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RESEARCH ARTICLE

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Corporate governance structure and climate-related financial disclosure: Conventional banks versus Islamic banks

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Abstract

This paper examines whether the different corporate governance structures of conventional banks (CBs) and Islamic banks (IBs) have varying effects on their respective climate-related disclosure (CRD). Employing a unique dataset of CBs and IBs' CRD and corporate governance structures for the period of 2016–2019, we found that their respective corporate governance structures did indeed affect their CRD in different ways. Our findings suggest that CBs disclose more climate-related information than IBs because IBs focus on Sharia compliance which does not emphasise the protection of the environment, while CBs may be more responsive to shareholders' and stakeholders' demands on climate and environment. These effects were stronger with the quality of governance, that is, CBs disclose more climate-related information with the governance quality, while IBs disclose even less when their governance quality increases. The findings of this study have important implications for climate change, especially the Paris Accord and The 26th Meeting of the Conference of Parties (COP26). There are also policy implications for sustainable financial markets and the financial services sector.

KEYWORDS
board of directors, climate-related disclosure (CRD), conventional banks, corporate governance, Islamic banks

1 | INTRODUCTION

Climate change, as one of the major challenges of the 21st century, is drawing significant attention from researchers and practitioners alike. The Kyoto Protocol (1997) and the Paris Agreement (2015) are amongst notable attempts to combat climate change. More recently, in 2017, the Financial Stability Board (FSB) launched the Task Force on Climate-Related Disclosures (TCFD) for corporate climate-related risk reporting. The extant literature suggests that stakeholder groups are putting firms under enormous pressure to be active in mitigating climate change (Bui et al., 2020; Bui & de Villiers, 2017). In this context, environmental responsibility actions and climate-related disclosure (CRD) have become important elements for both institutional and individual investors (Bui & de Villiers, 2017; de Villiers & van Staden, 2010). In the same vein, previous studies have suggested that stakeholders are the most important driving force of CRD (Caby et al., 2020). Thus, regulators are increasingly requiring firms to disclose both their impact on the environment and their actions taken to mitigate this.

Banks are playing a key role in the transformation of economies to low-carbon or net-zero emissions through sustainable finance and

green banking.[1] How are banks managing this difficult task? Previous research on corporate governance suggests that the board of directors plays an important role in serving both shareholders (Beasley, 1996) and stakeholders (Nekhili et al., 2021), by monitoring and controlling management actions and decisions (Anderson et al., 2004). In the current era of climate change, the role of bank boards is more important than ever. The disclosure of climate-related information has come under the spotlight since the TCFD was launched in 2017, due to pressure from stakeholders. Likewise, banks' boards of directors are under significant pressure from stakeholders to engage in more sustainable practices that contribute to climate change mitigation and adaptation. This study investigates the effects on CRD of the different corporate governance structures[2] of conventional banks (CBs) and Islamic banks (IBs).

A strand of corporate governance literature suggests that an effective board of directors is likely to increase the quality of financial disclosure (Chau & Gray, 2010; Eng & Mak, 2003; Gul & Leung, 2004; Haniffa & Cooke, 2002; Laksmana, 2008; Mallin & Ow-Yong, 2012). Likewise, another strand stresses that better corporate governance positively affects environmental disclosure (Adu, 2022; Gerged, 2021; Karn et al., 2023). In their study of Canadian firms, Ben-Amar and McIlkenny (2015) found that board effectiveness increased a firm's carbon disclosure quality. Similarly, investigating the associations between climate-change disclosure and corporate governance, Nekhili et al. (2021) and Reid and Toffel (2009) show that the board of directors is a vital organ that secures the flow of useful and necessary information to stakeholders. Despite the wealth of research on environmental performance, environmental disclosure, green initiatives, and sustainability and corporate governance (e.g. Cordeiro et al., 2020; Elmagrhi et al., 2019; Lu & Wang, 2021; Tawiah et al., 2023), it remains unclear whether governance differences between CBs and IBs explain their differences in CRD. This study addresses this issue. The paper's uniqueness lies in its comparative analysis of the governance structures of IBs and CBs and its investigation of how these distinct governance frameworks influence CRD, taking into account their motivations regarding environmental and climate-related actions and disclosure.

IBs and CBs have significantly different business models, as they operate under distinct corporate governance systems. The main difference is that the IB's governance structure has an important additional layer, which is the Sharia Supervisory Board (SSB). The SSB is a key feature of IBs' governance and takes an additional monitoring role to ensure Sharia compliance. Every contract and action of the IBs must be in compliance with Sharia rules and principles, or the legitimacy of the IB will be questioned by its customers (Ullah et al., 2018). The existence and responsibilities of the SSB highlight the importance of Sharia compliance for IBs. As a result, the Sharia perspective on

environmental and climate issues plays a crucial role in shaping how IBs approach the integration of sustainability practices into their operations and decision-making processes related to environmental and climate concerns.

In contrast, CBs have governance structures that typically do not include specialised boards dedicated to religious compliance. While CBs are subject to regulatory frameworks and ethical considerations, their corporate governance primarily revolves around standard regulatory bodies and internal committees responsible for oversight and risk management. The absence of an SSB in a CB allows the bank greater flexibility in shaping its operational strategies, including its approach to environmental and climate-related matters. In contrast, IBs must navigate a complex landscape that balances the requirements of Sharia with an increasing demand for sustainable practices. The Sharia perspective on environmental and climate issues significantly influences how IBs address concerns around carbon emissions, resource consumption, and the social and environmental impact of their activities. Integrating these principles into the banks' decision-making processes may involve careful consideration of ethical investments, sustainable financing options and environmentally responsible business practices that align with Islamic values. Considering the lack of attention given by Sharia to the role of humankind in environmental and climatic wellbeing—and indeed to the importance of achieving and protecting this—IBs and CBs may well take different stances on environmental and climate-related issues. While CBs might prioritise climate-related actions in response to demands from shareholders and stakeholders, IBs may focus on those areas of social responsibility explicitly mentioned in Sharia, rather than the climate, which is rarely and only implicitly referenced.

Examining hand-collected data for a sample of 591 banks (169 IBs and 422 CBs) from 24 countries for the period of 2016–2019, we conclude that CBs are more likely than IBs to disclose more extensive climate-related information in their annual reports. Furthermore, the results suggest that a robust corporate governance structure and practices indicating corporate governance quality, as assessed using the corporate governance index (CGI), were associated with higher CRD in CBs. One plausible explanation for this outcome is that robust corporate governance practices motivate CBs to disclose more comprehensive climate-related information. Unlike IBs, which have distinct legitimacy concerns, CBs are often responsive to demands from shareholders and stakeholders, as these banks' corporate governance frameworks encourage transparency and responsiveness to these demands. In contrast, the unique governance structures of IBs may prompt swift actions that do not consider climate-related factors, given that the Sharia principles governing these banks do not explicitly prioritise such concerns. Moreover, the endorsement of CRD by a board of directors appears to mitigate information asymmetry to a greater extent in CBs than in IBs. This enhanced transparency in CBs is achieved through the disclosure of valuable climate-related information, as suggested in prior research (Healy & Palepu, 2001; Huang & Zhang, 2012). As a result, while CBs may initially have higher agency costs due to a larger number of shareholders, the disclosed climate-related information helps lower their agency costs more significantly compared to IBs.

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[1] IPCC (2014) Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Geneva, Switzerland.

[2] Our study primarily compares the corporate governance structures between CBs and IBs. When we mention corporate governance quality, we are referring to the quality of the corporate governance structure, specifically focused on the characteristics of the board of directors.

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This study is the first to examine the effects of corporate governance structures on CRD in CBs and IBs. While theoretical comparisons of corporate governance structures between CBs and IBs (e.g. Choudhury & Hoque, 2006; Grais & Pellegrini, 2006a, 2006b; Hassan, 2011; Lewis, 2005; Safieddine, 2009; Shibani & De Fuentes, 2017) outnumber the practical comparisons (Aslam et al., 2021; Mollah & Zaman, 2015; Safiullah & Shamsuddin, 2019), the literature lacks empirical evidence on the effects of these differences. Therefore, this study fills a significant research gap. A unique and manually collected dataset sheds light on these areas, clarifying the effects of the composition of the board of directors in different corporate governance structure environments. Furthermore, while there is an existing body of literature on the effects of these different governance systems on risk-taking and performance (Farag et al., 2018; Mollah et al., 2017; Mollah, Liljeblom, & Mobarek, 2021; Mollah & Zaman, 2015), this study considers a similar empirical setting to investigate the effect of the corporate governance systems on corporate CRD, using a unique dataset. Thus, this study is designed to advance the conversation on the comparative governance of CBs and IBs by spotlighting the CRD issue.

The empirical findings of this study provide valuable insights into the relationship between corporate governance structures and CRD in CBs and IBs, grounded in the framework of legitimacy theory. The analysis reveals that better corporate governance structure and practices (proxied by CGI) significantly influence the level of CRD in CBs. However, in IBs, the index does not exert the same influence due to the unique legitimacy concerns (i.e. the need for Sharia compliance). Sustaining legitimacy is of the utmost importance for IBs, which might lead them to overlook contemporary problems and focus on the other ethical and social issues that receive greater emphasis in Sharia principles. Therefore, the distinct legitimacy concerns of IBs and CBs play a pivotal role in shaping these banks' respective actions. These findings underscore the value of legitimacy theory in explaining how corporate governance structures shape climate-related actions and disclosure behaviours. CBs and IBs address societal concerns in distinct ways, aligned with their respective paths to maintaining legitimacy.

Finally, this paper provides fresh insights into the climate debate and corporate policymaking on climate. One popular measure used in this context is ESG ratings (e.g. Bravo & Reguera-Alvarado, 2019; Li et al., 2017; Lu & Herremans, 2019). However, ESG ratings have been subject to various criticisms. For example, large companies tend to have higher ESG scores than smaller companies (Artiach et al., 2010; Gallo & Christensen, 2011), while ratings from different providers for the same company can fluctuate (Berg et al., 2022; Dimson et al., 2020). In this study, we employ unique metrics to measure financial institutions' engagement in climate-related issues. These metrics were constructed based on recommendations from the TCFD, 2017, which have seen widespread adoption by financial and non-financial companies. Furthermore, this study underscores the importance—in both CBs and IBs—of directors aligning their disclosure practices with the expectations of their stakeholders. For IBs, this includes not only satisfying Sharia compliance but also addressing other societal concerns, such as environmental sustainability. To gain trust and maintain legitimacy, managers must prioritise transparency in the reporting of climate-related actions and impacts. Regular reporting on sustainability efforts and achievements is important to ensure accountability and credibility.

