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Simsek, R., Mollah, S. and Tunyi, A. (2026) Climate-related disclosure and bank performance: does bank type matter? Business Strategy and the Environment. ISSN: 0964-4733

<https://doi.org/10.1002/bse.71212>

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RESEARCH ARTICLE OPEN ACCESS

Climate-Related Disclosure and Bank Performance: Does Bank Type Matter?

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Received: 7 October 2025 | **Revised:** 30 May 2026 | **Accepted:** 10 June 2026

Keywords: bank performance | climate risk | climate-related disclosure | conventional banks | Islamic banks

ABSTRACT

This paper investigates whether climate-related disclosure (CRD) affects the financial performance of conventional banks (CBs) and Islamic banks (IBs) differently. Using a unique hand-collected dataset on CRD for 591 banks (422 CBs and 169 IBs) from 24 countries over a 4-year period, we examine how the relationship between CRD and financial performance varies across bank types. The results reveal a contrasting effect of CRD on the financial performance of the two bank types. Specifically, CBs experience a significant improvement in financial performance as the extent of their environmental and CRDs increases, whereas IBs exhibit a significantly negative relationship between CRD and financial performance. We attribute this disparity to CBs' comparative advantages, including greater market power, higher cost efficiency and more flexible governance structures, which enable them to derive greater benefits from CRD practices than IBs. This study contributes to the literature on nonfinancial disclosure and bank performance by highlighting the heterogeneous effects of CRD across banking models. The findings also have important policy implications for addressing climate change and advancing sustainable finance initiatives, particularly in the context of the Paris Agreement and COP26. More broadly, the study underscores the critical role of the banking sector in facilitating the transition to a more sustainable economy.

1 | Introduction

The growing urgency to address climate change has intensified regulatory, market and societal pressures on financial institutions to integrate environmental considerations into their strategies, risk management practices and disclosure practices. As a part of this pressure, the Financial Stability Board (FSB) launched the Task Force on Climate-Related Financial Disclosures (TCFD) in 2017, which was formally disbanded in 2023 after its recommendations were incorporated into the International Sustainability Standards Board's IFRS S1

and IFRS S2 standards, thereby preserving its role in promoting transparency in climate-related risks and opportunities. While the financial sector plays a significant role in advancing sustainable practices, existing evidence on the relationship between corporate social responsibility (CSR) engagements and bank profitability remains mixed and context-dependent (e.g., Azmi et al. 2021; Cornett et al. 2016; Moufty et al. 2021; Philippas et al. 2025). In particular, prior research has paid limited attention to how climate-related disclosure (CRD) affects financial performance across heterogeneous banking models characterised by distinct governance structures and operational

The authors are grateful to Nurullah Gur, Mehmet Babacan, Ahmet Faruk Aysan and Salma Ibrahim for their discussion at the 2nd Annual Conference of ASFAAG, The Role of Accounting, Finance & Governance in Sustainability and Sustainable Development in Istanbul in 2022 and British Academy of Management BAM2022 Conference in Manchester in 2022.

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constraints. This study addresses this gap by examining the association between CRD and financial performance in conventional banks (CBs) and Islamic banks (IBs).

The rationale for focusing on the banking sector is grounded in its unique duality regarding climate change. Unlike manufacturing or production industries, where environmental degradation is a direct result of operations, banks typically exhibit a minimal direct carbon footprint. However, their indirect impact is profound. Through their lending and investment activities, financial institutions facilitate the operations of carbon-intensive sectors, effectively acting as the financial engine of global emissions. Consequently, stakeholders no longer view banks merely as neutral intermediaries but as critical levers for achieving global sustainability goals. This shift has transformed the nature of required disclosures: stakeholders now demand transparency not only regarding a bank's own energy consumption but, more importantly, regarding the climate risks embedded within their loan portfolios.

While increased CRD expectations suggest that sustainability is necessary for legitimacy, the economic implications for the banks themselves remain debated. CSR initiatives may enhance reputation and stakeholder trust, but not all firms experience these benefits equally. The relationship between CSR and financial performance is often context-dependent, varying based on factors such as industry type, governance structures and market conditions. The effectiveness of CSR practices in improving firm performance may depend on the alignment of these initiatives with core business strategies, suggesting that indiscriminate or poorly executed CSR efforts can lead to inefficiencies and diminished financial outcomes. These contrasting arguments suggest that the CSR–financial performance relationship is rather complex and there is a need to understand its mechanisms and implications across different contexts.

While existing literature extensively explores the link between environmental responsibility and financial performance, relatively little is known about how this relationship varies across distinct banking models, particularly between CBs and IBs. IBs and CBs differ in several key aspects, including their financial structures, product offerings, business models and corporate governance systems. While CBs are generally more cost-efficient, IBs exhibit greater stability during financial crises due to their risk-sharing mechanisms and conservative investment practices, suggesting the context-dependent differences between the two banking models (Beck et al. 2013). Prior empirical studies show that IBs are less stable (Čihák and Hesse 2010), less cost-effective, less diversified and less hedged, while also having higher intermediation costs (Beck et al. 2013). Ariss (2010) finds that IBs are less competitive compared with CBs. Meslier et al. (2017) suggest that CBs, which have higher market power compared with IBs, could set lower deposit rates, allowing CBs to operate more cost-efficiently. Johnes et al. (2014) argue that the business model structured and adopted by IBs puts these banks at a disadvantage by causing them to be less efficient. Simsek et al. (2024) find that better corporate governance results in improved CRD in CBs compared with IBs, revealing the differences in sustainability practices between these two types of banks. CBs typically operate within systems characterised by diversification, extensive geographic reach and well-established

market mechanisms, while IBs often face constraints related to Sharia-compliant operations, limited hedging instruments and higher costs of operation (Ariss 2010; Beck et al. 2013). These differences between CBs and IBs shape how stakeholders (e.g., investors, customers and regulators) perceive and respond to CRD. CRD can be seen as a signal of long-term stability and responsible governance for CBs, which aligns with their structurally strong positions. On the other hand, for IBs, CRD might be perceived as a cost-intensive activity, potentially diverting resources from their already constrained operational frameworks.

These structural differences present a compelling theoretical challenge. For CBs, CRD may serve as a signal of long-term stability that aligns with their strong market position. However, for IBs, which are already constrained by higher operational costs and limited hedging instruments, the resource-intensive process of comprehensive climate reporting might be perceived as a financial burden rather than a value-adding activity. Therefore, assuming a uniform economic impact of CRD across these distinct banking models may lead to misleading expectations, considering IBs and CBs differ structurally and operationally. This study investigates the following core research question: Does the impact of CRD on bank performance diverge between CBs and IBs due to their distinct structural characteristics? We propose that CRD may impact the financial performance of CBs and IBs differently, given their varying levels of cost-efficiency and positions in the competitive market. To assess this proposition, we use manually collected data for a sample of 591 banks (422 CBs, 169 IBs) from 24 countries for the period 2016–2019. We construct a CRD index to capture the extent of firm-level CRD, which contains 29 items under five categories. We use the NVivo software to perform a content analysis of annual reports, evaluating the level of CRD in relation to our CRD index for each report. Our results indicate that IBs disclose significantly less climate-related information than CBs, suggesting a lower emphasis on climate transparency. This difference may reflect IBs' smaller market share, resource constraints and operational focus on religious compliance rather than sustainability. Despite these lower disclosure levels, we investigate the financial implications of CRD for both bank types. Our findings show that while CRD is positively linked to profitability in CBs, the relationship is negative in IBs. Based on stakeholder and legitimacy theory, our results align with the perspective that, compared with IBs, CBs attract better resources (Waddock and Graves 1997), more climate-conscious investors, higher quality human capital (Greening and Turban 2000), enhanced marketing for products and services (Fombrun 1996), grants and subsidies (Davis et al. 2016) and unforeseen opportunities (Fombrun et al. 2000), and consequently, leverage CRD to create a competitive advantage. IBs, on the other hand, have a relatively smaller market share (IBs' global market share accounts for approximately 6%), attract fewer customers and investors, have limited options for human resources and operate with fewer branches in specific countries.

Additionally, we find that higher CRD increases costs for IBs, which are already more expensive than CBs. Allocating resources to climate-friendly initiatives or investing in less profitable sustainable projects may strain IBs' financial position, exacerbating their competitive disadvantage. This aligns with prior findings that sustainable projects require significant

upfront investments and yield cash flows perpetually, which can be financially burdensome for firms lacking sufficient capital (Nishihara 2023). Further, IBs' ethical investment constraints may limit their ability to offset these costs through conventional financial instruments (Beck et al. 2013).

This paper makes the following contributions to the existing literature. First, this is the first study to investigate the effect of CRD on financial performance with a comparative view of CBs and IBs. In the literature, there are few studies on IBs in the field of CSR, sustainability and environment (Aribi and Arun 2015; Belal et al. 2015; Haniffa and Hudaib 2007; Kamla and Rammal 2013; Maali et al. 2006; Mallin et al. 2014; Williams and Zinkin 2010). Aribi and Gao (2010) employ CBs and IBs as a sample and compare them from a CSR aspect using a sample of 42 banks (21 Islamic and conventional financial institutions) from the Gulf region, utilising data from only 1 year, 2004. Compared with Aribi and Gao (2010), this study deals with a larger sample and a longer period. Furthermore, Platonova et al. (2018) explore the impact of CSR disclosure on the financial performance of IBs. However, their study fails to include any environmental-related items in their CSR disclosure index, providing insight only into the corporate and social aspects of IBs. Our study attempts to focus on the climate aspects neglected by previous CSR studies on IBs.

Second, our study makes a significant contribution to the understanding of CRD and their impact on corporate performance, particularly within the banking sector, by building on recent literature. Moufity et al. (2021) demonstrate the multidimensionality of sustainability and its effects on bank performance in the United States and EU by revealing that CRD plays a crucial role in shaping financial outcomes, especially in varying governance contexts. Simsek et al. (2024) explore how corporate governance structures in IBs and CBs affect CRD, while Caby et al. (2020) find that country-level and bank-level characteristics are strong predictors of banks' commitment to carbon disclosure initiatives, though less so for the quality of disclosure, emphasising the role of size and national context in shaping these practices. From the corporate performance perspective, Helfaya et al. (2023) show that environmental goals disclosure (EGD) positively influences sustainability ratings and firm value in Egyptian companies. Furthermore, Migliavacca (2024) discusses the declining explanatory power of traditional financial metrics in ESG-rated companies by highlighting the continued importance of CRD in influencing financial performance. The current study not only extends the understanding of CRD and its impact on financial performance but also bridges the gap between theory and practice in sustainability reporting and corporate performance, particularly within the global banking sector.

Third, although there is an extensive body of literature on the effects of environmental, CSR and carbon disclosure and performance on firms' financial performance, to the best of our knowledge, this is the first study to examine the relationship from a climate perspective in the banking sector, comparing CBs and IBs. This is important because sustainability, environmental, or CSR disclosure or performance measures (e.g., KLD, Asset4, ESG) often include overly general measures and items for CRD, while carbon disclosure or performance measures do not cover the entirety of climate-related issues, such as energy and water

usage or pollution. Therefore, this study employs an alternative measure that captures climate-related aspects for CRD and explores its effects on the profitability of the banks.

Fourth, this study employs a unique dataset for the analyses. The corporate governance-related data (board size, CEO duality, internal CEO, CEO tenure) are collected manually using various sources such as annual reports, corporate governance reports, banks' websites and databases, as the available databases fail to provide accurate and adequate information for our sample. This is important because severe data gaps and missing variables are highly common, especially in corporate governance metrics for both IBs and CBs operating within the specific countries examined in this study. By hand collecting the data, we overcome a common limitation of automated databases.

Finally, our findings offer critical policy implications. We show that while CRD is positively linked to profitability in CBs, the relationship is negative for IBs. This suggests that for IBs, the costs of disclosure currently outweigh the benefits, likely due to their smaller market share and resource constraints. This finding provides important insights for regulators who might otherwise apply a 'one-size-fits-all' disclosure mandate.

The remainder of the paper is structured as follows. Section 2 provides CRD and bank reforms, while Section 3 includes a theoretical literature review. Section 4 explains the empirical literature and hypothesis development and Section 5 specifies the sample, data and model applied in this study. Finally, Section 6 includes the empirical results, and Section 7 presents the summary of the study and the conclusion.

2 | Climate Disclosure and Bank Reforms

Banks play a key role in the transformation of economies to low-carbon or net-zero emissions through sustainable finance and green banking (Liljeblom et al. 2024; Reghezza et al. 2022). In practice, banks have a minimal direct impact on climate change and environmental degradation compared with industries involved in manufacturing and production. While the negative effects of corporations from these industries are more apparent, the banking sector's role in climate change and environmental degradation lies in its support for those sectors through financial resources. Realising this impact, diverse stakeholders ranging from regulators and investors to advocacy groups increasingly expect financial institutions to align with global sustainability goals, such as the Paris Agreement and the UN Sustainable Development Goals. These expectations include enhancing transparency in CRDs, as suggested by the TCFD, investing in green finance initiatives both within the financial sector and in other industries, divesting from environmentally harmful sectors and adopting robust climate risk management frameworks. A unique challenge for financial institutions is that stakeholders demand not only the management of their direct emissions but also significant influence over the emissions of their clients and investees, for instance, by promoting green projects or adopting policies that limit financing for fossil fuel-dependent activities.

Adopting environmentally sustainable and climate-friendly practices is important not only for financial institutions to

satisfy their stakeholders but also because the banks themselves are not immune to climate change. For instance, while 70% of banks in the United Kingdom view climate change as a threat to the financial system, only 10% are developing strategies on climate-related financial risk management (Bank of England 2018). Severe climate-related issues affect banks by damaging tangible assets, reducing debtors' profitability, resulting in nonperforming loans and negatively impacting human and intellectual resources (Deryugina and Hsiang 2014; Hudson 2024; Nordhaus 2019; O'Neill et al. 2017; Ongena 2024; Reghezza et al. 2022; Stern 2008). Despite growing interest in sustainable finance, many banks remain reluctant to expand their green investment activities. Out of 101 banks studied in Stein et al. (2018), 51% did not yet offer dedicated climate products, even though 88% were interested in providing such products and services in the future. A primary reason for this hesitation regarding green investment may be that banks perceive the market as offering insufficient incentives, such as green revenues and profitability (Kruse et al. 2020).

CRD has gained importance as a regulatory response to the recognition that climate change poses material risks to financial stability (Moreno and Caminero 2022). While traditional environmental regulation primarily targets emissions and production processes, CRD frameworks in the financial sector aim to enhance transparency regarding institutions' exposure to climate risks (European Central Bank 2021; BIS 2023). These include both physical risks arising from extreme weather events and transition risks associated with shifts in climate policy, technological innovation and market preferences (TCFD 2017).

The banking sector is central to this regulatory landscape. Although financial institutions typically possess limited direct environmental footprints, they face significant indirect exposure to climate risk through their lending and investment activities (Mueller and Sfrappini 2025). Climate-related shocks can affect asset quality, capital adequacy and long-term viability (Bolton et al. 2020). In response, financial regulators and central banks have increasingly incorporated climate issues into supervisory frameworks and governance expectations (Campiglio et al. 2018). CRD serves as a key policy instrument, complementing traditional prudential regulation and enabling supervisors and investors to better assess climate risk exposure.

Beyond direct risk exposure, financial institutions exert a substantial indirect influence on climate outcomes through capital allocation. By providing funds to carbon-intensive industries, banks effectively shape the emissions trajectories of the real economy. Evidence suggests this indirect impact is substantial. For instance, the Carbon Disclosure Project (CDP) report in 2020 estimated that the portfolio emissions of global financial institutions are, on average, over 700 times larger than their direct operational emissions. Similarly, the Banking on Climate Chaos report in 2025 reveals that the world's 65 largest banks committed nearly \$8 trillion to the fossil fuel industry over the past 9 years. This dual role as both risk bearers and contributors to climate outcomes has increased regulatory scrutiny of financial institutions, as misaligned financial flows may cause greater transition and physical risks. CRD is intended to

enhance transparency regarding climate-related risks embedded within loan and investment portfolios.

