

CEO BUSYNESS AND CLIMATE CHANGE DISCLOSURE: THE ROLE OF CORPORATE GOVERNANCE AND OUTCOME ON FIRM PERFORMANCE



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Abstract

Growing regulatory and stakeholder pressure underscores the importance of climate change reporting, yet the role of CEO busyness in shaping corporate disclosure remains underexplored. Prior evidence from other disclosure contexts is mixed, and few studies examine corporate governance as a moderating factor. This research investigates the influence of CEO busyness on climate change disclosure, the moderating effect of corporate governance, and the impact of disclosure on firm performance. Using 1,980 firm-year observations of IDX-listed firms from 2020 to 2023, the study applies panel data regression, Coarsened Exact Matching, Generalized Least Squares, and a two-stage Heckman model to ensure robustness. The results reveal that CEO busyness has a positive effect on climate change disclosure, strengthened by strong corporate governance. Moreover, climate change disclosure enhances firm performance. These findings extend Upper Echelons Theory by showing that busy CEOs can promote transparency, contrasting prior evidence suggesting negative effects.

INTRODUCTION

Environmental issues such as climate change, global warming, biodiversity decline, depletion of the ozone layer, and tropical deforestation demonstrate that global ecological challenges remain unresolved (Aljughaiman et al., 2024). Among these threats, climate change stands out as a critical global concern, as its impacts driven by global warming are increasingly visible in daily news and pose significant economic and social risks for modern businesses (Dey, 2024; Hossain et al., 2023; Maji & Kalita, 2022; Zhang, 2024a). Mainly driven by human activities such as uses of fossil fuel, deforestation, and industrial processes, climate change demands urgent, large-scale, and coordinated sustainable actions (Mammadova, 2024; Supriyanto et al., 2025). Amid intensifying climate impacts, corporations face heightened accountability for reducing emissions under scrutiny from governments, investors, and other stakeholders, who increasingly demand comprehensive climate-related disclosures. In response, regulators have implemented policies linking climate risks to financial statements and requiring independent audits (Dilling et al., 2024; Pham et al., 2024; Zhang, 2024b). These developments have encouraged firms to adopt environmentally responsible practices and improve climate-related reporting to enhance transparency and stakeholder confidence. Nevertheless, the complex and costly nature of addressing climate change continues to pose challenges for growth-oriented companies seeking to balance sustainability with business performance (Fuadi et al., 2024; Octavio & Setiawan, 2024; Romadhina & Probohudono, 2025).

Indonesia, as a major global source of greenhouse gas (GHG) emissions and a rapidly developing industrial economy, faces substantial environmental risks (Wahyuningrum, Baroroh, et al., 2025). As one of the top eight largest GHG emitters in the world and a G20 member committed to international agreements, including the Paris Agreement and the Kyoto Protocol (Chandra et al., 2026), Indonesia increasingly needs to improve its carbon disclosure practices in line with the Agreement's goal to limit the increase of global temperatures to below 2°C, aiming for an objective of 1.5°C (Rahmatika et al., 2024; Wahyuningrum, Rizkyana, et al., 2025). Currently, carbon-related disclosure in Indonesia remains voluntary, resulting in inconsistent reporting across companies, despite its role in reducing information asymmetry and supporting future performance evaluation (Agustini & Arifa, 2024; Houten & Wedari, 2023). Stakeholders increasingly seek information regarding corporate carbon emissions, associated risks, financial impacts, and control systems, making voluntary disclosure a critical element in informed decision-making (Mahmudah et al., 2023; Nathalia & Setiawan, 2022). Given that climate change disclosure in Indonesia remains underexplored, this area presents a compelling opportunity for further research.

Research on climate change disclosure also benefits from a leadership perspective, as executive characteristics serve a key role in influencing a firm's climate-related reporting practices (Adlina & Junaidi, 2025). This study draws on Upper Echelons Theory, proposed by Hambrick & Mason (1984), asserts that the individual traits of top management teams (TMTs) influence strategic decision-making and organizational outcomes. The basic idea of UET is that the experiences, values, and personalities of executives shape their decisions and actions, ultimately determining firm-level outcomes (Boivie, 2025; Tiara et al., 2025). The CEO occupies a central role in determining how effectively firms design and implement climate change strategies (Cahyono et al., 2024), influencing not limited to core business strategies, but also encompassing social and environmental aspects of corporate strategy (Elsayih et al., 2021) while exerting significant influence over corporate governance mechanisms (Wagner & Fischer-Kreer, 2024). Prior research has analyzed the influence of several CEO characteristics on climate change disclosure, including overconfidence, foreign background, and STEM education (Aldoseri & Albaz, 2023; Cahyono et al., 2024; Setiawan et al., 2024). However, the role of CEO busyness remains largely unexplored. This gap is important because a busy CEO may have limited time and attention to oversee disclosure practices, making CEO busyness a critical factor for further investigation.

Prior research on the relationship between CEO busyness and corporate disclosure has produced mixed results. CEO busyness in relation to climate change disclosure has received little attention in existing studies, while many studies in other disclosure settings have found that busy CEOs are negatively associated with ESG disclosure, financial reporting, and the readability of financial statement footnotes

(Abdul Wahab et al., 2024; Harymawan et al., 2022; Prafiani & Utama, 2024). Holding multiple positions may impair a CEO's ability to dedicate sufficient attention to any single firm, potentially reducing overall performance (Ningsih et al., 2021). Conversely, experienced CEOs with multiple directorships can leverage their knowledge, expertise, and broad networks to foster partnerships, expand business opportunities, and strengthen their capacity to provide strategic guidance and effective monitoring for the firm (Ferris et al., 2018; Harymawan et al., 2019). However, these benefits are often constrained by the limited time available to focus on core responsibilities (Almulhim & Aljughaiman, 2023). These mixed findings reveal inconsistencies in the existing literature and highlight a gap regarding the effect of CEO busyness on climate change disclosure. This study enhances the existing literature by integrating CEO busyness and climate disclosure within a single framework while considering the potential moderating role of governance mechanisms, thereby provide a more refined understanding in which leadership attributes affect environmental reporting.