The remainder of the paper is structured as follows. Section 2 provides the theoretical framework and hypothesis, while Section 3 specifies the sample, data and the model applied in this study. Section 4 includes the empirical result, and Section 5 presents the conclusion.

2 | LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 | The role of financial institutions in the climate crisis

There are ongoing debates and discussions about climate change. However, Cook et al. (2016) argue that there is a consensus amongst researchers and experts on man-made global warming, with 90%–100% of climate scientists agreeing that human actions are the primary cause of the recent changes in the climate. Furthermore, Cook et al. (2016) state that, 'it doesn't matter if the consensus number is 90% or 100%. The level of scientific agreement on anthropogenic global warming (AGW) is overwhelmingly high because the supporting evidence is overwhelmingly strong' (p. 6).

Climate change is threatening all forms of life around the globe (Allen et al., 2009; Lash & Wellington, 2007). Global campaigns—such as 'New Plastic Economy' by the Ellen MacArthur Foundation—that aim to raise awareness of climate change and environmental degradation are becoming ever-more popular, and people are increasingly understanding the importance of taking action on these issues (Ballew et al., 2019). This realisation is leading people to put pressure on corporations and organisations to mitigate their impact on the environment, as it becomes evident that the actions of these corporations are the major cause of these threats.

The 'Banking on Climate Chaos' report published in March 2021 by BankTrack shows that the 60 largest private-sector banks around the world invested US$3.8 trillion in fossil fuel projects in the 4-year period from 2016 to 2020. Companies ranked in the top 100 for consumption of fossil fuels and greenhouse gas emissions made almost 40% of this total investment. The same report discusses the banks' policies on financed emissions, and its conclusions are not optimistic, with the majority of the firms having weak policies on 'commitment to zero out financed emission', 'intermediate commitment to cut financed emission' and/or 'financed emission measurement and disclosure'.

Corporations play a critical role in climate-related issues and environmental degradation and the banking sector is a vital agency in this scene. In fact, banks are amongst the biggest financial supporters and capital- and funds-providers for almost all sectors, industries and corporations that contribute to anthropogenic climate change, as detailed in the 'Banking on Climate Chaos, 2021' report. As a result, banks'

positions on climate change affect other companies in various sectors, as their positions influence their decisions about the operations and activities that they will finance (Caby et al., 2020). Banks' perceptions of climate-related challenges play an important role in tackling these issues. Bose et al. (2021) suggest that an increase in green banking activities results in a win–win situation for banks and competing stakeholders. As the existence and consequences of AGW become increasingly evident, a non-negotiable attitude regarding the need for immediate action against climate change has emerged amongst customers, investors, suppliers and other stakeholders (Bui et al., 2020; Bui & de Villiers, 2017).

In addition to the institutional and governmental pressure (such as the Kyoto Protocol, Paris Accord and TCFD), there is increasing demand from communities. Hence, the actions and disclosures of companies regarding their environmental responsibilities have become essential for meeting the demands of institutional and individual investors (Bui & de Villiers, 2017; de Villiers & van Staden, 2010). To satisfy societal demand on climate-related issues, it is important to sustain legitimacy in the eyes of stakeholders (Dowling & Pfeffer, 1975; Galbreath, 2010). Consequently, despite the profound risks of exposing their own climate-change-related challenges, banks must take action to de-escalate the momentum of climate change, environmental deterioration and pollution. To this end, they are expected to provide useful, relevant and sufficient information on their related actions, plans, policies and principles—not only as a requirement of international and national regulations and legislation but also to satisfy their stakeholders' concerns.

2.2 | Theoretical framework

Legitimacy theory is widely used in the literature to explain attitudes towards social responsibility and environmental disclosure (Archel et al., 2011; Chan et al., 2014; Deegan, 2002; Galbreath, 2010; Haniffa & Cooke, 2005). This theory states that the actions and operations of an organisation should be aligned with the bonds, norms, values, beliefs, definitions, and moral and ethical codes of the wider society (Suchman, 1995). Deegan and Unerman (2011) state that legitimacy theory rests on the notion of a 'social contract' between corporations and the society in which they conduct their businesses. This social contract is as important as legislation and regulation, as laws set out explicit terms for corporations, while societal demands construct the implicit terms (Deegan et al., 2002). Therefore, the inevitable conclusion for organisations that ignore societal beliefs, values and norms is that they cease to exist, as it is impossible to maintain their existence without societal approval (Maignan & Ralston, 2002). The management of an organisation will seek to ensure harmony between the aims and actions of the organisation and those of both the society in which it operates (Dowling & Pfeffer, 1975) and its stakeholders (Haniffa & Cooke, 2002). Sethi (1979) coined the term 'legitimacy gap' to describe the circumstance that arises when a corporation fails to align with its society's values. This might happen because of fundamental differences between the values of the

organisation and those of society or because an organisation is struggling to meet rapidly and continually changing values and expectations.

Legitimacy theory was chosen as the basis of the analysis in this study because organisations disclose social information not only for the economic benefits but also because they can use social responsibility and environmental-awareness disclosure to ensure their social legitimacy by showing that they are operating in alignment with social values (Deegan et al., 2002). Bridges (2004) argues that a legitimacy gap is a threat to a corporation because it prevents the establishment of a positive image, a good reputation and trust, which can detrimentally affect profitability, share prices and firm value.

IBs' motivation for seeking and sustaining legitimacy is unique, driven by an adherence to Sharia principles. For IBs, the primary objective is to maintain religious legitimacy, which is the legitimacy of Sharia, as this religious framework determines the permissible actions and operations. The Quran explicitly details the ethical and religious obligations imposed upon firms by Sharia, and these include a range of principles, such as *zakat*, which is charitable giving; *riba*, which is avoiding charging or paying interest; the avoidance of gambling; and the rejection of operations in society-harming sectors such as alcohol, tobacco, weaponry and other morally offensive domains. These notions stem from Quranic guidance and have profound importance within the Islamic banking context. IBs, therefore, allocate their resources and efforts in a manner that aligns with the ethical and religious priorities explicitly highlighted in the Quran. Their involvement in—or withdrawal from—certain actions, efforts or transactions is crucial for maintaining legitimacy in the eyes of religion-sensitive shareholders and stakeholders.

It is notable that the Quran offers relatively little explicit guidance on the protection of the environment and the mitigation of climate-related issues. Instead, it frequently notes that the environment has been created for the benefit of humankind, emphasising enjoyment and sustenance.[3] Consequently, the priorities of IBs often centre around areas of ethical significance, such as *zakat*, avoidance of interest (*riba*) and adherence to Sharia principles. While these institutions acknowledge their ethical and religious responsibilities, the absence of detailed instructions in the Quran pertaining to environmental protection might contribute to a narrower scope of direct actions compared to other areas of Islamic finance. This is in contrast to CBs, which may have more flexibility in adopting sustainability measures due to their broader operational parameters. These disparities between IBs and

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[3]'He it is who made the earth subservient to you. So traverse in the tracks thereof and partake of the sustenance He has provided. To Him will you be resurrected.' (Quran, Surah Al-Mulk, 67:15); 'Do you not see that Allah has made subject to you whatever is in the heavens and whatever is in the earth, and amply bestowed upon you His favors, both seen and unseen?' (Quran, Luqman, 31:20); 'And He has made subservient to you the night and the day, and the sun and the moon; and the stars are made subservient by His command. Surely there are signs in this for a people who reflect. And what He has multiplied for you in the earth of diverse hues; surely there is a sign in this for a people who remember. And He it is who has made subservient to you the sea, that you may eat of its fresh flesh, and take forth from it ornaments which you wear. And thou seest the ships cleaving through it, and that you might seek of His bounty, and that haply you may give thanks.' (Quran, Surah Al-Jathiya, 45:5–13).

CBs may result in different approaches to climate-related issues, consequently affecting their respective approaches to CRD. In other words, we argue that the combination of shareholder pressure and the greater flexibility of CBs in engaging with contemporary issues—and the lack of Sharia-based boundaries experienced by IBs—leads CBs to participate more actively in diverse sustainability efforts, ultimately resulting in higher disclosure of climate-related information. In contrast, Sharia principles do not provide the same strength of motivation to act on climate-related issues as they do to act on other social concerns. Consequently, we establish the first hypothesis of this study as follows:

H1. CBs disclose more climate-related information than IBs.

Fama and Jensen (1983) suggest that well-established corporate governance benefits shareholders because it mitigates the agency costs for the firm by implementing monitoring and controlling mechanisms for the decision-makers' actions. The board of directors, elected by shareholders, is the centre of the internal control mechanism, tasked with monitoring and supervising managerial actions and decisions (Fama, 1980). It is also responsible for duties such as hiring, firing and compensating the executives. To increase firm efficiency, executives may use incentive compensation to align their interests with those of shareholders (Eisenhardt, 1989; Haugen & Senbet, 1981) and to set an efficient monitoring channel for creditors (Jensen, 1986; Li & Wang, 2016). In addition, Healy and Palepu (2001) propose that disclosing relevant and useful information is one way to reduce inefficiency. Disclosure enables investors to strictly monitor and control firms' operations, evaluate their resources, and ensure their funds are being managed in their own best interests. Similarly, Huang and Zhang (2012) suggest that shareholders' ability to monitor and control is limited in more opaque firms.

The board of directors performs an important role in the process of delivering useful, relevant and adequate information to stakeholders, taking responsibility for the preparation of financial and non-financial information disclosure (Anderson et al., 2004). Therefore, well-structured corporate governance boosts the disclosure policies and practices that lead to quality information disclosures, thus benefitting shareholders and stakeholders. On this basis, Roychowdhury (2010) concludes that corporate governance characteristics such as board independence lead to better information-disclosure practices and policies that result in more efficient investments.

Bose et al. (2021) and de Villiers et al. (2011) suggest that, for companies considering the benefits of environmental performance for shareholders' wealth and other non-financial advantages, it is vital that the board of directors put sufficient emphasis on such practices. In fact, this should be a primary objective of the board of directors. Chan et al. (2014) argue that good corporate governance should encourage more socially and environmentally responsible behaviours and discourage poor corporate governance, producing positive

outcomes in terms of finance and prestige. Consequently, since a high level of disclosure is an indication of socially responsible behaviour (Gelb & Strawser, 2001; Lone et al., 2016), there is a strong positive association between good corporate governance and the level of social and environmental disclosure. Furthermore, the extant literature demonstrates the effects of corporate governance structures on social disclosure policies. Adu (2022) and Haniffa and Cooke (2005) suggest that corporate governance positively affects social responsibility disclosure. Similarly, Liao et al. (2015) conclude that an effective board of directors increases ecological transparency, which is consistent with stakeholder theory. Giannarakis et al. (2020) found that improved corporate governance increases sustainable transparency and reduces agency costs. These studies thus confirm that an effective corporate governance structure improves the quality of information disclosure (Botosan et al., 2004).