The 2015 Paris Agreement is a significant milestone for this regulatory momentum by seeking to align financial flows with low-carbon, climate-resilient development pathways. Following this agreement, the FSB established the TCFD in 2017. The TCFD framework required financial institutions to disclose how climate risks affect their governance, strategy and financial performance. It explicitly emphasized the assessment of risks embedded within loan portfolios and investment activities. For the banking sector, this reform was transformative. Further, it required banks to move beyond reporting operational emissions (Scope 1 and 2) to engaging in forward-looking assessments of financed activities (Scope 3). This shift increased informational and organisational demands, necessitating new data collection processes and enhanced governance structures. Although the TCFD was formally disbanded in 2023, its recommendations have been incorporated into the International Sustainability Standards Board's IFRS S1 and IFRS S2 standards, reflecting regulatory consolidation. Therefore, CRD has evolved from a voluntary initiative into an institutionalised component of financial reporting.

While both banking models are subject to similar macroprudential objectives, they operate under distinct institutional constraints. IBs face additional governance and operational requirements stemming from Sharia compliance, including restrictions on hedging instruments and higher intermediation costs. These constraints may affect the feasibility and economic consequences of implementing comprehensive CRD practices. In contrast, CBs typically benefit from greater diversification and more flexible risk management tools, potentially allowing them to absorb disclosure-related costs more effectively. The coexistence of CBs and IBs within the same regulatory environment provides a suitable context for examining the financial implications of CRD reforms. Both bank types face similar external regulatory pressures yet differ markedly in their internal structures and operational flexibility. This setting allows for an assessment of whether CRD reforms generate uniform benefits across banking models or whether their financial consequences are contingent on institutional characteristics. By exploiting this regulatory context, the present study contributes to a nuanced understanding of how CRD interacts with banking reforms and institutional heterogeneity.

3 | Theoretical Literature Review

Extensive literature examining the relationship between environmental performance and financial performance has proposed various theoretical explanations. The relationship between CRD and financial performance is complex. This study draws upon five theoretical perspectives: stakeholder theory, voluntary disclosure theory (signalling theory), trade-off theory, slack resources theory and proprietary cost theory. Together, these theories try to explain the mechanisms through which disclosure can create value by enhancing reputation, reducing information asymmetry or diminishing firm value via proprietary costs and resource diversion.

Freeman (1984) defines a stakeholder as 'any group or individual who can affect or is affected by the achievement of the firm's objectives'. According to stakeholder theory, firms are more likely to succeed when their strategies, business models and decisions align with stakeholder expectations (Deegan and Unerman 2006). This stakeholder theory is widely used to justify CSR, environmental sustainability and CRD actions (Buysse and Verbeke 2003; de Villiers et al. 2011; Delmas and Toffel 2008; Kassinis and Vafeas 2006; Schnackenberg and Tomlinson 2016). Companies that provide positive and progressive social and environmental disclosures may attract a broader range of stakeholders and strengthen stakeholder commitment. Enhanced CRD may strengthen trust, legitimacy and reputation, thereby improving access to critical resources such as capital, skilled labour and regulatory goodwill (Berrone and Gomez-Mejia 2009; Roberts 1992). Huang and Zhang (2012) demonstrate that stakeholder groups wield significant influence over the quantity and extent of environmental disclosure information. These stakeholders exert pressure on companies to become more active in social welfare actions and disclose more information about these initiatives. This pressure is highly substantive; for instance, investors who prioritise social welfare investments are willing to accept lower returns, lower reward-to-risk ratios and higher fees to support these initiatives (Riedl and Smeets 2017). In the banking context, these mechanisms are particularly salient. Banks operate in highly regulated environments and rely heavily on stakeholder confidence for deposit stability, investor support and regulatory approval. CRD may function as a signal of prudent risk management and long-term orientation, potentially translating into improved financial performance through lower funding costs, increased investor demand and enhanced market valuation.

Voluntary disclosure theory is another framework applied by researchers to explain nonfinancial voluntary disclosure by companies (Clarkson et al. 2008; Dye 1985; Lang and Lundholm 1993; Verrecchia 1983). Voluntary disclosure theory, which is often used in conjunction with signalling theory, refers to companies choosing to provide important information to stakeholders without being mandated to do so by regulations or legislation (Meek et al. 1995). Providing non-mandatory information enhances the company's legitimacy among stakeholders by influencing their perceptions of the company's image and reputation (Guidry and Patten 2012; Hooghiemstra 2000) and reduces social and political pressures (Patten 1991; Warren and Schwartz 1997). Firms may signal their relatively better social performance using corporate disclosure channels to differentiate themselves from lower performing competitors (Su et al. 2016; Zerbini 2017). Such disclosure is particularly important because it reduces information asymmetry between corporate insiders (such as managers) and outsiders (such as investors). Insiders possess private information about the firm's true exposure to climate risks and its strategic resilience. In the absence of disclosure, market participants cannot distinguish between firms with strong climate risk management and those with high exposure. Enhanced disclosure reduces information uncertainty, allowing investors to assess future cash flows more accurately, thereby reducing the firm's cost of equity and debt capital (Diamond and Verrecchia 1991; Dhaliwal

et al. 2011). The activities of financial institutions are inherently opaque, and external stakeholders often face difficulties in assessing the risk embedded within loan portfolios and investment activities (Fosu et al. 2017). By voluntarily disclosing climate-related information, banks may reduce uncertainty surrounding their exposure to physical and transition risks, thereby lowering perceived risk among investors and creditors. From this perspective, enhanced CRD may translate into improved financial performance through reduced funding costs, increased investor confidence and more favourable market valuations.

On the other hand, alternative theoretical perspectives such as trade-off theory, slack resources theory and proprietary cost theory suggest that CRD may detrimentally affect financial performance, particularly for firms facing structural or resource constraints. Friedman (1970) critiques CSR actions, arguing that management spending on social initiatives uses funds belonging to various stakeholders for a general social interest. If such actions diminish shareholder wealth, executives are effectively spending shareholders' money; if they impose additional costs on customers, executives are spending customers' money; and if they reduce earnings for some employees, executives are spending employees' money. Friedman suggests that executives should act as agents for these stakeholders and refrain from using their funds for social responsibility actions that stakeholders may not support or may consider excessive. Executives, according to Friedman, should leave decisions regarding social responsibility to stakeholders who can engage in such actions with their own resources rather than redistributing wealth from shareholders, customers, or employees to other stakeholders. This approach, as argued by McWilliams and Siegel (1997), could potentially reduce a company's financial performance by diverting resources away from value creation for shareholders. In this regard, Jensen (2002) proposes that firms should prioritise maximising total firm value over maximising social welfare. This does not diminish the importance of social welfare or deny the existence of social issues but asserts that social welfare is intrinsically linked to wealth creation. By focusing on maximising shareholder value, firms indirectly contribute to social welfare maximisation; however, prioritising social welfare alone could detract from firm value.

Slack resources theory suggests that engagement in costly discretionary activities, including extensive disclosure, depends on a firm's underlying financial capacity (Waddock and Graves 1997). Firms with limited financial slack may be less able to absorb the costs associated with climate-related engagement and disclosure. In competitive markets, such costs may place firms at an economic disadvantage, particularly when disclosure does not yield immediate financial benefits. Consistent with this, Barnett and Salomon (2006) argue that voluntary spending on social and environmental initiatives increases operating costs and may weaken competitive positioning. Finally, proprietary cost theory argues that disclosure may reveal sensitive risk exposures to competitors or regulators, potentially damaging the firm's competitive position (Verrecchia 1983). Extensive CRD may generate proprietary costs that outweigh its potential benefits, especially for firms operating under tighter constraints.

4 | Empirical Literature Review and Hypothesis Development

4.1 | CRD in CBs and IBs

Extensive prior literature on environmental responsibility of firms has proposed various approaches and theories. The research advocating a positive relationship has formed various approaches and theories to explain the concept of being green and its effects on profitability. Some of the most frequently cited theories on this topic are stakeholder theory and voluntary disclosure theory.

Stakeholders exert pressure on companies to become more active in social welfare actions and disclose more information about these initiatives. Larger firms especially feel this pressure more deeply, and they tend to disclose significantly more information, utilising both narratives and visual imagery, as a strategic response to pressure from powerful stakeholders, media, regulatory bodies and peers (Al-Tuwaijri et al. 2004; Clarkson et al. 2008). Hummel and Schlick (2016) find that superior corporate sustainability performers utilise high-quality disclosure to signal their advantage in accordance with voluntary disclosure theory, while firms with poor performance disclose low-quality reporting to mask their actual performance and maintain legitimacy. This signalling mechanism yields economic benefits to companies. Dhaliwal et al. (2011) demonstrate that firms with a high cost of equity are more likely to initiate voluntary CSR disclosure, which subsequently reduces their cost of capital by attracting dedicated institutional investors.

We hypothesise that CBs and IBs act differently regarding their environmental disclosure as a result of the different pressures from their stakeholders. CBs actively engage with a wide range of stakeholders, including environmental groups and regulators, to align their operations with societal expectations. CBs are more likely to implement comprehensive environmental disclosures to maintain their legitimacy and stakeholder trust. On the other hand, IBs primarily focus on Sharia-related social concerns, such as social justice (e.g., not involving *riba*-interest), ethical business practices (e.g., not involving sinful industries) and wealth distribution (e.g., *zakat*). Due to Sharia's limited emphasis on environmental matters, IBs are less likely to prioritise environmental disclosures, reflecting a narrower scope of stakeholder engagement (Simsek et al. 2024). Voluntary disclosure theory further supports this difference, as CBs are driven to disclose environmental information voluntarily to enhance their reputation and reduce social pressures. For IBs, voluntary disclosures are often driven more by religious and social imperatives rather than by environmental concerns. Therefore, the first hypothesis is set as follows:

H1. *The extent of the CRD differs in CBs and IBs.*

4.2 | CRD and Financial Performance in CBs and IBs

Consistent with stakeholder and voluntary disclosure theories, a substantial body of empirical literature documents a positive association between environmental disclosure and firm

financial performance. Companies that recognise stakeholders' demands, needs and concerns and inform those stakeholders about environmentally friendly actions are rewarded through improved financial outcomes. Al-Tuwaijri et al. (2004) demonstrate a positive relationship between economic and environmental performance, which represents a win-win scenario. Accordingly, good environmental performance is recognised as an intangible asset of the company by investors, and thus, it is rewarded by the market. Matsumura et al. (2014) compare companies that disclose carbon emission information with those that do not. The findings suggest that each additional ton of carbon emissions reduces firm value by approximately \$212, while companies disclosing this information have market values about \$2.3 billion higher than their counterparts. This implies that the cost of carbon emissions is higher for companies that fail to disclose their emissions. Although Griffin et al. (2017) do not find a significant difference between disclosing and non-disclosing companies, their findings indicate that greenhouse gas emissions negatively impact equity values, resulting in a decrease of \$79 per ton of greenhouse gas emissions. More recently, Helfaya et al. (2023) find that EGD increases the sustainability ratings of the firms as well as firm financial values. Plumlee et al. (2015) document that the quality of discretionary environmental disclosure is positively associated with firm value, which is proxied by expected future cash flows and the cost of equity. Martin and Moser (2016) suggest that company management is incentivised to undertake and disclose green investments because they attract investor attention and favourable investor responses, even though such investments may not directly contribute to future cash flows. Green investments often do not yield immediate financial benefits, as their costs typically exceed their returns. However, managers and shareholders favour green investments because the potential gain of attracting new investors through these initiatives outweighs the costs involved.

On the other hand, Friedman (1970) critiques CSR actions, arguing that management spending on social initiatives uses funds belonging to various stakeholders for a general social interest. If such actions diminish shareholder wealth, executives are effectively spending shareholders' money; if they impose additional costs on customers, executives are spending customers' money; and if they reduce earnings for some employees, executives are spending employees' money. Friedman suggests that executives should act as agents for these stakeholders and refrain from using their funds for social responsibility actions that stakeholders might not support or find excessive. Executives, according to Friedman, should leave decisions regarding social responsibility to stakeholders who can engage in such actions with their own resources rather than redistributing wealth from shareholders, customers or employees to other stakeholders. This approach, as argued by McWilliams and Siegel (1997), could potentially reduce a company's financial performance by diverting resources away from value creation for shareholders. In this regard, Jensen (2002) proposes that firms should prioritise maximising total firm value over maximising social welfare. This does not diminish the importance of social welfare or deny the existence of social issues but asserts that social welfare is intrinsically linked to wealth creation. By focusing on maximising shareholder value, firms indirectly contribute to social

welfare maximisation; however, prioritising social welfare alone could detract from firm value.

Some researchers argue that environmental performance worsens firms' financial performance (Barnett and Salomon 2006; Friedman 1970; Hillman and Keim 2001; Hong and Kacperczyk 2009; Jensen 2002; Mackey et al. 2007; McWilliams and Siegel 1997; Surroca and Tribó 2008), and several studies have documented a negative association between environmental performance and financial outcomes. Barnett and Salomon (2006) contend that voluntary spending on social and environmental initiatives increases costs, causing an economic disadvantage in the competitive market. Bolton and Kacperczyk (2021) investigate the relationship between carbon emissions data and US stock returns. They find that as CO₂ emissions increase, companies achieve higher returns. In et al. (2019) demonstrate that carbon-efficient firms outperform carbon-inefficient firms, although this result is not observed in small firm samples. Lyon et al. (2013) find that companies in low-pollution industries awarded the Green Company Awards in China experience significantly negative returns, while small companies with the same award show insignificantly negative returns. Consistent with recent reviews of the TCFD literature, prior studies document substantial heterogeneity in both the motivations for CRD and its financial consequences across institutions and regulatory contexts (Tumewang et al. 2025). This heterogeneity suggests that the economic implications of CRD are unlikely to be uniform across banking models with different structural and operational characteristics.

Compared with CBs, IBs are at a competitive disadvantage, even in Muslim-majority countries. IBs tend to be less stable, less cost-effective, less diversified, less hedged, less competitive, more costly to operate and characterised by weaker market power and less effective business models (Ariss 2010; Beck et al. 2013; Čihák and Hesse 2010; Johnes et al. 2014; Meslier et al. 2017). Furthermore, CBs typically have greater resources, even in Muslim-majority countries. According to Ernst and Young (2016), IBs' asset share constitutes 34% in the GCC, 13% in ASEAN countries (such as Malaysia and Indonesia), 12% in South Asia (Pakistan and Bangladesh) and 6% in other regions (including Egypt, Jordan, Turkey, South Africa and Sudan). Globally, 93% of IBs' assets are concentrated in only nine countries: 33% in Saudi Arabia, 15.5% in Malaysia, 15.4% in the UAE, 10.1% in Kuwait, 8.1% in Qatar, 5.1% in Turkey, 2.5% in Indonesia, 1.6% in Bahrain and 1.4% in Pakistan. These figures suggest that IBs face distinct competitive disadvantages relative to CBs. Specifically, in Saudi Arabia alone, the majority of banking assets belong to IBs by a narrow margin, at 51.2%, while in Kuwait, IBs' assets comprise 45% of the total banking assets (IBs' asset shares in other countries are as follows: 29.3% in Bahrain, 25.8% in Qatar, 21.6% in the UAE, 21.3% in Malaysia, 10.4% in Pakistan, 5.5% in Turkey and 3.7% in Indonesia). Considering these structural differences between CBs and IBs, CRD may enhance the financial performance of CBs through reputational benefits and improved access to capital markets, whereas the CRD reporting and compliance costs may impose a relatively greater financial burden on IBs. As a result, the financial implications of CRD are likely to differ across these

two banking models. Therefore, we set our next hypothesis as follows:

H2. *The relationship between CRD and financial performance differs between CBs and IBs.*

5 | Research Design

5.1 | Sample

Our primary sample is derived from the BankFocus database, following established criteria in the literature. Specifically, we set several sample selection criteria: (i) countries with both CBs and IBs, (ii) countries with a minimum of four banks and (iii) banks with at least 3 years of available data (Beck et al. 2013; Mollah and Zaman 2015; Mollah et al. 2017; Mollah, Liljeblom, and Mobarek 2021). The primary screening yields an initial population of 1348 banks, comprising 1163 CBs and 185 IBs, sourced from countries operating dual banking systems with at least four institutions from 40 countries. Next, we exclude 417 banks that lack 3 years of total asset (TA) data. Subsequently, we eliminate an additional 340 CBs located in countries¹ that fail to meet the dual banking comparative requirement or retain two or fewer banks. After applying these criteria, we obtain a sample comprising 591 banks, including 169 IBs and 422 CBs, across 24 countries for the period from 2016 to 2019. The sample selection procedure is presented in Table A1 in Appendix A. We begin the sample period in 2016 to assess the impact of the TCFD framework, which was published in 2017, and conclude with 2019, the most recent year for which CRD data were available. The sample consists of approximately 29% IBs and 71% CBs, a distribution consistent with other studies in the existing literature (e.g., Abdelsalam et al. 2016; Abedifar et al. 2013; Mollah et al. 2017; Mollah, Skully, and Liljeblom 2021). Table 1 illustrates the distribution of the sample across countries.