In this study, corporate governance functioning as a moderating variable to address the inconsistencies observed in prior research. Corporate governance is expected to enhance climate change disclosure by strengthening oversight and promoting transparency (Pradhan et al., 2025; Tiara et al., 2025). Disclosures are considered more credible when supported by effective monitoring mechanisms embedded in corporate governance structures (Itan et al., 2023; Lee, 2021). To capture governance holistically, this study uses a corporate governance index (CGI), which integrates multiple governance attributes into a single measure rather than examining them in isolation (Purwoaji et al., 2025). Corporate governance serves as supervisor and control function in the management of a company (Itan et al., 2023), particularly regarding decision-making, profit allocation, and investment strategies (Dilling et al., 2024). Compared to most Western nations that implement a single-tier governance framework, Indonesia adopts a dual-tier governance structure, requiring firms to have both a supervisory board and a management board under OJK Regulation No. 33/POJK.04/2014 (Nugraha & Soewarno, 2022), which serve an essential function in determining how CEO busyness influences climate change disclosure.

In addition, this research examines the effect of climate change disclosure on firm performance to explore its potential outcomes. A firm's overall productivity, reflected in its market value, integrates financial and non-financial aspects (Rochman et al., 2025) that collectively influence stakeholders' decisions based on the company's triple bottom line (Sari & Muslim, 2024). From the stakeholders' perspective, every business organization is expected to meet stakeholder expectations, which in modern finance is often described as achieving sustainable performance (Veeravel et al., 2024). By effectively managing financial risks, firms can strengthen their financial performance and provide investors with greater assurance in making informed investment decisions (Megeid, 2024).

This study aims to address this research gap by investigating the relationship between CEO busyness and climate change disclosure, while also examining how corporate governance moderates this relationship. The analysis uses 1,980 observations from 2020 to 2023, manually collected from company's annual and sustainability reports. The study includes year and industry fixed effects to control for unobserved differences across time periods and sectors, ensuring that the estimated relationships reflect firm-level differences rather than macroeconomic or industry-wide factors. A comparative analysis is conducted between firms with busy CEOs and those with non-busy CEOs to assess differences in climate change disclosure. To confirm the reliability of the findings, robustness tests are performed, including coarsened exact matching, generalized least squares, and a two-stage Heckman model. The next section presents the development of the hypotheses: A CEO is classified as busy if they hold two or more positions in other companies in addition to their primary role (Ratri et al., 2021). CEOs are recruited based on their knowledge, experience, and capacity to generate shareholder value (Harymawan et al., 2025). According to UET, top executives' personal characteristics and experiences strongly affects strategic decisions and organizational outcomes (Hambrick & Mason, 1984). Busy directors, known for their experience (Prafiani & Utama, 2024), knowledge (Saleh et al., 2018), reputational capital than non-busy directors, can reduce agency costs and information opacity by enhancing voluntary disclosure (Abdul Wahab et al., 2024), which in turn strengthens the firm's reputation and networks (Char-Lee & Chee-Wooi, 2018; Ivone et al., 2026). Thus, the busyness of a CEO is expected to significantly affect the firm's level of climate change disclosure.

Strong corporate governance, includes independent audit committees, effective board structures, and transparency policies (Toukabri, 2024), fosters the development of initiatives and strategic responses to climate change that enhance shareholder value (Luo & Tang, 2021). Effective corporate governance mechanisms contribute to better decision-making and policy implementation (David, 2024), which in turn positively influence the quality of carbon emission reporting and the level of environmental accountability (Wahyuningrum, Baroroh, et al., 2025). Busy CEOs' wider networks and access to external resources contribute to improved strategic opportunities and organizational outcomes (Tan et al., 2020), but they also expose them to the risk of divided attention and diminished managerial focus (Rizki et al., 2024). Effective governance systems play important role in aligning managerial decisions with shareholders and stakeholders interest (Alomair & Al Naim, 2025). By incorporating these attributes, corporate governance captures the multidimensional nature of governance and allows the analysis to test whether stronger governance structures can moderate the relationship between CEO busyness and climate change disclosure.

Climate change disclosure is increasingly recognized as a key aspect of corporate social responsibility (Setiawan et al., 2024), indicating a company's commitment to environmental transparency and sustainability (Barik & Mohapatra, 2025). Maji & Kalita (2022) find that climate change disclosure exerts a significant positive effect on firm performance, indicating that these dimensions of disclosure contribute positively to enhancing corporate performance. Companies that provide more transparent reporting on their climate change practices may gain financial advantages (Thai et al., 2024). High-quality disclosure can decrease the cost of capital while strengthening market confidence in the company's capabilities and long-term prospects (Saraswati et al., 2024).

This study examines how CEO busyness affects climate change disclosure and whether corporate governance strengthens this relationship, while also assessing the impact of climate disclosure on firm performance. This issue is particularly relevant in Indonesia, where corporate governance practices and climate-related disclosure standards are still developing, regulatory enforcement remains limited, and board effectiveness plays a crucial role in ensuring accountability and transparency. Although research on corporate disclosure is extensive, studies specifically examining climate change disclosure remain scarce, especially those using a unified corporate governance index. The findings contribute to UET by demonstrating how observable managerial characteristics shape strategic organizational outcomes, clarifying prior mixed evidence on CEO busyness, highlighting the role of governance systems, and emphasizing climate disclosure as a value-relevant component of sustainability reporting.

Based on the discussion above, this study proposes three hypotheses: H₁ states that CEO busyness is positively related to climate change disclosure; H₂ suggests that corporate governance strengthens the relationship between CEO busyness and climate change disclosure; and H₃ proposes that climate change disclosure is positively associated with firm performance. In line with these hypotheses and the preceding discussion, the conceptual framework in Figure 1 illustrates the proposed research model.

