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Does investment stimulate or inhibit CSR transparency? The moderating role of CSR committee, board monitoring and CEO duality

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ABSTRACT

This study examined the potential relationship between different facets of firm investment (i.e., sales growth, R&D intensity, and total tangible and intangible assets) and CSR reporting, assurance and GRI adoption. Also, it further explored the conditions under which investing firms can encourage or discourage their CSR transparency. Our sample included 44,996 firm-year observations from 2004 to 2019 across 61 countries. Using a random-effects logistic model, our results indicate that corporate investments reduce firms' CSR reporting and assurance tendency, which implies that a tradeoff exists between these two aspects of firm investment worldwide. Our moderation analysis outlined the contingent role of board-specific characteristics in the link between firm investment and CSR transparency. It appears that the CSR committee generates greater moderating effects on the firm investment–CSR transparency nexus than board monitoring and CEO duality. This empirical evidence also suggests several practical implications and future research agendas.

1. Introduction

An essential facet underlying the academic debate over corporate social responsibility (CSR) and its determinants elaborates on what constitutes a successful corporation. Although profitability has been viewed as a crucial metric of the success of firms, mainstream practitioners and academicians alike have indicated that other factors are involved (Erhemjamts et al., 2013). Conventionally, numerous managers perceive CSR as a self-imposed mechanism. Further, there are those who adopt the view of economist Milton Friedman that the only social responsibility that corporations should fulfil is to increase their investments for the sake of profits (Friedman, 2007). Nevertheless, modern CSR strategy has gradually and eventually become the foremost objective of various firms. In this context, in a recent interview with *Business Focus*, the chairperson of *Home Plus*, Mr. Lee Seung-han, emphasised the importance of CSR investments: In the past decades, the main objective of corporations was to obtain revenues. Nowadays, nevertheless, these firms also have a responsibility to protect the environment and improve people's living conditions by integrating the CSR

agenda into their essential values (Mahajan, 2019). This view has become a trend among firms worldwide, which have devoted substantial investments to their CSR agenda. For example, in 2015, the size of socially responsible investments in the US dramatically increased from US \$6.57 trillion to US\$8.72 trillion, an increase of nearly 18% compared with 2014 (Tashman et al., 2019; Krishnamurti et al., 2021). Similarly, a study conducted by the Governance & Accountability Institute indicated that 86% of S&P 500 Index firms published CSR reports in 2018 (Park et al., 2021). CSR reporting has become increasingly significant, as evident in the substantial change in the number of firms that publish CSR reports: 20% in 2011, 72% in 2013 and 86% in 2018. This increasing tendency to acknowledge CSR reporting as a key factor in the success of firms appears to be linked to the dynamic growth in the number of institutional investors, social activists and media groups that focus on persuading firms to conduct their operations in line with various CSR criteria (Graafland and Noorderhaven, 2020; Nazir et al., 2021).

Nevertheless, the remarkable growth in various types of socially responsible investing raises the question of whether corporations should

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their financial resources to CSR-related activities and away from investment activities. Our study was motivated by this question, which we sought to answer by examining the nature of the relationship between firms' investments and their CSR agenda worldwide.

The existing literature has found that a firm's investments, such as research and development (R&D) intensity (Stowe and Xing, 2006; Serrasqueiro and Nunes, 2010), sales growth (Badertscher et al., 2013; Yang and Jiang, 2023), and the growth of tangible and intangible assets (Benlemlih and Bitar, 2018; Shahzad et al., 2018; Ghanbarpour and Gustafsson, 2022), are critical determinants of international strategic and competitive positions. According to some studies (e.g., Sousa et al., 2021; Achi et al., 2022; Battisti et al., 2022; Ghanbarpour and Gustafsson, 2022; Randrianasolo and Semenov, 2022; Wang et al., 2022), these three types of investments (i.e., sales growth, R&D intensity, and the growth of tangible and intangible assets) are the most commonly used proxies for accounting-based investments in business research. Previous research has also found that CSR can help reinforce firms' competitive positions in the marketplace by improving corporate image (Becker-Olsen et al., 2011; Ioannou and Serafeim, 2012;), consumer satisfaction (Jean et al., 2016) and firm performance (Ghoul et al., 2017; Kuzey et al., 2021; Ghanbarpour and Gustafsson, 2022). Arguably, both firm investments and CSR approaches are deemed critical capabilities that can foster competitive advantages and success for investing firms. Thus, we were motivated to examine the link between specific firm investments (i.e., sales growth, R&D intensity, and the growth of tangible and intangible assets) and CSR transparency worldwide.

Although earlier work individually examined the association of R&D (Padgett and Galan, 2010; Alam et al., 2019; Randrianasolo and Semenov, 2022), sales growth (Nyame-Asiamah and Ghulam, 2019; Sun et al., 2020), and growth in the sum of tangible and intangible assets (Chong and Gilbert, 2010; Makosa et al., 2020) with CSR activities, no study has examined the effect of comprehensive investment measures on CSR transparency, including CSR disclosure, CSR assurance and Global Reporting Initiative (GRI) adoption. Also, prior studies were focused on linking firm investments to CSR performance rather than to disclosure (Alam et al., 2019; Sun et al., 2020; Jeriji et al., 2022; Randrianasolo and Semenov, 2022). Our study, therefore, adds to this ongoing debate by examining whether a tradeoff or synergy exists between a corporation's investments and its CSR disclosure, CSR assurance and GRI adoption. By doing so, the empirical evidence we generated can assist firms in effectively allocating their financial resources to investments and CSR reporting and assurance to achieve strategic competitive advantages.

To understand the expected influences of firm investments on CSR, numerous studies have explored the association between these two interrelated types of firm capabilities. And yet, these studies have produced mixed results. Theoretically, several previous studies argued that investing firms tend to disclose their CSR information in line with GRI guidance and obtain assurance for their CSR reports in an attempt to reach out to key stakeholders for the capital needed for investment (e.g., Ho et al., 2016; Ezzi et al., 2020). For example, Fernandez-Feijoo et al. (2014) suggested that pressure from powerful stakeholders seemed to determine the required level of CSR transparency among investing firms. Crucially, since CSR activities require corporations to innovate new socially responsible inputs, processes and outputs, R&D is positively associated with CSR approaches to support the synergy debate (Gallego-Álvarez et al., 2011; Jia, 2020). In contrast, other researchers have found a negative impact of investments, including in R&D, sales growth and assets growth, on CSR, thereby supporting the tradeoff argument (e.g., Hull and Rothenberg, 2008; McWilliams and Siegel, 2000) and suggesting that both investments and the CSR transparency approach are competitive instruments for acquiring rare resources, with a focus on one diminishing the other, and vice versa (Tang et al., 2012). These inconclusive findings on the investments-CSR transparency nexus as embodied in the synergy vs tradeoff debate suggest that contingencies might be at play (Randrianasolo and Semenov, 2022). Therefore, our study contributes to the extant international business literature by

exploring whether the nature of the investment-CSR transparency nexus worldwide is theoretically underpinned by a tradeoff or synergy perspective. We also sought to further contribute to the ongoing debate by clarifying this dilemma using a multi-theoretical perspective to propose various mechanisms by which investing firms engage in better CSR transparency performance.

Decision-makers, including directors on boards of investing firms, can undertake the necessary efforts to ensure the application of the best organisational practices in favour of internal stakeholders (e.g., shareholders and employees) while satisfying the increasing CSR requirements of other external stakeholders (e.g., regulators, customers, civil society activists) by employing appropriate policies and initiatives (AlJaberi et al., 2020; Jain and Zaman, 2020). As investment decisions and CSR activities are presumed to result from decisions made by boards (Ezeani et al., 2022; Rao and Tilt, 2016; Haque and Ntim, 2020), the characteristics of a firm's board can be a key determinant of investment decisions and simultaneously lead to improved CSR results. This demonstrates the crucial necessity of examining how board characteristics are attributed to CSR outcomes in investing firms. Previous research has mostly neglected the role of board structures in shaping investment strategies and has thus not examined their impact on approaches to CSR transparency. The present work, therefore, aimed to address this gap in the extant literature by determining whether the existence of a CSR committee, CEO duality and board monitoring has a moderating influence on the association between firm investments and CSR reporting approaches worldwide. Towards this end, we addressed the following question: *Is the association between firm investments and CSR reporting approaches contingent on the existence of a CSR committee, board monitoring and CEO duality?*

Using a global sample of 44,996 firm-year observations between 2004 and 2019 across 61 countries, we applied a random-effects (RE) model to examine the contingencies in the relationship between investments and CSR reporting approaches. Our findings suggest that firms' investments constrain their CSR reporting and assurance practices. This evidence implies that a tradeoff exists between firm investments and CSR reporting and assurance worldwide. Moreover, our moderation effect analysis shows that CSR committees generate a greater moderating effect on the association between firm investments and CSR reporting and assurance than board monitoring and CEO duality. Our results are robust to various alternative measures and endogeneity concerns.

Our empirical evidence adds to the ongoing debate by providing a more comprehensive understanding of the contingencies through which investing firms can enhance their CSR reporting practices. In doing this, our results could help firms to reconstruct their corporate strategies for or against corporate transparency and accountability. Also, our investigation could assist firms in allocating their financial resources appropriately.

The remainder of this paper is structured as follows. Section 2 reviews the literature, and Section 3 discusses the theoretical framing of the research hypotheses. Then, Section 4 explains the data and variables, and Section 5 explains the research design. While Section 6 explains the empirical results, Section 7 discusses the main findings and provides some relevant conclusions, and Section 8 outlines the implications of our findings for policies and practitioners as well as avenues for future research.

2. Literature review

Previous research has found that both firm investments (Kuemmerle, 1997; Nerkar and Paruchuri, 2005) and CSR (Malik, 2015) are significant corporate capabilities. Given the fact that any improvement in CSR requires investments in R&D and other intangible and tangible assets (McWilliams and Siegel, 2000), the expected impact of these investments on CSR activities has been examined by several earlier studies (e.g., Broadstock et al., 2020; Fu et al., 2020; Randrianasolo and

Semenov, 2022). However, these studies have generated mixed findings. For instance, Gallego-Álvarez et al. (2011), Guo et al. (2020) and Oh et al. (2017) suggested a negative association between firms' investments and CSR performance. In contrast, other researchers (e.g. Padgett and Galan, 2010; Sanzo et al., 2012; Szutowski and Ratajczak, 2016; Mishra, 2017; Broadstock et al., 2020; Fu et al., 2020; Battisti et al., 2022; Yang and Jiang, 2023) found that firm investments are associated with better engagement in CSR activities. These contradictory results on the investments–CSR transparency link indicate that contingencies might be at play. In this regard, Randrianasolo and Semenov (2022) claimed that the impact of investments on CSR activities worldwide is contingent on a country's national philanthropic environment (NPE). Specifically, in countries with a high-level NPE, there is a positive association between R&D intensity and CSR, whereas, among their low-level NPE counterparts, a tradeoff exists between R&D intensity and CSR. Nevertheless, despite the importance of board structure as a contingency mechanism through which investing firms can improve their CSR engagements, earlier research has paid insufficient attention to the moderating impact of such characteristics on the investment–CSR nexus.

Collectively, previous studies seemed to have several limitations. First, although they individually examined the influence of firm investments, such as R&D (Padgett and Galan, 2010; Alam et al., 2019; Battisti et al., 2022; Randrianasolo and Semenov, 2022), sales growth (Nyame-Asiamah and Ghulam, 2019; Sun et al., 2020; Yang and Jiang, 2023), and growth in the sum of tangible and intangible assets (Chong and Gilbert, 2010; Makosa et al., 2020), on CSR activities, they did not examine the effect of multiple measures of firm investments on corporate transparency and accountability practices. Second, earlier studies limited their focus to the role of firm investments in either CSR disclosure or performance only. In other words, extant research failed to generate empirical evidence on the impact of investments on comprehensive proxies of corporate transparency and accountability practices, such as CSR disclosure, CSR assurance and GRI adoption. Hence, our study exclusively focused on CSR reporting, particularly on the reliability of CSR reports by third-party assurance and the disclosure of structured CSR reports following GRI guidelines, both of which can enhance the credibility of information capture. Third, few studies have considered the contingencies by which firms' investments can enhance or degrade CSR outcomes.

Our study, therefore, addressed such limitations in the extant literature as follows. First, we considered three measures for firm investments – namely R&D intensity, sales growth, and the sum of tangible and intangible assets – for examining the investments–CSR nexus. Second, we comprehensively analysed the impact of the abovementioned investments on various aspects of corporate transparency approaches, including CSR disclosure, CSR assurance and GRI adoption, among a selected sample of firms worldwide. Third, we aimed to contribute to the existing literature by exploring the conditions under which a firm's investments can affect various transparency approaches. Crucially, we examined the moderating impact of board-specific characteristics (i.e., CSR committee, CEO duality, board monitoring) on the relationship between firm investments and various aspects of corporate transparency and accountability approaches. The theoretical framing of our research hypotheses is discussed in the next section.

3. Theory and hypotheses

3.1. Firm investments and CSR transparency

A stream of research on the investments–CSR nexus supports the synergy debate, which holds that integrating firms' investments with CSR approaches creates a type of organisational synergy, suggesting a positive link (Padgett and Galan, 2010; Borghesi et al., 2015). In contrast, another research stream tends to support the tradeoff argument – i.e. firms' investments and CSR compete for restricted resources – and

hence suggests a negative relationship (Hull and Rothenberg, 2008; Mithani, 2017).

Resource-based view (RBV) theory assumes that firms employ different techniques to bundle their capabilities (Özsoy and Gençtürk, 2003). The RBV also argues that corporations should appropriately integrate bundles of inimitable resources to obtain competitive advantages (Morash and Lynch, 2002). Previous literature indicates that both investments and CSR activities are vital to firms' capabilities (Malik, 2015; Randrianasolo and Semenov, 2022). Specifically, while investments in R&D and other intangible and tangible assets are regarded as a dynamic capability that allows firms to create new processes and products to cope with changing market circumstances (Helfat, 1997), CSR is a value-adding capability that leads to greater performance (Berchicci et al., 2012; Malik, 2015).

Since firm investments and CSR are capabilities for investing firms, literature employing the RBV indicates a positive relationship between these concepts (Padgett and Galan, 2010; Luo and Du, 2015). This synergistic approach suggests that businesses with higher investments in R&D and other tangible and intangible capabilities are better able to invest in and report on socially responsible activities (Sanzo et al., 2012; Luo and Du, 2015). Also, numerous aspects of CSR require investments in R&D and other innovation capabilities (McWilliams and Siegel, 2000). For instance, implementing socially responsible projects that decrease carbon emissions requires investments in R&D (Gallego-Álvarez et al., 2011; Tan et al., 2022). Put differently, firms' investments in R&D are attributable to efforts to improve CSR transparency (Bansal, 2005; Gallego-Álvarez et al., 2011). Thus, investing firms can better comply with stakeholder expectations of CSR engagements by disclosing their innovative CSR activities according to the GRI framework and by obtaining assurance for their CSR reports. Some previous studies have supported this theoretical stance. For example, Nyame-Asiamah and Ghulam (2019) found a positive relationship between sales growth and CSR engagements in the UK. Likewise, Guo et al. (2020) indicated that firms' investments in R&D reduce the negative impact of CSR disclosure on firms' financial performance worldwide. Further, Mishra (2017) found, among a sample of US firms, that more innovative firms that are associated with higher R&D investments tend to demonstrate high engagement in CSR activities. We, therefore, adopted this RBV perspective to theorise that firm investment positively influences CSR transparency approaches. We formulated H1a to reflect the synergy debate:

Hypothesis 1a. *Investing firms are more likely to (a) disclose CSR reports, (b) obtain assurance for their CSR reports, and (c) adopt GRI in their CSR reports.*

Conversely, other studies have found a negative association between R&D and other types of firm investments and CSR engagements, supporting the tradeoff argument (Gallego-Álvarez et al., 2011; Jia, 2020). This theoretical perspective suggests that since corporations have limited resources, R&D and CSR reporting investments are counterproductive, as these investments can be independently employed to obtain competitive advantages. Firm investments and CSR reporting engagements can also create an asymmetric information gap between shareholders and managers (Borghesi and Chang, 2020). Accordingly, it can be argued that since both investments and the adoption of various CSR reporting strategies are differentiation mechanisms, investing in both aspects simultaneously would be considered a waste of firms' resources (Randrianasolo and Semenov, 2022).

