by Shwairef et al. (2021) indicates neither direct nor indirect effects, suggesting that ownership concentration does not influence managers' posture towards environmental disclosure.

Shareholder identity

Conceptually, institutional investors are expected to enhance ER, improving scrutiny through their holdings (Stanny & Ely, 2008), particularly in using information concerning a firm's environmental performance as an investment criterion and a tool for mitigating potential reputational risks. However, empirical studies do not support this assumption. The lack of an effect arising from institutional investors may be attributed to their low holdings (Stanny & Ely, 2008) or may result from the presence of a majority of institutional investors who can easily access any internal information they require and limit manager autonomy (Rao et al., 2012). In addition, limited transparency may be in the interest of institutional investors as they intend to attract additional capital to the company. While Rupley et al. (2012) find no effect for either short-horizon or long-horizon institutional investors on three different measures of voluntary disclosure, they reveal a positive impact of institutional investors when dealing with negative media coverage, arguing that institutional investors exert influence over managerial decisions in light of negative environmental publicity. Contradicting conceptual assumptions, Gerged (2021) identifies a negative relationship between institutional ownership and corporate environmental disclosure for companies in Jordan.

The literature also provides growing evidence on the role of the state as a promoter of corporate transparency. The state is perceived as a shareholder that is more likely to balance financial and non-financial goals, thus potentially also being interested in environmental disclosure (Yeh et al. 2011). The positive association between governmental ownership and environmental disclosure is found in Italian (Fontana et al., 2015), Chinese (Yeh et al. 2011) and international (Wicaksono & Setiawan, 2022) samples of companies from environmentally sensitive industries. State ownership also serves as a characteristic that moderates company behavior. For instance, Cheng et al. (2017) find that while corporate political connection can lead to more environmental disclosure, it masks political rent-seeking in the guise of environmental protection, with this effect particularly prevalent in state-owned enterprises in the eastern and western parts of China. In this line of research, Dong et al. (2021) show that state ownership concentration and state links to dominant shareholders negatively impact the quality of disclosures for financial sector companies.

3.2.3 | Financial market governance of ER

Creditors

Financial leverage has been traditionally listed among the control mechanisms that place constraints on managers and stimulate creditors to discipline managers (Fahad & Nidheesh, 2020). In line with the dominant corporate governance perspective, creditors are assumed to have a positive effect on environmental disclosure (Kouloukoui et al., 2019). Studies investigating the relationship between indebtedness and ER remain limited but the existing ones deliver inconclusive results, ranging from a positive relationship (Déjean & Martinez, 2009; Fahad & Nidheesh, 2020; Huang & Kung, 2010) to no significant link (Chaklader & Gulati, 2015; Freedman & Jaggi, 2005; Kouloukoui et al., 2019; Liu & Anbumozhi, 2009; Luo et al., 2013; Neu et al., 1998).

In particular, the positive results observed in a sample of Taiwanese companies are explained by creditors' growing demands for more information about firms which face high financial risks (Huang & Kung, 2010). Nevertheless, no link is observed by Liu and

Anbumozhi (2009) in China or by Nurhayati et al. (2016) in India, suggesting that creditors do not exert significant power on companies in the area of non-financial reporting. Credit institutions are still more interested in the financial returns of listed companies than in environmental risks related to their business operations (Liu & Anbumozhi, 2009; Walker et al., 2014). However, the attitude of creditors has been gradually shifting in recent years due to the Green Credit Policy implemented by some of the Chinese banks, encouraging companies with lower leverage (i.e., with higher demand for credit) to proactively disclose environmental information (Lu & Abeysekera, 2014). On the other hand, as found by Luo et al. (2013), companies releasing Carbon Disclosure Project (CDP) reports characterized with higher leverage are less likely to disclose environmental information and they are more sensitive to carbon-prevention expenditures.

Stock market listing

Listing on a stock market is a company attribute suggesting exposure to public scrutiny and governance by external investors. Listed firms are subject to a set of standards and requirements related to the level and quality of disclosure (Monteiro & Aibar-Guzmán, 2010). Thus, quotation on a stock exchange is expected to have a positive effect on ER, both in terms of scope and quality (D'Amico et al., 2016; Dong et al., 2022). Again, in this research stream the results remain inconclusive. Some studies support the assumption of a positive effect – for instance, those undertaken by Monteiro and Aibar-Guzmán (2010), Kılıç and Kuzey (2019) and Haddock (2005). Yet, research conducted on Greek (Galani et al., 2012) and Chinese (Lu & Abeysekera, 2014) companies do not support this claim. Also, Alberici and Querci (2016) investigate environmental disclosure according to the Global Reporting Initiative's data by financial intermediaries (FIs), and they show that listing on a stock market is not significant for environmental disclosure. D'Amico et al. (2016) even find a negative relationship between stock market listing and environmental disclosure in Italy. Furthermore, high trading volumes are linked to lower levels of disclosure, yet this link turns out to be less negative in the case of poorly performing firms, suggesting that "the benefits of disclosure are higher because of the demand for the sensitive information" (Tadros & Magnan, 2019, p. 64). The summary of internal governance determinants of environmental disclosure is presented in Table 3.

3.3 | External governance mechanisms

3.3.1 | Legal and political system

Country governance

Strong country-level governance, including effective protection of property rights, an independent judiciary, effective monitoring (Pan & Yao, 2021), rule of law, law enforcement (Gallego-Álvarez & Pucheta-Martínez, 2020b; Tian et al., 2016), regulatory quality (Boura et al., 2020), civil and political liberties, and absence of corruption (Boura et al., 2020; Kolk & Fortanier, 2013) is one of the crucial elements of a country's environmental governance (Kolk & Fortanier, 2013). The literature provides empirical evidence that ER is positively affected by strong national-level institutions (Gallego-Álvarez & Pucheta-Martínez, 2020b), supporting the mirror effect hypothesis (Pinheiro et al., 2022). In such legal systems companies are more dependent on external financing, and thus more inclined to act in accordance with prescribed social dictates and disclose more environmental information to secure their legitimacy. In contrast, in countries like China, authoritarian state-society relations, a decentralized bureaucratic environment, weak monitoring and poor law enforcement can largely undermine the effectiveness of any transparency initiatives (Tan, 2014). In the absence of public pressure and competing interests between different stakeholders, companies are ultimately responsible to the government, which may diminish the reliability of ER (Situ et al., 2020; Situ & Seet, 2021). In a similar vein, Gerged, Beddewela, Cowton, and Christopher Cowton (2021) find that citizens' freedoms and governance effectiveness (as measured by the World Bank in World Governance Index) promote high levels of climate disclosure.

Political agenda

The political agenda (whether focused more on sustainability or GDP growth) is another formal institutional governance determinant of ER (Pan et al., 2020). The study on CDP Global 500 companies identifies governmental and social pressure as the most important driving force for climate change disclosure (Luo et al., 2012). De Villiers and van Staden (2006) show its impact on trends in reporting by South African companies between 1994 and 1999. The election of a pro-environmental and anti-capitalistic government in 1994 forced companies to increase environmental disclosure to gain legitimacy. This increase was observed not only within general disclosures but also specific ones. The former serves as a signal of a company's concern for the environment, while the latter provides information regarding the actual environmental impact and progress in its reduction. Specific disclosures include items described in quantitative terms or information on performance measured against previously set objectives. When the governing party's agenda shifted from environmental issues towards job creation and more capitalist ideals before the next elections in 1999, companies could move to the regime of maintaining legitimacy. They decreased the overall level of reporting, withholding from specific disclosures, while maintaining some minimum level of general disclosures. A more recent study on American companies reveal that Donald Trump's anti-environmental political agenda significantly reduced the willingness to disclose environmental information among companies headquartered in the US that had strongly supported Trump in the 2016 elections (Antonini et al., 2021).