Fama and Jensen (1983) show that, for CBs, a well-established corporate governance structure is one inherently aligned with shareholder interests. This alignment serves as a mechanism to mitigate agency costs by ensuring that monitoring and control measures are implemented. The board of directors, acting as the internal control mechanism, has a pivotal role in monitoring managerial decisions, implementing executive incentives and fostering transparency. The linkage between efficient governance and optimal information disclosure is well-documented (Healy & Palepu, 2001). The board's commitment to delivering relevant information benefits shareholders and stakeholders alike, fostering an environment in which disclosure practices are closely tied to governance quality. Adu (2022) argues, within the framework of agency theory, that banks with superior governance structures are more likely to participate in climate change initiatives compared to those with weaker governance. The study's findings support this argument, revealing a positive impact of corporate governance mechanisms on sustainable decisions, as evidenced by increased environmental disclosures and the implementation of sustainable banking initiatives. Similarly, stemming from legitimacy theory, Taglialatela et al. (2023) demonstrate that boards characterised by greater size, increased gender diversity and higher levels of independence are linked to a prevalence of green communication rather than effective implementation.

In contrast, IBs operate within a distinctive context, influenced by Sharia principles. The emphasis on ethical considerations, adherence to Sharia guidelines and social responsibility provide the underlying motivations that guide the banks' corporate governance decisions. The IB's board of directors plays a multifaceted role, prioritising religious compliance, adherence to ethical standards and the fulfilment of the obligations outlined by Sharia. The alignment between corporate governance and CRD is thus more nuanced within the framework of the IBs. The disparities between the motivations of CBs and IBs extend to their respective stances on climate-related actions and information disclosure. We argue that, while the CBs' stronger board of directors tends to respond to shareholder expectations and regulatory pressures, the better corporate governance structure of the IBs allows the banks to navigate the intricate landscape of religious and ethical obligations, often resulting in a less direct correlation between

TABLE 1 Sample distribution.

No.	Country	CBs	%	IBs	%	Total	%
1	Algeria	14	3.32%	2	1.18%	16	2.71%
2	Bahrain	13	3.08%	20	11.83%	33	5.58%
3	Bangladesh	40	9.48%	9	5.33%	49	8.29%
4	Egypt	19	4.50%	3	1.78%	22	3.72%
5	Indonesia	55	13.03%	13	7.69%	68	11.51%
6	Iraq	11	2.61%	18	10.65	29	4.91%
7	Jordan	14	3.32%	5	2.96%	19	3.21%
8	Kenya	18	4.27%	3	1.78%	21	3.55%
9	Kuwait	6	1.42%	11	6.51%	17	2.88%
10	Lebanon	14	3.32%	2	1.18%	16	2.71%
11	Libya	10	2.37%	1	0.59%	11	1.86%
12	Malaysia	38	9.00%	19	11.24%	57	9.64%
13	Mauritania	7	1.66%	5	2.96%	12	2.03%
14	Oman	6	1.42%	3	1.78%	9	1.52%
15	Pakistan	26	6.16%	9	5.33%	35	5.92%
16	Qatar	8	1.90%	6	3.55%	14	2.37%
17	Saudi Arabia	10	2.37%	5	2.96%	15	2.54%
18	Sri Lanka	14	2.32%	2	1.18%	16	2.71%
19	Syrian Arab Republic	10	2.37%	3	1.78%	13	2.20%
20	Tunisia	12	2.84%	2	1.18%	14	2.37%
21	Turkey	23	5.45%	7	4.14%	30	5.08%
22	United Arab Emirates	23	5.45%	10	5.92%	33	5.58%
23	United Kingdom	27	6.40%	8	4.73%	35	5.92%
24	Yemen	4	0.95%	3	1.78%	7	1.18%
	Total	422	100.00%	169	100.00%	591	100.00%

Note: This table presents the sample distribution for CBs, IBs and whole sample for given countries over a period of 2016–2019.
Abbreviations: CBs, conventional banks; IBs, Islamic banks.

governance strength and CRD. In light of this, we set our next hypothesis as follows:

> **H2.** Corporate governance quality positively (negatively) affects the level of corporate CRD in CBs (IBs).

3 | DATA AND METHOD

3.1 | Sample

We formed our primary sample using the BankFocus database. Following the extant literature, we employed the following sample selection criteria: (i) countries home to both CBs and IBs, (ii) countries with at least four banks and (iii) banks for which at least 3 years of data were available (Beck et al., 2013; Mollah et al., 2017; Mollah, Liljeblom, & Mobarek, 2021; Mollah & Zaman, 2015). These sampling criteria allowed us to identify a total of 591 banks (169 IBs and 422 CBs), from 24 countries, for the period of 2016–2019. We chose these dates because we wanted to assess the effect of the TCFD

frameworks, which were published in 2017. The sample was approximately 29% IBs and 71% CBs, a distribution similar to that of other studies in the extant literature (e.g. Abdelsalam et al., 2016; Abedifar et al., 2013; Mollah et al., 2017; Mollah, Skully, & Liljeblom, 2021). Table 1 presents the sample distribution across the countries.

3.2 | Definitions and measures of the variables

We began by constructing our CRD index to measure the level of CRD across all the banks in our sample. We hand-collected the financial statement data for the firms in the sample because several were unlisted. To quantify the level of disclosure across firms, we deployed a content analysis approach and used NVivo qualitative statistical software to carry out the text mining. The keywords were derived from TCFD reports (2017 and 2019) and literature on CRD (Caliskan & Esen, 2021; de Aguiar & Bebbington, 2014). Using these sources, we identified 29 keywords in five categories: carbon, climate, emission, environment and agreements. We present these keywords in Table A1. To capture all the related words, we treated the verb, adjective and

noun forms of those keywords as synonyms, stemming them and applying special characters—such as dashes (-), slashes (/), spaces () and concatenates ()—in the search criteria. We used NVivo to examine the frequency of occurrence of the keywords in each report. A problem we encountered during this process was the use of synonyms in annual reports. For example, entering the word 'environment' in NVivo produced results for contexts other than 'the natural world'—such as 'the setting or condition in which a particular activity was carried out' or 'the overall structure within which a user, computer, or program operates' (e.g. 'financial environment', 'business environment' and 'development environment'). Therefore, the process required careful observation and manual checking of every word in its context.

Our main explanatory variable was the CGI, which we used to assess the quality of the banks' corporate governance through characteristics of the board of directors of the banks. To capture the key variable of interest (i.e. the corporate governance structure), we followed Mollah et al. (2017) and constructed a CGI based on six characteristics of the board of directors, namely, board size, board independence, board meeting, board attendance, board committees and presence of female directors. We created dummy variables for each characteristic, using the medians of our sample. If a bank's number of board members was smaller than the median, it was coded as 1. On the other hand, if a bank's number of independent directors, board meetings or board committees was higher than the median, it was coded as 1. Similarly, if the attendance rate was above 75% (Mollah et al., 2017) and there were any women on the board (the median number of female directors for the sample was 0.5), this was coded as 1. A bank with figures higher than the medians for all variables in the sample was scored as 6 (1 for each variable) and given a governance rating of 100%. If a bank had figures larger than the medians for 3 variables, it received a score of 3 (out of 6) and a governance rating of 50%. The governance index ranged from 0 to 1.

The number of directors on a board and board independence is widely used in the literature as metrics of corporate governance structure, with the size of the board and board independence shaping the monitoring and controlling of activities and the decision-making processes (Haniffa & Hudaib, 2006; Jensen, 1993; Pathan, 2009; Yermack, 1996). High-frequency meetings held by the board of directors intensify the effectiveness of the monitoring and controlling activities, as well as giving the members of the board more time together as a group thus increasing the connection between them (Brick & Chidambaran, 2010; Laksmana, 2008; Vafeas, 1999). However, a larger number of board meetings is not significant, unless the attendance rate is also high. A lower rate of board attendance increases the possibility of financial misreporting and decreases the efficiency of the board (Cai et al., 2009; Masulis et al., 2012). Board committees under the board of directors enable specialisation in specific areas and knowledge, as well as task-division efficiency and accountability (Anderson et al., 2004; Beasley, 1996; Reeb & Upadhyay, 2010). Adams and Ferreira (2009) found that female directors show more commitment than male directors to attending meetings, while the presence of women on a board boosts men's attendance rate. Furthermore, heterogeneous boards of directors

have a different aura to homogeneous boards, and female directors may bring fresh perspectives to the table (Campbell & Minguez-Vera, 2008). Glass et al. (2016) suggested that gender diversity on boards, especially within leadership teams, strengthens the environmentally friendly strategies of firms.

Again, we followed the extant literature to capture CEO power as a control variable. For example, CEO and chairperson duality is widely used as a proxy for CEO power (Korkeamäki et al., 2017; Onali et al., 2016). In several studies, internally recruited CEOs are considered a CEO-power proxy (Adams et al., 2005; Pathan, 2009), as is the tenure of the CEO (Chikh & Filbien, 2011; Schmid et al., 2018). We employed these three proxies to construct a CEO-power index.

The firm control variables included company size, as measured by logarithm of the total assets; profitability, proxied by the return on assets (ROA); leverage, proxied by the ratio of customers' term deposits to total equity; loans, assessed by the ratio of loans to total assets; financial slack, calculated by cash and cash equivalents divided by total assets; firm age, which was the natural logarithm of the age of the bank; and listed firms, which was a dummy variable, taking 1 if the bank is listed in any stock exchange and 0 otherwise. Finally, a dummy variable for CBs was employed, where 1 was assigned to commercial banks and 0 to IBs. While coding bank types, we considered those that were 100% Sharia-compliant to be IBs. Some of the CBs offered some Islamic products to their customers and are coded as IBs in BankFocus, but we conducted a strict elimination process for 'Islamic window banks' and retained only pure IBs. Furthermore, some country controls were added to the model, namely, the natural logarithm of GDP and inflation proxied by yearly changes in the customer price index. Finally, we included the country-level Islamicity Indices to capture religiosity in the model (Rehman & Askari, 2010).