5.2 | Definitions and Measures of the Variables

We investigate the relationship between CRD and bank financial performance, using a recognised accounting-based measure, return on assets (ROA) as a dependent variable. This metric has been extensively employed in previous studies on environmental performance, disclosure and firm performance (Aguilera-Caracul and Ortiz-de Mandojana 2013; Chien and Peng 2012; Leonidou et al. 2013; Waddock and Graves 1997; Wang and Bansal 2012; Wiengarten et al. 2017). Al-Tuwaijri et al. (2004) highlight the drawbacks of using narrow economic performance metrics, noting that such metrics often fail to account for firm size and industry-specific characteristics. To mitigate these limitations, they propose scaling profitability measures by the firm's asset base, particularly when studying firms across different industries. Given that our study focuses exclusively on the banking sector, we avoid this potential bias and thus opt to use these standard accounting-based metrics to gauge economic performance.

Our independent variable is CRD. To measure the extent of CRD across banks in our sample, we construct a CRD index based on

hand-collected financial statement data from 2016 to 2019. Given that several banks in our sample are unlisted, we employ a content analysis approach using the NVivo qualitative statistical software. We identified 29 keywords across five thematic categories—carbon, climate, emission, environment and agreements—drawn from TCFD Reports (2017 and 2019) and relevant literature (Caliskan and Esen 2021; de Aguiar and Bebbington 2014). These keywords, presented in Table B1 in Appendix B, encompass verb, adjective and noun forms, as well as synonyms, stemmed variants and concatenated forms, to capture all related terms effectively. During the analysis, we encountered challenges with synonyms used in annual reports. For instance, the term ‘environment’ yielded diverse contexts such as ‘the natural world’, ‘the setting or condition of an activity’ or ‘the overall structure within which operations occur’, including ‘financial environment’, ‘business environment’ or ‘development environment’. Therefore, meticulous manual checking and context-sensitive analysis were essential

throughout the process to ensure accuracy and consistency in keyword identification.

Firm control variables in our analysis include company size, measured by the natural logarithm of TAs; nonperforming loans as a proportion of TAs; debt-to-equity ratio, calculated by dividing long-term debts by equity; firm age, represented by the natural logarithm of the bank’s age; and the number of branches operated by each bank. The number of directors on the board serves as a metric of corporate governance structure, aligning with prior literature that links board size to monitoring, control activities and decision-making processes within firms (Jensen 1993; Yermack 1996; Pathan 2009). CEO Power is captured through several proxies commonly used in empirical studies. CEO and chairperson duality, internal CEO recruitment and CEO tenure exceeding the median for the sample are utilised to construct a CEO Power Index (Adams et al. 2005;

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 the whole sample for the given countries over a period of 2016–2019.

Korkeamäki et al. 2017; Onali et al. 2016; Pathan 2009; Schmid et al. 2018). Additionally, country-level controls are incorporated, including the natural logarithm of GDP per capita and inflation measured by annual changes in the consumer price index. Religiosity data from the global Gallup survey conducted in 2009 across 114 countries are included, reflecting the importance of religion in daily life as reported by adults (Abdelsalam et al. 2021). Finally, a dummy variable distinguishes between commercial banks (CBs) and IBs. Banks are classified as CBs if they do not adhere strictly to Sharia principles, whereas banks adhering fully to Sharia principles are classified as IBs. Islamic Window banks, offering both conventional and Islamic products, are excluded through a rigorous screening process to ensure inclusion of only pure IBs in the analysis.

5.3 | Economic Model

To test our hypotheses, we first create the following model in which we assess CRD practices according to CBs and IBs.

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

Then, we create the following model to test the effect of the CRD on bank financial performance of the whole sample, only CBs and only IBs.

$$CFP_{b,c,t} = \alpha_0 + \beta_1 CRD_{b,c,t} + \gamma X_{b,c,t} + \vartheta Y_{c,t} + \varepsilon_{b,c,t} \quad (2)$$

Finally, the following model explores the financial costs of CRD, assessing whether IBs and CBs experience these costs differently for the whole sample, only CBs and only IBs.

$$Cost - Income_{b,c,t} = \alpha_0 + \beta_1 CRD_{b,c,t} + \gamma X_{b,c,t} + \vartheta Y_{c,t} + \varepsilon_{b,c,t} \quad (3)$$

The variables used in the model are as follows:

$CFP_{b,c,t}$	is the corporate financial performance of bank b in country c at time t .
$CRD_{b,c,t}$	is the CRD of bank b in country c at time t .
$Cost-Income_{b,c,t}$	is the Cost-to-Income ratio of bank b in country c at time t .
$BankType_{c,t}$	is a dummy variable that takes 1 for CBs and IBs, respectively.
$X_{b,c,t}$	is a matrix of 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 β , γ and ϑ are the vectors of coefficient estimates.

The bank-level control variables are TAs, nonperforming loans to TAs, debt-to-equity ratio, firm age, number of branches, the board size and CEO Power. The country-level control variables

are GDP per capita, religiosity and inflation rate. Variable definitions are provided in Appendix C.

In this study, we employ the random-effect GLS technique with robust standard errors for our estimations. The random-effect method has widely been used in the literature (Abedifar et al. 2013; Izzeldin et al. 2021; Johnes et al. 2014; Mollah and Zaman 2015; Mollah et al. 2017; Pathan 2009). Following these studies, we select random effects because of several reasons: (1) OLS ignores the panel data structure (Gambin 2004); (2) fixed-effects estimation is inefficient at estimating time-invariant variables such as religiosity (Abedifar et al. 2013; Mollah and Zaman 2015; Mollah et al. 2017); (3) fixed-effect estimation is inefficient for estimating limited-variance variables such as Board Size and CEO Power because these variables remain similar over time, and thus employing the fixed-effect technique would cause a loss of degrees of freedom (Baltagi 2008; Wooldridge 2002).

5.4 | Descriptive Statistics

Table 2 presents the descriptive statistics of the variables. The table includes the number of observations, mean, standard deviation, median, minimum and maximum values for the full sample, CBs and IBs. Additionally, a two-sample t -test comparing the means of CBs and IBs is displayed in Table 2. For the full sample, the mean value of ROA is 1.02 with a standard deviation of 4.31. For CBs, this mean value is 1.23 with a standard deviation of 2.94, and for IBs, it is 0.45 with a standard deviation of 6.67. The difference between these two types of banks is statistically highly significant. Furthermore, the mean value of CRD, our main explanatory variable, is 2.92 ($\sigma=1.58$) for the whole sample, 3.25 ($\sigma=1.51$) for CBs and 1.96 ($\sigma=1.38$) for IBs. The t -test reveals a highly significant difference between the mean CRD values of these banks.

The means for the bank-specific variables for the full sample, CB sample and IB sample are as follows: The natural logarithm of TAs is 14.94 (15.27; 14.10), the ratio of nonperforming loans to TA (NPL/TA) is 9.35 (8.83; 10.87), the ratio of debt to equity (Debt/Equity) is 9.14 (9.96; 6.97), the logarithm of firm age (Firm Age) is 3.40 (3.57; 2.91), the logarithm of the number of branches (No. Branches) is 1.90 (1.97; 1.69), the logarithm of board size (Board Size) is 2.12 (2.15; 2.05) and the CEO Power Index score is 1.05 (1.08; 0.95). Significant differences can be observed in all the bank-specific variables. Finally, the means for the country-specific variables are as follows: logarithm of GDP per capita (GDPPC) is 8.82, religiosity is 0.89 and inflation is 4.05.

A Pearson pairwise correlation analysis for the full sample is presented in Table 3. The signs of the variables between dependent variables and independent variables are consistent with expectations. The correlation analysis results indicate that no pairwise correlations are sufficiently high to raise multicollinearity concerns. The only strong correlations appear between TAs and the number of branches (No. Branch), exceeding 0.5 (Cohen 1988). Therefore, a variance inflation factor test is conducted for further investigation. Table D1 in Appendix D demonstrates that all of the variables satisfy the commonly accepted threshold, which is

TABLE 2 | Descriptive statistics.

	Panel A: CB sample						Panel B: IB sample						Panel C
	Obs.	Mean	SD	50%	Min	Max	Obs.	Mean	SD	50%	Min	Max	t-test
ROA	668	1.21	1.39	1.11	−6.16	16.68	224	0.13	4.14	0.92	−32.00	10.21	3.74***
CRD	697	3.22	1.52	3.53	0	6.84	234	1.96	1.39	1.95	0	5.46	11.31***
TA	674	15.91	1.69	15.69	10.52	21.72	227	14.72	1.98	15.02	7.32	18.44	12.39***
NPL/TA	614	5.81	8.70	3.94	0	100	199	10.08	20.84	2.57	0	100	−2.32**
Debt/Equity	674	8.89	4.95	7.93	−27.13	41.11	227	7.89	5.98	7.26	−11.14	42.72	1.84*
Firm Age	629	3.68	0.64	3.74	1.39	5.80	193	3.01	0.66	3.04	0.69	4.19	18.81***
No. Branch	585	2.14	1.44	2.08	0	7.85	188	1.89	1.07	1.95	0	4.60	3.14***
Board Size	668	2.14	0.41	2.20	0.69	3.00	229	2.04	0.42	2.08	0	3.00	3.88***
CEO Power	662	1.11	0.77	1	0	3.00	227	0.94	0.69	1	0	3.00	3.57***
GDPPC	697	8.76	1.13	8.33	7.16	11.10	235	9.33	1.15	9.34	7.16	11.10	
Religiosity	697	0.90	0.19	0.96	0.27	1.00	235	0.90	0.17	0.94	0.27	1.00	
Inflation	697	4.70	4.41	3.53	−2.09	29.51	235	3.36	3.85	2.17	−2.09	16.33	

Panel D: Full sample						
	Obs.	Mean	SD	50%	Min	Max
ROA	892	0.94	2.44	1.17	−32.00	16.68
CRD	932	2.90	1.58	3.00	0	6.84
TA	901	15.61	1.84	15.54	7.32	21.72
NPL/TA	813	6.86	12.90	3.78	0	100
Debt/Equity	901	8.64	5.24	7.79	−27.13	42.72
Firm Age	822	3.53	0.70	3.58	0.69	5.58
No. Branch	773	2.08	1.36	2.08	0	7.85
Board Size	897	2.11	0.42	2.20	0	3.00
CEO Power	889	1.07	0.76	1.00	0	3.00
GDPPC	932	8.90	1.16	8.39	7.16	11.10
Religiosity	932	0.90	0.18	0.96	0.27	1.00
Inflation	932	4.36	4.31	3.20	−2.09	29.51

***Significance level of 0.01.

**Significance level of 0.05.

*Significance level of 0.1.

lower than 10 (James et al. 2013; Kennedy 1998; Marquardt 1970; Vittinghoff et al. 2005). Consequently, the collinearity problem is not a concern in this study.

6 | Empirical Results and Discussion

6.1 | CRD in CBs and IBs

Equation (1) is designed to assess the differences in CRD across these bank types, allowing us to determine whether significant differences in CRD exist between CBs and IBs. In this regard, we run Equation (1) separately for CBs and IBs using dummy

variables to measure their respective CRD practices. The comparison of CRD between CBs and IBs is presented in Table 4. The table indicates that both CBs and IBs exhibit distinct patterns in their CRD engagements. CBs are positively associated with CRD, while IBs exhibit a significant negative relationship, suggesting that CBs engage in higher levels of CRD relative to their Islamic counterparts. The statistically significant chi-squared test shows that the coefficients of the different bank types (CBs and IBs) are significantly different from each other, thus providing empirical support for H1.

The results for CBs are consistent with stakeholder theory and voluntary disclosure theory (Freeman 1984; Guidry and

TABLE 3 | Correlation matrix.

	(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) ROA	1.00												
(2) CRD	0.11***	0.15***	1.00										
(3) TA	0.06***	0.08***	0.26***	1.00									
(4) NPL/TA	−0.23***	−0.12***	−0.19***	−0.40***	1.00								
(5) Debt/Equity	−0.03	−0.33***	0.20***	0.05**	−0.01	1.00							
(6) Firm Age	0.07***	0.16***	0.22***	0.42***	−0.16***	0.04*	1.00						
(7) No. Branch	0.01	0.04	0.22***	0.52***	−0.12***	0.05*	0.25***	1.00					
(8) Board Size	−0.01	0.07**	0.05	0.25***	−0.04	0.08***	−0.02	0.23***	1.00				
(9) CEO Power	0.10***	0.14**	0.02	0.12***	−0.05*	−0.03	0.20***	0.10***	0.05*	1.00			
(10) GDPPC	0.01	−0.03*	−0.32***	0.32***	−0.09***	−0.05**	−0.04	0.23***	0.03	0.01	1.00		
(11) Religiosity	−0.02	0.04*	−0.06*	−0.23***	0.05	−0.01	0.06**	−0.26***	−0.18***	0.02	−0.47***	1.00	
(12) Inflation	0.03	0.07***	0.14***	0.06***	−0.06**	0.03	0.18***	−0.02	0.09***	0.07**	−0.41***	0.11***	1.00

Note: (1) ROA: return on assets; (2) CRD: climate-related disclosure; (3) TA: the natural logarithm of total assets; (4) NPL/TA: the ratio of nonperforming loans to total assets; (5) Debt/Equity: the ratio of total debt to total equity; (6) Firm Age: the natural logarithm of the age of the firm; (7) No. Branch: the natural logarithm of the number of banks' branches; (8) Board Size: the natural logarithm of the number of members on the board of directors; (9) CEO Power: CEO Power Index; (10) GDPPC: the natural logarithm of the GDP per capita; (11) Religiosity: Gallup Survey on the religiosity by countries; (12) INF: Inflation, change in the inflation rate.

***Significance level of 0.01.

**Significance level of 0.05.

*Significance level of 0.1.

TABLE 4 | Comparison of CRD in CBs and IBs.

	Dependent variable: CRD	
	(1)	(2)
Independent variable		
CBDummy	0.5238*** (0.1482)	
IBDummy		-0.5238*** (0.1482)
Control variables		
TA	0.3387*** (0.0372)	0.3387*** (0.0372)
NPL/TA	-0.0059 (0.0040)	-0.0059 (0.0040)
Debt/Equity	-0.0203** (0.0080)	-0.0203** (0.0080)
Firm Age	-0.0072 (0.0479)	-0.0072 (0.0479)
No. Branch	0.1058*** (0.0202)	0.1058*** (0.0202)
Board Size	-0.2078 (0.1988)	-0.2078 (0.1988)
CEO Power	-0.0298 (0.0798)	-0.0298 (0.0798)
GDPPC	-0.8371*** (0.0639)	-0.8371*** (0.0639)
Religiosity	-2.3010*** (0.2295)	-2.3010*** (0.2295)
Inflation	-0.0346 (0.0287)	-0.0346 (0.0287)
Constant	7.4566*** (0.2788)	7.9804*** (0.4119)
chi ²	15.27***	
Prob > chi ²	0.0001	
Observations	610	610
Country FE	Yes	Yes
Year FE	Yes	Yes

Note: This table presents the results of Equation (1), which explores whether CRD practices differ in CBs and IBs. The dependent variable is CRD, which is the index to measure climate-related disclosure. TA is the natural logarithm of the total assets of the banks. NPL/TA is the ratio of nonperforming loans to total assets, Debt/Equity is the ratio of total debt to total equity, Firm Age is the natural logarithm of the age of the firm, No. Branch is the natural logarithm of the number of bank branches, Board Size is the natural logarithm of the number of members on the board of directors, CEO Power is the index that measures CEO power in the banks consisting of three different characteristics of a CEO, GDPPC is the natural logarithm of the GDP per capita, religiosity is the Gallup Survey on the religiosity by countries, and Inflation is the year-on-year change of the consumer price index. Robust standard errors are presented in parentheses.