In a similar vein, other studies show that companies from countries that ratified the Kyoto Protocol (Freedman & Jaggi, 2005) and from countries which score higher on the Environmental Performance Index (Caby et al., 2020) have higher levels of environmental disclosure. A recent study on the Chinese central government's effort to shift the economy towards sustainability reveals that the state can influence corporate ER through its various roles, including regulating,

TABLE 3 Internal governance and environmental disclosure—summary.

Determinant	Association	Studies
Board of directors		
Size	Positive	Gerged (2021); Hamrouni et al. (2022); Rao et al. (2012); Khaireddine et al. (2020); Kilincarslan et al. (2020); Nuskiya et al. (2021); Ofoegbu et al. (2018); Rupley et al. (2012); Shwairef et al. (2021); Trireksani and Djajadikerta (2016)
	Negative	Sun et al. (2010)
	Insignificant	Fernandes et al. (2019)
Independent directors	Positive	Fernandes et al. (2019); Gerged (2021); Kathy Rao et al. (2012); Khaireddine et al. (2020); Nuskiya et al. (2021); Ofoegbu et al. (2018); Rupley et al. (2012); Shwairef et al. (2021)
	Negative	Baalouch et al. (2019); Kilincarslan et al. (2020); Shwairef et al. (2021); Osemene et al. (2021)
	Insignificant	Trireksani and Djajadikerta (2016)
Independent chair	Positive	Said et al. (2013)
Outside directors	Positive	Rupley et al. (2012)
Directors representing institutional investors	Positive for pressure-resistant directors Negative for pressure-sensitive directors	Pucheta-Martínez and López-Zamora (2018)
Gender diversity	Positive	Baalouch et al. (2019); Kathy Rao et al. (2012); Khaireddine et al. (2020); Kilincarslan et al. (2020); Rupley et al. (2012) Carvajal et al. (2022); Fabrício et al. (2022); Gallego-Álvarez and Pucheta-Martínez (2020a), Haque and Jones (2020); Kirst et al. (2021)
	Positive for critical mass	Charumathi and Rahman (2019), Hollindale et al. (2019)
	Negative	Hamrouni et al. (2022)
	Insignificant	Trireksani and Djajadikerta (2016)
Separation of CEO/Chair	Positive	Nuskiya et al. (2021)
	Negative in the context of concentrated ownership	Gerged (2021)
	Insignificant	Fernandes et al. (2019); Rupley et al. (2012)
CSR or environmental committee	Positive	Cosma et al. (2022); Moalla et al. (2020); Ofoegbu et al. (2018); Shwairef et al. (2021)
	Positive with CSO	Peters and Romi (2014)
	Positive for committee and CSO expertise	Peters and Romi (2014)
	Negative for committee size	Peters and Romi (2014)
	Insignificant	Baalouch et al. (2019); Rupley et al. (2012)
Audit committee	Positive for committee size	Nurhayati et al. (2016)
	Positive for committee independence, activity and financial expertise	Al-Shaer et al. (2017); Sun et al. (2010)
Board effectiveness	Positive	Ben-Amar and McIlkenny (2015)
Board activity	Positive	Khaireddine et al. (2020); Nuskiya et al. (2021)
Ownership structure		
Ownership concentration	Positive	Burritt et al. (2016)
	Negative	Gerged (2021)
	Insignificant	Liu and Anbumozhi (2009); Nurhayati et al. (2016); Shwairef et al. (2021)
Ownership dispersion	Positive	Brammer and Pavelin (2006); Huang and Kung (2010)
	Insignificant	D'Amico et al. (2016)
Institutional investors	Negative	Gerged (2021)
	Insignificant	Stanny and Ely (2008), Rao et al. (2012), Rupley et al. (2012)
		Kim et al. (2020)

TABLE 3 (Continued)

Determinant	Association	Studies
	Negative for Republican-oriented institutional investors	
State	Positive	Cheng et al. (2017); Fontana et al. (2015); Wicaksono and Setiawan (2022); Yeh et al. (2011)
Foreign investors	Positive	Fahad and Nidheesh (2020); Gerged (2021); Wicaksono and Setiawan (2022)
Managerial ownership	Negative in the case of need for refinancing	Ji et al. (2020)
Promoter ownership	Negative	Fahad and Nidheesh (2020)
Financial leverage and capital need		
Creditor/financial leverage/need for capital	Positive	Déjean and Martinez (2009); Fahad and Nidheesh (2020); Huang and Kung (2010); Iatridis (2013)
	Insignificant	Chaklader and Gulati (2015); Déjean and Martinez (2009); Freedman and Jaggi (2005); Kouloukoui et al. (2019); Liu and Anbumozhi (2009); Luo et al. (2013); Neu et al. (1998); Wicaksono and Setiawan (2022)
Cost of capital	Negative to a turning point, then positive	Gerged, Beddewela, Cowton, and Christopher Cowton (2021)
Stock market listing		
Stock market listing	Positive	Kılıç and Kuzey (2019); Dong et al. (2022); Haddock (2005); Monteiro and Aibar-Guzmán (2010)
	Negative	D'Amico et al. (2016)
	Insignificant	Alberici and Querci (2016); Galani et al. (2012); Lu and Abeysekera (2014)

shareholding and incentivizing (Situ et al., 2020). Among these three roles, incentivizing in the form of environmental grants is found to be the most effective in facilitating comprehensive environmental disclosure (see also the study on environmental disclosure subsidies by Khosroshahi et al., 2021). Regulation in the form of non-binding disclosure guidelines and state-ownership have positive effects but only on a company's decision to report and not on the level of disclosure. The results suggest that, at least in this specific institutional environment, despite the evident political agenda towards sustainability, governmental regulation and shareholding influences trigger merely symbolic corporate actions. Moreover, the positive effect of a pro-environmental agenda may be undermined by tensions between central and local government agencies (Qian et al., 2022).

Legal origins

Researchers emphasize that it is not only the strength of law that explains ER practices, but also the type of the legal framework. Legal systems influence institutional constraints and the stakeholder pressures that companies face. On the one hand, some empirical evidence suggests that companies from common law countries characterized by a high level of investor protection are more likely to engage in ER (Ben-Amar & Chelli, 2018; Grauel & Gotthardt, 2016). Comparison of ER practices in coordinated market economies (CMEs) that tend to have a civil law tradition and liberal market economies (LMEs) provides similar findings. Since CME countries have more social and environmental regulations, companies domiciled there are better in the adoption of minimum standards and disclose less environmental information (Pucheta-Martínez, Gallego-Álvarez, & Bel-Oms, 2019).

On the other hand, civil law countries (and coordinated market economies—CMEs that tend to have civil law tradition) are considered to be more stakeholder-oriented than their common law (and liberal market economies—LMEs) peers, and hence promote higher levels of environmental disclosure among companies (Alberici & Querci, 2016; Gallego-Álvarez & Pucheta-Martínez, 2020a). This may result from legislation focused on stakeholder protection widely implemented in civil law countries, with continental European countries at the forefront (Gallego-Alvarez et al., 2017; Saida, 2009).