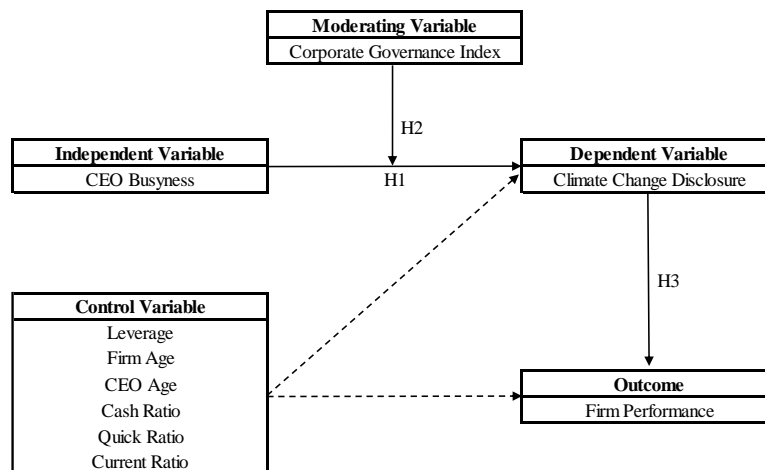


Figure 1. Research Framework

METHOD

This study employs a quantitative approach based on data acquired from the annual and sustainability reports of entities registered on the Indonesia Stock Exchange (IDX), totaling 787 firms. The study covers the period from 2020 to 2023, yielding 3,148 initial observations. After excluding observations with incomplete data, the final sample consists of 1,980 observations. The sample selection process and its distribution are presented in Tables 1 and 2.

Table 1. Sample Distribution

Panel A: distribution of data sample selection						
Criteria		Total				
Indonesian publicly listed companies on the IDX from 2020 to 2023		3.148 observations				
Missing Data		(1.168 observations)				
Number of samples used as research objects		787 companies				
Total final sample		1.980 observations				
Panel B: distribution of data by industry and year						
SIC		Year				Total
		2020	2021	2022	2023	
(SIC 1)	Energy	22	59	65	75	221
(SIC 2)	Basic Materials	20	78	84	90	272
(SIC 3)	Industrials	10	41	48	58	157
(SIC 4)	Consumer non-cyclicals	23	85	105	118	331
(SIC 5)	Consumer Cyclical	14	88	105	126	333
(SIC 6)	Healthcare	11	23	28	33	95
(SIC 8)	Property and Real Estate	10	60	63	75	208
(SIC 9)	Technology	4	19	27	37	87
(SIC 10)	Infrastructure	22	46	53	61	182
(SIC 11)	Transportation & Logistic	4	24	30	36	94
<i>Total</i>		140	523	608	709	1980

Source(s): Authors owns work

Table 2. CEO Busyness Data Distribution

	Year				Total
	2020	2021	2022	2023	
Busy CEO = 1	94	342	405	474	1315
Non-Busy CEO = 0	46	181	203	235	665

Source(s): Authors owns work

The dependent variable in this study is climate change disclosure (CCD). The Task Force on Climate-Related Financial Disclosures (TCFD, 2022) recommendations are categorized into four areas: governance (GOV), strategy (STR), risk management (RM), as well as metrics and targets (MT). Following Cosma et al. (2022) and Iriyadi & Antonio (2021), the CCD score is computed by climate change index reported by the company divided by the total climate change index. The list of the 11 key recommendations is presented in Table 3. The independent variable is CEO busyness (BUSY). BUSY is measured as a dummy variable equal to 1 if the firm's CEO holds two or more directorships in other companies, and 0 otherwise (Harymawan et al., 2019). Information on CEO directorships is obtained from publicly disclosed data in firms' annual reports. This measure captures external positions that are explicitly reported, including roles in private firms or other organizations, but only when such information is disclosed (Heaney et al., 2015).

Table 3. Climate Change Index

Climate Change Disclosure (CCD)		
Governance	Board Oversight	Elucidate the board's supervision of risks and opportunities associated with climate change.
	Management's role	Articulate the role of management in the evaluation and mitigation of risks and opportunities arising from climate change.
Strategy	Risks and opportunities	Identify the risks and opportunities arising from climate change that the organization has recognized across short, medium, and long-term horizons.
	Impact on the organization	Analyze the influence of risks and opportunities arising from climate change on the organization's business, strategy, and financial planning.
	Resilience of strategy	Evaluate the resilience of the organization's strategic framework, taking into consideration various climate-related scenarios, including a scenario projecting a 2°C or lower temperature rise.
Risk Management	Risk ID and assessment processes	Detail the organization's methodologies for identifying and evaluating climate-related risks.
	Risk management processes	Outline the organization's strategies for managing climate-related risks.
	Integration into overall risk management	Describe how the processes for the identification, assessment, and management of climate-related risks are assimilated into the organization's comprehensive risk management framework.
Metrics and Targets	Climate-related metrics	Disclose the metrics utilized by the organization to evaluate risks and opportunities arising from climate change in accordance with its strategic objectives and risk management protocols.
	Scope 1,2, and 3 GHG emissions	Disclose Scope 1, Scope 2, and, if applicable, Scope 3 greenhouse gas (GHG) emissions, along its related risks.
	Climate-related targets	Specify the targets established by the organization to manage risks and opportunities arising from climate change, as well as the performance against targets.

The moderating variable in this study is corporate governance, measured using the corporate governance index (CGI). Purwoaji et al. (2025) constructed the CGI based on five measures adapted from Singareddy et al. (2018) and confirmed its reliability through robustness and endogeneity tests. The CGI is a composite measure that combines several governance attributes, such as characteristics of the board, including its size, diversity, and independence, as well as audit committee size, and audit quality.