***Significance level of 0.01.

**Significance level of 0.05.

*Significance level of 0.1.

Patten 2012), confirming that CBs may utilise nonmandatory disclosures to signal competitive advantage and satisfy broad institutional pressures (Huang and Zhang 2012; Hummel and Schlick 2016). Conversely, the negative relationship observed for IBs may stem from their unique institutional context, where Sharia-compliant priorities such as social justice take precedence over climate issues, resulting in a narrower stakeholder focus (Simsek et al. 2024).

6.2 | The Link Between the CRD and Corporate Financial Performance

Next, we employ Equation (2) to explore the relationship between CRD and bank performance for each bank type. We document our regression results for the baseline specification in Table 5 for the full sample, only CBs and only IBs using the dependent variable ROA. Panel A of Table 5 reports results for the effects of CRD on ROA. We find no association between CRD and firm performance in the full sample. However, when examining each bank type separately, we observe a positive association between CRD and performance for CBs, while we observe a negative relationship between CRD and financial performance for IBs, with increased disclosure negatively affecting profitability at the 1% significance level. As a robustness check of our findings, we run the same model using ROE as the dependent variable in Table E1 in Appendix E. The results remain consistent with those obtained for ROA, confirming a positive association between CRD and financial performance for CBs, while IBs experience a negative relationship.

We also conduct a dependent variable coefficient comparison between CBs and IBs. The result shows that the coefficients of CRD for CBs and IBs are significantly different. In all models, we perform Hausman tests to determine the suitability of the random-effect regression model for testing panel data. The insignificant results of the Hausman tests indicate that the random-effect technique is preferred due to higher efficiency (Hausman 1978) for our data and models.

These results clearly distinguish CBs from IBs regarding the relationship between climate disclosure/performance and financial performance. We argue that CBs can increase their firm value and improve their financial performance by revealing extensive voluntary climate-related information in line with stakeholder, legitimacy and voluntary disclosure theories. The findings are consistent with the literature (Aguilera-Caracuel and Ortiz-de Mandojana 2013; Al-Tuwaijri et al. 2004; Griffin et al. 2017; Hull and Rothenberg 2008; Jacobs et al. 2010; Kang et al. 2016; Leonidou et al. 2013; Matsumura et al. 2014; Russo and Fouts 1997; Tang et al. 2012; Vishwanathan et al. 2020; Waddock and Graves 1997). On the other hand, IBs do not have adaptive competitive financial and nonfinancial abilities to focus on climate-related issues. With these disadvantages, when IBs utilise their financial and nonfinancial resources for climate-related issues, these discretionary expenditures increase the expenses and costs of IBs and deteriorate their position in the competitive market, negatively affecting their financial performance. The negative financial impact observed for IBs directly supports the trade-off hypothesis and the agency critiques proposed by Friedman (1970) and

TABLE 5 | Accounting performance and CRD in CBs and IBs.

Random effect	Dependent variable: ROA		
	Full sample	CBs	IBs
	(1)	(2)	(3)
Independent variable			
CRD	0.002 (0.003)	0.045*** (0.007)	−0.395*** (0.064)
Control variables			
TA	0.119* (0.068)	−0.041 (0.039)	0.668*** (0.185)
NPL/TA	−0.051*** (0.011)	0.015 (0.018)	−0.069* (0.037)
Debt/Equity	−0.098*** (0.011)	−0.149*** (0.010)	−0.096* (0.053)
Firm Age	0.062 (0.070)	−0.150*** (0.045)	0.375*** (0.115)
No. Branch	0.017 (0.054)	0.132*** (0.039)	0.036 (0.127)
Board Size	−0.160 (0.109)	−0.118 (0.169)	−1.038* (0.578)
CEO Power	0.211*** (0.014)	0.164*** (0.002)	0.313*** (0.048)
GDPPC	−0.209*** (0.052)	−0.045*** (0.006)	−0.869** (0.381)
Religiosity	0.543*** (0.202)	−0.157 (0.185)	−2.689** (1.192)
Inflation	0.010*** (0.003)	0.026*** (0.003)	−0.015 (0.011)
Constant	1.587 (1.264)	3.839*** (0.882)	3.873 (2.738)
Observation	604	463	141
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
chi ²		44.29***	
Prob > chi ²		0.000	
Hausman chi ²	1.17	0.51	2.42
Prob > chi ²	0.558	0.773	0.298

Note: This table presents the results for Equation (2) and shows the analysis of the association between climate-related disclosure and corporate financial performance of CBs, IBs, and the overall sample. The dependent variable is ROA, which is the measure of accounting performance of the banks. The main independent variable is CRD, which is the index to measure climate-related disclosure. TA is the natural logarithm of the total assets of the banks. NPL/TA is the ratio of nonperforming loans to total assets, Debt/Equity is the ratio of total debt to total equity, Firm Age is the natural logarithm of the age of the firm, No. Branch is the natural logarithm of the number of banks branches, Board Size is the natural logarithm of the number of members on the board of directors, CEO Power is the index that measures CEO power in the banks consisting of three different characteristics of a CEO, GDPPC is the natural logarithm of the GDP per capita, Religiosity is the Gallup Survey on the religiosity by countries, and Inflation is the year-on-year change of the consumer price index. Robust standard errors are presented in parentheses.

***Significance level of 0.01.

**Significance level of 0.05.

*Significance level of 0.1.

TABLE 6 | Costliness of the banks and CRD in CBs and IBs.

Independent variable	Dependent variable: Cost-Income		
	Full sample	CBs	IBs
	(1)	(2)	(3)
CRD	0.417 (0.438)	−0.184 (0.368)	6.769*** (2.013)
Control variables			
TA	−6.365*** (1.505)	−5.377*** (1.022)	−12.055* (6.949)
NPL/TA	0.674* (0.408)	0.408*** (0.067)	0.565 (0.729)
Debt/Equity	0.909** (0.445)	0.939*** (0.233)	0.662 (1.182)
Firm Age	−0.214 (1.264)	2.753*** (0.663)	−8.145 (5.408)
No Branch	1.584 (1.984)	1.172 (1.063)	−1.102 (5.647)
Board Size	−9.854*** (0.706)	−5.603*** (1.595)	−14.598*** (1.442)
CEO Power	−0.632*** (0.112)	−0.521*** (0.149)	−1.119 (1.266)
GDPPC	−0.498 (1.794)	−2.585*** (0.744)	6.629 (10.551)
Religiosity	−67.503*** (10.111)	−72.873*** (3.672)	4.982 (47.836)
Inflation	−0.894*** (0.017)	−0.812*** (0.058)	−1.279*** (0.329)
Constant	235.409*** (23.470)	222.509*** (12.915)	228.307*** (51.218)
Observations	610	468	142
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
chi ² (1)		8.32***	
Prob > chi ²		0.0039	

Note: This table presents the effect of climate-related disclosure on the costliness of the CBs, IBs, and the overall sample. The dependent variable is the cost-to-income ratio, which measures the expensiveness of the banks. The main independent variable is CRD, which is the index to measure climate-related disclosure. TA is the natural logarithm of the total assets of the banks. NPL/TA is the ratio of nonperforming loans to total assets, Debt/Equity is the ratio of total debt to total equity, Firm Age is the natural logarithm of the age of the firm, No. Branch is the natural logarithm of the number of banks branches, Board Size is the natural logarithm of number of members on the board of directors, CEO Power is the index that measures CEO power in the banks consisting of three different characteristics of a CEO, GDPPC is the natural logarithm of the GDP per capita, Religiosity is the Gallup Survey on the religiosity by countries, and Inflation is the year-on-year change of consumer price index. Robust standard errors are presented in parentheses.

***Significance level of 0.01.

**Significance level of 0.05.

*Significance level of 0.1.

TABLE 7 | Instrumental variable analysis.

	First stage—Dependent variable: CRD			Second stage—Dependent variable: ROA		
	Full sample	CBs	IBs	Full sample	CBs	IBs
	(1)	(2)	(3)	(4)	(5)	(6)
Instruments						
Climate risk	−0.821*** (0.116)	−0.924*** (0.129)	−0.762*** (0.267)			
Sharehol. Gov.	1.326*** (0.461)	0.925** (0.481)	1.818* (1.029)			
Independent variable						
CRD				0.097 (0.149)	0.135** (0.068)	−0.378 (0.849)
Control variables						
TA	0.267*** (0.067)	0.232** (0.092)	−0.074 (0.143)	0.098 (0.119)	−0.146*** (0.043)	0.661* (0.395)
NPL/TA	−0.008 (0.007)	−0.013 (0.013)	−0.002 (0.007)	−0.023 (0.050)	0.047 (0.049)	−0.052*** (0.005)
Debt/Equity	−0.002 (0.014)	0.013 (0.018)	0.069* (0.039)	−0.098*** (0.013)	−0.163*** (0.018)	−0.086 (0.059)
Firm Age	0.142 (0.102)	−0.085 (0.124)	0.849*** (0.205)	0.096** (0.040)	−0.223*** (0.035)	0.636 (0.756)
No Branch	0.192*** (0.054)	0.269*** (0.076)	0.186 (0.149)	−0.013 (0.063)	0.132*** (0.028)	0.066 (0.356)
Board Size	0.384 (0.338)	0.679*** (0.387)	0.233 (0.597)	−0.486 (0.406)	−0.697** (0.309)	−1.296** (0.665)
CEO Power	−0.075 (0.083)	−0.092 (0.092)	−0.117 (0.178)	0.184*** (0.006)	0.108*** (0.039)	0.028 (0.233)
GDPPC	−0.403*** (0.098)	−0.116 (0.113)	−0.401** (0.183)	−0.167 (0.235)	0.083 (0.084)	−0.792 (0.913)
Religiosity	−1.746*** (0.435)	−1.176** (0.543)	−1.791** (0.743)	0.627 (0.577)	−0.774*** (0.112)	−2.897 (3.263)
Inflation	−0.043 (0.025)	−0.016 (0.027)	−0.105 (0.077)	0.016 (0.016)	0.039*** (0.004)	0.062** (0.025)
Constant	5.384*** (1.563)	3.842 (80008.6)	7.016 (15206)	1.551 (1.507)	6.291*** (1.064)	2.982 (6.329)
Observations	388	305	83	388	305	83
R-squared				0.145	0.505	0.304
Country and Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Weak identification test:						
K.-Paap rk LM	389.987	10.420	5.860			

(Continues)

TABLE 7 | (Continued)

	First stage—Dependent variable: CRD			Second stage—Dependent variable: ROA		
	Full sample	CBs	IBs	Full sample	CBs	IBs
	(1)	(2)	(3)	(4)	(5)	(6)
Cragg-Donald Wald	26.417	24.524	4.044			
Underidentification test:						
K.-Paap Wald rk	48.027***	43.098***	12.064***			
Overidentification test:						
Sargan-Hansen (p-value)	0.257 (0.612)	0.327 (0.567)	1.243 (0.264)			

Note: This table presents the results of the instrumental variable (IV) analysis for the effect of climate-related disclosure (CRD) on the financial performance of banks, using ROA as the dependent variable. The table is divided into two parts: the first stage of the IV analysis and the second stage using the instrumented CRD as an explanatory variable. The first-stage regression results for CRD are shown in Columns (1), (2), and (3) for the full sample, conventional banks (CBs), and Islamic banks (IBs), respectively, in Panels A and B. The instruments used are Climate Risk and Shareholder Governance (Sharehol.Gov.). The second-stage regression results for ROA using the instrumented CRD are presented in Columns (4), (5), and (6) for the full sample, CBs, and IBs. TA is the natural logarithm of the total assets of the banks. NPL/TA is the ratio of nonperforming loans to total assets. Debt/Equity is the ratio of total debt to total equity. Firm Age is the natural logarithm of the age of the firm. No. Branch is the natural logarithm of the number of bank branches. Board Size is the natural logarithm of the number of members on the board of directors. CEO Power is the index that measures CEO power in the banks, consisting of three different characteristics of a CEO. GDPPC is the natural logarithm of the GDP per capita. Religiosity is the Gallup Survey on religiosity by countries. Inflation is the year-on-year change of the consumer price index. Robust standard errors are presented in parentheses.

***Significance level of 0.01.

**Significance level of 0.05.

*Significance level of 0.1.

Jensen (2002). For these institutions, engaging in extensive social and environmental reporting acts as a resource diversion rather than a value driver. This aligns with empirical studies documenting a negative association between environmental engagement and financial outcomes when implementation costs are high (Barnett and Salomon 2006; Bolton and Kacperczyk 2021; Lyon et al. 2013).

6.3 | The Link Between the CRD and the Costliness of the Banks

Furthermore, the resource-based view argues that firms might handle the cost of environmentally related activities and so achieve a competitive advantage within firms with superior resources (Barney 1991). On the other hand, if the firms lack the necessary financial power to handle these cost-increasing initiatives, then the companies might suffer financially from these actions (Hart 1995; Russo and Fouts 1997). Given the high operational costs and relatively weaker market power, IBs face difficulties in absorbing the costs of CRD. Compared with CBs, IBs have fewer resources and less market power, which places them at a competitive disadvantage in leveraging these additional costs into profitable returns. As a result, CRD increases the overall costliness for IBs, making it more challenging for them to remain competitive in the market. This is because IBs are already operating with higher costs compared with CBs (Beck et al. 2013; Čihák and Hesse 2010) and lack the resources to offset the additional burdens associated with implementing environmental disclosures.

We suggest that climate disclosure and related sustainability activities increase costs for IBs, which already operate with higher costs than CBs. Therefore, we argue that more extensive disclosure significantly raises their costs compared with CBs. To

assess this argument, we explore the effect of disclosure on costs for the full sample, CBs and IBs. Table 6 presents the association between disclosure and the cost-to-income ratio for these three sample groups. Accordingly, while the results indicate no significant effect of CRD on CBs' cost-to-income ratio, the extent of disclosure positively and significantly influences the cost-to-income ratio in IBs, which supports our second hypothesis (H2). Therefore, IBs may lack sufficient financial resources and competitive power to address climate-related issues effectively. When they attempt to do so, it results in increased expenses, making them less profitable and more costly compared with CBs.

6.4 | Endogeneity Tests

6.4.1 | Instrumental Variable (IV) Analysis

Our baseline models assess the effect of the CRD of banks on the financial performance of the banks. In this study, consistent with prior literature (Botosan 1997; Lang and Lundholm 1993), we assume the quantity of the disclosure is positively correlated with the quality of the disclosure, and the CRD is a proxy for the performance of the climate-related operations, actions and transactions of the banks. However, these assumptions give rise to potential endogeneity concerns. As the CRD could be determined by the banks' climate-related actions, operations or transactions, it could also be affected by other factors. To address this problem, we employ a two-stage least squares IV approach.

We employ two instruments to address this concern. Our first instrument is motivated by the idea that companies are more likely to disclose more information in countries where better investor protection exists. Minority shareholder protection regulations

TABLE 8 | Propensity score matching.