Regulatory pressure

Regulatory pressure, including environmental legislation, was found to increase firms' propensity to disclose environmental information (Agyei & Yankey, 2019; Grauel & Gotthardt, 2016; Liu & Anbumozhi, 2009; Walker et al., 2014; Zhou et al., 2021). Disclosure helps companies build good relationships with the government to avoid fines and penalties, as well as to influence future legislation. The introduction of mandatory requirements for CSR in India led to an increase in the quantity (with quality lagging behind) of environmental disclosures (Jessop et al., 2019). Content analysis of environmental reports from French companies reveals that environmental legislation remains a determining factor of this practice (Albertini, 2014). Furthermore, stringent climate-related regulations promote higher quality disclosure and discourage companies from indulging in greenwashing practices (Mateo-Márquez et al., 2022).

In spite of this, Delgado-Márquez et al. (2017) provide some contrasting evidence on the impact of regulatory pressures on ER. The authors show that companies in highly regulated industries disclose less environmental information than unregulated firms. The latter need to cope with a larger group of various stakeholders. As they face higher competitive incentives than regulated firms, they need to undertake greater efforts in building legitimacy, and one way to do this is through reporting. Once the level of regulation in an industry rises, stakeholders benefit from governmentally mandated corporate actions and stakeholder pressure towards companies declines.

Home country versus host country legal system

A growing body of research is investigating the determinants of ER among multinational companies, providing insight into whether they are more influenced by their home or host country governance mechanism. An analysis of companies in Brazil and a comparison of disclosure practices between those with domestic capital versus American capital reveal that due to more stringent environmental regulations and requirements foreign equity-controlled companies provide more information on environmental performance than their Brazilian counterparts (Kouloukoui et al., 2019). Similar conclusions can be drawn from an exploration of emissions disclosure practices of the automotive industry in Turkey (Hoştut & Deren van het Hof, 2020). At the same time, the relationship between the home country rule of law and environmental disclosure seems to be the reverse opposite for global companies originating from countries with low levels of national governance. In order to overcome the so-called liability of origins, multinational corporations (MNCs) from weak institutional contexts seek to attain legitimacy through good environmental performance, as well as from transparent corporate disclosure in this area (Ellimäki et al., 2021).

In contrast, evidence delivered by Kolk and Fortanier (2013) show a significantly negative relationship between the degree (not dispersion) of internationalization and environmental disclosure. This negative relationship is only partly mitigated by environmental governance and institutional quality in home and host countries. An alternative explanation suggests that the extent to which the local institutional environment influences MNC reporting practices is determined by the organizational strategy. While global MNCs are less likely to be influenced by host country pressures and tend to standardize their reporting at the corporate level, firms adopting a multidomestic or transnational strategy can take advantage of countries with lax environmental regulatory requirements and disclose information of lower quality (Comyns, 2018).

Voluntary vs mandatory ER

Finally, the question of the effectiveness of voluntary and mandatory frameworks in both promoting and regulating ER has been extensively explored in the literature. Two streams of research have evolved from these explorations. The first provides support to calls for mandatory ER (Chelli et al., 2014), emphasizing that reporting left solely to managerial discretion lacks comparability across companies (Dagiliene et al., 2020) and can be easily used opportunistically as greenwashing (Kim & Lyon, 2011) or impression management (Fialho et al., 2020) tool. As the evidence from the private and public sector reveals, coercive pressures were found to be more effective in encouraging ER than voluntary initiatives on environmental disclosure, such as GRI (Barbu et al., 2014; Lodhia et al., 2012). Moreover, some scholars argue that voluntary reporting frameworks have failed to increase the credibility and usefulness of environmental disclosures (D'Amico et al., 2016; Leong et al., 2014; Moseñe et al., 2013). In contrast, a number of empirical studies show that the introduction of mandatory ER has a positive and lasting influence on both the quantity (Barbu et al., 2022; Fontana et al., 2015; Frost, 2007; Monteiro & Aibar-Guzmán, 2010; Perera et al., 2019), as well as the quality of environmental disclosures (Chelli et al., 2014; Fatima et al., 2015; Frost, 2007; Yang et al., 2021). Cowan and Gadenne (2005) find that voluntary sections of the annual report of Australian listed companies are less balanced (i.e. they disclose higher levels of positive environmental information) than the statutory sections in the same document. This positive effect of mandatory reporting holds even in the absence of penalties for non-compliance, which is consistent with the institutional view of legitimacy, whereby managers comply with the law to meet the social expectations expressed in it and to ensure organizational legitimacy (Chelli et al., 2014).

The second stream of research delivers less optimistic results on the effectiveness of mandatory reporting in increasing corporate environmental transparency. It shows that neither the threat of respective regulation (Stanny, 2013) nor actual regulation in place translate into a higher quantity and quality of ER. Vormedal and Ruud (2009) find that in the absence of sufficient monitoring and enforcement only 10% of Norwegian companies comply with the compulsory requirements on ER. Similarly, Peters and Romi (2013) analyze adherence to the U.S. Securities and Exchange Commission's (SEC's) mandated disclosures of environmental sanctions. The authors find a continued 72% non-compliance rate for the period of 1996–2005. What is interesting is that the compliance rate after the implementation of the Sarbanes–Oxley Act (SOX) in 2002 is significantly lower than prior to the Act.[1] Furthermore, the evidence from Portugal, China and Italy shows that the introduction of ER requirements did not lead to any significant increase in corporate transparency (Ji et al., 2020; Lima Ribeiro & Aibar-Guzmán, 2010; Wang & Bernell, 2013), especially in the provision of hard, objective data (Papa et al., 2022). A similar conclusion may be drawn from the study by Ahmad and Mohamad (2014), who find that environmental disclosures of Malaysian public construction companies produced under the stock exchange mandatory reporting regime are incomplete and largely limited to a general narrative and non-verifiable statements.

Other authors reveal that the adoption of voluntary reporting standards by companies increases the transparency, credibility and comparability of environmental disclosure. Research shows that the use of GRI (Ben Ismail et al., 2021; de Grosbois & Fennell, 2022) and CDP (de Grosbois & Fennell, 2022) is positively associated with the disclosure of lifecycle assessment information related to climate change. Similar conclusions can be drawn from a recent study on a Thai sample of firms, but only with respect to specific industries,

[1]Section 302 of SOX introduces personal accountability of signing officers for the accuracy of all financial reports. It requires that the principal executive and financial officers of a company certify to their knowledge that the disclosures do not omit material facts.

i.e. the agriculture and food sector (Wichianrak et al., 2022). Additionally, some argue that mandatory reporting regulations might be counterproductive (Fallan & Fallan, 2009). If the legal reporting requirements are lower than the levels of information already provided by companies on a voluntary basis, as was true in the case of the Norwegian Accounts Act implemented in 1999, they might legitimize firms in lowering the amount of voluntary environmental disclosure. The evidence from the UK market, where mandatory GHG disclosure was introduced in 2013, suggests that companies associated with higher levels of GHG risk tend to be better disclosers on GHG emissions, which results in an increase in the cost of capital for all disclosing companies (Gerged, Matthews, & Elheddad, 2021). The authors argue that for a mandatory ER regime to work, that is to "maximise the interests of both corporations and societies simultaneously" (p. 928), policy makers should focus on designing regulation in a way that reflects GHG risks and fairly matches the quality of disclosure with performance.