3.3 | Empirical model

We began by creating the following model to test the effect of corporate governance on CRD for CBs, IBs and the whole sample:

$$CRD_{b,c,t} = \alpha_0 + \beta_1 CBs + \gamma X_{b,c,t} + \delta Y_{c,t} + \varepsilon_{b,c,t}. \quad (1)$$

Second, to test the effect of the different corporate governance systems on CRD, we used the following model:

$$CRD_{b,c,t} = \alpha_0 + \alpha_1 CBs + \beta_1 CGI_{b,c,t} + \beta_2 CBs \cdot CGI_{b,c,t} + \gamma X_{b,c,t} + \delta Y_{c,t} + \varepsilon_{b,c,t}. \quad (2)$$

The following variables were used in the models: $CRD_{b,c,t}$ is the climate-related financial disclosure of bank b in country c at time t.
CBs is the conventional bank dummy.
$CGI_{b,c,t}$ is a matrix CGI of bank b in country c at time t.
$CBs \cdot CGI_{b,c,t}$ is the interaction between CB dummy and CGI.
$X_{b,c,t}$ is a matrix of CEO power and firm-level control variables of bank b in country c at time t.
$Y_{c,t}$ is a matrix of country-level control variables of country c at time t.

$\varepsilon_{b,c,t}$ is the error term; α_0 is the constant; and α, β, γ and δ are the vectors of coefficient estimates.

The bank-level control variables were total assets, ROA, leverage, loans, financial slacks, firm age and listed firms. The country-level control variables were Islamicity, GDP and inflation rate. The descriptions of the variables are provided in Table B1.

3.4 | Descriptive statistics

Table 2 presents the descriptive statistics of the variables—giving the number of observations, mean, standard deviation, median, 5th and 95th percentiles for CBs, IBs and the full sample—as well as the results of two-sample t-tests to compare the means for CBs and IBs. The mean value of the CRD for the sample is 2.81, with a standard deviation of 1.60, or 3.12 for CBs and 1.88 for IBs, with standard deviations of 1.56 and 1.34, respectively. Furthermore, the mean value in the CGI is 2.78, with a standard deviation of 1.26, or 2.84 for CBs and 2.62 for IBs, with standard deviations of 1.29 and 1.15, respectively. A comparison via the t-test revealed that CBs disclose significantly more climate-related information, and a comparison of the corporate governance indices of these two banks found that CBs structure their corporate governance significantly better than their Islamic counterparts. The descriptive statistics for CEO power indicate that CEOs in CBs are significantly more powerful than the CEOs in IBs. The mean value for CBs in the CEO-power index is 1.05, with a standard deviation of 0.77, and 0.90 with a standard deviation of 0.71 for IBs. Furthermore, CBs have significantly more total assets (CBs 15.87 vs. IBs 14.68) and higher ROA (CBs 1.25 vs. IBs −0.15). Finally, the descriptive statistics show that CBs have a significantly longer history than IBs, with mean values of 48 and 24 years, respectively. However, there were no significant differences in the other bank-level control variables, including leverage and loans. The descriptive statistics show that 66% of the CBs are listed, compared with 55% of the IBs.

A Pearson's pairwise correlation analysis for the full sample is presented in Table 3. The signs of the dependent variables and independent variables are as expected. The correlation analysis result includes no highly correlated coefficients between the regressors. Furthermore, a variance inflation factor (VIF) analysis, presented in Table C1, was conducted to further investigate probable multicollinearity. The highest VIF value in the models is 2.49, and the average VIF value is 1.41, indicating that the variables remain within a safe threshold and do not exceed 10 for individual variables or 6 for average VIF (Kennedy, 1998; Marquardt, 1970; Vittinghoff et al., 2005), suggesting that a problematic amount of collinearity is not a concern in this study.

4 | EMPIRICAL RESULTS

4.1 | Climate-related disclosure in CBs and IBs

Following Mollah and Zaman (2015), we employed Equation (1) to assess the extent of the CRD in the banks in the sample. The results

are reported in Table 4. Our primary analysis found a positive and significant coefficient between the *CBs* dummy and CRD. This result suggests that CBs tend to have higher levels of CRD than IBs. In other words, the positive and significant coefficient of the *CBs'* dummy variable indicates that being a CB is associated with an increased likelihood or extent of information disclosure related to climate matters. Moreover, we conduct a new analysis using subsamples. The fourth and fifth models in Table 4 provide an insight into the variation in disclosure practices in CBs when CGI is high and low. Accordingly, the link between CB and CRD is positive and significant in subsamples of firms with high and low CGI, but the coefficient of high CGI is significantly higher than that of low CGI.

However, while a positive significant coefficient between CBs and CRD suggests a relationship, it is important to consider the potential underlying reasons for this difference. In this context, we explored the corporate governance practices of the two types of banks as potentially crucial contributors to this relationship. We added our CGI to the model, using the whole sample and then separated the CB and IB samples. The results are reported in Panel A of Table 5. The results suggest that CGI positively and significantly affects CRD for CBs and for the whole sample, while the effect is negative but insignificant for IBs. These results clearly distinguish CBs from IBs. The results support our first hypothesis that corporate governance is a driving factor for CBs but not for IBs. One plausible explanation for this result is the presence of additional factors that differentiate the two governance systems, as well as motivators guiding the actions of the banks. As previously discussed, the absence of emphasis on climate-related actions in the Holy Book of Quran and other Sharia sources allows IBs to divert their focus towards those areas of social responsibility explicitly mentioned, such as *zakat* and charity. This distinctive feature of the IBs' governance structure, influenced by the principles of Islamic finance, introduces a different set of priorities, aims and objectives. In contrast, CBs operate under a more conventional governance framework that may be more inclined to respond to the values, beliefs and concerns of stakeholders, due to shareholder and regulatory pressures. These differential motivators and governance structures contribute to the differing approaches to CRD, highlighting the critical role of governance systems in shaping climate-related actions and disclosures within the two banking sectors.

Additionally, we conducted analyses using subsamples. The first and second columns of Panel B in Table 5 provide insights into how boards of directors act in regard to disclosure practices when CGI is high and low, respectively. Both high and low CGI scores have significant and positive associations with CRD, but the coefficient of high CGI is significantly higher than that of low CGI. Furthermore, we created an interaction term (*Conventional*CGI*) and added this to our model as a robustness check of our primary results. The results are reported in the last column of Panel B in Table 5. The main variable of interest in the model is the interaction term of the *CBs* dummy and the CGI (*Conventional*CGI*). The interaction term of the *CBs* dummy and CGI is positive and significant at the 1% level. These results indicate that the corporate governance system of CBs

TABLE 2   Descriptive statistics.

	Panel A: CBs sample						Panel B: IBs sample						Panel C	Panel D: full sample					
	Obs	Mean	S. D.	50%	5%	95%	Obs	Mean	S. D.	50%	5%	95%	t-test	Obs	Mean	S. D.	50%	5%	95%
CRD	934	3.116	1.556	3.384	0	5.332	307	1.881	1.339	1.792	0	4.276	12.482***	1241	2.811	1.596	2.891	0	5.241
CGI	891	2.839	1.291	3	1	5	298	2.617	1.146	3	1	5	2.642***	1189	2.783	1.259	3	1	5
CEO power	879	1.051	0.774	1	0	2	294	0.898	0.713	1	0	2	2.974***	1173	1.012	0.762	1	0	2
Total assets	903	15.869	1.714	15.682	13.424	18.568	299	14.676	1.981	14.927	11.132	17.329	10.017***	1202	15.572	1.856	15.523	12.651	18.368
ROA	895	1.247	1.512	1.148	−0.207	3.148	295	−0.153	5.13	0.847	−8.882	3.016	7.268***	1190	0.901	2.932	1.092	−1.484	3.105
Leverage	911	6.918	8.968	5.869	1.514	13.618	274	6.556	4.515	5.759	0.035	15.019	0.645	1185	6.834	8.157	5.838	0.575	13.787
Loans	924	0.577	0.171	0.625	0.235	0.771	302	0.585	0.215	0.644	0.018	0.804	−0.623	1226	0.579	0.183	0.631	0.195	0.783
Financial slacks	901	0.098	0.071	0.079	0.023	0.246	292	0.089	0.088	0.068	0.001	0.251	1.780*	1193	0.096	0.076	0.076	0.012	0.246
Firm age	840	47.753	37.426	41	11.5	99	252	23.949	13.722	20.5	5	47	9.897***	1092	42.261	34.945	35.5	10	91
Listed firms	934	0.66	0.474	1	0	1	307	0.554	0.498	1	0	1	3.349***	1241	0.633	0.482	1	0	1
Islamicity	934	1.502	0.317	1.554	0.963	2.122	307	1.565	0.287	1.589	0.963	2.11		1241	1.518	0.312	1.554	0.963	2.123
GDP	934	26.535	1.217	26.474	24.447	28.622	307	26.215	1.299	26.431	24.292	28.612		1241	26.456	1.245	26.442	24.375	28.622
Inflation	910	4.379	4.056	3.526	0.134	14.401	290	3.255	3.463	2.617	−0.778	11.144		1200	4.107	3.948	3.198	−0.667	13.813

Note: This table presents descriptive statistics for CBs, IBs and full sample. *CRD* is the index created to measure the extend of the climate-related financial disclosure of the banks. *CGI* is the index that measures corporate governance structure consisting of six different characteristics of the board of directors: board size, board independence, board meeting, board attendance, board committees and female directors. *CEO power* is the index that measures CEO power in the banks consisting of three different characteristics of a CEO. *Total assets* is the natural logarithm of total assets of the banks. *ROA* is the return on average assets. *Leverage* is the ratio of customers' term deposits to total equity. *Loans* is the ratio of loans to total assets. *Financial slacks* is the cash and cash equivalents divided by total assets. *Firm age* is the natural logarithm of the age of the firms. *Listed firms* is the dummy variable takes 1 if the banks is listed. *Islamicity* is the Islamicity index constructed by Rehman and Askari (2010). *GDP* is the natural logarithm of the GDP. *Inflation* is the year-on-year change of consumer price index. In Panel C, *t*-test shows difference in means between the two subsamples, CBs and IBs, based on *t*-tests.

Abbreviations: CBs, conventional banks; IBs, Islamic banks.

*represents significance level of 0.1.

**represents significance level of 0.05.

***represents significance level of 0.01.

TABLE 3 Correlation matrix.