Panel A: Balancing table for propensity score matching—Outcome variable: ROA						
	Treatment Group		Control Group			t-test
	N	Mean	N	Mean	%Bias	Treatment-control
CRD	141	2.297	141	1.958	24.1	0.044
TA	141	15.684	141	15.439	16.4	0.169
NPL/TA	141	6.378	141	9.435	−19.2	0.108
Debt/Equity	141	8.675	141	8.141	10.6	0.375
Firm Age	141	3.302	141	3.088	36.4	0.002
No Branch	141	1.774	141	1.961	−16.3	0.171
Board Size	141	2.135	141	2.138	−0.9	0.937
CEO Power	141	0.893	141	0.950	−8.4	0.482
GDPPC	141	9.349	141	9.500	−12.9	0.279
Religiosity	141	0.919	141	0.901	12.5	0.294
Inflation	141	3.436	141	3.397	1.0	0.933
Panel B: Baseline regression using propensity score matched sample—Dependent variable: ROA						
	Full sample		CBs		IBs	
	(1)		(2)		(3)	
Independent variable						
CRD	0.148***		0.404***		−0.034*	
	(0.055)		(0.128)		(0.018)	
Control variables						
TA	0.256		−0.238		0.884***	
	(0.229)		(0.208)		(0.323)	
NPL/TA	−0.047***		0.024		−0.068	
	(0.009)		(0.016)		(0.046)	
Debt/Equity	−0.108***		−0.219***		−0.116	
	(0.012)		(0.038)		(0.075)	
Firm Age	0.159		−0.346		−0.149	
	(0.132)		(0.336)		(0.285)	
No Branch	0.017		0.068		−0.126	
	(0.089)		(0.170)		(0.258)	
Board Size	−0.945***		−0.521		−2.307*	
	(0.367)		(0.831)		(1.271)	
CEO Power	0.442***		0.162		0.541***	
	(0.076)		(0.197)		(0.136)	
GDPPC	−0.356		0.728		−4.515*	
	(2.926)		(3.479)		(2.528)	

(Continues)

TABLE 8 | (Continued)

Panel B: Baseline regression using propensity score matched sample—Dependent variable: ROA			
	Full sample	CBs	IBs
	(1)	(2)	(3)
Religiosity	−0.897 (1.911)	−0.177 (3.376)	−5.452 (3.372)
Inflation	−0.022 (0.063)	0.051 (0.087)	−0.109 (0.068)
Constant	2.892 (28.737)	1.276 (37.954)	43.918 (27.134)
Observations	282	141	141
R-squared	0.198	0.527	0.432
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
chi ² (1)		3.36*	
Prob > chi ²		0.066	

Note: This table presents the results of the baseline model after matching CB and IB samples using control variables as covariates. Panel A demonstrates the results of the one-to-one propensity score matching technique. Panel B shows the analysis of the association between climate-related disclosure (CRD) and corporate financial performance of CBs, IBs, and the overall sample using the sample created after the matching process. The dependent variable is ROA, which measures the accounting performance of the banks in Panel B. The main independent variable is CRD, which is an index measuring climate-related disclosure. TA represents the natural logarithm of the total assets of the banks. NPL/TA is the ratio of nonperforming loans to total assets, Debt/Equity is the ratio of total debt to total equity, Firm Age is the natural logarithm of the age of the firm, No. Branch is the natural logarithm of the number of bank branches, Board Size is the natural logarithm of the number of members on the board of directors, CEO Power is an index measuring CEO power in the banks, consisting of three different characteristics of a CEO, GDPPC is the natural logarithm of GDP per capita, Religiosity is the Gallup Survey on religiosity by countries, and Inflation is the year-on-year change of the consumer price index. Robust standard errors are presented in parentheses.

***Significance level of 0.01.

**Significance level of 0.05.

*Significance level of 0.1.

by countries ensure shareholders are delivered sufficient, reliable and useful information to make investment decisions (de Villiers and Marques 2016). For example, common-law countries are more shareholder-oriented by having better protection of minority shareholders and promoting shareholder values more compared with civil law origin countries (Ball et al. 2000; La Porta et al. 1998, 2000). In this regard, companies from common law countries make more frequent and more extensive disclosures compared with companies in civil law countries (Beekes et al. 2016; Bushman et al. 2004; DeFond et al. 2007; Jaggi and Low 2000).

Our second instrument is the climate risk index, which ranks countries according to their exposure to extreme weather events by looking at weather-related loss events. In a country where climate-related events are heavily experienced and incur losses, firms are more likely to disclose information about these events. Especially in these countries, banks could focus on disclosing climate-related information, as it is one of the primary topics demanded by stakeholders. Therefore, the main motivator for the CRD could not be the climate-related operations, actions, decisions or transactions, but the current situation of the country regarding these issues for the companies. To address this, we select the climate risk index as the second instrument in our model.

We obtain minority shareholder protection data from TCdata360, the World Bank database, using the ‘Protection of Minority Shareholders Interest’ indicator. For climate risk data, we employ yearly ‘Global Climate Risk Index’ reports published by ‘Germanwatch’. The global climate risk index includes four different components: annual average fatalities, annual average losses per 100,000 inhabitants, annual average losses in US\$ million and annual average losses per unit GDP. A lower climate risk index score indicates a higher climate risk a country is exposed to in these four components, while a higher climate risk index score indicates a lower loss in terms of death and economy for a country.

We conduct the IV analysis using ROA as the measure of financial performance, and the results are presented in Table 7. The results for ROA show consistency with our baseline results.

We report first-stage regression estimates of climate risk and shareholder protection as instruments for the CRD for the full sample, CBs and IBs in Models (1), (2) and (3) of Table 7. The findings suggest that the global climate risk index has a significant negative impact on the CRDs of the banks. This is consistent with our expectations, as we argue that the more severe the weather-related events a country experiences, the more likely

TABLE 9 | Channel analysis.

Panel A: CRD and spread						
	Dependent variable: spread					
	(1)		(2)		(3)	
	Full sample		CBs		IBs	
CRD	−0.311*** (0.104)		−0.237** (0.111)		−0.672* (0.362)	
Firm controls	Yes		Yes		Yes	
Country controls	Yes		Yes		Yes	
Observation	350		285		65	
R-squared	0.382		0.426		0.615	
Country and year FE	Yes		Yes		Yes	
Panel B: CRD and ROA by spread						
	Dependent variable: ROA					
	Full sample		CBs		IBs	
	H. Spread	L. Spread	H. Spread	L. Spread	H. Spread	L. Spread
CRD	0.099* (0.061)	−0.133** (0.052)	0.108** (0.052)	−0.069** (0.034)	−0.162 (0.195)	−0.205 (0.201)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes	Yes	Yes
Observation	165	181	135	147	30	34
R-squared	0.581	0.599	0.795	0.767	0.696	0.902
Country and year FE	Yes	Yes	Yes	Yes	Yes	Yes
chi² (1)	9.20***		8.90***		0.38	
Prob > chi²	0.002		0.003		0.535	
Panel C: CRD and Illiquidity						
	Dependent variable: Illiquidity					
	(1)		(2)		(3)	
	Full sample		CBs		IBs	
CRD	−0.257*** (0.058)		−0.241*** (0.063)		−0.823*** (0.264)	
Firm controls	Yes		Yes		Yes	
Country controls	Yes		Yes		Yes	
Observation	462		367		95	
R-squared	0.211		0.257		0.343	
Country and year FE	Yes		Yes		Yes	
Panel D: CRD and ROA by Illiquidity						
	Dependent variable: ROA					
	Full sample		CBs		IBs	
	H. Illiquid.	L. Illiquid.	H. Illiquid.	L. Illiquid.	H. Illiquid.	L. Illiquid.
CRD	0.774*** (0.244)	−0.467** (0.236)	0.924*** (0.274)	−0.464* (0.271)	1.211 (1.071)	−1.359** (0.587)

(Continues)

TABLE 9 | (Continued)

Panel D: CRD and ROA by Illiquidity						
	Dependent variable: ROA					
	Full sample		CBs		IBs	
	H. Illiquid.	L. Illiquid.	H. Illiquid.	L. Illiquid.	H. Illiquid.	L. Illiquid.
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes	Yes	Yes
Observation	179	276	141	223	38	53
R-squared	0.416	0.347	0.402	0.371	0.707	0.733
Country and year FE	Yes	Yes	Yes	Yes	Yes	Yes
chi ² (1)	5.65**		7.39***		3.12*	
Prob > chi ²	0.017		0.006		0.077	

Note: This table presents the results of the relationships between CRD and financial performance in different financial environments. Panels A and D show how CRD affects information asymmetry, measured by Spread and Illiquidity, respectively. Panels B and E present the results for the baseline model where the dependent variable is ROA, measuring the accounting performance of banks, for the full sample, CBs, and IBs under conditions of high and low information asymmetry, as measured by Spread and Illiquidity, respectively. Panels C and F present the results for the baseline model where the dependent variable is ROE, which measures the accounting performance of banks, for the full sample, CBs, and IBs under conditions of high and low information asymmetry, as measured by Spread and Illiquidity, respectively. The main independent variable is CRD, an index measuring climate-related disclosure. Firm and Country Controls include TA, NPL/TA, Debt/Equity, Firm Age, No. Branch, Board Size, CEO Power, GDPPC, Religiosity and Inflation. TA represents the natural logarithm of the total assets of the banks. NPL/TA is the ratio of nonperforming loans to total assets, Debt/Equity is the ratio of total debt to total equity, Firm Age is the natural logarithm of the age of the firm, No. Branch is the natural logarithm of the number of bank branches, Board Size is the natural logarithm of the number of members on the board of directors, CEO Power is an index measuring CEO power in the banks, consisting of three different characteristics of a CEO, GDPPC is the natural logarithm of GDP per capita, Religiosity is the Gallup Survey on religiosity by countries, and Inflation is the year-on-year change of the consumer price index. Robust standard errors are presented in parentheses.

***Significance level of 0.01.

**Significance level of 0.05.

*Significance level of 0.1.

companies in that country are to increase their CRD. The results show similarities for all three sample groups. On the other hand, shareholder protections in a country appear to have a significant positive effect on the CRD of the banks. The Cragg–Donald Wald *F*-statistics and Kleibergen–Paap Wald rk *F*-statistics in the first-stage regression model are higher than the 10% critical value, which suggests rejecting that both instruments are weak for the full and CBs samples. Further, the statistically significant Kleibergen–Paap rk LM statistic shows that the model is not under-identified. Therefore, the instruments and endogeneity test results support the validity of the instruments in the IV models.

We find that the CRD still affects the financial performance of the CBs after being instrumented with shareholder protection and climate risk by the countries. Although the direction of the relationship between the CRD and IBs' financial performance remains the same, the relationship loses its significance. Therefore, the results for the IV analysis support our baseline regression findings after addressing the endogeneity concerns, which is that the relationships between the CRD and financial performance of the CBs and IBs are unlikely to occur because of an unmeasured variable.

6.4.2 | Propensity Score Matching

The *t*-test reported in Table 2 demonstrates that CBs and IBs differ significantly across several characteristics. The findings of the mean comparison analysis indicate that CBs outperform IBs in terms of ROA. Additionally, CBs disclose more information (CRD), are larger in terms of TAs, are older (Firm Age), have a

lower NPL/TA ratio, have a higher debt-to-equity ratio (Debt/Equity), have more branches (No. of Branch), have a larger board of directors (Board Size) and have more powerful CEOs (CEO Power) compared with IBs. Consequently, our model may be subject to selection bias. The differences between CBs and IBs might stem from sample size or other factors rather than their climate-related practices. To address this issue, we employ a propensity score matching technique to control for the observable differences between CBs and IBs.

Following Rosenbaum and Rubin (1983), the propensity score matching technique consists of selecting a similar and balanced sample using observed covariates in the treatment and control groups. To achieve this, CBs are treated as the treatment group, while IBs are considered the control group. These two types of banks are matched one-to-one with their nearest neighbours without replacement based on CRD, TAs, nonperforming loans to TAs ratio, debt-to-equity ratio, age, number of branches, board size, CEO power, year and country, derived from financial and country-specific information of the observations.

Panel A of Table 8 presents the descriptive statistics of the matched sample. After propensity score matching, the sample consists of 141 matched pairs (282 total observations) with ROA as the outcome variable. The results indicate that the matching procedure has largely mitigated the differences between the treatment and control groups.

Panel B of Table 8 indicates that after using the same baseline regression model with a propensity score-matched sample, the

relationship between CRD and financial performance remains positive and significant for CBs and negative and significant for IBs. Therefore, the results of the regression using the propensity score-matched sample confirm that the baseline regression findings are not biased due to sample selection.

6.5 | Robustness Tests

6.5.1 | Channel Analysis

The existing literature emphasises that firms' disclosure policies and the flow of useful, reliable information to shareholders reduce information asymmetry (Cheng et al. 2011; Dhaliwal et al. 2011; Diamond 1985; Diamond and Verrecchia 1991; Healy and Palepu 2001; Healy et al. 1999; Hope and Thomas 2008; Lambert et al. 2007; Lang and Lundholm 1996; Leuz and Verrecchia 2000; Verrecchia 2001; Welker 1995). Consequently, we argue that CRD mitigates information asymmetry between agents (managers) and principals (shareholders and stakeholders), thereby enhancing firm value and financial performance.

In this section, we examine whether CRD, as a channel for reducing information asymmetry, affects banks' financial performance. To achieve this, we follow a two-step procedure. First, we investigate the direct association between CRD and information asymmetry, measured using spread and illiquidity, which are commonly used metrics in the literature (Amihud 2002; Daske et al. 2008; Fu et al. 2012; Goyenko et al. 2009; Mohd 2005; Silber 2005). Spread is calculated as $(\text{Ask}-\text{Bid})/((\text{Ask}+\text{Bid})/2)$, and illiquidity is calculated as the absolute return divided by the trading volume.

Panels A and C of Table 9 present the results for information asymmetry and CRD. As expected, higher CRD significantly mitigates information asymmetry across all sample groups (full sample, CBs and IBs). In the second stage, in Panels B and D, we divide our sample groups into high and low information asymmetry environments. We find that CRD significantly improves financial performance in banks characterised by high levels of information asymmetry. Conversely, when companies increase their CRD in environments with low information asymmetry, the financial performance of banks worsens.

One possible explanation for these findings is that higher disclosure by companies with greater information asymmetry reduces information asymmetry between banks and market participants, leading to a positive market response. Conversely, increased disclosure by banks with lower information asymmetry may raise costs and expenses, thereby negatively affecting financial performance. We also observe significant differences between high and low asymmetric environments across most of our models. Overall, the results suggest that the risk mitigation benefits of CRD operate through the reduction of information asymmetry.

6.5.2 | Reverse Causality

In this section, we explore potential issues of reverse causality and omitted variables. Our baseline results suggest that increased

TABLE 10 | Reverse causality analysis.

	Dependent variable: ROA		
	Full sample	CBs	IBs
	(1)	(2)	(3)
Independent variable			
CRD	0.005 (0.016)	0.021** (0.008)	-0.267*** (0.084)
Control variables			
TA	0.132 (0.082)	-0.011*** (0.002)	0.611*** (0.209)
NPL/TA	-0.028 (0.021)	0.019 (0.015)	-0.045*** (0.016)
Debt/Equity	-0.092*** (0.013)	-0.139*** (0.008)	-0.060 (0.045)
Firm Age	0.023 (0.031)	-0.173*** (0.037)	0.451*** (0.158)
No Branch	0.049 (0.089)	0.136*** (0.036)	0.092 (0.149)
Board Size	-0.235* (0.122)	-0.235 (0.201)	-1.163** (0.455)
CEO Power	0.177*** (0.046)	0.151*** (0.012)	0.349** (0.144)
GDPPC	-0.211*** (0.062)	-0.112*** (0.033)	-0.473 (0.318)
Religiosity	0.888*** (0.205)	-0.301 (0.352)	-2.210 (1.588)
Inflation	0.009*** (0.001)	0.025*** (0.003)	0.035*** (0.012)
ROA _{t-1}	0.007 (0.026)	0.034** (0.014)	-0.111 (0.153)
Constant	0.964 (1.106)	4.317*** (0.785)	-0.263 (1.365)
Observations	549	419	130
R-squared	0.178	0.348	0.376
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
chi ² (1)		10.96***	
Prob > chi ²		0.001	

Note: This table presents the results of the estimations of the baseline model, including lagged variables of the dependent variables in the models. The dependent variable is ROA in (1), (2), and (3) models, which are the measures of accounting performance of the banks. ROA_{t-1} is the 1-year lagged version of the dependent variable. The main independent variable is CRD, which is the index to measure climate-related disclosure. TA is the natural logarithm of the total assets of the banks. NPL/TA is the ratio of nonperforming loans to total assets, Debt/Equity is the ratio of total debt to total equity, Firm Age is the natural logarithm of the age of the firm, No. Branch is the natural logarithm of the number of banks branches, Board Size is the natural logarithm of the number of members on the board of directors, CEO Power is the index that measures CEO power in the banks consisting of three different characteristics of a CEO, GDPPC is the natural logarithm of the GDP per capita, Religiosity is the Gallup Survey on the religiosity by countries, and Inflation is the year-on-year change of the consumer price index. Robust standard errors are presented in parentheses.