3.3.2 | External auditors

The influence of external auditors on ER is attracting growing attention in the literature, though the current evidence provides somewhat mixed results. In general, environmental audits are expected to promote higher levels of ER (Saha et al., 2021). However, contrary to their predictions, D'Amico et al. (2016) observed a negative relationship between an audit by one of the Big 4 firms and voluntary ER by Italian listed companies. The authors expected that since large auditors have many customers, they are in a position to exert pressure on their clients to disclose more information, and that they tend to transfer best practices among the certified firms. Contradictory evidence is reported by Iatridis (2013) and Hassan et al. (2020), who show a positive relationship between the presence of a Big 4 auditor and the quality of environmental disclosure.

The literature also lacks empirical consensus in regard to the role of third-party assurance in ER. Once the company decides to provide information on its environmental performance, external assurance of this disclosure increases its scope (Dutta & Dutta, 2021), reliability and accuracy (Braam et al., 2016; Du & Wu, 2019). This is specifically true of content-focused (in contrast to process-focused) verification (Darnall et al., 2022). Others, however, demonstrate the ineffectiveness of external assurance in ensuring the disclosure quality (Talbot & Barbat, 2020; Talbot & Boiral, 2018). ER with third-party assurance has no greater influence on shareholder value than non-assured reporting (Nishitani et al., 2020). This suggests that sustainability assurance is still viewed more as a tool for enhancing legitimacy than demonstrating financial accountability. Once again, the inconsistency in the existing literature may stem from a more complex relationship between reporting and assurance. For instance, the positive role of assurance in fostering high-quality reporting may be dependent on the quality of the assurance service provided, and this may be related to the size of the assurance company. While evidence from French companies (a positive relationship between the size of the assurer and the scope of ER) provided by Moalla et al. (2020) support this argument, the findings of Dutta and Dutta (2021) seem to contradict these results.

3.3.3 | The media

The media belongs to some of the most extensively explored components of informal institutional governance system that influence ER. Research shows that organizations enhance legitimacy by increasing their disclosure on environmental issues covered by media (Neu et al., 1998; Pollach, 2014). Furthermore, there is strong consensus in the literature that, in line with legitimacy theory, increased pressure from the media, including social media (Fan et al., 2020), triggers higher levels (Agyei & Yankey, 2019; Azizul Islam & Aminul Islam, 2011; Cormier & Magnan, 2004; Dawkins & Fraas, 2011a; 2011b) but also better quality (Rupley et al., 2012; Solikhah & Maulina, 2021) of disclosure on environmental issues. Firms with lower legitimacy, as measured by negative media coverage (Guenther et al., 2016), try to change the public perception of themselves (Haddock, 2005; Rupley et al., 2012) or defend their reasons for poor environmental performance (Elijido-Ten, 2011; Elijido-Ten et al., 2010) through voluntary disclosures.

In contrast to the above evidence, Burritt et al. (2016) find no statistically significant relationship between media exposure and water-related disclosure among Japanese companies. A study by Dawkins and Fraas (2011a) provides some explanation for these surprising results. The authors show that it is not the general visibility in the media, but the visibility in relation to specific environmental issues that encourages companies to report more and better. General visibility, however, moderates the positive relationship between environmental performance and disclosure. That is, companies exposed to greater media attention are more willing to boast about their good performance. On the other hand, negative media coverage mediates the relationship between institutional shareholders and environmental disclosure. Evidence provided by Rupley et al. (2012) shows that institutional investors (no matter their investment horizon) encourage managers to report on environmental issues only when the firm faces adverse environmental publicity.

Nevertheless, a firm's reaction to criticism in the media is largely determined by its institutional environment. In a situation of conflicting interests, a company aims at legitimizing itself in the eyes of those most crucial stakeholders (government, financial stakeholders) and may disregard less relevant constituencies. Environmentally sensitive industries serve as an example of such an environment, with visible conflicts of interest between environmentalists and financial stakeholders. Analyzing the environmental disclosure of publicly-traded Canadian companies operating in environmentally-sensitive sectors, Neu et al. (1998) find that media coverage about environmental fines levied against a firm (used as a proxy of regulatory challenges) is associated with increased disclosure. At the same time, media coverage of environmentalists' criticisms are associated with decreased disclosure.

3.3.4 | Stakeholder activism

Researchers investigating the determinants of ER often point to civil society organizations as another source of institutional pressure on corporate accountability and transparency. A lack of activity from pressure groups not only has a negative effect on voluntary environmental disclosure (Rimmel & Jonäll, 2013; Vinnari & Laine, 2013), but also reduces the effectiveness of mandatory reporting legislation (Vormedal & Ruud, 2009). In contrast, criticism and pressure from powerful (Deegan & Blomquist, 2006) and legitimate (Thijssens et al., 2015) non-governmental organizations (NGO) can encourage companies to improve their environmental transparency. Liesen et al. (2015) show that companies targeted by NGOs in negative press releases are more likely to disclose GHG emissions. However, in line with the legitimacy argument, stakeholder pressures have little impact on the completeness of such disclosures.

Slightly different conclusions can be drawn from the economic model of greenwashing proposed by Lyon and Maxwell (2011). The authors predict that the threat of an environmental and social audit by NGOs is more likely to induce full disclosure if the firm's operations are likely to have environmentally damaging impacts, and if the firm is relatively well informed about these impacts. Empirical evidence provided by Marquis et al. (2016) positively validate this model. More specifically, the authors find that activism within civil society and public access to information have an inhibiting effect on greenwashing among companies with the poorest environmental performance. However, at the same time, the threat of action from environmental and social activists for providing inaccurate disclosures may cause firms who are good performers, yet not fully informed about how they will be perceived, to cease reporting entirely (Lyon & Maxwell, 2011). Additionally, Sinclair-Desgagné and Gozlan (2003) argue that the quality of environmental disclosure depends on the activist organization's prior attitude towards the company. A “worried” stakeholder, that is one that needs to be convinced to approve a company's activities, will encourage disclosure of higher quality.

Comparable attention has been paid to customer and employee activism. For instance, Guenther et al. (2016) and Huang and Kung (2010) reveal a positive relationship between environmental disclosure and the relevance of employees and customers. The evidence from Australia suggests that, in the absence of customer demand, firms withhold environmental information (Sutantoputra, 2022). Alignment with consumer pressure is among elements that distinguish disclosure leaders from laggards in the Canadian petroleum industry. The leaders are the companies that operate in both upstream and downstream markets, and as such are exposed to retail consumer demands (Herremans et al., 2009). Such demands, however, are largely dependent on the level of economic development. Walker et al. (2014), who find a negative association between external market stakeholder pressure and ER among Chinese companies, suggest that these groups of constituencies are price-driven and exert pressure more on cost cutting than long-term investment in environmentally friendly solutions. In developing economies, citizens/customers are more concerned about their material needs (Alberici & Querci, 2016) and less aware of environmental issues (Pucheta-Martínez, Gallego-Álvarez, & Bel-Oms, 2019). And even if the pressure is exerted, by for example foreign customers/clients, due to resource constraints companies from developing countries are not able to address their expectations on transparency (Luo et al., 2013).