Consistently, the conflict resolution perspective of stakeholder theory (Krishnamurti et al., 2021) indicates that it is likely that scarce resources do not enable firms with investments to engage in CSR reporting and assurance practices. However, it is also possible that firm investments might stimulate corporate adoption of various transparency and accountability approaches for many reasons, including legitimacy-seeking behaviours and external funding needs. Although the latter perspective indicates the complementarity of the two investments, the

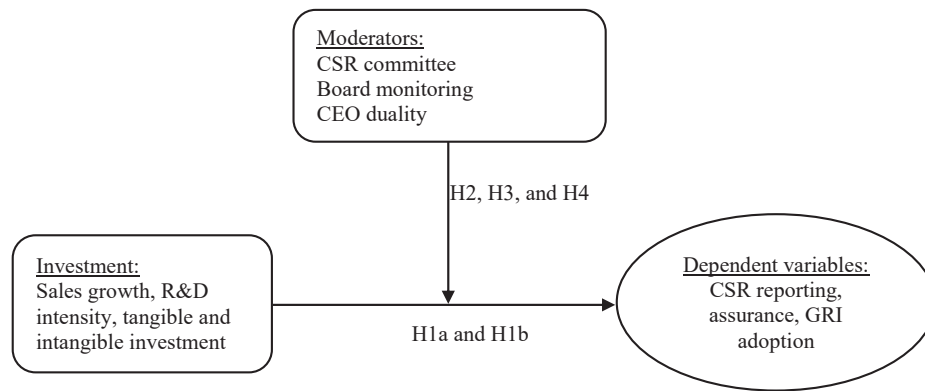


Fig. 1. The theoretical structure of the model.

former implies a tradeoff between them.

Supporting this, [Borghesi and Chang \(2020\)](#) suggested a tradeoff between R&D and CSR transparency approaches. They believed that intense R&D investments in the presence of heavy CSR involvement might create an asymmetric information gap between shareholders and managers, increasing agency costs. Similarly, [Gallego-Álvarez et al. \(2011\)](#) found a negative association between R&D and CSR activities among a sample of European companies. Hence, integrating traditional and CSR investments is not optimal for obtaining competitive advantages. Thus, we posited H1b to reflect this tradeoff:

Hypothesis 1b. *Investing firms are less likely to (a) disclose CSR reports, (b) obtain assurance for their CSR reports, and (c) adopt GRI in their CSR reports.*

3.2. The moderating role of board monitoring mechanisms

Previous studies (e.g., [Broadstock et al., 2020](#); [Fu et al., 2020](#); [Randrianasolo and Semenov, 2022](#)) have generated inconclusive findings. These mixed results suggest that some contingencies might be at play. Given the importance of board structures as contingency mechanisms for investing firms to improve their CSR transparency approaches, we hypothetically formulated a possible moderating impact of such characteristics on the investment–CSR nexus.

As mentioned above, the impact of firm investments on CSR transparency approaches could be contingent on other firm-level, industry-level and institutional-level variables ([Randrianasolo and Semenov, 2022](#)). Among these variables, it is essential to explore the possible role played by the presence of a CSR committee ([Martínez-Ferrero et al., 2021](#)). A CSR committee is perceived as a board's sub-commission, one that includes members with relevant knowledge and experience within the CSR field. These members can present policies to the board, ensure the veracity of the information reported, and monitor and supervise the proposed measures ([Fuente et al., 2017](#)). [Peters and Romi \(2014\)](#) indicated that the key purposes of a CSR committee are to ensure that corporate objectives adhering to stakeholders' expectations are met and that risks related to the sustainability of a firm's actions are properly managed.

Besides, CSR committees help the board implement and develop social and environmental responsibility programmes while simultaneously improving CSR disclosure ([Cucari et al., 2017](#)). The effectiveness of CSR committees was supported by recent studies that found that they have a positive moderating effect on the relationship between innovation and CSR reporting and assurance practices ([Kılıç et al., 2021](#); [Martínez-Ferrero et al., 2021](#)).

Moreover, board monitoring and CEO duality may play a moderating role in the relationship between firm investments and CSR activities. This is because these characteristics are effective mechanisms in inciting firms to disclose a CSR report. The board of directors performs two main

duties: advising and monitoring senior management ([Jensen, 1993](#)). The monitoring role includes overseeing management to minimise possible agency conflicts, whereas the advising role involves supporting top management in strategy design and implementation as well as providing guidance in other top-level decision-making areas ([Adams and Ferreira, 2007](#)). In this context, [Faleye et al. \(2011\)](#) found that intensive board monitoring conveys both costs and benefits, primarily by weakening the advising ability of the board, causing poor acquisition and innovation performance. This implies a negative moderating influence of board monitoring on the association between R&D and CSR reporting.

Furthermore, the effect of CEO duality on firm performance has not been consistently demonstrated in past research. Whereas some studies have found a positive influence, confirming stewardship theory ([Donaldson and Davis, 1991](#); [Xue, 2007](#); [Guillet et al., 2013](#); [Owusu et al., 2022](#)), others have found a negative impact, supporting agency theory ([García Martín and Herrero, 2020](#); [Uyar et al., 2021](#)). Similar inconsistencies appear when assessing the predictability of CEO duality in CSR reporting ([Jizi et al., 2014](#); [Muttakin et al., 2018](#)). Nevertheless, [Xue \(2007\)](#) argued that the potentially significant moderating effect of CEO duality on the association between R&D intensity and CSR reporting could be perceived as a negative, with R&D investments regularly exhibiting severe information asymmetry between shareholders and managers, supporting the agency argument. Thus, we posited that board-specific characteristics could moderate the association between firm investments and CSR transparency approaches:

Hypothesis 2. *Investing firms with a CSR committee are more likely to (a) disclose CSR reports, (b) obtain assurance for their CSR reports, and (c) adopt GRI in their CSR reports.*

Hypothesis 3. *Investing firms with stronger board monitoring are more likely to (a) disclose CSR reports, (b) obtain assurance for their CSR reports, and (c) adopt GRI in their CSR reports.*

Hypothesis 4. *Investing firms with more powerful CEOs are less likely to (a) disclose CSR reports, (b) obtain assurance for their CSR reports, and (c) adopt GRI in their CSR reports.*

Fig. 1 highlights these hypothesised relationships.

4. Data and variables

4.1. Data sources

The study sample included 44,996 firm-year observations from 2004 to 2019 across nine sectors and 61 countries. The data were retrieved from the Thomson Reuters Eikon database. In the first step of the data-screening process, the initial descriptive statistics were examined. The examination revealed that some of the research variables were heavily skewed, with significant average variability around mean values and significant extreme values on the tails. Thus, winsorization was

Table 1
Sample distribution.

Variable	Categories	Freq.	Percent
Sector	Basic Materials	5,930	13.18
	Consumer Cyclical	8,479	18.84
	Consumer Non-Cyclicals	4,005	8.90
	Energy	3,958	8.80
	Healthcare	4,103	9.12
	Industrials	9,452	21.01
	Technology	5,106	11.35
	Telecommunications Services	1,518	3.37
	Utilities	2,445	5.43
	Total	44,996	100.00
Year	2004	867	1.93
	2005	1,210	2.69
	2006	1,298	2.88
	2007	1,403	3.12
	2008	1,617	3.59
	2009	1,940	4.31
	2010	2,265	5.03
	2011	2,574	5.72
	2012	2,709	6.02
	2013	2,808	6.24
	2014	2,957	6.57
	2015	3,437	7.64
	2016	4,099	9.11
	2017	4,670	10.38
	2018	5,244	11.65
	2019	5,898	13.11
	Total	44,996	100.00

employed in this step (Cox, 2006). Second, the significant multivariate outliers were examined using the minimum covariance determinant (MCM) method (Verardi and Dehon, 2010), which can robustify the Mahalanobis distance. Following the detection of the outliers, the final sample of 44,996 firm-year observations was retained for further analysis.

In the next phase of the data-screening process, the missing values were examined in terms of their descriptive statistics. Variables with <5% missing values were imputed by employing Markov chain Monte Carlo-MCMC imputation with linear regression as the model type for scale variables (Schafer, 1999). However, three of the research variables – Salesgr, PPE&Intang and Bmonitoring¹ – were not imputed because of a significantly high ratio of missing values for these variables; hence, they were included in the analyses without imputing them.

Additionally, the research sample was examined using sector and year for sample distribution purposes. The results of this examination, which employed frequency analysis, are provided in Table 1. Regarding sector, 13.18% of the firm-year observations were from basic material, 18.84% were from consumer cyclical, 8.9% were from consumer non-cyclical, 8.8% were from energy, 9.12% were from health care, 21.01% were from industrial, 11.35% were from technology, 3.37% were from telecommunication services and 5.43% were from the utility. Regarding the year, the number of observations ranged from 1.93% in 2004 to 13.11% in 2019, with a steady increase each year. As noted above, the final sample size was 44,996 firm-year observations between 2004 and 2019. The total number of observations was associated with 5,898 unique firms, nine industries and 61 countries (for the detailed distribution, please see the appendix section in Table A2).

4.2. Variables

Corporate transparency and accountability practices were proxied by three dichotomous variables – namely CSR reporting (Report), CSR report assurance (Assurance) and GRI guideline adoption in the crafting of CSR reports (GRI). All took 1 if an associated practice existed and

0 otherwise (Du and Wu, 2019; Karaman et al., 2021).

We used three investment proxies: sales growth (Salesgr) (Badertscher et al., 2013), R&D intensity (RDintensity) (Stowe and Xing, 2006; Serrasqueiro and Nunes, 2010), and the sum of tangible and intangible assets growth (PPE&Intang) (Benlemlih and Bitar, 2018; Shahzad et al., 2018). Our rationale for choosing these three investment proxies was to capture different facets of investment and to test the consistency and sensitivity of the analytical outcomes for these three proxies. First, sales growth reflects the actions of firms' customers and competitors (Bae et al., 2019) and is a measure of organisational output that impacts the fund-generating ability of firms for CSR reporting practices (Wilden et al., 2013). Second, R&D-intensive firms focus more on product development and differentiation (Bustinza et al., 2019), are riskier than non-R&D-intensive firms (Jain, 2001) and have greater difficulty obtaining financing (Lee et al., 2015). Therefore, they may have greater difficulty in allocating funds for CSR reporting, assurance and GRI adoption. Third, compared to sales growth and R&D intensity, the growth in tangible and intangible assets as reported on balance sheets is a more substantive indicator of firm investment, one which requires the capital deployment and hence may limit corporate transparency and augment firm opacity.

Moderating variables represent governance structures that are likely to affect both investment tendency and CSR reporting practices. While CSR/Sustainability committee existence (CSRcommittee) implies a top-level team's presence to organise CSR investment and reporting issues (Uyar et al., 2021), board monitoring (Bmonitoring) signals the strength of the monitoring function based on board meeting participation rate, audit committee quality and the existence of four corporate governance committees (Ararat et al., 2015). Furthermore, CEO duality (CEO-duality) entails the combination of the chairman and CEO positions into a single, more powerful position (Uyar et al., 2021). Whereas CSRcommittee and CEOduality are binary, taking 1 if the associated establishment exists and 0 otherwise, Bmonitoring was assessed on a scale of 0 to 100.

Finally, a battery of control variables was incorporated into the research model, as they could potentially predict CSR reporting and assurance practices. Board structure was controlled by board size (Boardsize) and independence (Bindepend), firm financial characteristics were controlled by firm size (Firmsize), and profitability, leverage, liquidity and ownership structure were controlled by free float percentage (Freefloat) (Karaman et al., 2021; Uyar et al., 2021; Salem et al., 2022). All of the variables are defined in Table A1 in the Appendix.

5. Empirical methodology

5.1. Specification of multilevel model

A panel logistic regression model was selected to examine the research hypotheses since (i) the research sample incorporated firm (panel) and year (time) variables, which were longitudinal panel data, and (ii) a time-variant relationship was available between the dependent variables and the independent variables.

Besides, a likelihood-ratio (LR) test of rho (ρ) as a post-estimation test was performed to determine whether an ordinary logistic regression or a panel logistic regression was the best fit for this study. The results showed that rho (ρ) was significantly different from 0 for each of the research models (LR test of rho = 0; p-value: 0.000). This implied that a panel logistic regression should be used instead of an ordinary logistic regression. Furthermore, RE panel logistic regression analysis was used for testing the baseline research models based on Hausman's test (Hausman's test: p-values > 0.05). Finally, a fixed-effects (FE) panel logistic regression analysis was performed to test the robustness of the results from the baseline analysis as an alternative estimator in the robustness tests.

Panel regression analysis can reduce multicollinearity risk and eliminate any possible risk of estimation bias (Baltagi, 2005). Also, panel

¹ Please see the definitions of these variables in the next section.

Table 2
Descriptive statistics.

Variable	N	Mean	S.D.	Min.	Max.
Salesgr	39,474	0.08	0.34	−0.81	2.24
R&Dintensity	44,996	0.06	0.29	0.00	2.29
PPE&Intang	33,606	0.57	2.22	−1.04	17.50
Bmonitoring	32,375	82.10	10.96	11.32	98.19
Boardsize	44,996	9.99	3.34	4.00	21.00
Bindepend	44,996	73.44	21.61	0.00	100.00
Firmsize	44,996	22.10	1.62	10.65	27.41
Profitability	44,996	0.08	0.10	−0.37	0.36
Leverage	44,996	0.55	0.22	0.05	1.16
Liquidity	44,996	0.10	0.10	0.00	0.59
Freefloat	44,996	76.95	24.80	0.00	100.00
Variable	Categories	Freq.	Percent		
Report	Non-exist	21,491	47.76		
	Exist	23,505	52.24		
	Total	44,996	100.00		
Assurance	Non-exist	13,457	57.25		
(When Report Exist)	Exist	10,048	42.75		
	Total	23,505	100.00		
GRI	Non-exist	8,779	37.35		
(When Report Exist)	Exist	14,726	62.65		
	Total	23,505	100.00		
CSRcommittee	Non-exist	23,948	53.22		
	Exist	21,048	46.78		
	Total	44,996	100.00		
CEOduality	Non-exist	27,379	60.85		
	Exist	17,617	39.15		
	Total	44,996	100.00		

N: Number of observations

S.D.: Standard deviation

regression with an FE estimator can control for the risk of omitted variable bias (Wooldridge, 2010). The functional relationship between the dependent variables and the independent variables was formulated in equation (1) below.

$$P(Y_{it} = 1 | X_{it}) = F(\beta_0 + \beta_1 X_{it} + u_{it}) \quad i = 1, \dots, N; t = 1, \dots, t_i; \text{ where } F = e^z / (1 + e^z) \text{ is the logistic (distribution) function} \quad (1)$$

Report, Assurance and GRI were the dependent variables and are represented by the 'y_{it}' term in equation (1). These variables were based

Table 3
Correlation analysis.