***Significance level of 0.01.

**Significance level of 0.05.

*Significance level of 0.1.

information disclosure enhances banks' financial performance. However, this relationship may not stem from climate disclosure directly influencing performance but rather from the tendency of well-performing companies in one period to continue their positive performance in subsequent periods or vice versa. Jegadeesh and Titman (1993) provide evidence of this momentum effect in stock returns, where a strategy of buying well-performing stocks and selling poorly performing stocks earns an average monthly return of 1%. Similar observations of this momentum effect are reported in other studies (Griffin et al. 2003; Rouwenhorst 1998, 1999).

To address this issue, we modify our baseline regression model by including the 1-year lagged value of ROA, as shown in Table 10. The results are consistent with our baseline findings for the CB sample and the full sample. However, the significance of the relationship between CRD and financial performance does not remain consistent in our model for IBs compared with the baseline.

7 | Summary and Conclusion

The relationship between firm social responsibility performance, disclosure and financial performance remains a debated topic among researchers. Many existing studies suggest that environmental disclosures, providing necessary information and satisfying climate-sensitive stakeholders, enhance a company's financial performance. Conversely, another group of scholars argues that focusing on social responsibility performance and disclosure unnecessarily increases company expenditures, thereby reducing profitability and value, especially for firms with low competitive power. To examine whether these contrasting arguments hold for distinct banking models, this study investigated the impact of CRD on the financial performance of 591 banks, consisting of 169 IBs and 422 CBs, across 24 countries during the period from 2016 to 2019.

The empirical results reveal that climate-related information disclosed in annual reports affects the profitability of CBs and IBs differently. CBs experience a significant increase in their ROA as they include more climate-related information in their reports. Conversely, this relationship is significantly negative for IBs. One factor contributing to this difference between CBs and IBs could be that CRD and performance impose an additional financial burden on IBs, exacerbating their expenses and reducing profitability. Consistent with this argument, we find that CRD significantly increases costs for IBs. However, the study also shows a negative but statistically insignificant association between costs and climate disclosure for CBs.

This study contributes to the literature from different aspects. First, it provides evidence on the association between CRD and financial performance in CBs and IBs, which is a gap in the literature. Second, it advances measurement by focusing on climate-specific indicators rather than relying on aggregate ESG scores or single-dimension carbon proxies. In particular, the climate metric captures multiple channels through which banks' exposures and actions are reflected, including energy, water use and pollution-related dimensions. Third, as this study employs unique, manually collected data, it provides a distinct perspective on CRD. Furthermore, the manually collected dataset for

corporate governance characteristics reduces reliance on commercial databases where governance fields can be incomplete or inconsistently coded, especially for IBs. Finally, the results carry practical implications for regulators. The evidence indicates that the net benefits of CRD are not uniform across banking models and that compliance costs may be more salient for resource-constrained IBs. Accordingly, policy approaches that differentiate requirements and implementation pathways across bank types are likely to be more effective than uniform disclosure mandates. There are a number of limitations that could be addressed by future research. First, similar to many archival studies, the proxies for CRD, performance and bank type may not fully reflect actual practice. In this regard, future research could obtain further insights by conducting in-depth interviews with key stakeholders, such as conventional and IB executives, regulators, financial analysts and customers. Second, due to the labour-intensive nature of manual data collection, the sample of banks and the period examined are limited. Therefore, future research may be able to offer new insights by expanding the sample size and the timeframe examined. Finally, because this study has focused on financial and quantitative performance measures, future studies may provide new perspectives by focusing on non-financial and qualitative measures of performance.

Author Contributions

Rasim Simsek: conceptualization, investigation, formal analysis, data curation, software, methodology, writing – original draft. **Sabur Mollah:** conceptualization, writing – review and editing, supervision, visualization. **Abongeh Tunyi:** conceptualization, writing – review and editing, supervision.

Acknowledgments

The authors are grateful to Nurullah Gur, Mehmet Babacan, Ahmet Faruk Aysan and Salma Ibrahim for their valuable discussions at the 2nd Annual Conference of ASFAAG, 'The Role of Accounting, Finance & Governance in Sustainability and Sustainable Development', held in Istanbul in 2022 and at the British Academy of Management (BAM 2022) Conference in Manchester.

Endnotes

¹ At this step, banks from Albania, Bosnia and Herzegovina, Cyprus, Germany, Guinea, Kazakhstan, Maldives, Nigeria, Philippines, Senegal, Seychelles, Singapore, South Africa, Tajikistan, Thailand, and the United Republic of Tanzania are entirely dropped from the final dataset because they no longer meet the necessary comparative criteria.

References

- Abdelsalam, O., P. Dimitropoulos, M. Elnahass, and S. Leventis. 2016. "Earnings Management Behaviors Under Different Monitoring Mechanisms: The Case of Islamic and Conventional Banks." *Journal of Economic Behavior & Organization* 132: 155–173. <https://doi.org/10.1016/J.JEBO.2016.04.022>.
- Abdelsalam, O., M. Elnahass, J. A. Batten, and S. Mollah. 2021. "New Insights Into Bank Asset Securitization: The Impact of Religiosity." *Journal of Financial Stability* 54: 100854. <https://doi.org/10.1016/j.jfs.2021.100854>.
- Abedifar, P., P. Molyneux, and A. Tarazi. 2013. "Risk in Islamic Banking." *Review of Finance* 17, no. 6: 2035–2096. <https://doi.org/10.1093/rof/rfs041>.

- Adams, R. B., H. Almeida, and D. Ferreira. 2005. "Powerful CEOs and Their Impact on Corporate Performance." *Review of Financial Studies* 18, no. 4: 1403–1432. <https://doi.org/10.1093/rfs/hhi030>.
- Aguilera-Caracuel, J., and N. Ortiz-de Mandojana. 2013. "Green Innovation and Financial Performance: An Institutional Approach." *Organization and Environment* 26, no. 4: 365–385. <https://doi.org/10.1177/1086026613507931>.
- Al-Tuwaijri, S. A., T. E. Christensen, and K. E. Hughes II. 2004. "The Relations Among Environmental Disclosure, Environmental Performance, and Economic Performance: A Simultaneous Equations Approach." *Accounting, Organizations and Society* 29, no. 5–6: 447–471. [https://doi.org/10.1016/S0361-3682\(03\)00032-1](https://doi.org/10.1016/S0361-3682(03)00032-1).
- Amihud, Y. 2002. "Illiquidity and Stock Returns: Cross-Section and Time-Series Effects." *Journal of Financial Markets* 5, no. 1: 31–56. [https://doi.org/10.1016/S1386-4181\(01\)00024-6](https://doi.org/10.1016/S1386-4181(01)00024-6).
- Aribi, Z. A., and T. Arun. 2015. "Corporate Social Responsibility and Islamic Financial Institutions (IFIs): Management Perceptions From IFIs in Bahrain." *Journal of Business Ethics* 129: 785–794. <https://doi.org/10.1007/s10551-014-2132-9>.
- Aribi, Z. A., and S. Gao. 2010. "Corporate Social Responsibility Disclosure: A Comparison Between Islamic and Conventional Financial Institutions." *Journal of Financial Reporting and Accounting* 8, no. 2: 72–91. <https://doi.org/10.1108/19852511011088352>.
- Ariss, R. T. 2010. "Competitive Conditions in Islamic and Conventional Banking: A Global Perspective." *Review of Financial Economics* 19, no. 3: 101–108. <https://doi.org/10.1016/j.rfe.2010.03.002>.
- Azmi, W., M. K. Hassan, R. Houston, and M. S. Karim. 2021. "ESG Activities and Banking Performance: International Evidence From Emerging Economies." *Journal of International Financial Markets Institutions and Money* 70: 101277. <https://doi.org/10.1016/j.intfin.2020.101277>.
- Ball, R., S. P. Kothari, and A. Robin. 2000. "The Effect of International Institutional Factors on Properties of Accounting Earnings." *Journal of Accounting and Economics* 29, no. 1: 1–51. [https://doi.org/10.1016/S0165-4101\(00\)00012-4](https://doi.org/10.1016/S0165-4101(00)00012-4).
- Baltagi, B. H. 2008. *Econometrics*. 4th ed. Springer.
- Bank of England. 2018. "Transition in Thinking: The Impact of Climate Change on the UK Banking Sector."
- Barnett, M. L., and R. M. Salomon. 2006. "Beyond Dichotomy: The Curvilinear Relationship Between Social Responsibility and Financial Performance." *Strategic Management Journal* 27, no. 11: 1101–1122. <https://doi.org/10.1002/smj.557>.
- Barney, J. B. 1991. "Firm Resources and Sustained Competitive Advantage." *Journal of Management* 17, no. 1: 99–120.
- Beck, T., A. Demirgüç-Kunt, and O. Merrouche. 2013. "Islamic vs. Conventional Banking: Business Model, Efficiency and Stability." *Journal of Banking & Finance* 37, no. 2: 433–447. <https://doi.org/10.1016/j.jbankfin.2012.09.016>.
- Beekes, W., P. Brown, W. Zhan, and Q. Zhang. 2016. "Corporate Governance, Companies' Disclosure Practices and Market Transparency: A Cross Country Study." *Journal of Business Finance & Accounting* 43, no. 3–4: 263–297. <https://doi.org/10.1111/jbfa.12174>.
- Belal, A. R., O. Abdelsalam, and S. S. Nizamee. 2015. "Ethical Reporting in Islami Bank Bangladesh Limited (1983–2010)." *Journal of Business Ethics* 129: 769–784. <https://doi.org/10.1007/s10551-014-2133-8>.
- Berrone, P., and L. R. Gomez-Mejia. 2009. "Environmental Performance and Executive Compensation: An Integrated Agency-Institutional Perspective." *Academy of Management Journal* 52, no. 1: 103–126. <https://doi.org/10.5465/amj.2009.36461950>.
- BIS. 2023. "Climate-Related Financial Risks—Measurement Methodologies." Basel Committee on Banking Supervision. <https://www.bis.org/bcbss/publ/d560.pdf>.
- Bolton, P., M. Despres, L. A. Pereira Da Silva, F. Samama, and R. Svartzman. 2020. *The Green Swan: Central Banking and Financial Stability in the Age of Climate Change*. Bank for International Settlements. <https://www.bis.org/publ/othp31.pdf>.
- Bolton, P., and M. Kacperczyk. 2021. "Do Investors Care About Carbon Risk?" *Journal of Financial Economics* 142, no. 2: 517–549. <https://doi.org/10.1016/j.jfineco.2021.05.008>.
- Botosan, C. A. 1997. "Disclosure Level and the Cost of Equity Capital." *Accounting Review* 72, no. 3: 323–349.
- Bushman, R. M., J. D. Piotroski, and A. J. Smith. 2004. "What Determines Corporate Transparency?" *Journal of Accounting Research* 42, no. 2: 207–252. <https://doi.org/10.1111/j.1475-679X.2004.00136.x>.
- Buyse, K., and A. Verbeke. 2003. "Proactive Environmental Strategies: A Stakeholder Management Perspective." *Strategic Management Journal* 24, no. 5: 453–470. <https://doi.org/10.1002/smj.299>.
- Caby, J., Y. Ziane, and E. Lamarque. 2020. "The Determinants of Voluntary Climate Change Disclosure Commitment and Quality in the Banking Industry." *Technological Forecasting and Social Change* 161: 120282. <https://doi.org/10.1016/j.techfore.2020.120282>.
- Caliskan, A. O., and E. Esen. 2021. "Climate Change Disclosures in Different Cultures: A Study of Sustainability Reports." In *The Palgrave Handbook of Corporate Sustainability in the Digital Era*, edited by S. H. Park, M. A. Gonzalez-Perez, and D. E. Floriani, 1st ed., 671–692. Palgrave Macmillan.
- Campiglio, E., Y. Dafermos, P. Monnin, J. Ryan-Collins, G. Schotten, and M. Tanaka. 2018. "Climate Change Challenges for Central Banks and Financial Regulators." *Nature Climate Change* 8: 462–468. <https://doi.org/10.1038/s41558-018-0175-0>.
- Cheng, M., D. S. Dhaliwal, and M. Neamtiu. 2011. "Asset Securitization, Securitization Recourse, and Information Uncertainty." *Accounting Review* 86, no. 2: 541–568. <https://doi.org/10.2308/accr-00000020>.
- Chien, C. C., and C.-W. Peng. 2012. "Does Going Green Pay Off in the Long Run?" *Journal of Business Research* 65, no. 11: 1636–1642. <https://doi.org/10.1016/j.jbusres.2011.10.023>.
- Čihák, M., and H. Hesse. 2010. "Islamic Banks and Financial Stability: An Empirical Analysis." *Journal of Financial Services Research* 38: 95–113. <https://doi.org/10.1007/s10693-010-0089-0>.
- Clarkson, P. M., Y. Li, G. D. Richardson, and F. P. Vasvari. 2008. "Revisiting the Relation Between Environmental Performance and Environmental Disclosure: An Empirical Analysis." *Accounting, Organizations and Society* 33, no. 4–5: 303–327. <https://doi.org/10.1016/j.aos.2007.05.003>.
- Cohen, J. 1988. *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Lawrence Erlbaum Associates.
- Cornett, M. M., O. Erhemjamts, and H. Tehranian. 2016. "Greed or Good Deeds: An Examination of the Relation Between Corporate Social Responsibility and the Financial Performance of U.S. Commercial Banks Around the Financial Crisis." *Journal of Banking & Finance* 70: 137–159. <https://doi.org/10.1016/j.jbankfin.2016.04.024>.
- Daske, H., L. Hail, C. Leuz, and R. Verdi. 2008. "Mandatory IFRS Reporting Around the World: Early Evidence on the Economic Consequences." *Journal of Accounting Research* 46, no. 5: 1085–1142. <https://doi.org/10.1111/j.1475-679X.2008.00306.x>.
- Davis, A. K., D. A. Guenther, L. K. Krull, and B. M. Williams. 2016. "Do Socially Responsible Firms Pay More Taxes?" *Accounting Review* 91, no. 1: 47–68. <https://doi.org/10.2308/accr-51224>.
- de Aguiar, T. R. S., and J. Bebbington. 2014. "Disclosure on Climate Change: Analysing the UK ETS Effects." *Accounting Forum* 38, no. 4: 227–240. <https://doi.org/10.1016/j.accfor.2014.10.002>.
- de Villiers, C., and A. Marques. 2016. "Corporate Social Responsibility, Country-Level Predispositions, and the Consequences of Choosing a