Additionally, stakeholder activism is believed to be more profound towards multinational companies due to their size and impact. A firm's international position, and its resulting exposure to global scrutiny, positively influences its environmental disclosure (D'Amico et al., 2016; Delgado-Márquez et al., 2017; Herremans et al., 2009), but is also associated with poorer performance (Aragon-Correa et al., 2016). Once again, this is indicative of ER having a merely legitimizing function.

3.3.5 | Culture

Finally, the last element of external corporate governance identified in the literature as a determinant of ER refers to the national culture. Cultural and religious factors explain similarities and differences between stakeholder actions and preferences, and as such determine the agenda of stakeholder activists. Results from previous research indicate that environmental reporting is negatively associated with individualist, masculine and indulgent cultures (Gallego-Álvarez & Pucheta-Martínez, 2020b; Pucheta-Martínez & Gallego-Álvarez, 2020), while positively with Buddhism (Du et al., 2014). The evidence related to long-term orientation remains mixed, showing both negative (Panfilo & Krasodomska, 2022; Pucheta-Martínez & Gallego-Álvarez, 2020) and positive relationships (Gallego-Álvarez & Pucheta-Martínez, 2020a). However, the authors fail to provide any explanation for this inconsistency in their findings. Alongside this, Ben-Amar and Chelli (2018), using the Global Leadership and Organizational Behavior Effectiveness (GLOBE) framework, find a positive relationship between ER and countries' future orientation. Stakeholders in future oriented cultures attach greater importance to ER than to traditional financial reporting, as the latter fail to provide information about the future.

Similarly, mixed results are provided regarding the influence of uncertainty avoidance on ER. While some authors suggest that engagement in sustainability practices, including ER, can help reduce environmental uncertainties facing companies (Gallego-Álvarez & Pucheta-Martínez, 2020b; Pucheta-Martínez & Gallego-Álvarez, 2020), others argue that managers in countries with high avoidance of uncertainty prefer to keep their environmental practices secretive and unknowable, in order to avoid any undesirable conflicts with stakeholders (Ben-Amar & Chelli, 2018).

Furthermore, national culture was found to moderate the link between internal, organizational-level governance mechanisms and environmental disclosure. More specifically, Cui et al. (2020), in their study on 150 multinational companies (MNCs) from China, Japan, the UK and the USA, provide evidence that while, in general, board

TABLE 4 External governance and environmental disclosure—summary.

Determinant	Association	Studies
Legal and political system		
Country governance	Positive	Boura et al. (2020); Ellimäki et al. (2021); Gallego-Álvarez and Pucheta-Martínez (2020b); Gerged, Beddewela, Cowton, and Christopher Cowton (2021); Kolk and Fortanier (2013); Pan and Yao (2021); Pinheiro et al. (2022); Situ et al. (2020); Situ and Seet (2021); Tan (2014); Tian et al. (2016)
Political agenda	Positive	Antonini et al. (2021); Caby et al. (2020); De Villiers and van Staden (2006); Freedman and Jaggi (2005); Khosroshahi et al. (2021); Pan et al. (2020); Situ et al. (2020).
	Dependent on support from local governments	Qian et al. (2022)
Civil law	Positive	Alberici and Querci (2016); Gallego-Alvarez et al. (2017); Gallego-Álvarez and Pucheta-Martínez (2020a); Saida (2009)
	Negative	Ben-Amar and Chelli (2018); Grauel and Gotthardt (2016); Pucheta-Martínez, Gallego-Álvarez, and Bel-Oms (2019)
Regulatory pressure	Positive	Agyei and Yankey (2019); Albertini (2014); Grauel and Gotthardt (2016); Jessop et al. (2019); Liu and Anbumozhi (2009); Walker et al. (2014); Zhou et al. (2021)
	Negative	Delgado-Márquez et al. (2017)
Mandatory reporting regulation	Positive in regard to quantity or quality	Chelli et al. (2014); Cowan and Gadenne (2005); Fatima et al. (2015); Fontana et al. (2015); Frost (2007); Monteiro and Aibar-Guzmán (2010); Perera et al. (2019); Yang et al. (2021)
	Positive but moderate	Barbu et al. (2022)
	Negative in regard to quantity and/or quality of disclosure	Ahmad and Mohamad (2014); Fallan and Fallan (2009); Ji et al. (2020); Lima Ribeiro and Aibar-Guzmán (2010); Papa et al. (2022); Stanny (2013); Vormedal and Ruud (2009); Wang and Bernell (2013)
	Positive in regard to quantity of disclosure for parliamentary regimes backed with voluntary standards	Chelli et al. (2018)
Strength of home country legal system	Positive	Hoştut and Deren van het Hof (2020); Kouloukoui et al. (2019)
	Positive but moderate	Kolk and Fortanier (2013)
	Depends on internationalization strategy	Comyns (2018)
	Negative for companies originating from countries with poor governance	Ellimäki et al. (2021)
External auditors and rating agencies		
Environmental audit	Positive	Saha et al. (2021)
Audit by Big4 company	Positive in regard to quality of disclosure	Hassan et al. (2020); Iatridis (2013)
	Negative in regard to quantity of disclosure	D'Amico et al. (2016)
	Insignificant	Liu and Anbumozhi (2009); Nurhayati et al. (2016); Shwairef et al. (2021)
Third-part assurance of environmental disclosure	Positive in regard to quantity or quality of disclosure	Braam et al. (2016); Darnall et al. (2022); Du and Wu (2019); Dutta and Dutta (2021); Giannarakis et al. (2016)
	Insignificant	Nishitani et al. (2020); Talbot and Barbat (2020); Talbot and Boiral (2018)
	Positive in regard to quantity of disclosure if provided by Big4	Moalla et al. (2020)
	Size of assurer insignificant	Dutta and Dutta (2021)
Financial analysts	Positive in regard to quantity	Déjean and Martinez (2009)
Ratings	Positive	Bui et al. (2022)
Media		
Media agenda	Positive in regard to issues disclosed	Neu et al. (1998); Pollach (2014)

(Continues)

TABLE 4 (Continued)