The control variables in this research are included to enhance the robustness of the analysis. Leverage (LEV) is computed as total liabilities divided by total assets. Firm age (FAGE) represents the number of years since incorporation. CEO age (AGE) refers to the CEO's age at the end of the fiscal year. Liquidity is captured through the cash ratio (CASH), calculated as the ratio of total cash to total assets; the quick ratio (QUICK), computed the proportion of current asset excluding inventory to current liabilities; and the current ratio (CR), computed as the proportion of current assets to current liabilities. These variables account for firm-specific characteristics, including capital structure, organizational maturity, leadership demographics, and liquidity position, helping to reduce potential bias in the analysis. Although firm size is commonly used in disclosure studies, it is not included here, as its effects are addressed through the comprehensive set of firm-level controls, along with industry and year fixed effects, which mitigate concerns of omitted variable bias related to firm size (Breuer & Dehaan, 2024). All variables and their measurements are presented in Table 4.

Table 4. Variable definitions

Variable Name	Measurement	Data Sources
Dependent Variable		
Climate Change Disclosure (CCD)	The CCD score represents an average score of 11 disclosed items and includes factor analyses across four attributes: governance (GOV), strategy (STR), risk management (RM), and metrics and targets (MT).	Sustainability Report (Cosma et al., 2022)
Independent Variable		
CEO busyness (BUSY)	Value 1 if the firm’s CEO holds two or more positions in other companies, and value 0 if otherwise	Annual Report (Harymawan et al., 2019)
Moderating Variable		
Corporate Governance (CGI)	Sum of the binarized corporate governance attribute value. Value ranges from 0-5. CGI includes: <ul style="list-style-type: none"> - Board size: assigned 1 if the number of directors is more than 5; 0 if otherwise - Diversity of board: assigned 1 if there is more than 1 female director; 0 if otherwise - Independent board membership: assigned 1 if there is more than 1 independent and non-executive board member; 0 if otherwise - Size of audit committee: assigned 1 if the audit committee is one or more than 3 members; 0 if otherwise - Audit firm: assigned 1 if the firm is audited by a Big 4 auditor; 0 if otherwise 	Annual Report (Purwoaji et al., 2025)
Outcome of CCD – Firm Performance		
Return on Assets (ROA)	Total net income divided by total assets	Financial Statement (Harymawan et al., 2019)
Return on Equity (ROE)	Total net income divided by total equity	Financial Statement (Harymawan et al., 2019)
Control Variable		
Leverage (LEV)	Total debt divided by total assets	Financial Statement (Kılıç & Kuzeý, 2019)
Firm Age (FAGE)	Firm age by incorporation year	Annual Report (Li, 2024)
CEO Age (AGE)	The age of the CEO	Annual Report (Fuadi et al., 2024)
Cash Ratio (CASH)	Total cash divided by total assets	Financial Statement (Cahyono et al., 2024)
Quick Ratio (QUICK)	Current assets minus inventory, divided by current liabilities	Financial Statement (Cahyono et al., 2024)
Current Ratio (CR)	Current assets divided by current liabilities	Financial Statement (Khalid et al., 2022)

To examine the relationship between these variables, we estimate the following empirical model using data panel regression:

$$CCD_{i,t} = \beta_0 + \beta_1 BUSY_{i,t} + \beta_2 LEV_{i,t} + \beta_3 FAGE_{i,t} + \beta_4 AGE_{i,t} + \beta_5 CASH_{i,t} + \beta_6 QUICK_{i,t} + \beta_7 CR_{i,t} + INDUSTRY_FE + YEAR_FE + \epsilon_{i,t} \dots\dots\dots(1)$$

$$CCD_{i,t} = \beta_0 + \beta_1 BUSY_{i,t} + \beta_2 CGI_{i,t} + \beta_3 BUSYXCGI_{i,t} + \beta_4 LEV_{i,t} + \beta_5 FAGE_{i,t} + \beta_6 AGE_{i,t} + \beta_7 CASH_{i,t} + \beta_8 QUICK_{i,t} + \beta_9 CR_{i,t} + INDUSTRY_FE + YEAR_FE + \epsilon_{i,t} \dots\dots\dots(2)$$

$$FP_{i,t} = \beta_0 + \beta_1 CCD_{i,t} + \beta_2 LEV_{i,t} + \beta_3 FAGE_{i,t} + \beta_4 AGE_{i,t} + \beta_5 CASH_{i,t} + \beta_6 QUICK_{i,t} + \beta_7 CR_{i,t} + INDUSTRY_FE + YEAR_FE + \epsilon_{i,t} \dots\dots\dots(3)$$

In the model, $CCD_{i,t}$ represents the climate change disclosure score for a company (i) in a year (t). $BUSY_{i,t}$ is a dummy variable indicating whether the firm’s CEO holds two or more external positions in other companies. $CGI_{i,t}$ denotes the corporate governance index, while $BUSYXCGI_{i,t}$ captures the interaction terms between CEO busyness and corporate governance. The control variables include leverage ratio ($LEV_{i,t}$), firm’s age ($FAGE_{i,t}$), CEO’s age ($AGE_{i,t}$), cash ratio ($CASH_{i,t}$), quick ratio ($QUICK_{i,t}$), and current ratio ($CR_{i,t}$). The firm's performance ($FP_{i,t}$) serves as the outcome variable.

The model also incorporates industry fixed effects (INDUSTRY_FE) to control industry-specific characteristics and year fixed effects (YEAR_FE) to account for year-specific factors. Finally, $\epsilon_{i,t}$ represents the error term.

This study employs several statistical methods. Panel data regression is used to examine the relationship between CEO busyness and climate change disclosure (CCD), as well as the moderating effect of corporate governance. Coarsened Exact Matching (CEM) mitigates selection bias, Generalized Least Squares (GLS) addresses heteroskedasticity and autocorrelation, and the two-stage Heckman model adjusts for sample selection bias. All analyses are conducted using Stata 17.0. The model includes industry and year fixed effects to account for unobserved differences among firms within the same industry-year sample (Lee, 2021). Additionally, winsorization is applied to limit the influence of extreme values by capping the smallest and largest observations at predefined percentiles, ensuring more reliable results.