Variable	1	2	3	4	5	6	7	8
1 Report	1							
2 Assurance	0.261*	1						
3 GRI	0.088*	0.412*	1					
4 Salesgr	−0.088*	−0.058*	−0.029*	1				
5 R&Dintensity	−0.122*	−0.003	0.006	0.092*	1			
6 PPE&Intang	−0.059*	−0.040*	−0.024*	0.198*	0.041*	1		
7 CSRcommittee	0.571*	0.349*	0.296*	−0.080*	−0.096*		−0.058*	1
8 Bmonitoring	−0.100*	−0.056*	−0.019*	0.009	0.020*	0.016*	0.01	1
9 Boardsize	0.248*	0.197*	0.170*	−0.060*	−0.109*	−0.038*	0.216*	−0.024*
10 Bindepend	−0.008	−0.003	0.103*	0.010*	0.021*	0.031*	−0.003	0.231*
11 CEOduality	−0.088*	−0.049*	0.012	0.002	−0.008	0.004	−0.046*	0.139*
12 Firmsize	0.380*	0.298*	0.255*	−0.053*	−0.233*	−0.028*	0.336*	−0.002
13 Profitability	0.088*	−0.065*	−0.045*	0.043*	−0.427*	−0.017*	0.051*	0.012*
14 Leverage	0.125*	0.079*	0.066*	−0.055*	−0.146*	−0.009	0.114*	0.027*
15 Liquidity	−0.155*	−0.085*	−0.058*	0.055*	0.255*	0.01	−0.156*	−0.048*
16 Freefloat	−0.092*	−0.040*	−0.038*	−0.011*	0.044*	0.002	0.017*	0.309*
Variable	9	10	11	12	13	14	15	16
9 Boardsize	1							
10 Bindepend	−0.033*	1						
11 CEOduality	0.063*	−0.018*	1					
12 Firmsize	0.509*	0.016*	0.112*	1				
13 Profitability	0.047*	0.048*	0.038*	0.136*	1			
14 Leverage	0.198*	0.119*	0.042*	0.325*	−0.013*	1		
15 Liquidity	−0.149*	−0.122*	0.006	−0.284*		−0.106*	−0.227*	1
16 Freefloat	−0.056*	0.054*	0.135*	−0.001	−0.020*	0.033*	0.021*	1

*p < 0.05

on the existence of the Report since its existence is a priority for the existence of Assurance and GRI. Moreover, Salesgr, RDintensity and PPE&Intang were the independent variables, while Boardsize, Bindepend, CEOduality, Firmsize, Profitability, Leverage, Liquidity and Freefloat were the independent control variables. The independent and control variables are represented by the 'x_{it}' term in equation (1). Likewise, the index 'i' indicates firms as the panel variable, while the term 't' indicates years as the time variable. Also, the term 'u_{it}' is the error term in the equation. The heteroscedasticity-consistent robust standard errors (Huber, 1967; White, 1980) were reported in the regression analysis. It has been previously suggested that the estimator of the robust standard error approach be used to control and address the issue of heteroscedasticity (Wooldridge, 2020).

5.2. Moderation analysis

The baseline research models also include the moderating role of some of the research variables. The moderating roles of the CSRcommittee, Bmonitoring and CEOduality on the relationship of Salesgr, RDintensity and PPE&Intang with Report, Assurance and GRI were tested. The moderation analysis is formulated in equation (2) below.

$$P(y_{it} = 1 | x_{1it}, M_{it}, x_{2it}) = F(\beta_0 + \beta_1 x_{1it} + \beta_2 M_{it} + \beta_3 (x_{1it} * M_{it}) + \beta_4 x_{2it} + u_{it}) \quad i = 1, \dots, N; t = 1, \dots, t_i \text{ where } F = e^z / (1 + e^z) \text{ is the logistic (distribution) function} \quad (2)$$

In equation (2), the dependent variables are Report, Assurance and GRI, represented by 'y_{it}'; the independent variables are Salesgr, RDintensity and PPE&Intang, represented by the 'x_{1it}' term; the moderating variables are CSRcommittee, Bmonitoring and CEOduality, represented by the 'M_{it}' term; and the control variables are Boardsize, Bindepend, CEOduality, Firmsize, Profitability, Leverage, Liquidity and Freefloat, represented by the 'x_{2it}' term. The variable of CEOduality was used as a moderator as well as a control variable in the research models in which it was not a moderator. The moderation analysis was performed using panel logistic regression.

5.3. Multicollinearity

The research models were subjected to multicollinearity analysis

Table 4

RE panel logistic regression analysis for the association between investment and CSR Report, Assurance, and GRI.

Independent Variables	(1) Report	(2) Report	(3) Report	(4) Assurance	(5) Assurance	(6) Assurance	(7) GRI	(8) GRI	(9) GRI
Salesgr	−0.81*** (−13.05)			−0.58*** (−5.67)			−0.49*** (−5.02)		
R&Dintensity		−0.84*** (−5.47)			−0.57** (−2.05)			−0.25 (−0.92)	
PPE&Intang			−0.098*** (−11.23)			−0.061*** (−4.29)			−0.091*** (−6.90)
Boardsize	−0.016 (−1.55)	−0.011 (−1.19)	−0.017 (−1.49)	0.028** (2.00)	0.021 (1.61)	0.023 (1.54)	0.0060 (0.42)	0.0083 (0.62)	0.016 (1.08)
Bindepend	−0.0011 (−0.74)	−0.0017 (−1.24)	−0.0020 (−1.19)	0.0013 (0.58)	0.0018 (0.84)	0.00087 (0.37)	0.0080*** (3.53)	0.0078*** (3.58)	0.0080*** (3.35)
CEOduality	−0.85*** (−15.09)	−0.75*** (−14.41)	−0.83*** (−13.54)	−0.30*** (−3.63)	−0.24*** (−3.03)	−0.32*** (−3.74)	−0.38*** (−4.57)	−0.30*** (−3.84)	−0.40*** (−4.57)
Firmsize	1.86*** (41.52)	1.94*** (44.69)	1.82*** (37.29)	1.46*** (23.61)	1.42*** (24.26)	1.49*** (22.77)	1.07*** (19.56)	1.07*** (20.36)	1.11*** (18.91)
Profitability	−1.16*** (−3.40)	−2.59*** (−8.16)	−2.31*** (−5.81)	−2.43*** (−3.97)	−3.09*** (−5.35)	−3.34*** (−5.06)	−2.51*** (−4.31)	−3.09*** (−5.67)	−2.94*** (−4.56)
Leverage	0.18 (1.08)	0.023 (0.15)	−0.069 (−0.36)	0.59** (2.13)	0.44 (1.63)	0.33 (1.10)	−0.32 (−1.15)	−0.28 (−1.09)	−0.27 (−0.90)
Liquidity	−1.03*** (−3.09)	−1.18*** (−3.88)	−1.19*** (−3.22)	−0.21 (−0.39)	−0.50 (−0.95)	−0.36 (−0.62)	−0.79 (−1.49)	−0.85* (−1.68)	−0.50 (−0.88)
Freefloat	−0.013*** (−7.95)	−0.013*** (−8.61)	−0.013*** (−7.52)	−0.0032 (−1.31)	−0.0022 (−0.96)	−0.0017 (−0.68)	−0.0079*** (−3.33)	−0.0061*** (−2.77)	−0.0087*** (−3.47)
Constant	−39.2*** (−40.14)	−40.9*** (−43.37)	−37.9*** (−35.67)	−35.0*** (−25.12)	−34.3*** (−26.01)	−35.3*** (−23.96)	−22.7*** (−18.85)	−22.8*** (−19.90)	−23.6*** (−18.24)
N	39,474	44,996	33,606	21,904	23,505	19,641	21,904	23,505	19,641
χ^2 -stat.	2,246.33***	2,505.31***	1,798.19***	728.24***	749.57***	662.73***	524.90***	556.09***	515.29***

t statistics in parentheses

Columns #4–9: Sub-sample based on the existence of the Report

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 5

RE panel logistic regression analysis for the moderating role of CSR committee between investment and CSR Report, Assurance, and GRI.

Independent variables	(1) Report	(2) Report	(3) Report	(4) Assurance	(5) Assurance	(6) Assurance	(7) GRI	(8) GRI	(9) GRI
Salesgr	−0.68*** (−7.67)			−0.64*** (−2.60)			−0.34* (−1.72)		
R&Dintensity		−1.14*** (−5.16)			−2.25** (−2.33)			−0.20 (−0.33)	
PPE&Intang			−0.073*** (−5.97)			−0.034 (−1.12)			−0.077*** (−2.99)
CSRcommittee	3.80*** (59.03)	3.88*** (63.40)	3.83*** (54.80)	2.21*** (24.34)	2.21*** (25.46)	2.25*** (23.67)	2.67*** (28.83)	2.65*** (30.19)	2.62*** (26.88)
Salesgr × CSRcommittee	0.28** (2.15)			0.19 (0.72)			−0.067 (−0.29)		
R&Dintensity × CSRcommittee		1.18*** (3.77)			1.95** (2.00)			−0.085 (−0.13)	
PPE&Intang × CSRcommittee			0.030 (1.54)			−0.015 (−0.43)			0.00042 (0.01)
Boardsize	−0.0038 (−0.35)	−0.0036 (−0.36)	−0.0058 (−0.49)	0.036** (2.53)	0.031** (2.34)	0.029* (1.92)	0.013 (0.89)	0.016 (1.13)	0.022 (1.42)
Bindepend	−0.00027 (−0.17)	0.00026 (0.18)	−0.000051 (−0.03)	0.0012 (0.51)	0.0025 (1.13)	0.0011 (0.47)	0.010*** (4.41)	0.010*** (4.60)	0.010*** (4.29)
CEOduality	−0.76*** (−12.64)	−0.68*** (−12.17)	−0.75*** (−11.64)	−0.21** (−2.46)	−0.15* (−1.87)	−0.23*** (−2.65)	−0.30*** (−3.55)	−0.24*** (−2.94)	−0.34*** (−3.82)
Firmsize	1.15*** (30.17)	1.17*** (32.04)	1.11*** (26.68)	1.23*** (20.46)	1.18*** (20.53)	1.26*** (19.92)	0.88*** (16.13)	0.86*** (16.42)	0.92*** (15.77)
Profitability	−0.012 (−0.03)	−1.12*** (−3.40)	−0.90** (−2.19)	−2.19*** (−3.50)	−2.68*** (−4.53)	−2.98*** (−4.43)	−1.97*** (−3.24)	−2.41*** (−4.22)	−2.39*** (−3.58)
Leverage	−0.060 (−0.35)	−0.16 (−1.02)	−0.38** (−1.98)	0.46 (1.63)	0.30 (1.09)	0.22 (0.71)	−0.55* (−1.94)	−0.49* (−1.83)	−0.51* (−1.66)
Liquidity	−1.34*** (−3.85)	−1.46*** (−4.58)	−1.50*** (−3.91)	−0.41 (−0.73)	−0.58 (−1.08)	−0.55 (−0.94)	−0.91 (−1.63)	−0.88* (−1.67)	−0.64 (−1.07)
Freefloat	−0.015*** (−9.56)	−0.015*** (−10.56)	−0.015*** (−8.94)	−0.0047** (−1.96)	−0.0035 (−1.54)	−0.0032 (−1.28)	−0.011*** (−4.65)	−0.0088*** (−3.87)	−0.012*** (−4.72)
Constant	−25.3*** (−30.53)	−25.7*** (−32.46)	−23.9*** (−26.58)	−31.3*** (−23.01)	−30.2*** (−23.42)	−31.7*** (−22.12)	−20.2*** (−16.82)	−19.9*** (−17.43)	−21.1*** (−16.36)
N	39,474	44,996	33,606	21,904	23,505	19,641	21,904	23,505	19,641
χ^2 -stat.	4,624.18***	5,222.15***	3,900.38***	1,192.56***	1,275.72***	1,101.93***	1,242.82***	1,344.74***	1,133.35***

t statistics in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01; Columns #4–9: Sub-sample based on the existence of Report

Table 6

RE panel logistic regression analysis for the moderating role of board monitoring between investment and CSR Report, Assurance, and GRI.

Independent variables	(1) Report	(2) Report	(3) Report	(4) Assurance	(5) Assurance	(6) Assurance	(7) GRI	(8) GRI	(9) GRI
Salesgr	−0.0070 (−0.01)			0.082 (0.08)			0.56 (0.56)		
R&Dintensity		−0.80 (−0.60)			0.10 (0.05)			−0.32 (−0.16)	
PPE&Intang			−0.31*** (−2.90)			0.13 (0.72)			−0.015 (−0.09)
Bmonitoring	0.0013 (0.35)	0.0039 (1.16)	−0.0023 (−0.57)	−0.014*** (−2.71)	−0.0073 (−1.47)	−0.011** (−2.03)	0.0079 (1.54)	0.0088* (1.81)	0.0099* (1.81)
Salesgr × Bmonitoring	−0.0086 (−1.11)			−0.0078 (−0.61)			−0.012 (−1.02)		
R&Dintensity × Bmonitoring		−0.00044 (−0.03)			−0.0079 (−0.30)			0.0049 (0.19)	
PPE&Intang × Bmonitoring			0.0026** (2.05)			−0.0021 (−0.98)			−0.00065 (−0.35)
Boardsize	0.0028 (0.18)	0.016 (1.11)	−0.0057 (−0.34)	0.069*** (3.38)	0.059*** (3.00)	0.054** (2.54)	0.046** (2.25)	0.045** (2.31)	0.049** (2.24)
Bindepend	0.0032 (1.15)	0.0056** (2.16)	0.0035 (1.16)	0.0078** (2.01)	0.0077** (2.07)	0.0085** (2.10)	0.0099** (2.57)	0.010*** (2.76)	0.0098** (2.43)
CEOduality	−0.90*** (−11.77)	−0.83*** (−11.58)	−0.90*** (−10.55)	−0.38*** (−3.20)	−0.30*** (−2.60)	−0.37*** (−3.00)	−0.54*** (−4.62)	−0.51*** (−4.53)	−0.54*** (−4.35)
Firmsize	1.94*** (36.71)	2.00*** (39.48)	1.94*** (32.93)	1.51*** (20.22)	1.46*** (20.74)	1.56*** (19.86)	1.15*** (17.50)	1.16*** (18.45)	1.20*** (16.95)
Profitability	−0.11 (−0.27)	−1.32*** (−3.47)	−0.84* (−1.73)	−1.20 (−1.60)	−1.82** (−2.56)	−1.76** (−2.14)	−2.45*** (−3.51)	−2.96*** (−4.50)	−2.84*** (−3.63)
Leverage	0.32 (1.59)	0.30 (1.54)	−0.044 (−0.19)	1.13*** (3.27)	0.99*** (2.99)	0.90** (2.42)	0.21 (0.65)	0.22 (0.68)	0.16 (0.44)
Liquidity	−1.10*** (−2.67)	−1.26*** (−3.31)	−1.36*** (−2.88)	−1.13 (−1.64)	−1.36* (−2.11)	−1.36* (−1.86)	−0.28 (−0.42)	−0.39 (−0.61)	0.038 (0.05)
Freefloat	−0.010*** (−4.86)	−0.0098*** (−5.09)	−0.011*** (−4.69)	0.0023 (0.73)	0.0030 (1.02)	0.0040 (1.24)	−0.0038 (−1.28)	−0.0015 (−0.52)	−0.0042 (−1.33)
Constant	−41.7*** (−34.23)	−43.4*** (−37.39)	−40.7*** (−30.20)	−36.8*** (−21.14)	−36.3*** (−22.19)	−37.9*** (−20.70)	−26.2*** (−17.35)	−26.8*** (−16.67)	−27.4*** (−16.80)
N	28,621	32,375	23,795	15,846	16,926	13,984	15,846	16,926	13,984
χ^2 -stat.	1,819.57***	2,070.64***	1,448.87***	613.42***	623.16***	568.43***	449.76***	492.75***	422.20***

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; Columns #4–9: Sub-sample based on the existence of Report

before being run to test the hypotheses. Towards this end, variance inflation factor (VIF) analysis was utilised to examine whether a high correlation existed among the independent variables of the research models. The VIF values are reported in Table A3 in the Appendix. The results showed that the maximum VIF value was 1.57, and the lowest VIF value was 1.00. The VIF values were significantly less than the suggested cut-off value of 10 (Neter et al., 1996; Kennedy, 2008; Hair et al., 2019; Salem et al., 2021). Therefore, there was no risk of multicollinearity among the independent variables of the research models.