Determinant	Association	Studies
General media exposure	Positive in regard to quantity and quality	Agyei and Yankey (2019); Azizul Islam and Aminul Islam (2011); Cormier and Magnan (2004); Dawkins and Fraas (2011a); Dawkins and Fraas (2011b) Fan et al. (2020); Rupley et al. (2012); Solikhah and Maulina (2021)
	Insignificant	Burritt et al. (2016); Dawkins and Fraas (2011a); Dawkins and Fraas (2011b)
	Positive in interaction with superior environmental performance	Dawkins and Fraas (2011a); Dawkins and Fraas (2011b)
Issue-related media exposure	Positive in regard to quantity and quality	Dawkins and Fraas (2011a); Dawkins and Fraas (2011b)
Negative media coverage	Positive	Elijido-Ten (2011); Elijido-Ten et al. (2010); Guenther et al. (2016); Haddock (2005); Rupley et al. (2012)
Stakeholder activism		
Civil society	Positive in regard to quantity of voluntary and mandatory reporting	Deegan and Blomquist (2006); Rimmel and Jonäll (2013); Thijssens et al. (2015); Vinnari and Laine (2013); Vormedal and Ruud (2009)
	Positive in regard to quantity, not quality	Liesen et al. (2015)
	Negative for companies without full knowledge of its performance	Lyon and Maxwell (2011)
	Positive in regard to quality	Lyon and Maxwell (2011); Marquis et al. (2016); Sinclair-Desgagné and Gozlan (2003)
Customers	Positive	Guenther et al. (2016); Herremans et al. (2009); Huang and Kung (2010); Sutantoputra (2022)
Employees	Positive	Guenther et al. (2016); Huang and Kung (2010)
GDP as proxy for stakeholder interests	Positive	Alberici and Querci (2016); Pucheta-Martínez, Gallego-Álvarez, and Bel-Oms (2019); Walker et al. (2014)
Internationalization as proxy for exposure to global stakeholders	Positive	Aragon-Correa et al. (2016); D'Amico et al. (2016); Delgado-Márquez et al. (2017); Herremans et al. (2009)
Culture		
Uncertainty avoidance	Positive	Gallego-Álvarez and Pucheta-Martínez (2020b); Panfilo and Krasodomska (2022); Pucheta-Martínez and Gallego-Álvarez (2020)
	Negative	Ben-Amar and Chelli (2018)
Individualism, masculinity, indulgency	Negative	Gallego-Álvarez and Pucheta-Martínez (2020b); Pucheta-Martínez and Gallego-Álvarez (2020)
Long-term orientation/ Future orientation	Positive	Ben-Amar and Chelli (2018); Gallego-Álvarez and Pucheta-Martínez (2020b)
	Negative	Panfilo and Krasodomska (2022); Pucheta-Martínez and Gallego-Álvarez (2020)
Buddhism	Positive	Du et al. (2014)

independence positively affects corporate transparency in regard to environmental performance, and culture dimensions of masculinity and uncertainty avoidance negatively moderate this relationship. The summary of external governance determinants of environmental disclosure is presented in Table 4.

4 | DISCUSSION AND CONCLUSIONS

The objective of this research was to systematically review the existing literature (Thorpe et al., 2005; Tranfield et al., 2003) on the influence of various corporate governance mechanisms on ER and to contribute to the ongoing debate (Di Vaio et al., 2022; Khizar et al., 2021; Usman Khizar et al., 2022) providing future research directions. The results of our study are summarized in Figure 5, showing that that ER is driven by the motivation for greater monitoring (agency theory), response to stakeholder pressure (stakeholder theory), gaining legitimacy from constituencies (legitimacy theory), signaling of superior performance (signaling theory), and as a result of political economy impact.

In offering a synthesis of the existing studies, we contribute to the understanding of how corporate governance characteristics enter into decisions on communication of a company's impact on the natural

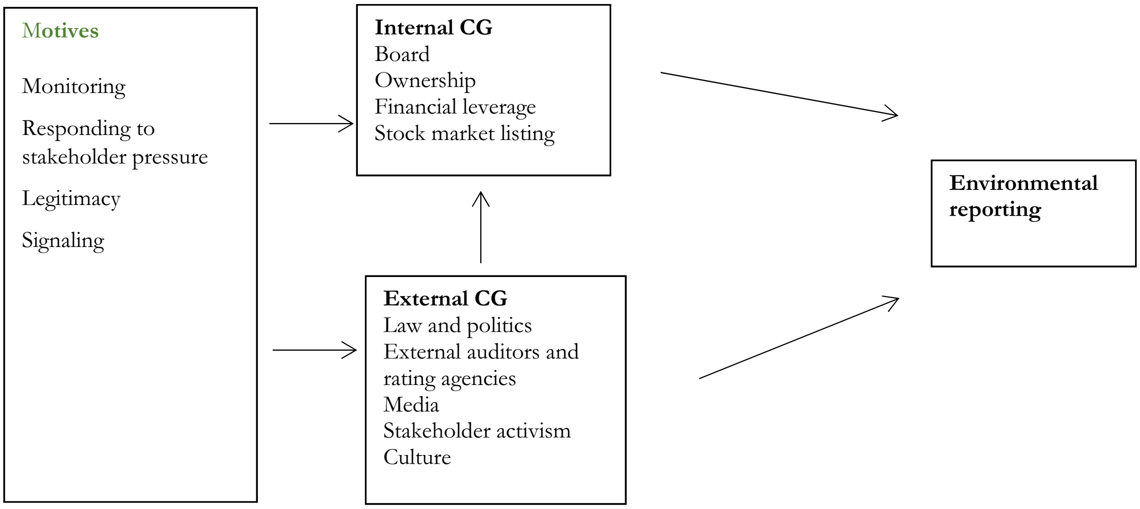

FIGURE 5 Links between internal and external corporate governance (CG) and environmental reporting (ER)—summary.

environment. In particular, research on the determinants of ER indicates the importance of internal governance (Khaireddine et al., 2020), which aims at effective control and monitoring on behalf of shareholders and stakeholders to improve financial performance and to increase firm value. Despite some inconsistencies, the majority of studies suggest that internal corporate governance offers control solutions, including monitoring mechanisms such as the board (Charumathi & Rahman, 2019; Fernandes et al., 2019; Gerged, 2021; Shwairef et al., 2021), with its size, CEO/Chair duality, committees, independence, diversity and activity. Studies in the field explore the link between ownership structure and ER, revealing mixed results on the effect of ownership concentration (Gerged, 2021; Huang & Kung, 2010) and investor identity (Rao et al., 2012). Stakeholder impact on environmental disclosure is viewed as an example of incorporation of their expectations into managerial decisions (Neu et al., 1998). In consequence, "the fear of adverse reactions by stakeholders stimulates firms to make high quality voluntary disclosures" (Brammer & Pavelin, 2006, p. 1170), particularly in circumstances of poor environmental performance. Additionally, the role of the creditor (Chaklader & Gulati, 2015), the need for capital (and stock exchange listing) in general and the adoption of company bylaws determine the level and quality of environmental disclosure (Kılıç & Kuzey, 2019). Studies also distinguish the effect of having foreign versus solely domestic investors, suggesting a positive effect for the former. For instance, Gerged (2021) observed a positive link between foreign investors and ER in the context of an emerging market. The same conclusion is drawn from an analysis on Indian listed companies, where foreign ownership shows a positive influence towards ER (Fahad & Nidheesh, 2020).

With regard to external corporate governance, our review reveals that previous studies on ER determinants have focused primarily on four mechanisms: the legal system, stakeholder activism, the media and external auditors. The literature provides strong empirical evidence concerning the role of the institutional environment in promoting corporate transparency. Prior research suggests that, in line with legitimacy theory, companies increase their transparency by providing more information when they are pressured by the political context (De Villiers & van Staden, 2006), strong national-level institutions (Gallego-Álvarez & Pucheta-Martínez, 2020b; Tian et al., 2016), media coverage (Agyei & Yankey, 2019; Azizul Islam & Aminul Islam, 2011; Cormier & Magnan, 2004; Dawkins & Fraas, 2011a; 2011b) and activists (Rimmel & Jonäll, 2013; Vinnari & Laine, 2013). Nevertheless, the impact of these mechanisms on the quality of disclosure remains unclear.