	CRD	CB	CGI	CP	TA	ROA	LV	LO	FS	FA	LF	OIS	GDP	INF
CRD	1													
CB	0.334***	1												
CGI	0.404***	0.087***	1											
CP	0.031	0.092***	−0.022	1										
TA	0.253***	0.258***	0.167***	0.128***	1									
ROA	0.106***	0.081***	0.003	0.094***	0.059***	1								
LV	0.083***	0.03	0.002	−0.023	0.035	−0.068***	1							
LO	0.208***	0.013	−0.174***	−0.091***	0.201***	0.036	0.043	1						
FS	−0.111***	0.007	−0.118***	0.197***	−0.171***	0.071***	−0.024	−0.460*	1					
FA	0.205***	0.319***	0.155***	0.115***	0.417***	0.032	−0.004	0.004	0.001	1				
LF	0.147***	0.053***	0.072***	0.064**	0.190***	0.019	−0.012	0.095***	−0.110***	0.053**	1			
OIS	−0.036	−0.018	0.157***	−0.039	0.382***	0.025	−0.047**	0.297***	−0.276***	0.144***	−0.081***	1		
GDP	0.262***	0.091***	0.099***	−0.136***	0.323***	0.080***	0.009	0.164***	−0.106***	0.1303***	−0.0235	0.443***	1	
INF	0.155***	0.129***	−0.050*	0.012	0.017	0.031	0.053**	−0.023	−0.019	0.103***	−0.021	−0.358***	0.0648***	1

Abbreviations: CB, conventional bank dummy; CGI, corporate governance index; CP, CEO power index; CRD, climate-related financial disclosure; FA, firm age, the natural logarithm of the age of the firm; FS, financial slacks, cash and cash equivalents divided by total assets; GDP, GDP, the natural logarithm of the GDP; INF, inflation, change in the inflation rate; LF, listed firms dummy; LO, loans, the ratio of loans to total assets which shows the liquidity ratio; LV, leverage, the ratio of customers' term deposits to total equity; OIS, Islamicity index; ROA, return on assets; TA, total assets, log of total assets.

*represents significance level of 0.1.

**represents significance level of 0.05.

***represents significance level of 0.01.

encourages higher CRD. Overall, our results show that the better corporate governance structure and higher CGI of the CBs increase their CRD. Our results are in line with the extant literature on disclosure, showing that effective boards of directors increase the level of information provided to stakeholders (Anderson et al., 2004; Chau & Gray, 2010; Haniffa & Cooke, 2002; Laksmana, 2008; Mallin & Ow-Yong, 2012).

The results of the Ordinary Least Squares (OLS) estimate demonstrate that powerful CEOs have a substantial (significant) positive effect on CRD, as shown by previous studies (Hui & Matsunaga, 2015; Li et al., 2018; Ruigrok et al., 2006). We found that, amongst the bank-level control variables, total assets, ROA and leverage have a positive relationship with the level of CRD, indicating that larger banks disclose more climate-related information. This finding is consistent with those of other studies (e.g. Clarkson et al., 2008; Cooke, 1989; Cooke, 1992; Deumes & Knechel, 2008; Eng & Mak, 2003; Haniffa & Cooke, 2002; Inchausti, 1997; Khanna et al., 2004; Linsley & Shrives, 2005; Meek et al., 1995; Meng et al., 2013). However, we found that financial slack affects CRD negatively, indicating that greater financial slack is associated with lower CRD, which contradicts a small number of previous studies (e.g. de Villiers et al., 2011; Kim et al., 2019). As expected, being listed on any stock exchange is associated with higher levels of CRD, as listed companies have greater legitimacy concerns and are subject to more public pressure on environmental and climate-related matters.

For the country-level variables, we found that Islamicity positively affects CRD, which is unsurprising when the content of the Islamicity index is considered. GDP seems to positively affect CRD, which is consistent with the conclusions of Hassan and Romilly (2018) and Yu et al. (2018). The higher inflation rate of a country might lead the companies to reveal more information to convince stakeholders of their reliability and enable investors to make informed decisions (Archambault & Archambault, 2003; Meek & Saudagaran, 1990).

Finally, we included a country–year interaction variable to capture the effects of unobservable country-level factors that had occurred during that year in the country. This method has been employed in several previous studies, such as Beck et al. (2013) and Uddin et al. (2020). In this case, we controlled for country–year fixed effects, and our results remained consistent.

We tested the same model on fixed-effect panel regressions. The results presented in Panel C of Table 5 reconfirm that the higher-scoring corporate governance structure of the CBs is positively associated with CRD. Consequently, the findings of the OLS under different models—and the fixed-effect panel regressions presented in Table 5 under Panel A, Panel B and Panel C—demonstrate consistency and provide clear evidence to support our hypothesis. Therefore, the empirical tests prove that corporate governance is a determinant of CRD and that the corporate governance structure of CBs increases their level of corporate CRD.

4.2 | Endogeneity tests

The extent of CRD differs significantly between CBs and IBs, and corporate governance structure is one causal factor in this. In this section, we examine the potential endogeneity concerns that might affect our findings. Specifically, we address the possible endogeneity issues that could have influenced our main regression, employing instrumental variables (IV) analysis and propensity score matching (PSM) techniques.

4.2.1 | Instrumental variables analysis

Although the board of directors is responsible for determining the content of the disclosures, external factors may also affect the disclosure policy. For example, public pressure might be an important driver, pushing companies to disclose more information, and banks might choose to disclose in response to this (Dyck & Zingales, 2002). To address such endogeneity problems, we employed a two-stage least squares (2sls) IV approach.

Our instrument was the number of newspapers circulated in a bank's headquartered country. Dyck and Zingales (2004) define 'extra-legal institutions' as those associated with the legal protection of investors (La Porta et al., 1998, 2006). According to Dyck (2000), they can affect the decisions taken by corporate governance. Chen et al. (2009) used newspaper circulation as a proxy for such institutions, as the pressure of public opinion is stronger in countries with higher newspaper circulation. When public-opinion pressure is high, this can lead managers to act to maximise stakeholders' value, even if this does not benefit shareholders. For example, Dyck and Zingales (2002) show that media pressure (and public opinion pressure) motivates firms to suspend actions that have negative environmental impacts. Moreover, there is a positive correlation between newspaper circulation and the level of education in the community (Wanta et al., 1995), while education increases public awareness, which leads to demands for greater transparency. This can create leverage to push companies into providing more information to satisfy the demands of a highly educated society. Therefore, in countries where newspaper circulation is high, a higher-level CGI and thus a higher level of CRD is expected in response to public opinion and media pressure.

The Cragg–Donald Wald F-statistics (24.50) and Kleibergen–Paap Wald rk F-statistics (30.23) are higher than the 10% critical value (16.38), rejecting the hypothesis that the instrument is weak. Furthermore, the statistically significant Kleibergen–Paap rk LM statistic shows that the model is not under-identified.

We report first-stage regression estimates of newspaper circulation as an instrument of measurement of CGI in Column 1 of Table 6. Consistent with our expectations, we found that the instrument has a positive and significant impact on CGI. The second-stage models are reported in Column 2. The second stage of the models shows that the

TABLE 4 Climate-related disclosure in CBs.

Variables	(1) CRD	(2) CRD	(3) CRD	(4) CRD higher CGI	(5) CRD low CGI
CBs	1.236***	0.782***	0.747***	1.062***	0.544***
	(0.092)	(0.101)	(0.100)	(0.147)	(0.155)
CEO power		0.105*	0.133**	0.114	0.142*
		(0.058)	(0.056)	(0.093)	(0.072)
Total assets		−0.011	0.031	0.036	0.045
		(0.034)	(0.035)	(0.049)	(0.043)
ROA		0.051*	0.053*	0.023	0.047
		(0.029)	(0.030)	(0.048)	(0.035)
Leverage		0.091***	0.101***	0.112***	0.053***
		(0.014)	(0.014)	(0.020)	(0.017)
Loans		0.965***	0.644**	0.635	0.386
		(0.292)	(0.294)	(0.479)	(0.296)
Financial slacks		−3.165***	−3.221***	−4.237***	−1.340*
		(0.646)	(0.641)	(1.011)	(0.801)
Firm age		0.006***	0.005***	0.005***	0.004*
		(0.001)	(0.001)	(0.002)	(0.002)
Listed firms		0.473***	0.582***	0.717***	0.522***
		(0.107)	(0.106)	(0.162)	(0.132)
Islamicity		0.005	0.698***	0.063	−0.004
		(0.222)	(0.232)	(0.381)	(0.276)
GDP		0.292***	0.339***	0.271***	0.457***
		(0.037)	(0.039)	(0.059)	(0.053)
Inflation		0.037***	0.063***	0.031	0.057***
		(0.014)	(0.015)	(0.027)	(0.015)
Constant	1.880***	−7.048***	−9.398***	−6.912***	−11.057***
	(0.076)	(0.998)	(1.087)	(1.374)	(1.535)
Observations	1241	951	951	346	604
R-squared	0.112	0.284	0.328	0.456	0.316
Year FE	No	No	Yes	Yes	Yes
Country FE	No	No	Yes	Yes	Yes
Chi^2				6.67***	
Prob > Chi^2				0.009	

Note: This table presents the results of Equation (1) and shows the analysis of effect of bank types on climate-related financial disclosure. The dependent variable is *CRD* which is the index to measure climate-related financial disclosure. *CBs* is the dummy variable takes 1 if the bank is a CB and 0 if the bank is IB. *CEO power* is the index that measures CEO power in the banks consisting of 3 different characteristics of a CEO. *Total assets* is the natural logarithm of total assets of the banks. *ROA* is the return on average assets. *Leverage* is the ratio of customers' term deposits to total equity. *Loans* is the ratio of loans to total assets. *Financial slacks* is the cash and cash equivalents divided by total assets. *Firm age* is the natural logarithm of the age of the firms. *Islamicity* is the Islamicity index constructed by Rehman and Askari (2010). *GDP* is the natural logarithm of the GDP. *Inflation* is the year-on-year change of consumer price index. Robust standard errors are presented in parentheses.
Abbreviations: CBs, conventional banks; CGI, corporate governance index.
*represents significance level of 0.1.
**represents significance level of 0.05.
***represents significance level of 0.01.

interaction terms of the *CBs* dummy and CGI are positive and significant at the 1% level. Overall, the IV results support the baseline regression estimates that better corporate governance promotes a higher level of CRD in CBs than in IBs. Thus, the results of the IV analysis support the baseline regression after addressing the endogeneity problems.