6. Empirical results

6.1. Descriptive statistics

The summary statistics of the research variables are presented in Table 2. The categorical variables were examined using the frequency table, while the continuous numerical research variables were examined using descriptive statistics with means, standard deviations, and minimum and maximum values. Regarding the dependent variables, 52.24% of the firm-year observations revealed the existence of a Report, 42.75% revealed the existence of Assurance, and 62.65% revealed the existence of GRI. Assurance and GRI were based on the existence of the Report, as highlighted above. In terms of the independent testing variables, the mean of Salesgr was 0.08, the mean of RDintensity was 0.06, and the mean of PPE&Intang was 0.57. Regarding the moderating variables, the mean value of Bmonitoring was 82.10; 46.78% of the firm-year observations revealed the existence of CSRcommittee, while 39.15% revealed the existence of CEOduality.

6.2. Correlation analysis

The research variables were subjected to Pearson's correlation analysis to examine the bivariate linear correlation coefficients (Table 3). The results revealed that Salesgr and PPE&Intang had a significant and negative linear correlation with Report, Assurance and GRI ($p < 0.05$). Moreover, RDintensity had a significant negative linear correlation with Report ($p < 0.05$) but no significant linear correlation with Assurance and GRI.

6.3. Baseline results

The first group of the baseline research models was investigated using RE panel logistic regression analysis (Table 4). The results revealed that Salesgr ($p < 0.01$), RDintensity ($p < 0.01$) and PPE&Intang ($p < 0.01$) had a significant and negative relationship with Report. Similarly, Salesgr ($p < 0.01$), RDintensity ($p < 0.05$) and PPE&Intang ($p < 0.01$) had a significant negative relationship with Assurance. Finally, Salesgr ($p < 0.01$) and PPE&Intang ($p < 0.01$) had a significant negative relationship with GRI, while the coefficient of RDintensity was insignificant. Thus, we accepted hypothesis H1b and rejected its alternative (H1a) regarding the investment–CSR nexus. Specifically, while H1b(a) and H1b(b) were accepted for all three investment metrics, H1b(c) was accepted for Salesgr and PPE&Intang but not for RDintensity.

6.4. Moderation analysis results

The second group of the research models incorporated the moderating roles of three research variables. Initially, the moderating role of CSRcommittee on the relationship of Salesgr, RDintensity and PPE&Intang with Report, Assurance and GRI was examined using RE panel

Table 7

RE panel logistic regression analysis for the moderating role of CEO duality between investment and CSR Report, Assurance, and GRI.

Independent variables	(1) Report	(2) Report	(3) Report	(4) Assurance	(5) Assurance	(6) Assurance	(7) GRI	(8) GRI	(9) GRI
Salesgr	−0.83*** (−10.77)			−0.52*** (−4.16)			−0.37*** (−3.07)		
R&Dintensity		−1.23*** (−6.01)			−0.75** (−2.04)			−0.23 (−0.58)	
PPE&Intang			−0.098*** (−8.50)			−0.065*** (−3.65)			−0.092*** (−5.56)
CEOduality	−0.85*** (−14.98)	−0.78*** (−14.75)	−0.83*** (−13.36)	−0.29*** (−3.50)	−0.25*** (−3.12)	−0.32*** (−3.76)	−0.36*** (−4.35)	−0.30*** (−3.78)	−0.40*** (−4.53)
Salesgr × CEOduality	0.052 (0.41)			−0.17 (−0.82)			−0.30 (−1.55)		
R&Dintensity × CEOduality		0.87*** (3.28)			0.34 (0.78)			−0.021 (−0.04)	
PPE&Intang × CEOduality			−0.0012 (−0.07)			0.011 (0.37)			0.0017 (0.06)
Boardsize	−0.016 (−1.55)	−0.011 (−1.13)	−0.017 (−1.49)	0.028** (2.00)	0.021 (1.62)	0.023 (1.55)	0.0059 (0.41)	0.0083 (0.62)	0.016 (1.08)
Bindepend	−0.0011 (−0.74)	−0.0017 (−1.22)	−0.0020 (−1.19)	0.0013 (0.57)	0.0018 (0.84)	0.00089 (0.38)	0.0080*** (3.51)	0.0078*** (3.58)	0.0080*** (3.35)
Firmsize	1.86*** (41.52)	1.94*** (44.63)	1.82*** (37.29)	1.46*** (23.62)	1.42*** (24.24)	1.49*** (22.76)	1.07*** (19.57)	1.07*** (20.36)	1.11*** (18.90)
Profitability	−1.16*** (−3.41)	−2.62*** (−8.23)	−2.31*** (−5.81)	−2.42*** (−3.95)	−3.09*** (−5.35)	−3.34*** (−5.06)	−2.48*** (−4.26)	−3.09*** (−5.66)	−2.94*** (−4.56)
Leverage	0.18 (1.08)	0.018 (0.11)	−0.069 (−0.36)	0.59** (2.13)	0.44* (1.65)	0.33 (1.11)	−0.31 (−1.15)	−0.28 (−1.09)	−0.27 (−0.90)
Liquidity	−1.03*** (−3.09)	−1.15*** (−3.80)	−1.19*** (−3.22)	−0.22 (−0.40)	−0.48 (−0.92)	−0.36 (−0.62)	−0.82 (−1.53)	−0.85* (−1.68)	−0.50 (−0.88)
Freefloat	−0.013*** (−7.95)	−0.013*** (−8.60)	−0.013*** (−7.52)	−0.0031 (−1.31)	−0.0022 (−0.96)	−0.0017 (−0.68)	−0.0080*** (−3.34)	−0.0061*** (−2.77)	−0.0087*** (−3.47)
Constant	−39.2*** (−40.14)	−40.8*** (−43.30)	−37.9*** (−35.67)	−35.0*** (−25.12)	−34.3*** (−26.00)	−35.3*** (−23.95)	−22.7*** (−18.86)	−22.8*** (−19.90)	−23.6*** (−18.24)
N	39,474	44,996	33,606	21,904	23,505	19,641	21,904	23,505	19,641
χ^2 -stat.	2,246.27***	2,502.37***	1,798.17***	729.16***	749.98***	662.79***	526.81***	556.09***	515.30***

t statistics in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01; Columns #4–9: Sub-sample based on the existence of Report

Table 8

FE panel logistic regression analysis for the association between investment and CSR reports, Assurance, and GRI.

Robustness tests Independent Variables	(1) Report	(2) Report	(3) Report	(4) Assurance	(5) Assurance	(6) Assurance	(7) GRI	(8) GRI	(9) GRI
Salesgr	−0.77*** (−11.46)			−0.62*** (−5.64)			−0.53*** (−5.05)		
R&Dintensity		−0.54*** (−2.69)			−0.67** (−2.06)			−0.52 (−1.63)	
PPE&Intang			−0.11*** (−12.03)			−0.074*** (−4.78)			−0.099*** (−7.18)
Boardsize	−0.031*** (−2.64)	−0.022** (−2.10)	−0.034*** (−2.72)	−0.020 (−1.30)	−0.023 (−1.60)	−0.028* (−1.69)	−0.027* (−1.67)	−0.022 (−1.45)	−0.019 (−1.08)
Bindepend	−0.0017 (−0.98)	−0.0033** (−2.18)	−0.0027 (−1.44)	0.0015 (0.57)	0.0011 (0.44)	−0.00022 (−0.08)	−0.0027 (−1.01)	−0.0031 (−1.22)	−0.0033 (−1.17)
CEOduality	−0.61*** (−9.85)	−0.53*** (−9.33)	−0.60*** (−8.78)	−0.096 (−1.07)	−0.077 (−0.89)	−0.15 (−1.60)	−0.35*** (−3.82)	−0.30*** (−3.39)	−0.39*** (−4.03)
Firmsize	2.88*** (41.48)	3.00*** (46.75)	2.91*** (36.90)	2.30*** (20.44)	2.22*** (21.20)	2.41*** (19.73)	1.49*** (14.14)	1.53*** (15.42)	1.60*** (13.86)
Profitability	−2.84*** (−6.73)	−4.37*** (−11.52)	−4.06*** (−8.33)	−2.64*** (−3.72)	−3.62*** (−5.46)	−3.80*** (−4.95)	−3.14*** (−4.58)	−3.80*** (−5.98)	−3.83*** (−5.05)
Leverage	0.58*** (2.69)	0.32 (1.61)	0.32 (1.29)	0.93*** (2.65)	0.61* (1.83)	0.39 (1.02)	−0.38 (−1.07)	−0.51 (−1.53)	−0.66* (−1.67)
Liquidity	0.23 (0.57)	−0.049 (−0.14)	0.27 (0.61)	1.06* (1.70)	0.78 (1.32)	1.25* (1.88)	−0.39 (−0.65)	−0.31 (−0.54)	0.20 (0.30)
Freefloat	−0.00073 (−0.33)	−0.00047 (−0.24)	−0.0038 (−1.56)	0.0067* (1.93)	0.0043 (1.36)	0.0050 (1.35)	0.00056 (0.15)	0.0011 (0.33)	−0.00082 (−0.21)
N	22,772	26,174	18,914	9,902	10,687	8,932	9,777	10,590	8,670
χ^2 -stat.	3,052.59***	3,891.15***	2,376.20***	637.21***	674.87***	585.13***	322.88***	367.98***	323.39***

Note: Multiple positive outcomes within groups were encountered. Many groups (many obs) dropped because of all positive or negative outcomes.

t statistics in parentheses.

Columns #4–9: Sub-sample based on the existence of the Report.

* p < 0.10, ** p < 0.05, *** p < 0.01.

Table 9

RE panel logistic regression analysis using a lag of independent testing variables.

Independent Variables	(1) Report	(2) Report	(3) Report	(4) Assurance	(5) Assurance	(6) Assurance	(7) GRI	(8) GRI	(9) GRI
Salesgr(t-1)	-0.75*** (-11.25)			-0.54*** (-5.17)			-0.49*** (-4.94)		
R&Dintensity(t-1)		-0.63*** (-4.07)			-0.47 (-1.63)			0.14 (0.53)	
PPE&Intang(t-1)			-0.092*** (-9.66)			-0.067*** (-4.65)			-0.073*** (-5.50)
Boardsize	0.0023 (0.20)	-0.012 (-1.19)	0.00066 (0.05)	0.029** (1.97)	0.029** (2.07)	0.028* (1.75)	0.010 (0.69)	0.0081 (0.58)	0.018 (1.12)
Bindepend	-0.0031* (-1.76)	-0.00100 (-0.65)	-0.0056*** (-2.91)	0.0012 (0.51)	0.0013 (0.58)	0.00066 (0.26)	0.0096*** (3.99)	0.0080*** (3.53)	0.0095*** (3.73)
CEOduality	-0.93*** (-14.88)	-0.84*** (-15.03)	-0.92*** (-13.38)	-0.31*** (-3.63)	-0.30*** (-3.63)	-0.32*** (-3.54)	-0.38*** (-4.43)	-0.38*** (-4.59)	-0.41*** (-4.46)
Firmsize	1.87*** (38.77)	1.82*** (41.29)	1.85*** (34.95)	1.59*** (23.91)	1.43*** (23.41)	1.67*** (23.40)	1.14*** (19.34)	1.05*** (19.35)	1.18*** (18.69)
Profitability	-0.89** (-2.36)	-2.06*** (-6.10)	-1.75*** (-3.92)	-2.51*** (-3.83)	-3.15*** (-5.23)	-2.92*** (-4.12)	-2.29*** (-3.69)	-3.05*** (-5.32)	-2.39*** (-3.45)
Leverage	0.13 (0.71)	0.20 (1.21)	-0.00056 (-0.00)	0.40 (1.37)	0.59** (2.12)	0.26 (0.83)	-0.47 (-1.64)	-0.33 (-1.22)	-0.42 (-1.33)
Liquidity	-0.85** (-2.27)	-1.00*** (-2.99)	-0.78* (-1.87)	0.11 (0.19)	-0.15 (-0.28)	0.010 (0.02)	-0.34 (-0.58)	-0.78 (-1.46)	-0.34 (-0.56)
Freefloat	-0.014*** (-7.58)	-0.013*** (-7.81)	-0.015*** (-7.16)	-0.0027 (-1.04)	-0.0030 (-1.23)	-0.0017 (-0.62)	-0.0075*** (-2.93)	-0.0078*** (-3.26)	-0.0080*** (-2.98)
Constant	-39.3*** (-37.23)	-38.5*** (-39.96)	-38.4*** (-33.13)	-38.1*** (-25.20)	-34.4*** (-24.94)	-39.4*** (-24.45)	-24.3*** (-18.66)	-22.3*** (-18.64)	-25.3*** (-18.04)
N	34,576	39,604	29,368	20,417	21,913	20,417	20,417	21,913	18,221
χ^2 -stat.	1,977.69***	2,182.03***	1,596.36***	721.12***	706.89***	680.76***	500.70***	504.74***	476.20***

t statistics in parentheses.

Columns #4–9: Sub-sample based on the existence of the Report.

* p < 0.10, ** p < 0.05, *** p < 0.01.

Table 10

Multi-level logistic regression analysis (Level: Country).

Independent Variables	(1) Report	(2) Report	(3) Report	(4) Assurance	(5) Assurance	(6) Assurance	(7) GRI	(8) GRI	(9) GRI
Salesgr	-0.57*** (-14.44)			-0.28*** (-4.73)			-0.18*** (-3.17)		
R&Dintensity		-0.29*** (-4.73)			-0.25** (-2.38)			0.056 (0.52)	
PPE&Intang			-0.054*** (-9.14)			-0.029*** (-3.40)			-0.032*** (-3.79)
Boardsize	0.011** (2.49)	0.014*** (3.40)	0.012*** (2.59)	0.034*** (6.01)	0.032*** (5.92)	0.033*** (5.57)	0.042*** (7.21)	0.042*** (7.60)	0.045*** (7.42)
Bindepend	-0.0097*** (-16.74)	-0.0089*** (-16.38)	-0.010*** (-16.29)	-0.012*** (-15.37)	-0.011*** (-15.03)	-0.011*** (-13.35)	0.0032*** (4.25)	0.0033*** (4.42)	0.0030*** (3.66)
CEOduality	-0.51*** (-20.60)	-0.48*** (-20.34)	-0.50*** (-18.49)	-0.45*** (-12.72)	-0.42*** (-12.21)	-0.47*** (-12.56)	0.052 (1.52)	0.056* (1.69)	0.060 (1.64)
Firmsize	0.60*** (56.40)	0.60*** (60.79)	0.61*** (51.48)	0.57*** (38.55)	0.57*** (39.81)	0.59*** (37.56)	0.50*** (34.59)	0.49*** (35.39)	0.51*** (32.87)
Profitability	1.27*** (8.62)	0.89*** (6.39)	1.06*** (6.28)	0.53*** (2.19)	0.39* (1.69)	0.39 (1.50)	-0.52** (-2.29)	-0.55** (-2.53)	-0.42* (-1.67)
Leverage	-0.17*** (-2.82)	-0.20*** (-3.56)	-0.20*** (-3.02)	-0.23** (-2.55)	-0.27*** (-3.08)	-0.19** (-1.97)	-0.37*** (-4.29)	-0.33*** (-3.97)	-0.27*** (-2.89)
Liquidity	-0.83*** (-5.96)	-0.78*** (-6.02)	-1.10*** (-7.26)	0.35 (1.53)	0.38* (1.74)	0.035 (0.15)	1.09*** (5.03)	1.01*** (4.88)	0.99*** (4.30)
Freefloat	0.00079 (1.35)	0.00070 (1.30)	0.0013** (2.01)	0.0022*** (2.73)	0.0019** (2.42)	0.0023*** (2.70)	0.00032 (0.39)	0.00053 (0.68)	-0.00071 (-0.82)
Constant	-12.7*** (-56.30)	-12.8*** (-61.52)	-12.6*** (-50.61)	-13.3*** (-40.81)	-13.1*** (-42.31)	-13.6*** (-39.48)	-11.9*** (-37.47)	-11.6*** (-38.69)	-12.0*** (-35.36)
N	39,474	44,996	33,606	21,904	23,505	19,641	21,904	23,505	19,641
χ^2 -stat.	5,000.94***	5,790.50***	4,046.56***	2,220.55***	2,346.33***	2,055.30***	1,827.95***	1,946.61***	1,651.10***

t statistics in parentheses

Columns #4–9: Sub-sample based on the existence of the Report

* p < 0.10, ** p < 0.05, *** p < 0.01

logistic regression analysis (Table 5). The results revealed that the interaction variables Salesgr $\times$ CSRcommittee (p < 0.05) and RDintensity $\times$ CSRcommittee (p < 0.01) had a significant positive association with Report, while PPE&Intang $\times$ CSRcommittee did not have a significant association with Report. Also, the interaction variable,

RDintensity $\times$ CSRcommittee (p < 0.05), had a significant positive relationship with Assurance, while Salesgr $\times$ CSRcommittee and PPE&Intang $\times$ CSRcommittee did not have a significant relationship with Assurance. Finally, the interaction variables of Salesgr $\times$ CSRcommittee, RDintensity $\times$ CSRcommittee, and PPE&Intang $\times$ CSRcommittee did not

Table 11

RE panel logistic regression analysis using the Industrial sector as the alternative sample.