- Level of Disclosure." *Accounting and Business Research* 46, no. 2: 167–195. <https://doi.org/10.1080/00014788.2015.1039476>.
- de Villiers, C., V. Naiker, and C. J. van Staden. 2011. "The Effect of Board Characteristics on Firm Environmental Performance." *Journal of Management* 37, no. 6: 1636–1663. <https://doi.org/10.1177/0149206311411506>.
- Deegan, C., and J. Unerman. 2006. *Financial Accounting Theory*. McGraw Hill Education Berkshire, European Edition.
- DeFond, M., M. Hung, and R. Trezevant. 2007. "Investor Protection and the Information Content of Annual Earnings Announcements: International Evidence." *Journal of Accounting and Economics* 43, no. 1: 37–67. <https://doi.org/10.1016/j.jacceco.2006.09.001>.
- Delmas, M. A., and M. W. Toffel. 2008. "Organizational Responses to Environmental Demands: Opening the Black Box." *Strategic Management Journal* 29, no. 10: 1027–1055. <https://doi.org/10.1002/smj.701>.
- Deryugina, T., and S. M. Hsiang. 2014. "Does the Environment Still Matter? Daily Temperature and Income in the United States." Natioanl Bureau of Economic Research, NBER Working Paper Series, 20750, 1–47. <https://doi.org/10.3386/w20750>.
- Dhaliwal, D. S., O. Z. Li, A. Tsang, and Y. G. Yang. 2011. "Voluntary Nonfinancial Disclosure and the Cost of Equity Capital: The Initiation of Corporate Social Responsibility Reporting." *Accounting Review* 86, no. 1: 59–100. <https://doi.org/10.2308/accr.00000005>.
- Diamond, D. W. 1985. "Optimal Release of Information by Firms." *Journal of Finance* 40, no. 4: 1071–1094. <https://doi.org/10.1111/j.1540-6261.1985.tb02364.x>.
- Diamond, D. W., and R. E. Verrecchia. 1991. "Disclosure, Liquidity, and the Cost of Capital." *Journal of Finance* 46, no. 4: 1325–1359. <https://doi.org/10.2307/2328861>.
- Dye, R. A. 1985. "Disclosure of Nonproprietary Information." *Journal of Accounting Research* 23, no. 1: 123–145. <https://doi.org/10.2307/2490910>.
- Ernst & Young. 2016. "World Islamic Banking Competitiveness Report."
- European Central Bank. 2021. "Climate-Related Risk and Financial Stability." <https://www.ecb.europa.eu/pub/pdf/other/ecb.climateriskfinancialstability202107~87822fae81.en.pdf>.
- Fombrun, C. J. 1996. *Reputation: Realizing Value From the Corporate Image*. Harvard Business School Press.
- Fombrun, C. J., N. A. Gardberg, and M. L. Barnett. 2000. "Opportunity Platforms and Safety Nets: Corporate Citizenship and Reputational Risk." *Business and Society Review* 105, no. 1: 85–106. <https://doi.org/10.1111/0045-3609.00066>.
- Fosu, S., C. G. Ntim, W. Coffie, and V. Murinde. 2017. "Bank Opacity and Risk-Taking: Evidence From Analysts' Forecasts." *Journal of Financial Stability* 33: 81–95. <https://doi.org/10.1016/j.jfs.2017.10.009>.
- Freeman, R. E. 1984. *Strategic Management: A Stakeholder Approach*. 1st ed. Pitman.
- Friedman, M. 1970. "The Social Responsibility of Business Is to Increase Its Profits." *The New York Times Magazines*.
- Fu, R., A. Kraft, and H. Zhang. 2012. "Financial Reporting Frequency, Information Asymmetry, and the Cost of Equity." *Journal of Accounting and Economics* 54, no. 2–3: 132–149. <https://doi.org/10.1016/j.jacceco.2012.07.003>.
- Gambin, L. 2004. "Gender Differences in the Effect of Health on Wages in Britain."
- Goyenko, R. Y., C. W. Holden, and C. A. Trzcinka. 2009. "Do Liquidity Measures Measure Liquidity?" *Journal of Financial Economics* 92, no. 2: 153–181. <https://doi.org/10.1016/j.jfineco.2008.06.002>.
- Greening, D. W., and D. B. Turban. 2000. "Corporate Social Performance as a Competitive Advantage in Attracting a Quality Workforce." *Business & Society* 39, no. 3: 254–280. <https://doi.org/10.1177/000765030003900302>.
- Griffin, J. M., X. Ji, and J. S. Martin. 2003. "Momentum Investing and Business Cycle Risk: Evidence From Pole to Pole." *Journal of Finance* 58, no. 6: 2515–2547. <https://doi.org/10.1046/j.1540-6261.2003.00614.x>.
- Griffin, P. A., D. H. Lont, and E. Y. Sun. 2017. "The Relevance to Investors of Greenhouse Gas Emission Disclosures." *Contemporary Accounting Research* 34, no. 2: 1265–1297. <https://doi.org/10.1111/1911-3846.12298>.
- Guidry, R. P., and D. M. Patten. 2012. "Voluntary Disclosure Theory and Financial Control Variables: An Assessment of Recent Environmental Disclosure Research." *Accounting Forum* 36, no. 2: 81–90. <https://doi.org/10.1016/j.accfor.2012.03.002>.
- Haniffa, R., and M. Hudaib. 2007. "Exploring the Ethical Identity of Islamic Banks via Communication in Annual Reports." *Journal of Business Ethics* 76: 97–116. <https://doi.org/10.1007/s10551-006-9272-5>.
- Hart, S. L. 1995. "A Natural-Resource-Based View of the Firm." *Academy of Management Review* 20: 874–907.
- Hausman, J. A. 1978. "Specification Tests in Econometrics." *Econometrica* 46, no. 6: 1251–1271. <https://doi.org/10.2307/1913827>.
- Healy, P. M., A. P. Hutton, and K. G. Palepu. 1999. "Stock Performance and Intermediation Changes Surrounding Sustained Increases in Disclosure." *Contemporary Accounting Research* 16, no. 3: 485–520. <https://doi.org/10.1111/j.1911-3846.1999.tb00592.x>.
- Healy, P. M., and K. G. Palepu. 2001. "Information Asymmetry, Corporate Disclosure, and the Capital Markets: A Review of the Empirical Disclosure Literature." *Journal of Accounting and Economics* 31, no. 1–3: 405–440. [https://doi.org/10.1016/S0165-4101\(01\)00018-0](https://doi.org/10.1016/S0165-4101(01)00018-0).
- Helfaya, A., A. Aboud, and E. Amin. 2023. "An Examination of Corporate Environmental Goals Disclosure, Sustainability Performance and Firm Value—An Egyptian Evidence." *Journal of International Accounting, Auditing and Taxation* 52: 100561. <https://doi.org/10.1016/j.intaccudtax.2023.100561>.
- Hillman, A. J., and G. D. Keim. 2001. "Shareholder Value, Stakeholder Management, and Social Issues: Whats the Bottom Line?" *Strategic Management Journal* 22, no. 2: 125–139. [https://doi.org/10.1002/1097-0266\(200101\)22:2<125::AID-SMJ150>3.0.CO;2-H](https://doi.org/10.1002/1097-0266(200101)22:2<125::AID-SMJ150>3.0.CO;2-H).
- Hong, H., and M. Kacperczyk. 2009. "The Price of Sin: The Effects of Social Norms on Markets." *Journal of Financial Economics* 93, no. 1: 15–36. <https://doi.org/10.1016/j.jfineco.2008.09.001>.
- Hooghiemstra, R. 2000. "Corporate Communication and Impression Management—New Perspectives Why Companies Engage in Corporate Social Reporting." *Journal of Business Ethics* 27: 55–68. <https://doi.org/10.1023/A:1006400707757>.
- Hope, O. K., and W. B. Thomas. 2008. "Managerial Empire Building and Firm Disclosure." *Journal of Accounting Research* 46, no. 3: 591–626. <https://doi.org/10.1111/j.1475-679X.2008.00289.x>.
- Huang, P., and Y. Zhang. 2012. "Does Enhanced Disclosure Really Reduce Agency Costs? Evidence From the Diversion of Corporate Resources." *Accounting Review* 87, no. 1: 199–229. <https://doi.org/10.2308/accr-10160>.
- Hudson, R. 2024. "Biodiversity and Risk in the Financial Sector." *Journal of Sustainable Finance and Accounting* 2: 100009. <https://doi.org/10.1016/j.josfa.2024.100009>.
- Hull, C. E., and S. Rothenberg. 2008. "Firm Performance: The Interactions of Corporate Social Performance With Innovation and Industry Differentiation." *Strategic Management Journal* 29: 781–789. <https://doi.org/10.1002/smj.675>.

- Hummel, K., and C. Schlick. 2016. "The Relationship Between Sustainability Performance and Sustainability Disclosure—Reconciling Voluntary Disclosure Theory and Legitimacy Theory." *Journal of Accounting and Public Policy* 35, no. 5: 455–476. <https://doi.org/10.1016/j.jaccpubpol.2016.06.001>.
- In, S. Y., K. Y. Park, and A. Monk. 2019. "Is "Being Green" Rewarded in the Market? An Empirical Investigation of Decarbonization and Stock Returns." Stanford Global Projects Center, Working Paper, Stanford, 1–53.
- Izzeldin, M., J. Johnes, S. Ongena, V. Pappas, and M. Tsionas. 2021. "Efficiency Convergence in Islamic and Conventional Banks." *Journal of International Financial Markets, Institutions & Money* 70: 101279. <https://doi.org/10.1016/j.intfin.2020.101279>.
- Jacobs, B. W., V. R. Singhal, and R. Subramanian. 2010. "An Empirical Investigation of Environmental Performance and the Market Value of the Firm." *Journal of Operations Management* 28, no. 5: 430–441. <https://doi.org/10.1016/j.jom.2010.01.001>.
- Jaggi, B., and P. Y. Low. 2000. "Impact of Culture, Market Forces, and Legal System on Financial Disclosures." *International Journal of Accounting* 35, no. 4: 495–519. [https://doi.org/10.1016/S0020-7063\(00\)00076-5](https://doi.org/10.1016/S0020-7063(00)00076-5).
- James, G., D. Witten, T. Hastie, and R. Tibshirani. 2013. *An Introduction to Statistical Learning With Applications in R*. 1st ed. Springer.
- Jegadeesh, N., and S. Titman. 1993. "Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency." *Journal of Finance* 48, no. 1: 65–91. <https://doi.org/10.2307/2328882>.
- Jensen, M. C. 1993. "The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems." *Journal of Finance* 48, no. 3: 831–880. <https://doi.org/10.1111/j.1540-6261.1993.tb04022.x>.
- Jensen, M. C. 2002. "Value Maximization, Stakeholder Theory, and the Corporate Objective Function." *Business Ethics Quarterly* 12, no. 2: 235–256. <https://doi.org/10.2307/3857812>.
- Johnes, J., M. Izzeldin, and V. Pappas. 2014. "A Comparison of Performance of Islamic and Conventional Banks 2004–2009." *Journal of Economic Behavior & Organization* 103, no. Supplement: S93–S107. <https://doi.org/10.1016/j.jebo.2013.07.016>.
- Kamla, R., and H. G. Rammal. 2013. "Social Reporting by Islamic Banks: Does Social Justice Matter?" *Accounting, Auditing & Accountability Journal* 26, no. 6: 911–945. <https://doi.org/10.1108/AAAJ-03-2013-1268>.
- Kang, C., F. Germann, and R. Grewal. 2016. "Washing Away Your Sins? Corporate Social Responsibility, Corporate Social Irresponsibility, and Firm Performance." *Journal of Marketing* 80, no. 2: 59–79. <https://doi.org/10.1509/jm.15.0324>.
- Kassinis, G., and N. Vafeas. 2006. "Stakeholder Pressures and Environmental Performance." *Academy of Management Journal* 49, no. 1: 145–159. <https://doi.org/10.5465/AMJ.2006.20785799>.
- Kennedy, P. 1998. *A Guide to Econometrics*. 4th ed. MIT Press.
- Korkeamäki, T., E. Liljeblom, and D. Pasternack. 2017. "CEO Power and Matching Leverage Preferences." *Journal of Corporate Finance* 45: 19–30. <https://doi.org/10.1016/j.jcorpfin.2017.04.007>.
- Kruse, T., M. Mohnen, P. Pope, and M. Sato. 2020. "Green Revenues, Profitability and Market Valuation: Evidence From a Global Firm Level Dataset." Technical Report Working Paper, Grantham Research Institute on Climate Change and the Environment.
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. W. Vishny. 1998. "Law and Finance." *Journal of Political Economy* 106, no. 6: 1113–1155. <https://doi.org/10.1086/250042>.
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. W. Vishny. 2000. "Investor Protection and Corporate Governance." *Journal of Financial Economics* 58, no. 1–2: 3–27. [https://doi.org/10.1016/S0304-405X\(00\)00065-9](https://doi.org/10.1016/S0304-405X(00)00065-9).
- Lambert, R., C. Leuz, and R. E. Verrecchia. 2007. "Accounting Information, Disclosure, and the Cost of Capital." *Journal of Accounting Research* 45, no. 2: 385–420. <https://doi.org/10.1111/j.1475-679X.2007.00238.x>.
- Lang, M. H., and R. J. Lundholm. 1993. "Cross-Sectional Determinants of Analyst Ratings of Corporate Disclosures." *Journal of Accounting Research* 31, no. 2: 246–271. <https://doi.org/10.2307/2491273>.
- Lang, M. H., and R. J. Lundholm. 1996. "Corporate Disclosure Policy and Analyst Behavior." *Accounting Review* 71, no. 4: 467–492.
- Leonidou, C. N., C. S. Katsikeas, and N. A. Morgan. 2013. "'Greening' the Marketing Mix: Do Firms Do It and Does It Pay Off?" *Journal of the Academy of Marketing Science* 41: 151–170. <https://doi.org/10.1007/s11747-012-0317-2>.
- Leuz, C., and R. E. Verrecchia. 2000. "The Economic Consequences of Increased Disclosure." *Journal of Accounting Research* 38, no. Supplement: 91–124. <https://doi.org/10.2307/2672910>.
- Liljeblom, E., S. Mollah, S. Akbar, et al. 2024. "The Role of Finance, Accounting and Governance in Sustainability and Sustainable Development." *Journal of Sustainable Finance and Accounting* 1: 100005. <https://doi.org/10.1016/j.josfa.2024.100005>.
- Lyon, T. P., Y. Lu, X. Shi, and Q. Yin. 2013. "How Do Investors Respond to Green Company Awards in China?" *Ecological Economics* 94: 1–8. <https://doi.org/10.1016/j.ecolecon.2013.06.020>.
- Maali, B., P. Casson, and C. Napier. 2006. "Social Reporting by Islamic Bank." *Abacus* 42, no. 2: 266–289. <https://doi.org/10.1111/j.1467-6281.2006.00200.x>.
- Mackey, A., T. B. Mackey, and J. B. Barney. 2007. "Corporate Social Responsibility and Firm Performance: Investor Preferences and Corporate Strategies." *Academy of Management Review* 32, no. 3: 817–835. <https://doi.org/10.5465/amr.2007.25275676>.
- Mallin, C., H. Farag, and K. Ow-Yong. 2014. "Corporate Social Responsibility and Financial Performance in Islamic Banks." *Journal of Economic Behavior & Organization* 103, no. Supplement: S21–S38. <https://doi.org/10.1016/j.jebo.2014.03.001>.
- Marquardt, D. W. 1970. "Generalized Inverses, Ridge Regression, Biased Linear Estimation, and Nonlinear Estimation." *Technometrics* 12, no. 3: 591–612. <https://doi.org/10.1080/00401706.1970.10488699>.
- Martin, P. R., and D. V. Moser. 2016. "Managers' Green Investment Disclosures and Investors' Reaction." *Journal of Accounting and Economics* 61, no. 1: 239–254. <https://doi.org/10.1016/j.jacceco.2015.08.004>.
- Matsumura, E. M., R. Prakash, and S. C. Vera-Muñoz. 2014. "Firm-Value Effects of Carbon Emissions and Carbon Disclosures." *Accounting Review* 89, no. 2: 695–724. <https://doi.org/10.2308/accr-50629>.
- McWilliams, A., and D. Siegel. 1997. "The Role of Money Managers in Assessing Corporate Social Responsibility Research." *Journal of Investing* 6, no. 4: 98–107. <https://doi.org/10.3905/joi.1997.408440>.
- Meek, G. K., C. B. Roberts, and S. J. Gray. 1995. "Factors Influencing Voluntary Annual Report Disclosures by U.S., U.K. and Continental European Multinational Corporations." *Journal of International Business Studies* 26, no. 3: 555–572. <https://doi.org/10.1057/palgrave.jibs.8490186>.
- Meslier, C., T. Risfandy, and A. Tarazi. 2017. "Dual Market Competition and Deposit Rate Setting in Islamic and Conventional Banks." *Economic Modelling* 63: 318–333. <https://doi.org/10.1016/j.econmod.2017.02.013>.
- Migliavacca, A. 2024. "Value Relevance of Accounting Numbers and Sustainability Information in Europe: Empirical Evidence From Nonfinancial Companies." *Journal of International Accounting, Auditing and Taxation* 55: 100620. <https://doi.org/10.1016/j.intaccaudtax.2024.100620>.
- Mohd, E. 2005. "Accounting for Software Development Costs and Information Asymmetry." *Accounting Review* 80, no. 4: 1211–1231. <https://doi.org/10.2308/accr.2005.80.4.1211>.