Culture might be one of the moderating variables explaining the relationship between legislation and ER practice. While evidence from China (Wang & Bernell, 2013), Norway (Vormedal & Ruud, 2009) and the USA (Peters & Romi, 2013) suggests poor compliance with compulsory disclosure requirements, thus supporting the call for strong enforcement, the compliance rate for French regulation has remained high without any punitive mechanism. One possible reason for the latter case might be, as pointed out by Chelli et al. (2014), the high uncertainty avoidance score present in the French culture. Moreover, the specific type of mandatory reporting regime has been found to influence its potency. Chelli et al. (2018) analyze two types of mandatory reporting regimes – parliamentary and stock exchange (market-based) regulation – and find the introduction of the former, proceeded by an extensive multi-stakeholder debate, to be more successful in triggering environmental disclosure. Finally, Brehm and Hamilton (1996) argue that non-compliance might be the result of evasion, when the marginal costs of compliance are higher than the marginal benefits. Evasion is the main reason behind the low compliance rate in Norway, where the pressure of consumers, the media and civil society organizations towards companies in implementing environmental policies is low compared to other countries (Vormedal & Ruud, 2009). Analogously, companies facing more institutional pressures, like those operating in environmentally sensitive and economically regulated industries (Tang & Demeritt, 2018), with higher litigation risks or facing substantial environmental sanctions (Peters & Romi, 2013), are more inclined to comply with reporting rules. However, non-compliance can be also the result of ignorance, when companies are simply not aware of the law or do not fully understand it (Brehm & Hamilton, 1996). While strong enforcement is required in the case of evasion to increase the level of compliance, ignorance-related non-compliance can be dealt with via investment in communication and education.

4.1 | Avenues for future research

Our literature review allows us to identify gaps in the existing evidence on CG-ER links and formulate directions for further analysis on the internal and external corporate governance mechanisms which may stimulate or inhibit environmental transparency (Ben-Amar & McIlkenny, 2015). Specifically, we formulate three main avenues for research—(1) studies on governance mechanisms for which prior literature does not deliver conclusive results (i.e. board independence) or for which there is no or very limited evidence (i.e., executive compensation), (2) multi-level studies which could investigate the interactions between disclosure, company level governance and institutional determinants and (3) the analysis of the effectiveness of mandatory reporting legislation introduced globally for environmental disclosure. We summarize the directions for future research in Table 5 and discuss them below.

4.1.1 | Corporate governance mechanisms and ER

Firstly, addressing the inconsistency in prior studies, there is a need for additional research on governance mechanisms. Studies on corporate governance emphasize the essential role of the board, which traditionally serves as the liaison between shareholders and the company, and oversees the actions and decisions made by executives. The board acts as stewards of communication among stakeholders, broadening disclosure from financial towards non-financial information, and ultimately bears the responsibility of ensuring the firm's survival and performance. While the results of previous studies are largely consistent with respect to the positive impact of larger, diversified boards (with audit and CSR committees) in enhancing ER, the role of independent directors remains controversial. A recent study by Shwairef et al. (2021) conducted on data collected from chief executive managers and chief financial managers of 197 large companies in Malaysia, argues that the link between board independence and ER is more complex. As the results show no evidence of a link between these two variables, they suggest an indirect relation through the mediating role of managers' strategic posture, referring to their attitude towards environmental reporting. Specifically, while active posture represents managers who engage in ER to strengthen competitive advantage in response to stakeholders' claims, passive posture leads to reactive disclosure practices when addressing pressure from within or outside the organization (Shwairef et al., 2021). Noting these results, we encourage future research to analyze the direct and indirect effects of board independence on transparency of environmental disclosure. Additionally, investigating the role of individual director characteristics including age, education and leadership (of which the current understanding is significantly limited) (Said et al., 2013), may constitute a promising direction for future studies.

TABLE 5 Avenues for future research on corporate governance (CG) and environmental reporting (ER)—summary.

Gap to address	CG mechanism	Exemplary research topic
Avenue 1: Corporate governance mechanisms and ER		
Inconsistencies in prior research	Board	Board independence and strategic posture
		Demographic characteristics of directors
	Investors	Types and characteristics (size, orientation, profile, political orientation) of institutional investors
		Managerial and insider ownership
	Need for capital	Capital for firm growth and development
	External mechanisms	Media exposure External auditors Ratings
The lack of research on particular CG mechanism	Incentive mechanisms	Executive pay, in particular bonus/ performance related pay
	External mechanisms	Market for corporate control
Avenue 2: Interactions between governance mechanisms for ER		
Distinguishing between complementary and substitutive effect	Firm-level governance moderated by internal CG mechanisms	Independent directors and CEO duality may be moderated by ownership structure
Recognizing open system view	Firm and country level governance	Using combined measures of corporate governance, introducing bundle variables
Avenue 3: Impact of mandatory legislation on ER		
Understanding CG-ER link	Multilevel and interdisciplinary studies	Role of CG (e.g., board) in ER implementation (different strategies)
Policy implications	Formal and informal pressures for CG best practice	Diversity on board under quota regulation ER content and quality under sustainability legislation

With the growing interest in the shareholder role in corporate governance, the existing evidence still lacks a full understanding of the role of investors, particularly institutional and foreign investors, as well as family control or promoter ownership in enhancing environmental transparency. The empirical inconsistencies suggest that the determinants for explaining environmental disclosure policies remain more complex than initially expected. The investigation into the role of institutional investors requires a detailed analysis, taking into account not only the type of institutional investor but also other characteristics (Rao et al., 2012; Rupley et al., 2012; Stanny & Ely, 2008) related to its background, portfolio size and specialization, as well as investment policy and horizon. Some efforts have been made to address these concerns. For instance, Kim et al. (2020) use employees' political donation data and construct a political ideology rating for institutional investors to distinguish between a more Republican or a more Democratic leaning culture. Their study shows that firms led by institutional shareholders with a more Republican-oriented political ideology are less likely to issue environmental reports. This effect is more pronounced for firms with long-term oriented institutional investors, for high corporate Republican ideology scores, and in the absence of an environmental committee. However, fine-grained analysis of investor characteristics, including political ideology, religious beliefs or cultural background, has been largely neglected in previous studies. Therefore, our study calls for further research in this vein.

The research on family and managerial ownership and their impact on ER remains scarce. Fahad and Nidheesh (2020) find that promoter ownership (ownership by person or family member who is directly or indirectly in control of a company) shows a negative relationship with environmental disclosure. Insider ownership is globally revealed more often as ownership by institutional investors, which remains the attribute of highly developed economies. Therefore, studies on the importance of family, promoter and managerial ownership remain essential in explaining efforts for increasing ER in developing economies.

The need for capital is another of the internal corporate governance mechanisms identified in the literature review. The conceptual frameworks suggest that more capital will be attracted by firms which demonstrate a higher level and quality of disclosure (Iatridis, 2013). Since environmental disclosure denotes exposure to negative media coverage, reputation and risks, potential capital providers would choose more transparent companies. However, the evidence on the relations between the need for capital and ER remains scarce so far, while existing studies offer inconclusive results. The conceptual assumption of a positive link between the need for capital and ER is supported by studies on companies from Malaysia (Iatridis, 2013). Interestingly, research on French companies does not support the hypothesis of the association between ER and the cost of equity (Déjean & Martinez, 2009). Taking into account the essential impact of demand for funds for company growth, we call for further studies in this area.