Independent variables	(1) Report	(2) Report	(3) Report	(4) Assurance	(5) Assurance	(6) Assurance	(7) GRI	(8) GRI	(9) GRI
Salesgr	-1.02*** (-6.29)			-0.74*** (-2.79)			-1.19*** (-4.78)		
R&Dintensity		-0.55 (-0.43)			-0.94 (-1.22)			-2.38 (-1.51)	
PPE&Intang			-0.14*** (-7.38)			-0.078*** (-2.58)			-0.068** (-2.40)
Boardsize	-0.017 (-0.82)	-0.019 (-1.01)	-0.013 (-0.60)	0.023 (0.78)	0.031 (1.12)	0.020 (0.65)	0.00014 (0.01)	0.0034 (0.13)	0.012 (0.42)
Bindepend	-0.0012 (-0.39)	-0.0027 (-0.97)	-0.0032 (-1.02)	0.00076 (0.17)	0.0019 (0.45)	0.00083 (0.18)	0.0072* (1.71)	0.0099** (2.49)	0.0089** (2.06)
CEOduality	-0.91*** (-7.92)	-0.77*** (-7.18)	-0.86*** (-7.20)	-0.70*** (-4.43)	-0.68*** (-4.46)	-0.76*** (-4.55)	-0.36** (-2.37)	-0.29** (-2.02)	-0.44*** (-2.75)
Firmsize	1.77*** (17.71)	1.96*** (19.36)	1.67*** (16.47)	1.23*** (9.36)	1.20*** (9.42)	1.30*** (9.44)	1.07*** (8.66)	1.04*** (8.83)	1.02*** (8.07)
Profitability	-3.54*** (-3.67)	-5.15*** (-5.77)	-4.47*** (-4.39)	-2.11 (-1.46)	-2.66* (-1.91)	-2.09 (-1.40)	-4.89*** (-3.19)	-4.86*** (-3.36)	-6.17*** (-3.85)
Leverage	-0.90** (-2.29)	-1.27*** (-3.39)	-0.99** (-2.36)	1.55** (2.40)	1.37** (2.19)	1.36** (2.01)	-0.72 (-1.11)	-0.29 (-0.48)	-0.57 (-0.86)
Liquidity	-0.67 (-0.87)	-0.82 (-1.15)	-0.43 (-0.52)	0.023 (0.02)	-0.31 (-0.27)	0.062 (0.05)	0.055 (0.05)	0.083 (0.07)	0.52 (0.42)
Freefloat	0.0018 (0.50)	0.00017 (0.05)	0.000048 (0.01)	-0.0063 (-1.17)	-0.0039 (-0.76)	-0.0054 (-0.96)	-0.013** (-2.45)	-0.0079* (-1.69)	-0.012** (-2.30)
Constant	-37.6*** (-17.16)	-41.2*** (-18.67)	-34.8*** (-15.77)	-29.9*** (-10.07)	-29.5*** (-10.32)	-31.4*** (-10.09)	-22.1*** (-8.09)	-22.3*** (-8.62)	-21.4*** (-7.61)
N	8,367	9,452	7,750	4,882	5,232	4,658	4,658	5,232	4,658
χ^2 -stat.	439.85***	483.18***	394.86***	144.64***	144.57***	141.24***	128.48***	114.51***	112.49***

t statistics in parentheses

Columns #4–9: Sub-sample based on the existence of the Report

* p < 0.10, ** p < 0.05, *** p < 0.01

have a significant relationship with GRI. Hence, while H2(a) was validated for the Salesgr and RDintensity metrics, H2(b) was validated only for RDintensity, whereas H2(c) was not validated by any investment metric.

Second, the moderating role of Bmonitoring in the relationship of Salesgr, RDintensity and PPE&Intang with Report, Assurance and GRI was tested using RE panel logistic regression analysis (Table 6). The results indicated that only the interaction variable, PPE&Intang $\times$ Bmonitoring ($p < 0.05$), had a significant and positive relationship with Report. However, none of the interaction variables had a significant association with Assurance and GRI. Thus, H3(a) was supported for the PPE&Intang metric, whereas H3(b) and H3(c) were not supported for any investment metric.

In the final moderation analysis, the moderating role of CEOduality on the relationship of Salesgr, RDintensity and PPE&Intang with Report, Assurance and GRI was investigated with RE panel logistic regression analysis (Table 7). The results showed that only the interaction variable, RDintensity $\times$ CEOduality ($p < 0.01$), had a significant and positive relationship with Report. On the other hand, none of the interaction variables had a significant association with Assurance and GRI. Therefore, H4(a), (b) and (c), which posited a negative moderating effect of CEOduality between firm investment and CSR reporting and assurance, were not empirically validated.

6.5. Robustness tests

The robustness of the primary results was tested by performing nine further analyses. Towards this end, an alternative estimator with FE panel regression, lag of independent testing variables, an alternative methodology with multilevel logistic regression, an alternative sample with the industrial sector and polluting sectors, an alternative sample that excluded US-based firms, moderation analyses with an alternative estimator, and Instrumental Variable Probit (IVPROBIT) regression analysis were all performed.

(i) The baseline research model was re-run using the alternative

estimator – namely FE panel logistic regression (Table 8). The number of observations dropped during the FE panel logistic regression analysis because there were multiple positive outcomes within the groups encountered during the analysis (StataCorp., 2015). The results showed that Salesgr, RDintensity and PPE&Intang had a significant negative relationship with Report and Assurance, while only Salesgr and PPE&Intang had a significant negative relationship with GRI. This output completely confirms the baseline results.

(ii) To strengthen the causality between the independent and dependent variables and address endogeneity concerns (Richardson et al., 2013; Godos-Díez et al., 2018), the baseline research models were re-run using the one firm-year lag of the independent testing variables with RE panel logistic regression analysis (Table 9). Accordingly, Salesgr (t-1), RDintensity(t-1) and PPE&Intang(t-1) had a significant negative association with Report, while Salesgr(t-1) and PPE&Intang(t-1) had a significant negative association with Assurance and GRI. The lag test largely confirmed the baseline analysis except for the association of R&Dintensity(t-1) with Assurance, which was not significant in this test but was significant in the baseline analysis.

(iii) The baseline research models were examined by utilising an alternative analysis method. A multilevel logistic regression analysis was performed since the research sample incorporated the country level. Multilevel logistic regression, typically employed to determine multi-level aspects of samples in the social sciences, is a widely used alternative analytical approach when the dependent variable is a binary categorical variable (Leyland and Goldstein, 2001; Swierzy et al., 2018; Koseoglu et al., 2021). This robustness test allowed us to account for the multilevel aspects of the research models. The results of this test are presented in Table 10, in which Country is denoted as a multilevel variable in the regression analysis. The results indicated that Salesgr, RDintensity and PPE&Intang had a significant negative relationship with Report and Assurance, while Salesgr and PPE&Intang had a significant negative relationship with GRI. This output also completely confirms the baseline results.

(iv) An alternative sub-sample was used to assess the robustness of

Table 12

RE Panel logistic regression analysis using Polluting industries as the alternative sample.

Independent Variables	(1) Report	(2) Report	(3) Report	(4) Assurance	(5) Assurance	(6) Assurance	(7) GRI	(8) GRI	(9) GRI
Salesgr	−0.64*** (−7.75)			−0.49*** (−3.64)			−0.52*** (−4.17)		
R&Dintensity		−0.21 (−0.84)			−0.29 (−0.79)			−0.21 (−0.55)	
PPE&Intang			−0.11*** (−9.02)			−0.054*** (−2.86)			−0.070*** (−3.85)
Boardsize	−0.015 (−1.09)	−0.0097 (−0.76)	−0.026 (−1.62)	0.034* (1.79)	0.031* (1.75)	0.021 (1.05)	−0.017 (−0.93)	−0.0087 (−0.50)	−0.0081 (−0.40)
Bindepend	−0.00093 (−0.43)	−0.0032* (−1.65)	−0.0016 (−0.65)	−0.00064 (−0.21)	−0.00026 (−0.09)	−0.0022 (−0.66)	0.0027 (0.90)	0.0040 (1.43)	0.0026 (0.81)
CEOduality	−0.85*** (−10.60)	−0.69*** (−9.41)	−0.84*** (−9.26)	−0.46*** (−4.05)	−0.39*** (−3.60)	−0.54*** (−4.41)	−0.55*** (−4.98)	−0.47*** (−4.44)	−0.64*** (−5.38)
Firmsize	1.79*** (28.85)	1.89*** (31.26)	1.75*** (24.43)	1.38*** (16.27)	1.33*** (16.73)	1.47*** (15.68)	1.01*** (13.59)	1.01*** (14.25)	1.09*** (13.11)
Profitability	−3.50*** (−6.75)	−4.58*** (−9.82)	−5.44*** (−8.38)	−3.19*** (−3.74)	−3.69*** (−4.64)	−4.31*** (−4.40)	−2.95*** (−3.69)	−3.52*** (−4.72)	−3.64*** (−3.91)
Leverage	−0.78*** (−3.13)	−0.98*** (−4.20)	−1.21*** (−3.98)	0.57 (1.42)	0.45 (1.18)	−0.042 (−0.09)	−0.60 (−1.57)	−0.53 (−1.48)	−0.55 (−1.29)
Liquidity	−0.017 (−0.03)	−0.37 (−0.79)	−0.46 (−0.76)	−0.31 (−0.37)	−0.60 (−0.77)	−0.83 (−0.90)	−1.01 (−1.27)	−0.90 (−1.22)	−0.73 (−0.83)
Freefloat	−0.0045** (−2.00)	−0.0047** (−2.31)	−0.0033 (−1.34)	−0.0045 (−1.36)	−0.0039 (−1.25)	−0.0017 (−0.49)	−0.0051 (−1.64)	−0.0039 (−1.36)	−0.0057* (−1.71)
Constant	−37.5*** (−27.81)	−39.5*** (−30.19)	−35.8*** (−23.03)	−32.9*** (−17.02)	−31.9*** (−17.69)	−34.0*** (−15.96)	−20.3*** (−12.32)	−20.7*** (−13.27)	−22.2*** (−11.93)
N	19,304	21,785	15,307	11,644	12,496	9,879	11,644	12,496	9,879
χ^2 -stat.	1,063.23***	1,181.39***	793.47***	369.53***	381.50***	329.65***	261.46***	273.92***	248.32***

Polluting industries include basic materials, energy, industrials, and utilities.

t statistics in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Columns #4–9: Sub-sample based on the existence of the Report

Table 13

RE panel logistic regression analysis by excluding US-based firms.

Independent Variables	(1) Report	(2) Report	(3) Report	(4) Assurance	(5) Assurance	(6) Assurance	(7) GRI	(8) GRI	(9) GRI
Salesgr	−0.63*** (−9.54)			−0.59*** (−5.49)			−0.48*** (−4.72)		
R&Dintensity		−0.66*** (−3.88)			−0.58** (−2.05)			−0.37 (−1.31)	
PPE&Intang			−0.10*** (−9.83)			−0.070*** (−4.41)			−0.10*** (−6.91)
Boardsize	−0.032*** (−2.85)	−0.029*** (−2.88)	−0.032*** (−2.72)	0.024* (1.68)	0.018 (1.33)	0.019 (1.26)	0.0077 (0.51)	0.0100 (0.71)	0.020 (1.25)
Bindepend	0.0018 (1.10)	0.00054 (0.37)	0.0014 (0.84)	0.0058** (2.54)	0.0057*** (2.60)	0.0054** (2.23)	0.011*** (4.78)	0.011*** (4.81)	0.011*** (4.44)
CEOduality	−0.59*** (−9.02)	−0.50*** (−8.40)	−0.58*** (−8.26)	−0.16* (−1.76)	−0.10 (−1.19)	−0.18* (−1.94)	−0.24*** (−2.59)	−0.15* (−1.71)	−0.27*** (−2.80)
Firmsize	1.59*** (31.94)	1.70*** (34.43)	1.55*** (28.27)	1.50*** (22.53)	1.47*** (23.19)	1.53*** (21.74)	1.10*** (18.14)	1.10*** (18.94)	1.15*** (17.73)
Profitability	−2.68*** (−6.46)	−4.09*** (−10.76)	−3.85*** (−8.05)	−2.80*** (−4.15)	−3.44*** (−5.42)	−4.05*** (−5.55)	−3.40*** (−5.21)	−3.99*** (−6.59)	−3.74*** (−5.28)
Leverage	−0.79*** (−3.86)	−0.97*** (−5.09)	−1.12*** (−4.77)	0.22 (0.70)	0.072 (0.24)	−0.21 (−0.62)	−0.66** (−2.12)	−0.62** (−2.10)	−0.50 (−1.49)
Liquidity	−1.82*** (−4.48)	−2.00*** (−5.54)	−2.10*** (−4.76)	−1.18* (−1.93)	−1.41** (−2.46)	−1.29** (−2.01)	−1.46** (−2.47)	−1.42** (−2.56)	−0.99 (−1.58)
Freefloat	−0.0046** (−2.56)	−0.0060*** (−3.65)	−0.0039** (−2.01)	0.0074*** (2.94)	0.0071*** (3.03)	0.0089*** (3.38)	−0.0057** (−2.24)	−0.0041* (−1.73)	−0.0064** (−2.41)
Constant	−32.3*** (−30.70)	−34.4*** (−33.11)	−31.0*** (−26.73)	−35.9*** (−24.13)	−35.2*** (−24.96)	−36.1*** (−23.04)	−23.3*** (−17.41)	−23.4*** (−18.44)	−24.4*** (−17.11)
N	27,971	31,668	24,666	18,142	19,617	16,671	18,142	19,617	16,671
χ^2 -stat.	1,241.00***	1,402.70***	1,000.59***	669.38***	698.96***	616.39***	476.09***	512.19***	478.79***

t statistics in parentheses

Columns #4–9: Sub-sample based on the existence of the Report

* p < 0.10, ** p < 0.05, *** p < 0.01

the baseline research models. For this, the industrial sector was selected as the alternative sample to observe the validity of the results in one homogeneous sector. The baseline research models were re-run using RE panel logistic regression analysis (Table 11). The results revealed that Salesgr and PPE&Intang had a significant negative relationship with

Report, Assurance and GRI. However, the coefficients of R&Dintensity were not significantly associated with Report, Assurance and GRI. This test largely confirmed the baseline analysis except for the association of R&Dintensity(t-1) with Report and Assurance, which was not significant in this test but was significant in the baseline analysis.

Table 14
Moderating role of CSR committee using FE panel logistic regression (Alternative estimator).