- Mollah, S., M. K. Hassan, O. Al Farooque, and A. Mobarek. 2017. "The Governance, Risktaking, and Performance of Islamic Banks." *Journal of Financial Services Research* 51: 195–219. <https://doi.org/10.1007/s10693-016-0245-2>.
- Mollah, S., E. Liljeblom, and A. Mobarek. 2021. "Heterogeneity in Independent Non-Executive Directors' Attributes and Risk-Taking in Large Banks." *Journal of Corporate Finance* 70: 102074. <https://doi.org/10.1016/j.jcorpfin.2021.102074>.
- Mollah, S., M. Skully, and E. Liljeblom. 2021. "Strong Boards and Risk-Taking in Islamic Banks." *Review of Corporate Finance* 1, no. 1–2: 135–180. <https://doi.org/10.1561/114.000000004>.
- Mollah, S., and M. Zaman. 2015. "Shari'ah Supervision, Corporate Governance and Performance: Conventional vs. Islamic Banks." *Journal of Banking & Finance* 58: 418–435. <https://doi.org/10.1016/j.jbankfin.2015.04.030>.
- Moreno, A., and T. Caminero. 2022. "Application of Text Mining to the Analysis of Climate-Related Disclosures." *International Review of Financial Analysis* 83: 102307. <https://doi.org/10.1016/j.irfa.2022.102307>.
- Moufty, S., E. Clark, and B. Al-Najjar. 2021. "The Different Dimensions of Sustainability and Bank Performance: Evidence From the EU and the USA." *Journal of International Accounting, Auditing and Taxation* 43: 100381. <https://doi.org/10.1016/j.intaccudtax.2021.100381>.
- Mueller, I., and E. Sfrappini. 2025. "Climate Change-Related Regulatory Risks and Bank Lending." *Journal of International Economics* 158: 104156. <https://doi.org/10.1016/j.jinteco.2025.104156>.
- Nishihara, M. 2023. "Corporate Sustainability, Investment, and Capital Structure." *Annals of Operations Research*. <https://doi.org/10.1007/s10479-023-05699-3>.
- Nordhaus, W. 2019. "Climate Change: The Ultimate Challenge for Economics." *American Economic Review* 109, no. 6: 1991–2014. <https://doi.org/10.1257/aer.109.6.1991>.
- Onali, E., R. Galiakhmetova, P. Molyneux, and G. Torluccio. 2016. "CEO Power, Government Monitoring, and Bank Dividends." *Journal of Financial Intermediation* 27: 89–117. <https://doi.org/10.1016/j.jfi.2015.08.001>.
- O'Neill, B. C., E. Kriegler, K. L. Ebi, et al. 2017. "The Roads Ahead: Narratives for Shared Socioeconomic Pathways Describing World Futures in the 21st Century." *Global Environmental Change* 42: 169–180. <https://doi.org/10.1016/j.gloenvcha.2015.01.004>.
- Ongena, S. 2024. "Which Banks for Green Growth? A Review and a Tentative Research Agenda." *Journal of Sustainable Finance and Accounting* 1: 100001. <https://doi.org/10.1016/j.josfa.2024.100001>.
- Pathan, S. 2009. "Strong Boards, CEO Power and Bank Risk-Taking." *Journal of Banking & Finance* 33, no. 7: 1340–1350. <https://doi.org/10.1016/j.jbankfin.2009.02.001>.
- Patten, D. M. 1991. "Exposure, Legitimacy, and Social Disclosure." *Journal of Accounting and Public Policy* 10, no. 4: 297–308. [https://doi.org/10.1016/0278-4254\(91\)90003-3](https://doi.org/10.1016/0278-4254(91)90003-3).
- Philippas, D., P. Tziogkidis, and M. Sfakianakis. 2025. "The Fine Line Between ESG Commitment and Bank Performance." *Energy Economics* 151: 108978. <https://doi.org/10.1016/j.eneco.2025.108978>.
- Platonova, E., M. Asutay, R. Dixon, and S. Mohammad. 2018. "The Impact of Corporate Social Responsibility Disclosure on Financial Performance: Evidence From the GCC Islamic Banking Sector." *Journal of Business Ethics* 151: 451–471. <https://doi.org/10.1007/s10551-016-3229-0>.
- Plumlee, M., D. Brown, R. M. Hayes, and R. S. Marshall. 2015. "Voluntary Environmental Disclosure Quality and Firm Value: Further Evidence." *Journal of Accounting and Public Policy* 34, no. 4: 336–361. <https://doi.org/10.1016/j.jaccpubpol.2015.04.004>.
- Reghezza, A., Y. Altunbas, D. Marques-Ibanez, C. R. D'Acri, and M. Spaggiari. 2022. "Do Banks Fuel Climate Change?" *Journal of Financial Stability* 62: 101049. <https://doi.org/10.1016/j.jfs.2022.101049>.
- Riedl, A., and P. Smeets. 2017. "Why Do Investors Hold Socially Responsible Mutual Funds?" *Journal of Finance* 72, no. 6: 2505–2550. <https://doi.org/10.1111/jofi.12547>.
- Roberts, R. W. 1992. "Determinants of Corporate Social Responsibility Disclosure: An Application of Stakeholder Theory." *Accounting, Organizations and Society* 17, no. 6: 595–612. [https://doi.org/10.1016/0361-3682\(92\)90015-K](https://doi.org/10.1016/0361-3682(92)90015-K).
- Rosenbaum, P. R., and D. B. Rubin. 1983. "The Central Role of the Propensity Score in Observational Studies for Causal Effects." *Biometrika* 70, no. 1: 41–55. <https://doi.org/10.1017/CBO9780511810725.016>.
- Rouwenhorst, K. G. 1998. "International Momentum Strategies." *Journal of Finance* 53, no. 1: 267–284. <https://doi.org/10.1111/0022-1082.95722>.
- Rouwenhorst, K. G. 1999. "Local Return Factors and Turnover in Emerging Stock Markets." *Journal of Finance* 54, no. 4: 1439–1464. <https://doi.org/10.1111/0022-1082.00151>.
- Russo, M. V., and P. A. Fouts. 1997. "A Resource-Based Perspective on Corporate Environmental Performance and Profitability." *Academy of Management Journal* 40, no. 3: 534–559. <https://doi.org/10.2307/257052>.
- Schmid, S., F. Altfeld, and T. Dauth. 2018. "Americanization as a Driver of CEO Pay in Europe: The Moderating Role of CEO Power." *Journal of World Business* 53, no. 4: 433–451. <https://doi.org/10.1016/j.jwb.2017.12.002>.
- Schnackenberg, A. K., and E. C. Tomlinson. 2016. "Organizational Transparency: A New Perspective on Managing Trust in Organization-Stakeholder Relationships." *Journal of Management* 42, no. 7: 1784–1810. <https://doi.org/10.1177/0149206314525202>.
- Silber, W. L. 2005. "What Happened to Liquidity When World War I Shut the NYSE?" *Journal of Financial Economics* 78, no. 3: 685–701. <https://doi.org/10.1016/j.jfineco.2005.02.005>.
- Simsek, R., S. Mollah, and A. Tunyi. 2024. "Corporate Governance Structure and Climate-Related Financial Disclosure: Conventional Banks Versus Islamic Banks." *Business Strategy and the Environment* 33, no. 6: 5503–5528. <https://doi.org/10.1002/bse.3753>.
- Stein, P., G. Rooprai, and T. Kludovacz. 2018. *Raising \$23 Trillion Green Banks and Capital Markets for Growth*. International Finance Corporation, World Bank Group.
- Stern, N. 2008. "The Economics of Climate Change." *American Economic Review* 98, no. 2: 1–37. <https://doi.org/10.1257/aer.98.2.1>.
- Su, W., M. W. Peng, W. Tan, and Y. Cheung. 2016. "The Signaling Effect of Corporate Social Responsibility in Emerging Economies." *Journal of Business Ethics* 134: 479–491. <https://doi.org/10.1007/s10551-014-2404-4>.
- Surroca, J., and J. A. Tribó. 2008. "Managerial Entrenchment and Corporate Social Performance." *Journal of Business Finance & Accounting* 35, no. 5–6: 748–789. <https://doi.org/10.1111/j.1468-5957.2008.02090.x>.
- Tang, Z., C. E. Hull, and S. Rothenberg. 2012. "How Corporate Social Responsibility Engagement Strategy Moderates the CSR-Financial Performance Relationship." *Journal of Management Studies* 49, no. 7: 1274–1303. <https://doi.org/10.1111/j.1467-6486.2012.01068.x>.
- TCFD. 2017. "Recommendations of the Task Force on Climate-Related Financial Disclosures." Financial Stability Board. <https://www.fsb-tcfd.org/recommendations/>.
- Tumewang, Y. K., C. G. Ntim, and F. Haque. 2025. "Task Force on Climate-Related Financial Disclosures: A Systematic Literature Review and Future Research." *Business Strategy and the Environment* 34: 10033–10058. <https://doi.org/10.1002/bse.70112>.
- Verrecchia, R. E. 1983. "Discretionary Disclosure." *Journal of Accounting and Economics* 5: 179–194. [https://doi.org/10.1016/0165-4101\(83\)90011-3](https://doi.org/10.1016/0165-4101(83)90011-3).

- Verrecchia, R. E. 2001. "Essays on Disclosure." *Journal of Accounting and Economics* 32, no. 1–3: 97–180. [https://doi.org/10.1016/S0165-4101\(01\)00025-8](https://doi.org/10.1016/S0165-4101(01)00025-8).
- Vishwanathan, P., H. J. van Oosterhout, P. P. M. A. R. Heugens, P. Duran, and M. van Essen. 2020. "Strategic CSR: A Concept Building Meta-Analysis." *Journal of Management Studies* 57, no. 2: 314–350. <https://doi.org/10.1111/joms.12514>.
- Vittinghoff, E., D. V. Glidden, S. C. Shiboski, and C. E. McCulloch. 2005. *Regression Methods in Biostatistics: Linear, Logistic, Survival, and Repeated Measures Models*. 2nd ed. Springer.
- Waddock, S. A., and S. B. Graves. 1997. "The Corporate Social Performance—Financial Performance Link." *Strategic Management Journal* 18, no. 4: 303–319. [https://doi.org/10.1002/\(SICI\)1097-0266\(199704\)18:4<303::AID-SMJ869>3.0.CO;2-G](https://doi.org/10.1002/(SICI)1097-0266(199704)18:4<303::AID-SMJ869>3.0.CO;2-G).
- Wang, T., and P. Bansal. 2012. "Social Responsibility in New Ventures: Profiting From a Long-Term Orientation." *Strategic Management Journal* 33, no. 10: 1135–1153. <https://doi.org/10.1002/smj.1962>.
- Warren, W. D., and B. N. Schwartz. 1997. "Environmental Disclosures and Public Policy Pressure." *Journal of Accounting and Public Policy* 16, no. 2: 125–154. [https://doi.org/10.1016/S0278-4254\(96\)00015-4](https://doi.org/10.1016/S0278-4254(96)00015-4).
- Welker, M. 1995. "Disclosure Policy, Information Asymmetry and Liquidity in Equity Markets." *Contemporary Accounting Research* 11, no. 2: 801–827. <https://doi.org/10.1111/j.1911-3846.1995.tb00467.x>.
- Wiengarten, F., C. K. Lo, and J. Y. Lam. 2017. "How Does Sustainability Leadership Affect Firm Performance? The Choices Associated With Appointing a Chief Officer of Corporate Social Responsibility." *Journal of Business Ethics* 140: 477–493. <https://doi.org/10.1007/s10551-015-2666-5>.
- Williams, G., and J. Zinkin. 2010. "Islam and CSR: A Study of the Compatibility Between the Tenets of Islam and the UN Global Compact." *Journal of Business Ethics* 91: 519–533. <https://doi.org/10.1007/s10551-009-0097-x>.
- Wooldridge, J. M. 2002. *Econometric Analysis of Cross Section and Panel Data*. 2nd ed. Cambridge, Massachusetts.
- Yermack, D. 1996. "Higher Market Valuation for Firms With a Small Board of Directors." *Journal of Financial Economics* 40, no. 2: 185–211. [https://doi.org/10.1016/0304-405X\(95\)00844-5](https://doi.org/10.1016/0304-405X(95)00844-5).
- Zerbini, F. 2017. "CSR Initiatives as Market Signals: A Review and Research Agenda." *Journal of Business Ethics* 146: 1–23. <https://doi.org/10.1007/s10551-015-2922-8>.

Appendix A

TABLE A1 | Sample selection process.

Selection criteria	No of CBs	No of IBs	No of banks
Banks from countries where both banks operate and with at least four banks	1163	185	1348
Less: Banks without at least 3 years of total assets data	401	16	417
Less: Banks from countries where 2 or fewer banks or only one type of bank remain	340	0	340
Final selected sample	422	169	591

Appendix B

TABLE B1 | Climate-related disclosure (CRD) 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 gas emission
13. Scope 1
14. Scope 2
15. Scope 3
16. Greenhouse gas 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

Appendix C

TABLE C1 | Descriptions of variables.

Name	Definition
Dependent variable	
Corporate Financial Performance (CFP)	Proxied by the accounting-based economic performance variable, return on assets (ROA)
Main explanatory variable	
Climate-Related Disclosure (CRD)	Content analysis is undertaken. First, we determine a checklist that contains keywords for the climate-related disclosure that are presented in Table B1 in Appendix B. Then, we analyse the number of words that appear in the annual reports of the banks.
Bank-specific control variables	
Total Assets	Log of total assets
NPL/TA	The ratio of nonperforming loans to total assets.
Debt/Equity	The ratio of long-term debts to equity.
Firm Age	The natural logarithm of the age of the firm.
No. Branch	The natural logarithm of the number of the banks' branches.
Board Size	The number of directors on the board of the banks.
CEO Power	The 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.
Conventional Banks	Conventional banks is a dummy for conventional banks. If the bank is a conventional bank, then one, otherwise zero.
Cost-Income	Cost-to-income ratio is calculated as the ratio of the operating expenses to the operating income.
Spread	Annual average of the ratio of the bid-ask spread to the midpoint of the bid and ask prices.
Illiquidity	The absolute return divided by the trading volume.

Name	Definition
Country-specific control variables	
GDPPC	The natural logarithm of the GDP per capita.
Religiosity	The Gallup Survey research was conducted in 2009.
Inflation	Year-on-year change of consumer price index (CPI).

Appendix D

TABLE D1 | Variance inflation factor (VIF) analysis.

Variables	ROA	
	VIF	1/VIF
CRD	1.55	0.647
TA	3.45	0.289
NPL/TA	1.41	0.711
Debt/Equity	1.62	0.618
Firm Age	1.45	0.691
No. Branch	1.94	0.515
Board Size	1.17	0.856
CEO Power	1.10	0.906
GDPPC	3.22	0.311
Religiosity	1.89	0.528
Inflation	1.38	0.723
Mean VIF	1.83	

Appendix E

TABLE E1 | Accounting performance and CRD in CBs and IBs.

	Random effect		
	Dependent variable: ROE		
	Full sample (1)	CBs (2)	IBs (3)
CRD	0.338 (0.292)	0.546* (0.291)	−1.249** (0.575)
TA	1.634*** (0.313)	1.054*** (0.359)	3.639*** (1.151)
NPL/TA	−0.253*** (0.018)	−0.274 (0.196)	−0.144 (0.089)
Debt/Equity	−0.575 (0.367)	−0.755* (0.444)	0.018 (0.232)
Firm Age	−0.683* (0.359)	−0.678 (0.541)	1.865*** (0.438)
No. Branch	−0.139 (0.518)	−0.069 (0.654)	0.898* (0.486)
Board Size	2.398** (1.203)	3.296* (1.877)	−2.453*** (0.585)
CEO Power	1.012*** (0.334)	1.061*** (0.381)	1.223*** (0.089)
GDPPC	−1.392*** (0.259)	−1.336 (0.939)	−3.568* (1.936)
Religiosity	12.402*** (3.729)	10.176** (5.144)	−5.643 (4.438)
Inflation	0.365*** (0.006)	0.369*** (0.029)	0.192*** (0.039)
Constant	−16.247*** (4.502)	−6.940 (9.877)	−11.202 (7.809)
Observation	602	463	139
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
chi ²		3.91**	
Prob > chi ²		0.048	
Hausman chi ²	0.31	0.39	2.35
Prob > chi ²	0.858	0.824	0.308

***Significance level of 0.01.

**Significance level of 0.05.

*Significance level of 0.1.