Finally, in the literature review we noted a lack of research on the effect of incentive mechanisms on environmental reporting. The only article identified in our sample relates to the impact of salary (Wang et al., 2023) on environmental disclosure in China. In this study authors find that a low level of disclosure is related to various configurations of company and top management team (TMT) characteristics, including executive salary. With growing evidence on the importance of executive compensation in corporate governance (Aggarwal, 2008; Conyon, 1997), we call for further studies on the role of fixed and performance related pay in environmental disclosure.

In addition, we call for the analysis to understand how external mechanisms of corporate governance can stimulate greater transparency and limit selective disclosure. In particular, we argue that addressing the impact of the media as well as the role of external auditors constitutes a promising avenue for further studies, noting inconsistency in prior research. While some authors argue that public scrutiny merely triggers higher levels of disclosure that do not translate into anything comprehensive (Liesen et al., 2015), others show that under the threat of audit companies are less prone to greenwashing practices (Lyon & Maxwell, 2011; Marquis et al., 2016). Given the difficulties in measuring greenwashing for the purpose of large-scale studies, the empirical evidence on governance mechanisms aimed at preventing it is still somewhat limited. Future research in this vein could draw on the accounting literature exploring impression management in corporate disclosure with computer-aided text analysis (Aerts & Yan, 2017) and machine learning techniques (Choudhury et al., 2019).

Additionally, while the literature highlights the rather positive role of external auditors in promoting corporate transparency, researchers have been far less interested in the role of rating agencies in explaining ER practice. The scarce evidence available in the literature suggests a positive relationship between the number of analysts following a firm and its level of ER (Déjean & Martinez, 2009). In similar vein, Bui et al. (2022) find that climate change disclosure ratings are effective in pressuring poorly-rated firms to improve their disclosure scores in subsequent years. However, how these external governance mechanisms influence reporting quality and the likelihood of greenwashing remains an open question. Similarly, little is known on the impact of market for corporate control on environmental reporting, opening an interesting field for future investigations.

4.1.2 | Interactions between firm-level governance and external governance mechanisms

Secondly, while the literature on governance determinants of corporate transparency has been substantially growing over the last two decades, studies on the internal and external mechanisms have largely been conducted separately from each other, limiting our understanding on their impact of ER. Even if some papers provide evidence on both types of governance, they rarely test interactions between them. The few exceptions in our sample include a study by García-Sánchez et al. (2022), who find a substitutive effect between firm-level climate governance and coverage by financial analysts, highlighting the compensating role of external governance mechanisms. Similarly, Pisano et al. (2022) reveal that the association between board characteristics and ER is moderated by the geographic location, while Fei (2022) shows that media exposure has a more pronounced effect on reporting practices of state-owned than non-state-owned firms.

The review of existing literature provides the evidence from various countries (Antonini et al., 2021; Dong et al., 2021; Gerged, Beddewela, Cowton, & Christopher Cowton, 2021), suggesting that the inconsistency of the results obtained may be driven by the interactions between different corporate governance mechanisms and the impact of institutional environment. This calls for multi-level studies to investigate the interplay between disclosure, company-level governance and institutional determinants, and to identify substitutive or complementary effects between these mechanisms. Thus, the analyses of the combined effects of governance mechanisms appear to be a promising path to take – for instance, the role of independent directors (Pucheta-Martínez & López-Zamora, 2018) and CEO duality (Gerged, 2021) may be moderated by ownership structure, whereas the impact of ownership structure may be dependent on the level of media exposure (Ananzeh, Bugshan, & Amayreh, 2023) or the need for capital. For instance, Ji et al. (2020) observe that specific environmental disclosure on consumption and emissions increases the cost of debt financing. In addition, authors find that firms in the high-managerial ownership group would reduce ER and withhold bad news to avoid negative consequences when in need of refinancing.

At the same time, corporate governance scholars call for an open system view, rejecting the "one size fits all" model and moving towards the so-called *bundle* approach that accounts for the complementarities and substitutions which may exist between internal and external governance (Aguilera et al., 2008, 2012, 2015). The institution-based approach emphasized the importance of the institutional environment, showing that the functioning of internal corporate governance mechanisms depends on country-specific determinants (Cui et al., 2020; Fligstein & Choo, 2005; Hall & Gingerich, 2009; Matten & Moon, 2008). Empirical evidence also indicates that specific internal governance practices can complement a favorable institutional environment or compensate for some of the detrimental cultural influences on corporate reporting (Adnan et al., 2018). Complementarities have been also found between financial analysts' monitoring activity and the board structure (Hussain et al., 2021). This, together with the empirical inconsistencies highlighted in our study, suggests that no monotonic relationship between transparency and any single organizational or institutional factor exists. In order to fully understand disclosure behavior, empirical work should move beyond the investigation of direct effects of specific governance mechanisms and focus on including a bundle of variables to capture the interplay between different drivers. Thus, following the open system view we call for further studies on the bundle effects of corporate governance mechanisms, investigating potential moderation effects, complementary and substitutive relations, since "different corporate governance practices may be more or less effective depending on the context of different organizational environments" (Aguilera et al., 2008: p. 476).

4.1.3 | Mandatory reporting legislation and ER

Thirdly, scholars investigate the effectiveness of mandatory reporting legislation for environmental disclosure in the context of selected governance mechanisms (Ji et al., 2020; Peters & Romi, 2013). The review of prior studies shows that the question with regard to how the relationship between external governance and ER relates to the impact of mandatory frameworks on both the scope and quality of disclosure remains unresolved. The inconsistency in findings delivered by previous studies suggests that it is the interplay of different institutional as well as organizational factors that can determine the impact of mandatory environmental disclosure frameworks (Chelli et al., 2014; Vormedal & Ruud, 2009; Yang et al., 2021). Given the growing regulatory interest in environmental disclosure, identifying effective mandatory mechanisms remains at the forefront of the research agenda. This calls for multilevel and interdisciplinary studies harnessing the perspectives of management, economic law analysis, sociology and political science. We argue that in light of the increasing regulatory pressure the literature on CG-ER links reveals significant potential for future research.

The literature review of existing studies offers numerous policy implications that can be useful for decision makers and regulators. It suggests that the governance structure with regard to board size, composition and committees differentiates the scope and quality of environmental disclosure (Cui et al., 2020; Gerged, 2021). Therefore, formal and informal pressures towards certain corporate governance best practice (e.g. independent directors, board committees) or efforts to increase board diversity may stimulate greater ER. As the review shows the need for capital and the financing by listing on a stock market (Cheng et al., 2017; Rupley et al., 2012), or financing by loans (Kouloukoui et al., 2019), can also have an impact on level of corporate environmental transparency. Therefore, policy makers may impose requirements on capital providers to exert influence over companies in terms of ER, as is currently seen in the EU sustainable finance legislation. Finally, with the observed limitations of internal and external governance, further studies can address the question of conditions under which the implementation of mandatory reporting may contribute to increased environmental disclosure by companies. Understanding how CG arrangement can lead to effective implementation of the regulation still requires additional analyses (Ji et al., 2020; Yang et al., 2021). While regulation can offset some limitations of company control mechanisms, both internal and external corporate governance may strengthen the enforcement of mandatory reporting legislation.

ORCID

Maria Aluchna https://orcid.org/0000-0001-8094-4295
Maria Roszkowska-Menkes https://orcid.org/0000-0003-2490-1797
Sana Khan https://orcid.org/0000-0002-7633-8177

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