Independent variables	(1) Report	(2) Report	(3) Report	(4) Assurance	(5) Assurance	(6) Assurance	(7) GRI	(8) GRI	(9) GRI
Salesgr	-0.61*** (-6.19)			-0.66** (-2.52)			-0.32 (-1.53)		
R&Dintensity		-1.11*** (-2.94)			-1.54* (-1.65)			-1.02 (-0.86)	
PPE&Intang			-0.092*** (-6.64)			-0.051 (-1.56)			-0.087*** (-3.12)
CSRcommittee	3.06*** (45.07)	3.15*** (48.84)	3.03*** (41.16)	1.84*** (18.98)	1.89*** (20.28)	1.84*** (18.26)	2.27*** (23.25)	2.29*** (24.18)	2.21*** (21.41)
Salesgr × CSRcommittee	0.17 (1.15)			0.17 (0.60)			-0.16 (-0.66)		
R&Dintensity × CSRcommittee		1.12** (2.41)			1.09 (1.18)			0.50 (0.41)	
PPE&Intang × CSRcommittee			0.022 (1.04)			-0.012 (-0.34)			0.0055 (0.17)
Boardsize	-0.018 (-1.36)	-0.013 (-1.05)	-0.025* (-1.70)	-0.012 (-0.75)	-0.012 (-0.77)	-0.021 (-1.24)	-0.018 (-1.05)	-0.011 (-0.69)	-0.011 (-0.58)
Bindepend	-0.00035 (-0.18)	-0.0015 (-0.86)	-0.00074 (-0.35)	0.0012 (0.47)	0.0017 (0.67)	-0.00035 (-0.12)	-0.0017 (-0.60)	-0.0017 (-0.63)	-0.0023 (-0.77)
CEOduality	-0.53*** (-7.47)	-0.45*** (-6.93)	-0.54*** (-7.00)	0.014 (0.15)	0.027 (0.31)	-0.042 (-0.43)	-0.29*** (-2.97)	-0.24*** (-2.64)	-0.36*** (-3.50)
Firmsize	2.21*** (30.06)	2.27*** (33.50)	2.27*** (27.01)	2.06*** (17.95)	1.93*** (18.04)	2.17*** (17.47)	1.17*** (10.63)	1.16*** (11.18)	1.27*** (10.60)
Profitability	-2.13*** (-4.59)	-3.46*** (-8.13)	-3.06*** (-5.57)	-2.61*** (-3.54)	-3.44*** (-5.00)	-3.52*** (-4.45)	-2.62*** (-3.60)	-3.21*** (-4.72)	-3.16*** (-3.95)
Leverage	0.35 (1.49)	0.16 (0.74)	0.15 (0.56)	0.78** (2.15)	0.44 (1.28)	0.31 (0.79)	-0.74** (-2.00)	-0.87** (-2.47)	-0.97** (-2.37)
Liquidity	-0.57 (-1.28)	-0.85** (-2.10)	-0.58 (-1.17)	0.87 (1.35)	0.67 (1.10)	1.06 (1.55)	-0.68 (-1.06)	-0.57 (-0.94)	-0.20 (-0.29)
Freefloat	0.00094 (0.38)	0.0012 (0.57)	-0.0025 (-0.93)	0.0081** (2.26)	0.0062* (1.86)	0.0063 (1.64)	-0.0010 (-0.25)	0.0019 (0.54)	-0.0024 (-0.56)
N	22,772	26,174	18,914	9,902	10,687	8,932	9,777	10,590	8,670
χ^2 -stat.	6,207.27***	7,745.97***	4,975.80***	1,078.52***	1,194.55***	982.47***	1,006.14***	1,148.68***	904.37***

t statistics in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01; Columns #4–9: Sub-sample based on the existence of Report.

Table 15
Moderating role of board monitoring using FE panel logistic regression.

Independent variables	(1) Report	(2) Report	(3) Report	(4) Assurance	(5) Assurance	(6) Assurance	(7) GRI	(8) GRI	(9) GRI
Salesgr	0.23 (0.32)			0.42 (0.36)			0.49 (0.44)		
R&Dintensity		-2.63 (-1.33)			0.12 (0.05)			-2.03 (-0.65)	
PPE&Intang			-0.31*** (-2.62)			0.073 (0.36)			-0.068 (-0.42)
Bmonitoring	0.036*** (7.93)	0.037*** (9.05)	0.033*** (6.45)	0.0089 (1.40)	0.014** (2.38)	0.0098 (1.47)	0.033*** (5.19)	0.032*** (5.20)	0.039*** (5.68)
Salesgr × Bmonitoring	-0.010 (-1.16)			-0.012 (-0.82)			-0.011 (-0.84)		
R&Dintensity × Bmonitoring		0.028 (1.19)			-0.0097 (-0.34)			0.023 (0.62)	
PPE&Intang × Bmonitoring			0.0026* (1.81)			-0.0015 (-0.62)			-0.00000017 (-0.00)
Boardsize	-0.047** (-2.56)	-0.034** (-2.01)	-0.062*** (-3.00)	-0.031 (-1.33)	-0.034 (-1.52)	-0.051** (-2.09)	-0.032 (-1.31)	-0.028 (-1.18)	-0.042 (-1.58)
Bindepend	0.021*** (6.08)	0.021*** (6.59)	0.022*** (5.49)	0.0100** (2.00)	0.0088* (1.85)	0.0087* (1.66)	-0.0033 (-0.65)	-0.0035 (-0.72)	-0.0033 (-0.59)
CEOduality	-0.40*** (-4.53)	-0.38*** (-4.56)	-0.39*** (-3.93)	0.045 (0.33)	0.076 (0.58)	-0.022 (-0.15)	-0.42*** (-3.08)	-0.45*** (-3.46)	-0.48*** (-3.26)
Firmsize	2.59*** (31.33)	2.67*** (34.44)	2.65*** (27.44)	2.13*** (15.63)	2.02*** (15.96)	2.17*** (14.58)	1.34*** (10.60)	1.33*** (11.20)	1.34*** (9.69)
Profitability	-2.21*** (-4.40)	-3.33*** (-7.23)	-2.79*** (-4.65)	-1.28 (-1.46)	-2.28*** (-2.76)	-1.98** (-2.03)	-2.62*** (-3.24)	-3.28*** (-4.30)	-3.28*** (-3.61)
Leverage	1.29*** (4.94)	1.24*** (5.06)	0.91*** (2.97)	1.93*** (4.34)	1.63*** (3.83)	1.39*** (2.88)	1.15*** (2.68)	0.98*** (2.41)	0.87* (1.81)
Liquidity	0.28 (0.55)	-0.034 (-0.07)	0.21 (0.36)	0.17 (0.21)	0.0057 (0.01)	0.33 (0.40)	-0.18 (-0.24)	-0.13 (-0.18)	0.46 (0.55)
Freefloat	0.0091*** (2.96)	0.010*** (3.71)	0.0048 (1.44)	0.015*** (3.06)	0.012*** (2.62)	0.012** (2.36)	0.0058 (1.19)	0.0075* (1.68)	0.0043 (0.83)
N	14,184	16,044	11,253	6,035	6,476	5,349	6,160	6,625	5,332
χ^2 -stat.	1,876.36***	2,354.88***	1,406.03***	402.39***	419.35***	337.53***	228.31***	254.97***	206.60***

t statistics in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01; Columns #4–9: Sub-sample based on the existence of Report

Table 16
Moderating role of CEO duality using FE panel logistic regression.

Independent variables	(1) Report	(2) Report	(3) Report	(4) Assurance	(5) Assurance	(6) Assurance	(7) GRI	(8) GRI	(9) GRI
Salesgr	−0.85*** (−10.07)			−0.58*** (−4.25)			−0.40*** (−3.05)		
R&Dintensity		−0.95*** (−3.41)			−0.86** (−1.99)			−0.82 (−1.59)	
PPE&Intang			−0.12*** (−9.40)			−0.077*** (−3.94)			−0.098*** (−5.76)
CEOduality	−0.63*** (−9.97)	−0.55*** (−9.59)	−0.61*** (−8.80)	−0.090 (−1.00)	−0.087 (−1.00)	−0.15 (−1.61)	−0.33*** (−3.64)	−0.31*** (−3.46)	−0.39*** (−4.00)
Salesgr × CEOduality	0.21 (1.55)			−0.13 (−0.59)			−0.34 (−1.60)		
R&Dintensity × CEOduality		0.78** (2.34)			0.33 (0.71)			0.45 (0.73)	
PPE&Intang × CEOduality			0.013 (0.69)			0.0068 (0.21)			−0.0010 (−0.04)
Boardsize	−0.031*** (−2.64)	−0.021** (−2.04)	−0.034*** (−2.71)	−0.020 (−1.30)	−0.023 (−1.59)	−0.028* (−1.69)	−0.027* (−1.68)	−0.021 (−1.43)	−0.019 (−1.08)
Bindepend	−0.0017 (−0.98)	−0.0033** (−2.15)	−0.0027 (−1.45)	0.0014 (0.55)	0.0011 (0.44)	−0.00020 (−0.07)	−0.0028 (−1.03)	−0.0031 (−1.22)	−0.0033 (−1.17)
Firmsize	2.88*** (41.50)	3.00*** (46.74)	2.91*** (36.89)	2.30*** (20.44)	2.22*** (21.18)	2.41*** (19.72)	1.50*** (14.16)	1.53*** (15.43)	1.60*** (13.86)
Profitability	−2.85*** (−6.76)	−4.36*** (−11.49)	−4.06*** (−8.32)	−2.63*** (−3.70)	−3.62*** (−5.46)	−3.80*** (−4.94)	−3.10*** (−4.52)	−3.81*** (−5.99)	−3.83*** (−5.05)
Leverage	0.58*** (2.67)	0.32 (1.59)	0.32 (1.29)	0.93*** (2.65)	0.62* (1.85)	0.39 (1.02)	−0.38 (−1.07)	−0.51 (−1.53)	−0.66* (−1.67)
Liquidity	0.24 (0.60)	−0.034 (−0.09)	0.27 (0.61)	1.06* (1.69)	0.80 (1.35)	1.25* (1.88)	−0.43 (−0.71)	−0.30 (−0.53)	0.20 (0.30)
Freefloat	−0.00071 (−0.31)	−0.00048 (−0.24)	−0.0038 (−1.55)	0.0067* (1.94)	0.0043 (1.36)	0.0050 (1.35)	0.00052 (0.14)	0.0011 (0.32)	−0.00082 (−0.21)
N	22,772	26,174	18,914	9,902	10,687	8,932	9,777	10,590	8,670
χ^2 -stat.	3,054.98***	3,896.86***	2,376.67***	637.56***	675.40***	585.18***	325.44***	368.51***	323.40***

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; Columns #4–9: Sub-sample based on the existence of Report

(v) Another sub-sample was generated to examine the baseline research models. In line with Clarkson et al. (2011), polluting industries, including basic materials, energy, industrials and utilities, were used as an alternative sample and assessed via RE panel logistic regression analysis (Table 12). The purpose of this analysis was to detect any difference in the uptake of CSR between polluting and non-polluting industries. The results indicated that Salesgr and PPE&Intang had a significant negative association with Report, Assurance and GRI, while RDintensity did not have a significant association with Report, Assurance and GRI. This test mostly validated the output of the baseline analysis except for the association of R&Dintensity(t-1) with Report and Assurance, which was not significant in this test but was significant in the baseline analysis.

(vi) The baseline research models were re-run by excluding US-based firms from the research sample since the US was the most dominant country in the sample, and this could have altered the association between the variables. The results reported in Table 13 revealed that Salesgr, RDintensity and PPE&Intang had a significant negative association with Report and Assurance. Moreover, Salesgr and PPE&Intang had a significant negative association with GRI, while RDintensity did not have a significant impact on GRI. The output of this test was completely in line with the baseline results.

(vii) The moderation analyses of the baseline research model were re-investigated using an alternative estimator. FE panel logistic regression analysis was performed to examine the moderating roles of CSRcommittee, Bmonitoring and CEOduality.

The moderating role of CSRcommittee in the relationship of Salesgr, RDintensity and PPE&Intang with Report, Assurance and GRI is presented in Table 14 with FE panel logistic regression analysis. The results indicated that the interaction variable, RDintensity × CSRcommittee, had a significant positive relationship with Report. However, the interaction variables, including Salesgr × CSRcommittee and PPE&Intang × CSRcommittee, did not have a significant relationship with Report, Assurance and GRI. In the baseline analysis, although

RDintensity × CSRcommittee was significant for Report, the interaction variables of Salesgr × CSRcommittee and R&Dintensity × CSRcommittee were also significant for Report and Assurance, respectively. Hence, this robustness test partially confirmed the baseline moderation analysis.

Similarly, the moderating role of Bmonitoring was re-investigated using FE panel logistic regression analysis (Table 15). Accordingly, only the interaction variable, PPE&Intang × Bmonitoring, had a significant positive relationship with Report, while the other interaction variables did not have a significant relationship with the dependent variables. The outcome of this test supported the results of the baseline analysis.

(viii) The moderating role of CEOduality was investigated with FE panel logistic regression analysis (Table 16). The results revealed that the interaction variable, RDintensity × CEOduality, had a significant positive relationship with Report, while the other interaction variables did not have a significant relationship with Report, Assurance and GRI. The outcome of this test supported the results of the baseline analysis.

(ix) A regression analysis employing an IVPROBIT model with continuous endogenous regressors was conducted to investigate possible endogeneity issues. The IVPROBIT model fits the research models with binary dependent variables (Report, Assurance and GRI). We utilised Newey's (1987) minimum chi-square two-step estimator in the analysis with the continuous endogenous covariates. In the analysis, Gov_Proc² and Pol_Stab³ were used as the exogenous instrumental variables to predict firm investment.⁴ Following prior studies (Ben-Amar et al.,

² Government procurement of advanced technology products, scaling from 1 to 7 (best), was retrieved from the WEF (2018).

³ Political stability and absence of violence/terrorism, scaling from −2.5 to 2.5 (best), was retrieved from the World Bank (2021).

⁴ Both instruments are country-level indicators and hence external to the firm.

Table 17
Instrumental Variable Probit (IVPROBIT) regression analysis (Dependent variable: CSR Report).

Independent variables	(1) 1st Stage Salesgr	(2) 2nd Stage Report	(3) 1st Stage RDintensity	(4) 2nd Stage Report	(5) 1st Stage PPE&Intang	(6) 2nd Stage Report
Gov_Proc	0.026*** (7.35)		0.019*** (7.47)		0.063** (2.52)	
Pol_Stab	-0.025*** (-6.87)		-0.029*** (-11.58)		-0.091*** (-3.71)	
Salesgr		-11.4*** (-9.37)				
RDintensity				-9.14*** (-11.53)		
PPE&Intang						-3.07*** (-4.28)
Boardsize	-0.0049*** (-7.50)	-0.017* (-1.75)	0.00077* (1.67)	0.050*** (10.31)	-0.019*** (-4.25)	-0.019 (-0.98)
Bindepend	0.000062 (0.72)	0.00068 (0.66)	0.00084*** (13.56)	0.0074*** (7.33)	0.0020*** (3.35)	0.0056** (2.26)
CEOduality	-0.00061 (-0.15)	-0.33*** (-7.13)	0.0060** (2.17)	-0.28*** (-9.30)	0.015 (0.53)	-0.28*** (-3.25)
Firmsize	-0.0033*** (-2.20)	0.34*** (19.15)	-0.021*** (-20.65)	0.18*** (9.15)	0.0081 (0.78)	0.39*** (11.89)
Profitability	0.19*** (8.83)	3.65*** (10.46)	-1.11*** (-80.93)	-8.69*** (-9.87)	-0.21 (-1.28)	0.72 (1.41)
Leverage	-0.061*** (-6.39)	-0.68*** (-5.24)	-0.13*** (-19.20)	-1.17*** (-9.93)	-0.17** (-2.44)	-0.57** (-2.43)
Liquidity	0.11*** (5.28)	0.58* (1.93)	0.46*** (32.26)	3.45*** (8.46)	-0.012 (-0.08)	-1.06** (-2.24)
Freefloat	-0.000088 (-1.07)	-0.0044*** (-4.73)	0.00044*** (7.63)	0.00059 (0.97)	-0.00057 (-1.01)	-0.0049*** (-2.75)
Constant	0.11*** (3.52)	-5.84*** (-13.85)	0.47*** (21.15)	-3.24*** (-7.05)	0.31 (1.32)	-6.30*** (-8.32)
N	31,301	31,301	35,300	35,300	26,849	26,849
F-stat.	43.71***		1093.74***		6.36***	
χ^2 -stat.		1,020.27***		2,471.54***		274.45***
Wald test of exogeneity		646.41***		454.50***		400.11***

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. t statistics in parentheses of the 1st stages. Z-statistics in the parentheses of the 2nd stage.