RESULTS

Table 5 shows the descriptive summary of the variables included in this research. The average climate change disclosure (CCD) score is 0.120, indicating that, on average, firms disclose only about 12% of the climate-related items in the checklist. The corporate governance index (CGI) has a mean of 3.214 out of a maximum score of 5, suggesting that most firms satisfy approximately three of the five governance criteria. Regarding financial performance, ROA has a mean of -0.001 and a median of 0.029, while ROE has a mean of 0.085 and a median of 0.059. The lower mean relative to the median suggests a left-skewed distribution, where a few poorly performing firms reduce the overall average. Leverage (LEV) has a mean of 2.734 and a median of 0.427, reflecting relatively high debt levels among the sampled firms.

Regarding firm characteristics, the mean firm age (FAGE) is 31.429, close to its median of 30, indicating that most companies in the sample are mature and well-established. The CEO age (AGE) variable has a mean of 54.711 and a median of 55, suggesting that the typical CEO is in their mid-fifties, reflecting experienced leadership. For liquidity indicators, the cash ratio (CASH) has a mean of 1.090 and a median of 0.072, showing that while most firms maintain relatively low cash reserves, a few hold substantially higher amounts. The quick ratio (QUICK) has a mean of 2.568 and a median of 1.083, and the current ratio (CR) has a mean of 3.555 with a median of 1.683, indicating that most firms maintain adequate liquidity, though some exhibit exceptionally high ratios. Finally, the BUSY variable shows a frequency of 66.41%, meaning that the majority of firms have a CEO holding two or more directorships.

Table 5. Statistic descriptive

	Mean	Minimum	Median	Maximum
CCD	0.120	0.000	0.091	1.000
CGI	3.214	0.000	3.000	5.000
ROA	-0.001	-33.110	0.029	4.693
ROE	0.085	-19.472	0.059	72.356
LEV	2.734	-0.871	0.427	3461.978
FAGE	31.429	0.000	30.000	117.000
AGE	54.711	26.000	55.000	87.000
CASH	1.090	0.000	0.072	252.875
QUICK	2.568	-4.414	1.083	218.021
CR	3.555	0.000	1.683	308.790
Frequency	0		1	
BUSY	33.59%		66.41%	

Source(s): Processed Data (2025) *CCD = climate change disclosure, BUSY = CEO busyness, CGI = corporate governance index, ROA = return on assets, ROE = return on equity, LEV = leverage, FAGE = firm age, AGE = CEO age, CASH = cash ratio, QUICK = quick ratio, CR = current ratio

Table 6 displays the Pearson correlation matrix of the study variables. The results reveal several significant relationships with CCD. BUSY, CGI, FAGE, and AGE are positively correlated with CCD, suggesting that firms with busy and experienced CEOs, stronger governance structures, and longer operating histories tend to disclose more climate-related information. In contrast, LEV and CR are negatively correlated with CCD, indicating that highly leveraged or financially cautious firms may engage less in environmental disclosure. Overall, the findings imply that governance quality and firm maturity play a more significant role in promoting climate change disclosure than financial characteristics.

Table 6. Pearson Correlation

	CCD	BUSY	CGI	LEV	FAGE	AGE	CASH	QUICK	CR
CCD	1.000								
BUSY	0.089*** (0.000)	1.000							
CGI	0.289*** (0.000)	0.076*** (0.001)	1.000						
LEV	-0.045** (0.045)	-0.045** (0.043)	-0.059*** (0.008)	1.000					
FAGE	0.165*** (0.000)	-0.025 (0.264)	0.208*** (0.000)	0.087*** (0.000)	1.000				
AGE	0.064*** (0.004)	0.104*** (0.000)	0.106*** (0.000)	0.024 (0.278)	0.226*** (0.000)	1.000			
CASH	0.027 (0.231)	0.003 (0.878)	0.054** (0.017)	-0.015 (0.512)	0.033 (0.139)	0.001 (0.956)	1.000		
QUICK	-0.027 (0.225)	-0.012 (0.591)	-0.058** (0.010)	-0.338*** (0.000)	-0.129*** (0.000)	-0.119*** (0.000)	0.054** (0.016)	1.000	
CR	-0.021 (0.356)	-0.038* (0.093)	-0.047** (0.038)	-0.188*** (0.000)	-0.090*** (0.000)	-0.091*** (0.000)	0.007 (0.761)	0.656*** (0.000)	1.000

*Significant at 10%. **Significant at 5%. ***Significant at 1%

Source(s): Processed Data (2025) *CCD = climate change disclosure, BUSY = CEO busyness, CGI = corporate governance index, ROA = return on assets, ROE = return on equity, LEV = leverage, FAGE = firm age, AGE = CEO age, CASH = cash ratio, QUICK = quick ratio, CR = current ratio

Table 7 presents the results of the independent t-test comparing firms led by non-busy and busy CEOs. CCD is significantly higher in firms with a busy CEO, indicating that BUSY tends to enhance environmental transparency. CGI also shows a higher mean for busy CEOs, suggesting that firms with busy leaders generally have stronger governance practices. AGE is significantly higher for busy CEOs, implying greater experience. LEV and CR display small but significant differences, reflecting variations in financial structure and liquidity between the two groups. On the other hand, FAGE, CR, and QUICK show no significant differences, indicating that these characteristics are relatively similar regardless of CEO busyness. Overall, the t-test results suggest that CEO busyness is associated with higher climate disclosure and stronger governance, while other firm characteristics remain relatively stable across both groups.