TABLE 5 Climate-related disclosure and corporate governance in CBs and IBs.

Variables	Panel A			Panel B			Panel C
	CBs CRD	IBs CRD	F. sample CRD	High CGI CRD	Low CGI CRD	F. sample CRD	Fixed effect CRD
CBs*CGI						0.258***	0.251***
						(0.068)	(0.077)
CBs						−0.042	0.008
						(0.21)	(0.235)
CGI	0.428***	−0.127	0.396***	0.664***	0.317***	0.178***	0.207***
	(0.038)	(0.061)	(0.034)	(0.096)	(0.064)	(0.058)	(0.069)
CEO power	0.181***	0.006	0.176***	0.160*	0.129*	0.158***	0.115**
	(0.063)	(0.101)	(0.053)	(0.093)	(0.071)	(0.051)	(0.054)
Total assets	0.081**	−0.027	0.065**	0.070	0.070*	0.047	0.013
	(0.035)	(0.063)	(0.031)	(0.050)	(0.042)	(0.031)	(0.031)
ROA	0.093**	0.039	0.085***	0.045	0.063*	0.064**	0.066**
	(0.037)	(0.041)	(0.028)	(0.048)	(0.035)	(0.028)	(0.027)
Leverage	0.091***	0.092***	0.084***	0.112***	0.055***	0.084***	0.075***
	(0.015)	(0.019)	(0.013)	(0.020)	(0.017)	(0.013)	(0.011)
Loans	0.261	0.781*	0.398	0.291	0.425	0.490*	0.701***
	(0.295)	(0.445)	(0.292)	(0.480)	(0.293)	(0.279)	(0.242)
Financial slacks	−2.426***	−2.288***	−2.019***	−3.182***	−0.551	−1.859***	−1.481**
	(0.781)	(0.863)	(0.583)	(1.049)	(0.801)	(0.583)	(0.609)
Firm age	0.002*	0.018***	0.004***	0.005***	0.004***	0.003***	0.003***
	(0.001)	(0.005)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
Listed firms	0.431***	0.367**	0.528***	0.751***	0.511***	0.449***	0.339***
	(0.116)	(0.174)	(0.101)	(0.162)	(0.131)	(0.099)	(0.098)
Islamicity	0.416	−0.526	−0.009	−0.368	−0.113	0.113	−0.412**
	(0.256)	(0.375)	(0.230)	(0.396)	(0.268)	(0.228)	(0.195)
GDP	0.277***	0.612***	0.376***	0.355***	0.445***	0.353***	0.291***
	(0.044)	(0.077)	(0.036)	(0.060)	(0.053)	(0.035)	(0.037)
Inflation	0.052***	0.037	0.052***	0.044	0.050***	0.048***	0.029**
	(0.014)	(0.025)	(0.014)	(0.027)	(0.014)	(0.014)	(0.012)
Constant	−8.250***	−14.141***	−10.32***	−10.968***	−11.376***	−9.444***	−7.001***
	(1.178)	(2.237)	(0.987)	(1.484)	(1.517)	(0.967)	(0.996)
Observations	743	207	950	346	604	950	950
R-squared	0.346	0.477	0.387	0.453	0.330	0.419	0.392
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Chi^2	18.68***			9.43***			
Prob > Chi^2	0.000			0.002			

Note: This table illustrates the results of Equation (2) based on the analysis of the effect of the board of directors in CBs on CRD using different methods. Specifically, Panel A presents the effects of corporate governance structures in CBs, IBs and full sample, while Panel B provides the result for the analysis of the effect of the board of directors in CBs on CRD using different methods. Finally, Panel C demonstrates the result for the same model as Panel B using Generalized Method of Moments (GMM). All regressions control for year and country fixed effects, whose coefficients are suppressed. The dependent variable is CRD which is the index to measure climate-related financial disclosure. The main independent variable is CBs*CGI which is the interaction term of CBs dummy and CGI variables. CBs denotes the dummy variables for CBs. CGI which is the index for board of directors consisting of six different characteristics of the board of directors. CEO power is the index that measures CEO power in the banks consisting of three different characteristics of a CEO. Total assets is the natural logarithm of total assets of the banks. ROA is the return on average assets. Leverage is the ratio of customers' term deposits to total equity. Loans is the ratio of loans to total assets. Financial slacks is the cash and cash equivalents divided by total assets. Firm age is the natural logarithm of the age of the firms. Islamicity is the Islamicity index constructed by Rehman and Askari (2010). GDP is the natural logarithm of the GDP. Inflation is the year-on-year change of consumer price index. Robust standard errors are presented in parentheses.
Abbreviations: CBs, conventional banks; CGI, corporate governance index; IBs, Islamic banks.
*represents significance level of 0.1.
**represents significance level of 0.05.
***represents significance level of 0.01.

TABLE 6 Instrumental variable analysis.

Variables	First stage CGI	Second stage CRD
Daily newspaper	0.029***	
	(0.019)	
CBs*CGI		1.628***
		(3.488)
CBs	−0.109	−3.703***
	(0.098)	(9.301)
CGI		1.214***
		(3.549)
CEO power	0.154***	0.135
	(0.055)	(0.087)
Total assets	0.072**	0.055**
	(0.036)	(0.038)
ROA	0.042	0.065*
	(0.028)	(0.034)
Leverage	0.082***	0.088***
	(0.014)	(0.018)
Loans	0.667**	0.831
	(0.282)	(0.901)
Financial slacks	−2.728***	−2.232*
	(0.625)	(1.231)
Firm age	0.004***	0.004
	(0.001)	(0.003)
Listed firms	0.525***	0.376*
	(0.105)	(0.215)
Islamicity	0.883***	0.261**
	(0.24)	(0.486)
GDP	0.324***	0.344***
	(0.038)	(0.047)
Inflation	0.089***	0.038**
	(0.019)	(0.026)
Constant	9.507***	5.863***
	(1.043)	(9.195)
Observations	0.154***	950
R-squared		0.166
Country and year FE	Yes	Yes
Weak identification test:		
Kleibergen–Paap rk LM statistic	28.40***	
Cragg–Donald Wald F statistic	24.501	
Underidentification test:		
Kleibergen–Paap Wald rk F statistics	30.231	

Note: This table presents estimation results for the instrumental variable (IV) approach based on Equation (2). The dependent variable is *CRD* which is the climate-related financial disclosure. The main independent variable is *CBs*CGI* which is the interaction term of CBs dummy and CGI variables. *CBs* denotes the dummy variables for CBs. *CGI* is the index for board of directors consisting of six different characteristics of the board of directors. *CEO power* is the index that measures CEO power in the banks

consisting of three different characteristics of a CEO. *Total assets* is the natural logarithm of total assets of the banks. *ROA* is the return on average assets. *Leverage* is the ratio of customers' term deposits to total equity. *Loans* is the ratio of loans to total assets. *Financial slacks* is the cash and cash equivalents divided by total assets. *Firm age* is the natural logarithm of the age of the firms. *Islamicity* is the Islamicity index constructed by Rehman and Askari (2010). *GDP* is the natural logarithm of the GDP. *Inflation* is the year-on-year change of consumer price index. *Daily newspapers* refer to the circulation of daily newspaper in the country. First column presents first stage results for CGI. The second stage of the estimation is presented in the 2nd column. The models are estimated using two-stage least squares (2sls) IV approach. Robust standard errors are presented in parentheses.

Abbreviations: CBs, conventional banks; CGI, corporate governance index.
*represents significance level of 0.1.
**represents significance level of 0.05.
***represents significance level of 0.01.

4.2.2 | Propensity score matching

The descriptive statistics for the sample presented in Table 2 show that CBs and IBs differ in various ways. The comparisons of the means reveal that CBs disclose more climate-related information, they have a higher CGI, their CEOs are more powerful, they have higher total assets and ROA, they hold more cash, and they are older and more experienced. The findings indicate that the banks' respective levels of CRD differ because the banks' corporate governance structures are different. However, the extant literature shows that firm characteristics may determine disclosure level. CEOs influence the level of disclosure and disclosure quality (Botosan, 1997; Bushman & Smith, 2001; Francis et al., 2008; Hui & Matsunaga, 2015). Li et al. (2018) found that more powerful CEOs are associated with enhanced ESG disclosure. In addition, the size of the firm (Eng & Mak, 2003; Haniffa & Cooke, 2002; Linsley & Shrives, 2005), firm performance (Adams & Hardwick, 1998; Ben-Amar & McIlkenny, 2015; Khanna et al., 2004) and amount of cash (de Villiers et al., 2011; Kim et al., 2019) are all associated with enhanced ESG disclosure. Therefore, differences in level of CRD could originate with firm characteristics, rather than corporate governance structure. Furthermore, CBs have approximately three times as many observations as IBs for all variables.

To address this sample selection bias, a PSM technique was employed. This technique allowed an examination of whether the differences in CRD emerged not because of the corporate governance structures of the banks but rather due to the sample size or other differences. Following Rosenbaum and Rubin (1983), the PSM technique consisted of a similar and balanced sample, using observed covariates in the treatment and control groups. CBs were coded as the treatment group and IBs as the control group, and the banks were matched to their nearest neighbour, one-to-one, without replacement, based on the following: CGI; CEO power; total assets; ROA; leverage; loans; financial slack; and firm age, year and country. This was done without replacement, according to their PSM, which was derived from financial and country information from the observations. Panel A of Table 7 presents the descriptive statistics of the matched sample.

TABLE 7 Propensity score matching.