Instrumental variables are Gov_Proc (Government procurement of advanced technology products, 1–7 (best)) was retrieved from the [WEF \(2018\)](#) and Pol_Stab (Political stability and absence of violence/terrorism, -2.5 to 2.5 (best)) was retrieved from the [World Bank \(2021\)](#). The availability of Gov_Proc data for the years 2007–2018 downsized the sample a bit in the IVPROBIT analysis.

2017; [García-Meca et al., 2022](#)), the first and second stages with the Wald test of exogeneity (Null Hypothesis: No endogeneity) are reported in [Tables 17 and 18](#).

The results revealed that Salesgr, RDintensity and PPE&Intang had a significant negative relationship with Report ([Table 17](#); Columns #2, 4 and 6), Assurance ([Table 18](#); Columns #2, 4 and 6) and GRI ([Table 18](#); Columns #8, 10 and 12), which is consistent with the results from the baseline analysis.

(x) To mitigate potential endogeneity, we used two approaches: entropy balancing and propensity score matching (PSM). First, the entropy balancing method ([Hainmueller, 2012](#)), which creates a balanced sample that can translate into lower approximation errors and reduced model dependency in finite samples, was applied. This method minimises variability among variables in the treatment and control groups. The control group is re-weighted to match the covariate moments in the treatment group ([Hainmueller, 2012](#)). After the matching, the covariate imbalance is likely improved ([Hainmueller, 2012](#); [Hainmueller and Xu, 2013](#)). We employed the entropy balancing method based on recent research to reduce the likelihood of self-selection bias, which may arise from observable characteristics ([Hainmueller, 2012](#); [Fei, 2022](#); [Treepongkaruna et al., 2022](#)) – as a result, we avoided observable selection bias ([Treepongkaruna et al., 2022](#)).

We created a binary variable with the treatment and control groups using the variables of interest (Salesgr, R&Dintensity and PPE&Intang). The treatment group was given a value of 1, which corresponded to the top quartile observations of the variables of interest (Salesgr, R&Dintensity and PPE&Intang). The control group was given a value of 0, which accounted for the remainder of the observations. Then, the entropy balancing method was applied to the baseline research models

([Table 19](#)). The results were mainly consistent with the initial analysis results.⁵

Finally, we performed PSM ([Leuven and Sianesi, 2003](#)) to address endogeneity concerns. PSM is sufficient to remove bias due to all observed covariates ([Rosenbaum and Rubin, 1983](#)) and may mitigate the impact of any hidden bias ([Rosenbaum, 2005](#)). PSM has been extensively employed in recent research ([Lee et al., 2022](#); [Treepongkaruna et al., 2022](#); [Gu, 2023](#)) and is frequently used in accounting and finance research ([Peel and Makepeace, 2012](#)). We used similar binary variables and generated the treatment and control groups using Salesgr, R&Dintensity and PPE&Intang. Similarly, the top quartile values were coded as 1, representing the treatment group, while the rest were coded as 0, representing the control group. The baseline research models were re-examined using PSM ([Table 20](#)). The results of PSM were consistent with the initial analysis results.

Consequently, the results obtained from the robustness tests were mostly in line with the baseline analyses for the direct and moderating effects despite the existence of minor deviations. Therefore, the results were robust to alternative estimator usage, lag of independent testing variables, alternative methodology, endogeneity concerns and alternative samples.

7. Discussion and conclusion

Drawing on the conflict resolution perspective of stakeholder theory

⁵ Only one coefficient did not survive the robustness check: R&Dintensity did not have a significant association with Assurance in the robustness test.

Table 18

Instrumental Variable Probit (IVPROBIT) regression analysis (Dependent variables: Assurance and GRI).

Independent variables	(1) 1st Stage Salesgr	(2) 2nd Stage Assurance	(3) 1st Stage RDIntensity	(4) 2nd Stage Assurance	(5) 1st Stage PPE&Intang	(6) 2nd Stage Assurance	(7) 1st Stage Salesgr	(8) 2nd Stage GRI	(9) 1st Stage RDIntensity	(10) 2nd Stage GRI	(11) 1st Stage PPE&Intang	(12) 2nd Stage GRI
Gov_Proc	0.013*** (3.30)		0.0044** (1.97)		0.031 (1.01)		0.013*** (3.30)		0.0044** (1.97)		0.031 (1.01)	
Pol_Stab	−0.022*** (−5.97)		−0.013*** (−6.34)		−0.11*** (−4.01)		−0.022*** (−5.97)		−0.013*** (−6.34)		−0.11*** (−4.01)	
Salesgr		−11.5*** (−6.00)						−7.92*** (−5.45)				
RDIntensity				−14.5*** (−5.55)						−9.96*** (−4.77)		
PPE&Intang						−1.37*** (−3.67)						−1.13*** (−3.44)
Boardsize	−0.0038*** (−5.77)	−0.0015 (−0.14)	−0.0013*** (−3.46)	0.025*** (3.80)	−0.0038*** (−5.77)	0.018* (1.87)	−0.0038*** (−5.77)	0.0036 (0.44)	−0.0013*** (−3.46)	0.024*** (4.36)	−0.0038*** (−5.77)	0.015* (1.82)
Bdepend	−0.00032*** (−3.70)	−0.0050*** (−4.36)	0.00016*** (3.19)	0.00067 (0.70)	−0.00032*** (−3.70)	0.00031 (0.28)	−0.00032*** (−3.70)	0.0045*** (5.14)	0.00016*** (3.19)	0.0081*** (10.66)	−0.00032*** (−3.70)	0.0078*** (7.89)
CEOduality	0.00077 (0.18)	−0.21*** (−3.95)	0.018*** (7.65)	0.053 (0.83)	0.00077 (0.18)	−0.20*** (−3.97)	0.00077 (0.18)	−0.045 (−1.13)	0.018*** (7.65)	0.12** (2.35)	0.00077 (0.18)	−0.039 (−0.90)
Firmsize	0.0092*** (5.47)	0.39*** (14.08)	0.0036*** (3.93)	0.32*** (17.66)	0.0092*** (5.47)	0.34*** (15.32)	0.0092*** (5.47)	0.32*** (15.14)	0.0036*** (3.93)	0.27*** (18.45)	0.0092*** (5.47)	0.29*** (14.68)
Profitability	0.48*** (16.25)	5.79*** (5.55)	−0.12*** (−7.54)	−1.56*** (−4.06)	0.48*** (16.25)	0.45 (1.17)	0.48*** (16.25)	3.51*** (4.44)	−0.12*** (−7.54)	−1.51*** (−4.96)	0.48*** (16.25)	0.0013 (0.00)
Leverage	−0.048*** (−4.31)	−0.60*** (−3.80)	−0.092*** (−14.99)	−1.40*** (−5.45)	−0.048*** (−4.31)	−0.24* (−1.79)	−0.048*** (−4.31)	−0.57*** (−4.77)	−0.092*** (−14.99)	−1.10*** (−5.39)	−0.048*** (−4.31)	−0.28** (−2.45)
Liquidity	0.00017 (0.01)	−0.32 (−0.90)	0.18*** (11.19)	2.15*** (4.10)	0.00017 (0.01)	−0.62* (−1.91)	0.00017 (0.01)	0.29 (1.10)	0.18*** (11.19)	1.93*** (4.64)	0.00017 (0.01)	0.13 (0.45)
Freefloat	−0.00035*** (−4.04)	−0.0064*** (−4.73)	0.00019*** (4.06)	0.00069 (0.90)	−0.00035*** (−4.04)	−0.0023** (−2.07)	−0.00035*** (−4.04)	−0.0060*** (−5.82)	0.00019*** (4.06)	−0.00092 (−1.52)	−0.00035*** (−4.04)	−0.0043*** (−4.42)
Constant	−0.12*** (−3.40)	−7.70*** (−16.03)	−0.034* (−1.70)	−6.68*** (−19.84)	−0.12*** (−3.40)	−7.18*** (−17.21)	−0.12*** (−3.40)	−6.43*** (−17.55)	−0.034* (−1.70)	−5.66*** (−21.00)	−0.12*** (−3.40)	−5.98*** (−16.26)
N	18,106	18,106	19,247	19,247	18,106	16,242	18,106	18,106	19,247	19,247	18,106	16,242
F-stat.	46.46***		52.68***		46.46***		46.46***		52.68***		46.46***	
χ^2 -stat.		388.57***		613.70***		449.39***		535.13***		769.35***		474.06***
Wald test of exogeneity		208.11***		113.47***		61.96***		101.58***		56.4***		42.48***

t statistics in parentheses of the 1st stage. Z-statistics in the parentheses of the 2nd stage. * p < 0.10, ** p < 0.05, *** p < 0.01

Instrumental variables:

Gov_Proc (Government procurement of advanced technology products, 1–7 (best)) was retrieved from the [WEF \(2018\)](#).Pol_Stab (Political stability and absence of violence/terrorism, −2.5 to 2.5 (best)) was retrieved from the [World Bank \(2021\)](#).

The availability of Gov_Proc data for the years 2007–2018 downsized the sample a bit in the IVPROBIT analysis.

Table 19
Entropy balancing.

Independent variables	(1) Report	(2) Report	(3) Report	(4) Assurance	(5) Assurance	(6) Assurance	(7) GRI	(8) GRI	(9) GRI
Salesgr	−0.49*** (−11.89)			−0.21*** (−3.52)			−0.17*** (−2.98)		
R&Dintensity		−0.15** (−2.46)			0.059 (0.61)			0.13 (1.27)	
PPE&Intang			−0.043*** (−7.63)			−0.026*** (−3.22)			−0.023*** (−2.88)
Boardsize	0.044*** (8.90)	0.050*** (9.66)	0.041*** (7.69)	0.067*** (11.45)	0.065*** (10.57)	0.061*** (10.06)	0.054*** (8.63)	0.045*** (7.24)	0.047*** (7.28)
Bindepend	−0.0042*** (−6.86)	−0.0068*** (−10.85)	−0.0033*** (−5.06)	−0.0028*** (−3.67)	−0.0055*** (−7.10)	−0.0015* (−1.82)	0.010*** (13.38)	0.0081*** (10.77)	0.011*** (14.01)
CEOduality	−0.65*** (−24.04)	−0.63*** (−22.70)	−0.66*** (−22.77)	−0.37*** (−9.96)	−0.37*** (−9.78)	−0.34*** (−8.83)	−0.14*** (−3.85)	−0.12*** (−3.13)	−0.062 (−1.58)
Firmsize	0.52*** (45.07)	0.59*** (48.45)	0.52*** (41.11)	0.41*** (27.55)	0.45*** (28.37)	0.44*** (27.38)	0.37*** (24.34)	0.39*** (24.58)	0.38*** (23.75)
Profitability	1.60*** (10.91)	1.88*** (10.88)	1.58*** (9.11)	0.18 (0.70)	0.13 (0.45)	−0.20 (−0.73)	−0.77*** (−3.25)	−0.75*** (−2.81)	−0.77*** (−3.00)
Leverage	−0.054 (−0.82)	0.18** (2.52)	−0.043 (−0.59)	0.023 (0.24)	−0.18* (−1.75)	−0.11 (−1.06)	−0.18* (−1.96)	−0.096 (−0.91)	−0.19* (−1.96)
Liquidity	−1.61*** (−11.37)	−1.88*** (−12.75)	−1.87*** (−11.91)	−1.16*** (−4.88)	−1.42*** (−5.68)	−1.07*** (−4.22)	0.10 (0.43)	−0.34 (−1.37)	0.088 (0.36)
Freefloat	−0.0074*** (−13.47)	−0.0075*** (−11.89)	−0.0062*** (−10.32)	−0.00076 (−1.14)	−0.00053 (−0.69)	−0.00047 (−0.66)	−0.0043*** (−6.12)	−0.0013* (−1.68)	−0.0049*** (−6.50)
Constant	−10.5*** (−43.92)	−12.1*** (−47.43)	−10.6*** (−39.85)	−9.97*** (−30.73)	−10.4*** (−30.71)	−10.4*** (−29.65)	−8.57*** (−26.17)	−9.08*** (−26.53)	−8.83*** (−25.16)
N	39,474	44,996	33,606	21,904	23,505	19,641	21,904	23,505	19,641
χ^2 -stat.	4,034.79***	5,144.81***	3,230.03***	1,406.87***	1,476.22***	1,271.60***	1,198.01***	1,204.99***	1,126.09***

This table includes the analysis results based on the entropy balancing method to address the endogeneity concern.

t statistics in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01; Columns #4–9: Sub-sample based on the existence of Report

Table 20
Propensity score matching (PSM).

Independent Variables	(1) Report	(2) Report	(3) Report	(4) Assurance	(5) Assurance	(6) Assurance	(7) GRI	(8) GRI	(9) GRI
Salesgr	−0.78*** (−10.67)			−0.59*** (−4.65)			−0.45*** (−3.77)		
R&Dintensity		−0.72*** (−4.44)			−0.68** (−2.22)			−0.25 (−0.91)	
PPE&Intang			−0.092*** (−9.50)			−0.061*** (−3.93)			−0.071*** (−4.81)
Boardsize	0.010 (0.70)	−0.015 (−1.02)	0.020 (1.28)	0.11*** (5.57)	0.044** (2.05)	0.092*** (4.40)	0.064*** (3.14)	0.041* (1.89)	0.042* (1.95)
Bindepend	−0.0024 (−1.17)	−0.0054*** (−2.60)	−0.0027 (−1.20)	−0.0012 (−0.38)	−0.0015 (−0.51)	0.0040 (1.27)	0.015*** (4.89)	0.012*** (4.02)	0.014*** (4.33)
CEOduality	−0.93*** (−11.83)	−0.99*** (−12.66)	−1.09*** (−12.43)	−0.42*** (−3.45)	−0.33*** (−2.83)	−0.35*** (−2.82)	−0.45*** (−3.79)	−0.45*** (−3.90)	−0.26** (−2.06)
Firmsize	1.53*** (28.59)	1.79*** (28.79)	1.45*** (25.25)	1.13*** (15.36)	1.37*** (16.55)	1.14*** (15.31)	0.89*** (13.45)	1.14*** (14.88)	0.99*** (13.86)
Profitability	−0.53 (−1.22)	−0.50 (−1.13)	−0.63 (−1.18)	−2.53*** (−3.04)	−2.17** (−2.51)	−3.34*** (−3.65)	−3.01*** (−3.84)	−3.09*** (−3.75)	−4.34*** (−4.80)
Leverage	−0.35 (−1.60)	0.17 (0.72)	−0.22 (−0.91)	0.32 (0.87)	0.46 (1.17)	−0.11 (−0.28)	−0.11 (−0.29)	−0.86** (−2.14)	−0.37 (−0.97)
Liquidity	−1.23*** (−2.89)	−1.06*** (−2.68)	−2.16*** (−4.39)	−0.71 (−0.94)	−0.54 (−0.74)	−1.86** (−2.32)	−0.42 (−0.58)	−0.64 (−0.90)	0.046 (0.06)
Freefloat	−0.015*** (−7.56)	−0.018*** (−8.06)	−0.016*** (−7.29)	−0.0026 (−0.89)	−0.0029 (−0.79)	−0.0041 (−1.36)	−0.0095*** (−3.36)	−0.0033 (−0.97)	−0.012*** (−3.96)
Constant	−31.8*** (−27.70)	−37.2*** (−27.96)	−29.7*** (−24.19)	−27.6*** (−16.73)	−32.8*** (−17.67)	−27.2*** (−16.30)	−19.6*** (−13.66)	−24.7*** (−15.11)	−21.2*** (−13.62)
N	17,642	18,998	14,997	8,856	9,165	8,255	8,856	9,165	8,255
χ^2 -stat.	1,140.39***	1,125.87***	932.68***	384.26***	372.29***	368.52***	313.06***	315.79***	315.34***

This table incorporates an alternative sample based on PSM to address the endogeneity concern.

t statistics in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01; Columns #4–9: Sub-sample based on the existence of Report

(Krishnamurti et al., 2021), RBV theory (Randrianasolo and Semenov, 2022) and agency theory (García Martín and Herrero, 2020; Uyar et al., 2021), our study tested whether firm investment inhibits CSR reporting and assurance practices. By doing so, our investigation sought to generate findings that could be used by firms to allocate their financial resources appropriately. Moreover, our exploration of the channels of interaction between investment and CSR reporting could help firms

better configure their corporate strategies for or against CSR transparency.