Table 7. Independent T-Test

Variables	MEAN		Coef	t-value
	Non-Busy CEO	Busy CEO		
CCD	0.098	0.131	-0.033**	-3.980
CGI	3.110	3.267	-0.157**	-3.394
LEV	0.516	0.475	0.041*	2.020
FAGE	31.992	31.062	0.930	1.117
AGE	53.235	55.446	-2.212**	-4.670
CASH	0.404	0.421	-0.017	-0.153
QUICK	2.134	2.053	0.081	0.537
CR	4.159	3.249	0.911*	1.680

Source(s): Processed Data (2025) *CCD = climate change disclosure, BUSY = CEO busyness, CGI = corporate governance index, ROA = return on assets, ROE = return on equity, LEV = leverage, FAGE = firm age, AGE = CEO age, CASH = cash ratio, QUICK = quick ratio, CR = current ratio

This study employed panel data regression to examine whether BUSY influences variations in CCD among publicly listed companies. Table 8 reports the results of four regression models analyzing the relationship between BUSY and CCD while controlling for LEV, FAGE, AGE, CASH, QUICK, and CR. The results indicate that BUSY is positively associated with CCD. Across all four models, BUSY consistently shows a positive and statistically significant effect at the 1% level ($p < 0.01$), both with and without year and industry fixed effects, suggesting that firms led by busy CEOs are more likely to engage in CCD.

Table 8. Regression Analysis: CEO Busyness and Climate Change Disclosure

	(1)	(2)	(3)	(4)
	CCD	CCD	CCD	CCD
BUSY	0.033*** (4.42)	0.033*** (4.41)	0.037*** (4.85)	0.037*** (4.86)
LEV	-0.027*** (-4.59)	-0.026*** (-4.39)	-0.027*** (-4.37)	-0.026*** (-4.20)
FAGE	0.002*** (6.77)	0.002*** (6.98)	0.001*** (5.85)	0.002*** (6.09)
AGE	0.000 (0.77)	0.000 (0.84)	0.000 (0.62)	0.000 (0.68)
CASH	0.002 (0.86)	0.003 (1.34)	0.001 (0.54)	0.002 (1.03)
QUICK	-0.002 (-1.32)	-0.002 (-1.64)	-0.002 (-1.16)	-0.002 (-1.48)
CR	0.000 (0.36)	0.000 (0.48)	0.000 (0.51)	0.000 (0.64)
_cons	0.045** (2.18)	0.019 (0.82)	0.072*** (2.80)	0.041 (1.46)
Year FE	No	Yes	No	Yes
Industry FE	No	No	Yes	Yes
r2	0.040	0.053	0.070	0.084
r2_a	0.037	0.048	0.062	0.075
N	1980	1980	1980	1980

*Significant at 10%. **Significant at 5%. ***Significant at 1%

Source(s): Processed Data (2025) *CCD = climate change disclosure, BUSY = CEO busyness, CGI = corporate governance index, ROA = return on assets, ROE = return on equity, LEV = leverage, FAGE = firm age, AGE = CEO age, CASH = cash ratio, QUICK = quick ratio, CR = current ratio

Table 9 examines the moderating role of CGI on the relationship between BUSY and CCD. Specification 1 shows that BUSY has a positive and significant effect on CCD at the 1% level ($p < 0.01$), indicating that firms with busy CEOs tend to provide more climate-related information. In Specification 2, the interaction term BUSYXCGI is positive and statistically significant at the 10% level ($p < 0.10$), demonstrating that higher corporate governance quality strengthens the impact of CEO busyness on CCD. This implies that even when CEOs hold multiple board positions, effective governance structures can improve firm's environmental transparency and accountability.

Table 9. Moderating of Corporate Governance

	(1) CCD	(2) CCD
BUSY	0.029*** (4.01)	-0.023 (-0.94)
CGI	0.048*** (10.96)	0.037*** (5.42)
BUSYxCGI		0.016* (1.91)
LEV	-0.015** (-2.53)	-0.015*** (-2.65)
FAGE	0.001*** (4.30)	0.001*** (4.35)
AGE	-0.000 (-0.04)	-0.000 (-0.19)
CASH	0.001 (0.53)	0.001 (0.50)
QUICK	-0.001 (-0.59)	-0.001 (-0.78)
CR	0.000 (0.33)	0.000 (0.42)
_cons	-0.103*** (-3.49)	-0.066** (-2.08)
Year FE	Yes	Yes
Industry FE	Yes	Yes
r2	12.663	12.133
r2_a	0.139	0.140
N	1980	1980

*Significant at 10%. **Significant at 5%. ***Significant at 1%

Source(s): Processed Data (2025) *CCD = climate change disclosure, BUSY = CEO busyness, CGI = corporate governance index, ROA = return on assets, ROE = return on equity, LEV = leverage, FAGE = firm age, AGE = CEO age, CASH = cash ratio, QUICK = quick ratio, CR = current ratio

Table 10 investigates the relationship between CCD and FP, measured using ROA and ROE. The coefficients for CCD are positive and statistically significant at the 1% level ($p < 0.01$) across all model specifications, indicating that higher levels of CCD are linked to better firm performance.