Panel A: balancing table for propensity score matching						
	Treatment group		**Control group**			***t*-test**
Variables	**N**	**Mean**	**N**	**Mean**	**%Bias**	**Treatment - control**
CGI	219	2.658	219	2.653	0.4	0.04 (0.968)
CEO power	219	0.845	219	0.899	−7.3	−0.80 (0.427)
Total assets	219	15.2	219	15.193	0.3	0.05 (0.964)
ROA	219	0.774	219	0.468	5.9	1.91* (0.057)
Leverage	219	7.065	219	6.607	3.4	1.05 (0.292)
Loans	219	0.617	219	0.589	12.1	1.59 (0.111)
Financial slacks	219	0.088	219	0.091	−2.3	−0.48 (0.634)
Firm age	219	21.078	219	24.425	−12.3	−3.07*** (0.002)
Listed firm	219	0.571	219	0.545	−0.9	−0.10 (0.923)

Panel B: baseline regression using propensity score matched sample			
	(1)	**(2)**	**(3)**
Variables	**CRD**	**CRD**	**CRD**
CBs*CGI	6.811**	6.594**	8.778***
	(3.378)	(3.353)	(3.032)
CBs	−4.244	−3.976	−19.093**
	(9.442)	(9.35)	(8.965)
CGI	−1.504	−1.428	−0.786
	(1.48)	(1.422)	(1.779)
CEO power	1.059	1.504	4.133*
	(2.661)	(2.688)	(2.278)
Total assets	5.548***	6.553***	7.984***
	(1.418)	(1.43)	(1.609)
ROA	1.506**	2.545**	2.041**
	(1.067)	(1.073)	(1.062)
Leverage	0.721	0.713	0.093
	(0.626)	(0.617)	(0.526)
Loans	2.798	2.012	−9.156
	(10.3)	(10.218)	(8.278)
Financial slacks	−96.65***	−89.172***	−64.196**
	(25.701)	(25.459)	(30.935)
Firm age	−0.109***	−0.159***	−0.043*
	(0.119)	(0.123)	(0.106)
Listed firms	13.641***	13.38***	16.623***
	(3.503)	(3.444)	(3.833)
Islamicity	28.755*	27.613*	21.483
	(10.69)	(10.637)	(39.186)
GDPPC	7.272***	6.554***	21.755
	(1.53)	(1.555)	(62.631)
Inflation	0.255	0.222	0.119
	(0.629)	(0.654)	(1.58)
Constant	−113.049***	−98.114**	−687.576
	(40.169)	(40.915)	(1502.639)

(Continues)

TABLE 7   (Continued)

Panel B: baseline regression using propensity score matched sample			
Variables	**(1)** **CRD**	**(2)** **CRD**	**(3)** **CRD**
Observations	426	426	426
R-squared	0.338	0.346	0.593
Year FE	No	Yes	Yes
Country FE	No	No	Yes

Note: This table presents estimation results for propensity score matching method where CBs are denoted as treatment groups while IBs are denoted as control groups. Panel A illustrates the descriptive statistics of the matched sample. Panel B presents estimation done using matched sample. The dependent variable is *CRD* which is the climate-related financial disclosure. The main independent variable is *CBs*CGI* which is the interaction term of CBs dummy and CGI variables. *CBs* denotes the dummy variables for CBs. *CGI* is the index for board of directors consisting of six different characteristics of the board of directors. *CEO power* is the index that measures CEO power in the banks consisting of three different characteristics of a CEO. *Total assets* is the natural logarithm of total assets of the banks. *ROA* is the return on average assets. *Leverage* is the ratio of customers' term deposits to total equity. *Loans* is the ratio of loans to total assets. *Financial slacks* is the cash and cash equivalents divided by total assets. *Firm age* is the natural logarithm of the age of the firms. *Islamicity* is the Islamicity index constructed by Rehman and Askari (2010). *GDP* is the natural logarithm of the GDP. *Inflation* is the year-on-year change of consumer price index. Robust standard errors are presented in parentheses.
Abbreviations: CBs, conventional banks; CGI, corporate governance index.
*represents significance level of 0.1.
**represents significance level of 0.05.
***represents significance level of 0.01.

After the PSM, the sample consisted of 219 matched pairs (438 total observations), and the matching procedure largely discharged the differences between the treatment and control groups.

Panel B in Table 7 shows that, when the same regression model is run using the propensity score-matched sample, the regression result for the interaction term of the CBs and strong corporate governance remains positive, at a 1% significant level, while the CBs dummy has a negative and strongly significant relationship with the variable and strong corporate governance has an insignificant and negative relationship. Therefore, the results of the regression estimates using the propensity score-matched sample verify that the baseline regression result is not biased by the sample selection.

4.3 | Further robustness tests

This section details the robustness tests conducted to check our primary findings, which indicate that the CBs' less-complex corporate governance structures promote a higher level of CRD.

4.3.1 | Channel analysis

Previous studies have found that good governance practices mitigate firm-level information asymmetry (Healy & Palepu, 2001; Huang & Zhang, 2012; Kanodia & Lee, 1998), which may improve information disclosure and enhance information transparency (Healy & Palepu, 2001). Accordingly, we argue that better governance practices in CBs mitigate asymmetric information and thus increase the level of climate disclosure. We tested the causality between governance and CRD channels through information asymmetry.

To mitigate information asymmetry, organisations may increase transparency between themselves and their stakeholder groups (Healy & Palepu, 2001; Huang & Zhang, 2012). This can be accomplished by improving the quality of disclosure by increasing the amount of relevant and useful information revealed. As a result, shareholders are able to more closely monitor the companies' operations and practices and evaluate whether the companies are being run according to the best interests of the owners (Healy & Palepu, 2001). Furthermore, Kanodia and Lee (1998) suggest that companies can discipline management by setting strict disclosure policies that prevent managers from exploiting shareholders' wealth for the benefit of themselves rather than seeking to maximise shareholders' benefits. One motivation for banks to disclose more information might be a desire to decrease the negative effects of information asymmetry. If that were the case, it would be expected that boards of directors would promote higher levels of disclosure in banks where there was greater information asymmetry. To test this, we investigated various companies with high and low levels of information asymmetry to assess their respective levels of CRD.

In this study, two proxies of spread and illiquidity were chosen to assess information asymmetry between investors. Following previous studies (Cheng et al., 2011; Corwin & Schultz, 2012), daily bid-ask spreads based on closing prices were collected from DataStream and the daily ratios of the spreads were annually averaged. Illiquidity is another proxy for information asymmetry, and one measure of illiquidity popular in the literature, first suggested by Amihud (2002), is price impact (Amiram et al., 2016; Lang & Maffett, 2011; Nagar et al., 2019; Schoenfeld, 2017). To calculate annualised Amihud illiquidity, we measured daily price sensitivity to one dollar trading volume. The daily ratios of the absolute return to dollar trade volume were calculated using DataStream and averaged annually.

TABLE 8 Channel analysis.

Panel A: *CBs* and the corporate governance index and spread, illiquidity.		
Variables	**Spread**	**Illiquidity**
CBs*CGI	−2.905***	−1.110**
	(1.130)	(0.503)
CBs	6.982*	5.559***
	(3.756)	(1.883)
CGI	1.153	0.477
	(0.909)	(0.379)
Control variables	Yes	Yes
Observations	518	718
R-squared	0.151	0.128
Year FE	Yes	Yes
Country FE	Yes	Yes

Panel B: *CBs* and the corporate governance index via level of spread, illiquidity				
Variables	**CRD High spread**	**CRD Low spread**	**CRD High illiquidity**	**CRD Low illiquidity**
CBs*CGI	0.434***	−0.149	0.342***	0.032
	(0.158)	(0.147)	(0.117)	(0.112)
CBs	−1.161***	0.465	−0.827**	0.082
	(0.402)	(0.429)	(0.385)	(0.298)
CGI	−0.244	0.228*	−0.117	0.093
	(0.148)	(0.133)	(0.117)	(0.104)
Controls variables	Yes	Yes	Yes	Yes
Observations	248	223	270	385
R-squared	0.725	0.703	0.674	0.688
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Chi^2	9.35***		4.11**	
Prob > Chi^2	0.002		0.042	

Note: This table illustrates results of estimation of the channel analysis method. Panel A presents how corporate governance affect the information asymmetry. In Panel A, dependent variables are *Spread* which is the daily bid-ask spread and *Illiquidity* which is the daily price sensitivity one dollar trading volume. Panel B demonstrates the results of estimation using Equation (2) under different levels of information asymmetry. The dependent variable is *CRD* which is the climate-related financial disclosure. The main independent variable is *CBs**CGI which is the interaction term of CBs dummy and CGI variables. *CBs* denotes the dummy variables for CBs. *CGI* is the index for board of directors consisting of six different characteristics of the board of directors. *Control variables* includes firm and country specific variables; CEO power, total assets, ROA, leverage, loans, financial slacks, firm age, Islamicity, GDP and inflation. *CEO power* is the index that measures CEO power in the banks consisting of three different characteristics of a CEO. *Total assets* is the natural logarithm of total assets of the banks. *ROA* is the return on average assets. *Leverage* is the ratio of customers' term deposits to total equity. *Loans* is the ratio of loans to total assets. *Financial slacks* is the cash and cash equivalents divided by total assets. *Firm age* is the natural logarithm of the age of the firms.

Islamicity is the Islamicity index constructed by Rehman and Askari (2010). *GDP* is the natural logarithm of the GDP. *Inflation* is the year-on-year change of consumer price index. Robust standard errors are presented in parentheses.
Abbreviations: CBs, conventional banks; CGI, corporate governance index.
*represents significance level of 0.1.
**represents significance level of 0.05.
***represents significance level of 0.01.

Panel A of Table 8 presents the impact of corporate governance on information asymmetry. As expected, the strong corporate governance in CBs decreases information asymmetry, at a 1% significance level. Furthermore, the median of the sample was used to divide the banks into two categories, representing high and low information asymmetry. Panel B shows the effect of the CBs' boards of directors on CRD in the high- and low-spread and illiquidity environments. It appears that a board of directors will promote CRD when spread and illiquidity levels are high, but not in banks with low information asymmetry. Therefore, the regression results are consistent with the literature showing that the causality stems from a difference between CBs and IBs in terms of their governance structures and channels for mitigating information asymmetry.

4.3.2 | Reverse causality and omitted variables analyses

To address reverse causality, we added 1-year and 2-year lagged values of the explanatory and interaction variables into the model (Larcker et al., 2013). The 1-year and 2-year lag values of the CGI were calculated, and the interaction term was formed using a 1-year and 2-year lagged CGI and *CBs* dummy. In Table 9, Models 2 and 3 include 1-year and 2-year lagged values of the board structure and interaction term, respectively. The results do not indicate any differences. The coefficients of 1-year and 2-year lagged interaction terms do not change their signs (they remain positive and highly significant), and they are very close to the estimated coefficient in the baseline regression model. Therefore, the results suggest that endogeneity problems such as reverse causality are not a driving factor in relation to the findings in this study.

Einhorn and Ziv (2008) argue that disclosures are 'sticky across periods', with information disclosure by companies in previous periods implying a similar level of disclosure in the future. To address this issue, we followed Amin et al. (2020), Cheng (2008) and Faleye (2007) and used lagged values of the dependent and independent variables as an additional control in the model. While a lagged dependent variable decreases the variation of the data, this method deals with both unobserved heterogeneity and reverse causality problems (Amin et al., 2020; Faleye et al., 2014). In Table 9, Columns 4 and 5 present the models with 1-year and 2-year lagged variables of the dependent variable as independent variables in the model. Both results remain constant. The positive significant relationship between interaction

TABLE 9 Reverse causality analysis and omitted variables.