The results indicated that firms' investment constrains their CSR reporting and assurance practices. We further confirmed the direction of causality from investment to CSR reporting and assurance by a lagged model and validated the robustness of the results with various approaches, such as employing alternative samples (excluding the US,

Table A1
Variables and their descriptions.

Dependent variables:	Descriptions
Report	Report is a binary variable taking 1 if a CSR/sustainability report is disclosed by the company and 0 otherwise.
Assurance	Assurance is a binary variable taking 1 if the issued CSR report is assured by a third party and 0 otherwise.
GRI	GRI is a binary variable taking 1 if the issued CSR report is prepared in accordance with GRI guidelines and 0 otherwise.
<i>Test variables:</i>	
Salesgr	Sales growth during the year relative to the previous year is computed by (Sales revenue (t) - Sales revenue (t-1)) / Sales revenue (t-1).
R&Dintensity	Research and development (R&D) intensity is computed by R&D expenditures scaled by net sales.
PPE&Intang	Tangible and intangible investments are calculated by the sum of percentage change in tangible and intangible assets as follows: [Property plant and equipment (t) - Property plant and equipment (t-1)] / Property plant and equipment (t-1) + [Intangible assets (t) - Intangible assets (t-1)] / Intangible assets (t-1)
<i>Moderators:</i>	
CSRcommittee	CSR/Sustainability committee or team existence, which takes 1 if it exists and 0 otherwise.
Bmonitoring	Board monitoring function is computed by taking the average of three indicators (out of 100): (Board committee index + Board meeting attendance + Audit committee quality) / 3. Board committee index indicates the rate of the presence of four committees, namely nomination, audit, corporate governance, and compensation committees. Board meeting attendance is assessed based on meeting participation percentage. Audit committee quality is calculated by taking the average of audit committee expertise and independence.
CEOduality	CEO duality takes 1 if the chairman and CEO are the same person and 0 otherwise.
<i>Control variables:</i>	
Boardsize	The total number of directors on the board.
Bindepend	The proportion of non-executive directors to the total number of directors on the board.
Firmsize	Firm size is the natural logarithm of total assets.
Profitability	Income before interest and tax to total assets.
Leverage	Total liabilities to total assets.
Liquidity	Cash and cash equivalents to total assets.
Freefloat	Free float percentage of shares available for stockholders' trading.

focusing only on industrial and polluting sectors), using an alternative estimator, and considering country-level variations. Our finding contradicts those produced by Erhemjamts et al. (2013), who found a positive association between investment and CSR or CSR reporting in the US; however, our results are in line with those of other studies that demonstrated the existence of a tradeoff between investment and CSR in the US (Krishnamurti et al., 2021) as well as between mandatory CSR disclosure and investment in China (Makosa et al., 2020).

Moderation analysis outlined the role of contingencies in the link between investment and CSR reporting and assurance. It appears that CSR committees generate a greater moderating effect between investment and CSR reporting and assurance compared to board monitoring and CEO duality. Noting that the outcome is investment-metric sensitive, investing firms with a CSR committee are more likely to issue a CSR report and assure their CSR reports with a third party. Despite the lack of directly comparable prior studies, several research efforts have found that CSR committees play a positive role in CSR reporting and assurance practices (Kılıç et al., 2021) and a favourable mediating role between board diversity and the sustainability commitment of firms (Martínez-Ferrero et al., 2021). Moreover, board monitoring and CEO duality have a more limited moderating ability than CSR committees between firm investment and CSR reporting and assurance – that is, they are influential in inciting firms to disclose a CSR report (i.e., metric-sensitive) but not to assure their CSR reports. Previously, Faleye et al. (2011) found that intensive board monitoring is accompanied by both costs and

Table A2
Number of distinct firms and data points within countries.

Country	Distinct firms	Percent	Data points	Percent
Argentina	46	0.78	112	0.25
Australia	308	5.22	2,611	5.80
Austria	23	0.39	170	0.38
Bahrain	2	0.03	9	0.02
Belgium	37	0.63	300	0.67
Brazil	78	1.32	594	1.32
Canada	245	4.15	2,383	5.30
Chile	33	0.56	228	0.51
China	373	6.32	1,148	2.55
Colombia	15	0.25	79	0.18
Czech Republic	2	0.03	23	0.05
Denmark	37	0.63	338	0.75
Egypt	5	0.08	40	0.09
Finland	32	0.54	359	0.80
France	137	2.32	1,221	2.71
Germany	152	2.58	1,168	2.60
Greece	17	0.29	135	0.30
Hong Kong	187	3.17	1,504	3.34
Hungary	4	0.07	33	0.07
India	112	1.90	741	1.65
Indonesia	33	0.56	268	0.60
Ireland; Republic of	8	0.14	67	0.15
Israel	9	0.15	102	0.23
Italy	71	1.20	466	1.04
Japan	375	6.36	5,121	11.38
Kazakhstan	2	0.03	4	0.01
Kenya	1	0.02	5	0.01
Korea; Republic (S. Korea)	117	1.98	921	2.05
Kuwait	4	0.07	25	0.06
Luxembourg	1	0.02	8	0.02
Malaysia	49	0.83	405	0.90
Mexico	38	0.64	277	0.62
Morocco	1	0.02	11	0.02
Netherlands	45	0.76	403	0.90
New Zealand	42	0.71	291	0.65
Norway	54	0.92	359	0.80
Oman	4	0.07	17	0.04
Pakistan	2	0.03	6	0.01
Peru	26	0.44	91	0.20
Philippines	16	0.27	140	0.31
Poland	30	0.51	186	0.41
Portugal	15	0.25	125	0.28
Qatar	8	0.14	42	0.09
Russia	35	0.59	326	0.72
Saudi Arabia	20	0.34	83	0.18
Singapore	32	0.54	410	0.91
Slovenia	1	0.02	2	0.00
South Africa	89	1.51	760	1.69
Spain	56	0.95	484	1.08
Sri Lanka	1	0.02	10	0.02
Sweden	110	1.87	706	1.57
Switzerland	98	1.66	713	1.58
Taiwan	128	2.17	1,045	2.32
Thailand	33	0.56	245	0.54
Turkey	43	0.73	192	0.43
Uganda	1	0.02	1	0.00
United Arab Emirates	4	0.07	23	0.05
United Kingdom	312	5.29	3,257	7.24
United States of America	2137	36.23	14,192	31.54
Vietnam	1	0.02	1	0.00
Zimbabwe	1	0.02	10	0.02
Total	5,898	100.00	44,996	100.00

benefits, especially by weakening the advising ability of the board, which could be more relevant for CSR reporting and assurance. Hence, in our case, intensive board monitoring did not strengthen the link between investment and CSR reporting except for one investment metric.

Furthermore, the role of CEO duality in firm performance has not been consistently identified in past studies; while some studies have found a positive influence, thereby verifying stewardship theory (Donaldson and Davis, 1991; Guillet et al., 2013), others have found a negative influence, thus confirming agency theory (García Martín and

Table A3
Multicollinearity analysis.

Variable	VIF-M1	Variable	VIF-M2	Variable	VIF-M3
Firmsize	1.51	Firmsize	1.57	Firmsize	1.41
Boardsize	1.36	Boardsize	1.36	Boardsize	1.31
Leverage	1.16	RDintensity	1.34	Leverage	1.16
Liquidity	1.12	Profitability	1.25	Liquidity	1.11
Bindepend	1.04	Leverage	1.18	Bindepend	1.06
CEOduality	1.04	Liquidity	1.17	CEOduality	1.03
Freefloat	1.03	Bindepend	1.04	Freefloat	1.03
Profitability	1.03	CEOduality	1.04	Profitability	1.02
Salesgr	1.01	Freefloat	1.03	PPE&Intang	1.00
Mean VIF	1.14	Mean VIF	1.22	Mean VIF	1.13
Variable	VIF-M4	Variable	VIF-M5	Variable	VIF-M6
Firmsize	1.35	Firmsize	1.36	Firmsize	1.31
Boardsize	1.25	Boardsize	1.25	Boardsize	1.23
Leverage	1.15	Leverage	1.16	Leverage	1.14
Liquidity	1.09	Liquidity	1.1	Liquidity	1.09
Profitability	1.08	Bindepend	1.07	Bindepend	1.09
Bindepend	1.08	Profitability	1.06	Profitability	1.07
CEOduality	1.05	CEOduality	1.06	CEOduality	1.05
Freefloat	1.03	RDintensity	1.03	Freefloat	1.03
Salesgr	1.02	Freefloat	1.03	PPE&Intang	1
Mean VIF	1.12	Mean VIF	1.12	Mean VIF	1.11
Variable	VIF-M7	Variable	VIF-M8	Variable	VIF-M9
Firmsize	1.35	Firmsize	1.36	Firmsize	1.31
Boardsize	1.25	Boardsize	1.25	Boardsize	1.23
Leverage	1.15	Leverage	1.16	Leverage	1.14
Liquidity	1.09	Liquidity	1.1	Liquidity	1.09
Profitability	1.08	Bindepend	1.07	Bindepend	1.09
Bindepend	1.08	Profitability	1.06	Profitability	1.07
CEOduality	1.05	CEOduality	1.06	CEOduality	1.05
Freefloat	1.03	RDintensity	1.03	Freefloat	1.03
Salesgr	1.02	Freefloat	1.03	PPE&Intang	1
Mean VIF	1.12	Mean VIF	1.12	Mean VIF	1.11

VIF: Variance Inflation Factor.

M1-M3: Dependent variable is the Report.

M4-M6: Dependent variable is the Assurance.

M7-M9: Dependent variable is GRI.

Herrero, 2020; Uyar et al., 2021); still, others have found a neutral effect (Elsayed, 2007). Similar inconsistencies appear when assessing the predictability of CEO duality in CSR reporting (Jizi et al., 2014; Mutakin et al., 2018). In our study, these inconsistencies helped to explain the lack of a strong positive or negative moderating effect of CEO duality between investment and CSR reporting and assurance. However, the significant moderating effect of CEO duality between R&D intensity and CSR reporting was perceived as a very positive signal, given that R&D engagement mostly entails severe information asymmetry between managers and shareholders (Xue, 2007).

8. Implications and future research

The findings of our study justify the validity of a tradeoff between investment and CSR reporting and assurance; investing firms avoid disclosing a CSR report, and CSR reporters are reluctant to ensure their reports and follow GRI guidelines. This demonstrates the dominance of the shareholder perspective over the stakeholder perspective for firms pursuing investment opportunities. Although investing firms might have a justifiable reason for not reporting CSR initiatives and assuring CSR reports, such as additional costs, firm priorities and scarce financial resources, a lack of CSR reporting and assurance may trigger scepticism among stakeholders, particularly for investing firms that are under great scrutiny. As such, we recommend investing firms incorporate CSR dimensions into their overall corporate strategy and disclose them in their CSR reports. While CSR report assurance reinforces the credibility of the content of these reports, following GRI guidelines may help firms better understand what and how to report CSR in a systematic and consistent way, which may have a greater impact on stakeholders. Overall, the results imply that an overemphasis on investment might be detrimental

to the interests of non-investing stakeholders and consequently degrade communication channels between stakeholders and firms. Hence, we outline that CSR reports are currently the only media channel that can succinctly convey such information to the relevant parties.

The moderating effects revealed in this study imply that board structure has a limited effect on encouraging investing firms to engage with CSR transparency practices. CSR committees appear to convince investing firms of the benefits of issuing a CSR report and the credibility of the disclosed CSR report with third-party assurance. These committees might shape the CSR agenda of their firm and help the board maintain a more balanced decision-making process by aligning the interests of both shareholders and stakeholders. Thus, our empirical evidence suggests that if investing firms consider CSR initiatives and reporting as solely costly and ignore their benefits, the presence of a CSR committee could both represent and present a more expert and experienced view that may highlight the advantages of these CSR initiatives while moderating the CSR transparency and associated CSR engagements of investing firms. Hence, CSR committees/teams may help investing firms take substantive actions on environmental and social issues while simultaneously shaping the corporate sustainability and transparency agenda. On the other hand, board monitoring is not as influential as CSR committees in strengthening the CSR reporting and assurance tendency of investing firms. Hence, our findings suggest that board monitoring mechanisms may focus more on financial performance than non-financial initiatives, as directors may feel shareholder pressure more than stakeholder pressure. Moreover, our evidence implies that powerful CEOs with dual roles exert limited pressure on the CSR reporting practices of investing firms. This finding warrants future studies that consider other CEO characteristics, such as education, gender and experience (if data are available), beyond its dual role. While these characteristics were shown to play a positive moderating role in CSR reporting based on the R&D-intensity metric, they had a neutral moderating effect between investment and CSR report assurance, which could be attributable to the interplay of agency theory and stewardship theory. Overall, our empirical evidence encourages policymakers and regulators to enact more practical corporate governance reforms that encourage investing firms in engaging in more effective CSR transparency practices.

Our research focused more on accounting-based investment proxies; market-based investment opportunity proxies (i.e., market capitalisation) might reveal different outcomes and implications, which could be both generated and explained in future research. Additionally, although we focused on an international sample and nine sectors to corroborate the generalisability of our findings, further research could employ sector-specific, R&D-intensive-specific, or country- or region-specific samples for the purpose of generating complementary insights to those related to firms and stakeholders. Thus, further research that explores the conditions under which investing firms in specific industries (e.g., technology sectors) or countries (e.g., G7 or G20 economies) can engage in a more effective CSR agenda is recommended to support and validate our findings. Given our evidence that the presence of a CSR committee dedicated to encouraging investing firms to enhance their CSR transparency and CSR engagements plays an effective moderating role, future studies can examine the moderating impact of various characteristics of CSR committee members, such as age, gender, ethnicity, education and expertise, on the investment-CSR nexus. Moreover, as the moderating effect of board monitoring has not yet produced significant results, future studies focused on more refined board monitoring proxies are warranted. For example, as our board monitoring proxy was based on three proxies – namely, board committee index, board meeting attendance and audit committee quality – future studies could explore whether each of these metrics might moderate between firm investment and CSR reporting practices. Doing so may yield additional implications for the strength of internal governance, such as audit committee quality.

Compliance with Ethical Standards Statements:

- **Disclosure of potential conflicts of interest:** The authors whose names are listed immediately below certify that they have NO affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.
- **Research involving Human Participants and/or Animals (If applicable):** Not applicable.
- **Informed consent (If applicable):** Not applicable.
- **Data Availability:** the data that support the findings of this study are available from the corresponding author upon reasonable request.

CRedit authorship contribution statement

Ali Meftah Gerged: Writing – review & editing, Supervision, Data curation, Conceptualization. **Cemil Kuzey:** Methodology, Formal analysis, Data curation, Conceptualization. **Ali Uyar:** Writing – review & editing, Supervision, Data curation, Conceptualization. **Abdullah S. Karaman:** Writing – review & editing, Data curation, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix A

See Table A1–A3.

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