Table 10. Regression Analysis: Climate Change Disclosure and Firm Performance

	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROE	(6) ROE	(7) ROE	(8) ROE
CCD	0.071*** (5.95)	0.072*** (5.95)	0.060*** (5.47)	0.060*** (5.46)	0.130*** (4.04)	0.129*** (4.01)	0.133*** (4.13)	0.133*** (4.09)
LEV	-0.127*** (-7.29)	-0.127*** (-7.31)	-0.127*** (-7.37)	-0.127*** (-7.41)	-0.025 (-1.28)	-0.022 (-1.10)	-0.025 (-1.26)	-0.022 (-1.08)
FAGE	0.000*** (2.58)	0.000*** (2.65)	0.000** (2.27)	0.000** (2.36)	0.000 (0.58)	0.000 (0.43)	0.000 (0.53)	0.000 (0.39)
AGE	0.000 (1.58)	0.000 (1.59)	0.000 (1.43)	0.000 (1.44)	0.001 (1.30)	0.001 (1.11)	0.001 (1.28)	0.001 (1.09)
CASH	0.003*** (3.56)	0.003*** (3.66)	0.002** (2.00)	0.002** (2.21)	0.004*** (3.46)	0.003** (2.01)	0.004*** (3.10)	0.003* (1.83)
QUICK	0.005*** (3.21)	0.005*** (3.25)	0.002 (1.30)	0.002 (1.29)	0.008*** (3.18)	0.004 (1.30)	0.008*** (3.22)	0.004 (1.38)
CR	-0.005*** (-4.60)	-0.006*** (-4.63)	-0.003** (-2.15)	-0.003** (-2.16)	-0.006*** (-2.99)	-0.002 (-0.71)	-0.005*** (-2.96)	-0.002 (-0.72)
_cons	0.050*** (3.01)	0.031 (1.57)	0.110*** (5.50)	0.087*** (3.98)	-0.015 (-0.37)	0.061 (1.23)	0.003 (0.06)	0.075 (1.27)
Year FE	No	Yes	No	Yes	No	No	Yes	Yes
Industry FE	No	No	Yes	Yes	No	Yes	No	Yes
r2	0.187	0.190	0.224	0.228	0.010	0.021	0.010	0.022
r2_a	0.184	0.186	0.217	0.220	0.006	0.013	0.005	0.013
N	1980	1980	1980	1980	1980	1980	1980	1980

*Significant at 10%. **Significant at 5%. ***Significant at 1%

Source(s): Processed Data (2025) *CCD = climate change disclosure, BUSY = CEO busyness, CGI = corporate governance index, ROA = return on assets, ROE = return on equity, LEV = leverage, FAGE = firm age, AGE = CEO age, CASH = cash ratio, QUICK = quick ratio, CR = current ratio

This research applies the CEM robust test to mitigate selection bias. Table 11 illustrates the CEM regression results to maintain the consistency and reliability of the main regression findings. The matching process balances characteristics between two groups: Group 0 (non-busy CEO) and Group 1 (busy CEO). Initially, Group 0 had 665 observations and Group 1 had 1,315. After applying CEM, 664 observations from Group 0 were successfully paired with those in Group 1, and 1,299 observations from Group 1 were matched with Group 0, leaving 1 observation in Group 0 and 16 in Group 1 unmatched. This indicates that the matched samples are well-balanced, allowing a fair comparison regarding CCD. The result shows a positive and significant effect of BUSY on CCD, with a coefficient of 0.028 and a t-value of 3.95 ($p < 0.01$). This finding reinforces the main regression results, indicating that firms led by busy CEOs tend to disclose more climate-related information.

Table 11. Robustness test – using the coarsened exact matching (CEM) method

PANEL A: Matching Summary		
	Non-Busy CEO = 0	Busy CEO = 1
All	665	1315
Matched	664	1299
Unmatched	1	16
PANEL B: Regression Result		
	(1)	CCD
BUSY	0.028***	(3.95)
CGI	0.048***	(10.94)
LEV	-0.015**	(-2.56)
FAGE	0.001***	(4.42)
AGE	0.000	(0.19)
CASH	0.001	(0.77)
QUICK	-0.001	(-0.89)
CR	0.000	(0.54)
_cons	-0.107***	(-3.65)
YEAR FE	Yes	
Industry FE	Yes	
r2	0.151	
r2_a	0.142	
N	1963	

*Significant at 10%. **Significant at 5%. ***Significant at 1%

Source(s): Processed Data (2025) *CCD = climate change disclosure, BUSY = CEO busyness, CGI = corporate governance index, ROA = return on assets, ROE = return on equity, LEV = leverage, FAGE = firm age, AGE = CEO age, CASH = cash ratio, QUICK = quick ratio, CR = current ratio

Table 12 provides the robustness test results using GLS. This method addresses potential heteroscedasticity and autocorrelation, ensuring the reliability of the regression results. The GLS regression shows that the coefficient of BUSY remains positive and statistically significant at the 1% level ($p < 0.01$), indicating that BUSY is associated with higher CCD. This finding confirms that the relationship between CEO busyness and CCD remains robust even after correcting for heteroscedasticity and autocorrelation.

Table 12. Robustness test – using the generalized least squares (GLS) method

	(1) CCD
BUSY	0.030*** (44.72)
CGI	0.042*** (51.61)
LEV	-0.011*** (-7.13)
FAGE	0.001*** (33.27)
AGE	-0.000*** (-10.21)
CASH	0.001** (2.06)
QUICK	0.000 (0.26)
CR	0.000 (0.43)
_cons	-0.077*** (-13.29)
Year FE	Yes
Industry FE	Yes
F	
p	.
r ² _p	
r ² _a	
N	1874

*Significant at 10%. **Significant at 5%. ***Significant at 1%

Source(s): Processed Data (2025) *CCD = climate change disclosure, BUSY = CEO busyness, CGI = corporate governance index, ROA = return on assets, ROE = return on equity, LEV = leverage, FAGE = firm age, AGE = CEO age, CASH = cash ratio, QUICK = quick ratio, CR = current ratio

Table 13 illustrates the robustness test results using the two-stage Heckman method, which addresses potential sample selection bias and verifies the reliability of the main regression findings. In the first stage, MEAN_BUSY is highly significant, indicating that the model effectively captures variation in BUSY across firms. In the second stage, BUSY remains positive and statistically significant at the 1% level, confirming that BUSY is associated with higher CCD. These consistent results suggest that the relationship between BUSY and CCD is not influenced by selection bias.