Variables	(1) CRD	(2) CRD	(3) CRD	(4) CRD	(5) CRD
$CBs*CGI$	0.255***				
	(0.061)				
$CBs*CGI_{t-1}$		0.253***	0.099*		
		(0.071)	(0.053)		
$CBs*CGI_{t-2}$				0.215***	0.132*
				(0.074)	(0.068)
CBs	−0.316*	−0.004	−0.036	0.086	0.006
	(0.214)	(0.217)	(0.164)	(0.224)	(0.211)
CGI	−0.005				
	(0.061)				
CGI_{t-1}		0.134**	0.005		
		(0.061)	(0.046)		
CGI_{t-2}				0.144**	0.011
				(0.062)	(0.058)
CRD_{t-1}			0.665***		
			(0.034)		
CRD_{t-2}					0.446***
					(0.039)
CEO power	0.140***	0.159***	0.096**	0.115*	0.156***
	(0.052)	(0.056)	(0.048)	(0.061)	(0.058)
Total assets	0.262***	0.053	0.055**	0.065*	0.084***
	(0.034)	(0.033)	(0.026)	(0.035)	(0.032)
ROA	−0.006	0.045	0.014	0.036	0.024
	(0.033)	(0.029)	(0.019)	(0.03)	(0.025)
Leverage	0.048***	0.09***	0.037***	0.088***	0.062***
	(0.013)	(0.013)	(0.01)	(0.014)	(0.013)
Loans	0.317	0.465	0.044	0.4	0.051
	(0.285)	(0.301)	(0.254)	(0.312)	(0.31)
Financial slacks	−1.931***	−2.636***	−1.738***	−2.822***	−2.783***
	(0.609)	(0.651)	(0.525)	(0.714)	(0.685)
Firm age	0.001	0.003***	0.001	0.003***	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Listed firms	0.381***	0.464***	0.109	0.431***	0.227**
	(0.096)	(0.106)	(0.09)	(0.113)	(0.111)
Islamicity	2.465***	0.238	0.107	0.198	0.089
	(0.271)	(0.241)	(0.191)	(0.26)	(0.244)
GDP	−0.910***	0.358***	0.135***	0.349***	0.211***
	(0.075)	(0.038)	(0.031)	(0.041)	(0.04)
Inflation	0.053***	0.054***	0.02*	0.061***	0.023
	(0.014)	(0.015)	(0.011)	(0.016)	(0.014)
Constant	1.871***	−9.683***	−4.011***	−9.418***	−6.147***
	(0.630)	(1.041)	(0.813)	(1.13)	(1.042)
Observations	950	854	788	784	701

TABLE 9 (Continued)

Variables	(1) CRD	(2) CRD	(3) CRD	(4) CRD	(5) CRD
R-squared	0.437	0.406	0.662	0.396	0.512
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes

Note: This table presents results of the estimations of the Equation (2) using lagged variables of the main interest variables. First model includes regression results of the base model. Second model presents the model that includes 1 year lagged $CBs*CGI$, CGI while 3rd model adds 1 year lagged of CRD to 2nd model. In 4th and 5th models, we used 2 year lagged variables instead of 1 year. The dependent variable is CRD which is the climate-related financial disclosure while CRD_{t-1} and CRD_{t-2} are the 1 and 2 years lagged version of variable. The main independent variable is $CBs*CGI$ which is the interaction term of CBs dummy and CGI variables while $CBs*CGI_{t-1}$ and $CBs*CGI_{t-2}$ are the 1 and 2 years lagged version of variable. CBs denotes the dummy variables for CBs. CGI is the index for board of directors consisting of six different characteristics of the board of directors while CGI_{t-1} and CGI_{t-2} are the 1 and 2 years lagged version of variable. *CEO power* is the index that measures CEO power in the banks consisting of three different characteristics of a CEO. *Total assets* is the natural logarithm of total assets of the banks. *ROA* is the return on average assets. *Leverage* is the ratio of customers' term deposits to total equity. *Loans* is the ratio of loans to total assets. *Financial slacks* is the cash and cash equivalents divided by total assets. *Firm age* is the natural logarithm of the age of the firms. *Islamicity* is the Islamicity index constructed by Rehman and Askari (2010). *GDP* is the natural logarithm of the GDP. *Inflation* is the year-on-year change of consumer price index. Robust standard errors are presented in parentheses.
Abbreviations: CBs, conventional banks; CGI, corporate governance index.
*represents significance level of 0.1.
**represents significance level of 0.05.
***represents significance level of 0.01.

terms and CRD means that the findings do not suffer from reverse causality or unobserved heterogeneity.

5 | CONCLUSION

The purpose of this study was to explore whether the different corporate governance structures found in CBs and IBs affect their respective CRDs. Derived from a sample of 591 banks (169 IBs and 422 CBs), from 24 countries, for the period of 2016–2019, the findings suggest that the boards of directors in CBs ensure a level of CRD significantly higher than that of their Islamic counterparts. The results suggest that the more flexible corporate governance structure in CBs allows these firms to adopt new policies and implement new practices quickly and easily. Furthermore, the study confirms that this causal relationship is associated with information asymmetry: specifically, CRD mitigates information asymmetry for these banks.

The findings of this research provide good examples for IBs to follow regarding climate-related action and corporate governance systems. As discussed earlier, although it provides customers with proof of the IBs' legitimacy, the complex structure of the banks' corporate governance has certain disadvantages, especially in relation to CRD. The findings of the study suggest that IBs may need to restructure their corporate governance systems to mitigate this complexity and enhance their climate disclosure, within the boundaries of Sharia compliance.

This study has various limitations regarding the exclusion of other important governance mechanisms, such as audit committee characteristics, the quality of external auditing and ownership structure. These limitations primarily arose from data constraints, particularly concerning IBs. Consideration of these additional factors could provide further insights into the topic and enhance understanding of the relationship between governance and climate disclosure. Moreover, the analysis in this study did not incorporate the specific roles and responsibilities of the SSBs in IBs. This omission was due to the limited information available in annual reports or the unavailability of such data in databases.

Future research could incorporate SSBs and their impact on CRD. Furthermore, this study focuses on a 4-year time period, from 2016 to 2019, to assess the effect of the TCFD recommendations, which were first published in 2017. If the analysis were conducted over an extended period and with a larger dataset, this could provide a more comprehensive understanding of the long-term effects of climate-related governance practices. Lastly, this study specifically measures the impact of the board of directors' composition and characteristics on climate disclosure. Future studies could expand this analysis to assess the influence of the board of directors on climate performance in both IBs and CBs, thus providing a broader perspective on the relationship between board governance and climate-related outcomes.

CONFLICT OF INTEREST STATEMENT

After a careful review of the areas of conflicts of interest, we confirm that neither of the co-authors has any sort of conflicts of interest with the companies studied in this paper.

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APPENDIX A

TABLE A1 Climate-related financial disclosure keyword list.

A. Carbon
1. Carbon
2. Carbon footprint
3. Carbon pricing/trading
4. Carbon related assets
5. Carbon disclosure project
6. Carbon emission

B. Climate
7. Climate
8. Climate change
9. Climate risk/opportunity

C. Emission
10. Emission
11. Greenhouse gases
12. Greenhouse gases emission
13. Scope 1
14. Scope 2
15. Scope 3
16. Greenhouse gases protocol
17. Reducing greenhouse gases
18. Harmful gases

D. Environment
19. Environment
20. Pollution
21. Global warming
22. Natural disasters
23. Energy consumption
24. Water consumption
25. Green finance

E. Agreements
26. Kyoto
27. Paris agreement
28. TCFD

Abbreviation: TCFD, Task Force on Climate-Related Disclosures.

APPENDIX B

TABLE B1 Descriptions of variables.

Name	Definition
Dependent variable	
Climate-related financial disclosure (CRD)	Content analysis is undertaken. First, we determine a checklist that contains keywords for the climate-related financial disclosure that are presented in Appendix A. Then, we analyse the number of words that appear in the annual reports of the banks.
Corporate governance index (CGI)	
CGI	The corporate governance index consists of six different characteristics of the board of directors; (1) *Board Size*: If the board size of this bank is smaller than the median board size of the sample, then one, otherwise zero. (2) *Board Independence*: If the value of the board's independence is larger than the median of the sample, then one, otherwise zero. (3) *Board Meeting*: If the number of board meetings is larger than the median board meetings of the sample, then one, otherwise zero. (4) *Board Attendance*: If the percent of board attendance is larger than 75%, then one, otherwise zero. (5) *Board Committees*: If the number of board committees is larger than the median board committees of the sample, then one, otherwise zero. (6) *Woman Directors*: If there any woman director on the board then one, otherwise zero.
CEO power index	
CEO power index (CEO power)	CEO power index consists of three different characteristics of the CEO; (1) *CEO Duality*: If the roles of CEO and Chairperson are not separated, then one, otherwise zero. (2) *Internal CEO*: If the CEO is internally recruited, then one, otherwise zero. (3) *CEO Tenure*: If the CEO has more than the median tenure in the sample then one, otherwise zero.
Bank-specific variables	
Total assets	Log of total assets.
ROA	Return on average assets.
Leverage	The ratio of customers' term deposits to total equity.
Loans	The ratio of loans to total assets.
Financial slacks	Cash and cash equivalents divided by total assets.
Firm age	The natural logarithm of the age of the firm.
Conventional banks	Conventional banks is dummy for conventional banks. If the bank is a conventional bank then one, otherwise zero.
Country-specific variables	
Islamicity	We use the Islamicity index by Rehman and Askari (2010).
GDP	The natural logarithm of the GDP.
Inflation	Year-on-year change of Consumer Price Index (CPI).

APPENDIX C

Variable	VIF	1/VIF
CBs	1.19	0.843
CGI	1.14	0.880
CEO power	1.14	0.876
Total assets	1.75	0.573
ROA	1.19	0.843
Leverage	1.48	0.678
Loans	1.15	0.869
Financial slacks	1.22	0.817
Firm age	1.39	0.719
Listed firms	1.29	0.775
Islamicity	2.49	0.402
GDP	1.37	0.731
Inflation	1.51	0.661
Mean VIF	1.41	

TABLE C1 Variance inflation factor (VIF) analysis.

Abbreviations: CBs, conventional banks; CGI, corporate governance index; ROA, return on assets.