Table 13. Robustness test – using the two-stage Heckman method

	First Stage	Second Stage
	(1) CCD	(1) CCD
BUSY		
MEAN_BUSY	3.579*** (3.70)	
BUSY		0.028*** (3.56)
CGI	0.117*** (3.66)	0.046*** (8.33)
LEV	-0.109 (-1.46)	-0.013 (-1.23)
FAGE	-0.003 (-1.53)	0.001*** (4.23)
AGE	0.014*** (4.55)	-0.000 (-0.40)
CASH	-0.005 (-0.39)	0.001 (0.71)
QUICK	0.010 (0.74)	-0.001 (-0.57)
CR	-0.007* (-1.74)	0.000 (0.42)
MILLS		-0.030 (-0.49)
_cons	-2.984*** (-4.01)	-0.074 (-1.09)
Year FE	Yes	Yes
Industry FE	Yes	Yes
r2_p	0.039	
r2_a		0.139
N	1980	1980

*Significant at 10%. **Significant at 5%. ***Significant at 1%

Source(s): Processed Data (2025) *CCD = climate change disclosure, BUSY = CEO busyness, CGI = corporate governance index, ROA = return on assets, ROE = return on equity, LEV = leverage, FAGE = firm age, AGE = CEO age, CASH = cash ratio, QUICK = quick ratio, CR = current ratio

DISCUSSION

The first hypothesis is supported by evidence showing that directors who hold multiple board positions tend to possess stronger reputations and wider external networks (Thang & Anh, 2025), enabling firms to build valuable external connections that may enhance their environmental strategies (Zakiya & Arifin, 2024). As a central strategic leader, the CEO plays a decisive role in shaping the firm's environmental direction (Mahran & Elamer, 2024), and even when busy, the CEO remains influential in setting disclosure priorities. From a reputational standpoint, companies led by busy CEOs may be motivated to strengthen climate-related transparency to protect legitimacy across the multiple roles the CEO occupies (Do et al., 2017). Importantly, CEOs do not operate in isolation: strong corporate governance mechanisms can complement a busy CEO's limited time, ensuring that disclosure quality remains high through effective monitoring and advisory support (Sari, 2023). At the same time, the external environment has evolved regulatory expectations, investor demands, and environmental norms have intensified, meaning that busyness no longer automatically reduces transparency. Instead, a busy CEO may adapt to these pressures by prioritizing climate change disclosure as part of long-term strategic positioning (Arya & Ramanan, 2024). Although this perspective differs from the traditional busyness hypothesis, which argues that busy leaders weaken monitoring effectiveness (Ferris et al., 2003), recent findings suggest a more nuanced reality Lerner & Osgood (2023) report that busy boards can enhance the implementation of corporate climate policies, indicating that external engagements may provide access to legitimacy, knowledge, and resources supportive of environmental alignment. Consequently, a busy CEO's broader managerial experience, professional networks, and external exposure can ultimately strengthen the firm's climate reporting practices (Harymawan et al., 2022).

The results for the second hypothesis confirm that corporate governance significantly moderates the relationship between CEO busyness and climate change disclosure, indicating that H2 is supported.

The positive and significant interaction term shows that strong governance mechanisms enable busy CEOs to translate their external roles, networks, and reputational advantages into enhanced environmental transparency. Corporate governance provides the coordination, monitoring, and strategic alignment needed for firms to leverage the external knowledge and resources that busy CEOs bring. An interesting pattern appears in Table 9, Model (2): when the interaction term is included, the main effect of CEO busyness loses significance. This does not contradict the earlier findings but suggests that the influence of CEO busyness is not independent; it becomes observable only when the firm maintains a sufficient level of governance. From the perspective of Upper Echelons Theory, this is expected, as the theory emphasizes that managerial characteristics operate within organizational conditions. In this case, the effect previously attributed to CEO busyness is absorbed by the interaction term once governance quality is accounted for. This indicates that CEO busyness matters most when governance is strong enough to guide, support, and channel the CEO's external engagements toward meaningful climate-related disclosure outcomes.

The third hypothesis in this research is supported, indicating that firms with higher climate change disclosure tend to exhibit stronger firm performance. Firms that provide greater disclosure tend to build a strong reputation and attract greater consumer attention, which can, in turn, positively influence their financial performance (Chijoke-Mgbame et al., 2020). Transparent climate change disclosure enhances stakeholder confidence and supports better financial outcomes (Secinaro et al., 2020). Transparency in sustainability reporting serves as the main approach for firms to meet their obligations toward stakeholders, reflecting their commitment to accountability and responsible business practices (Octavio & Wicaksono, 2025). Voluntary disclosure practices can minimize information gaps between companies and stakeholders (Chakraborty & Sun, 2025). Firms with strong climate change performance tend to manage stakeholder relationships more effectively, fostering greater trust and collaboration with their stakeholders (Alshahrani et al., 2023).

CONCLUSION

This study investigates the influences of CEO busyness on climate change disclosure, with corporate governance as a moderating variable, as well as the influence of climate change disclosure on firm performance, using 1,980 firm-year observations of IDX-listed firms from 2020 to 2023. The findings confirm that CEO busyness positively and significantly affects climate change disclosure, indicating that CEOs with multiple external roles engage more actively in transparent reporting. Corporate governance positively strengthens this relationship, suggesting that strong governance mechanisms effectively channel CEOs' external experience and networks into improved disclosure practices. Climate change disclosure is also positively associated with firm performance, enhancing stakeholder confidence and overall firm outcomes. Robustness checks, including CEM, GLS, and the two-stage Heckman method, reinforce the consistency and reliability of these results. This study offers important theoretical and practical implications for key stakeholders, including firms. The findings support the Upper Echelons Theory by demonstrating that CEO characteristics shape strategic disclosure decisions. For practitioners, appointing a busy CEO can be beneficial when accompanied by robust governance mechanisms that mitigate potential monitoring weaknesses. The results also highlight the importance of enhancing governance structures and improving disclosure practices to ensure consistent, high-quality climate change reporting across firms. Overall, this research underscores the need to align executive characteristics with effective governance structures to improve transparency and support broader sustainability objectives.

However, this study has several limitations. First, the reliance on secondary data may not fully capture managerial judgment, motivations, and internal decision-making processes that influence climate change disclosure. Second, the measurement of climate change disclosure and CEO busyness relies on publicly reported data, which may be subject to reporting bias or inconsistencies across firms and may not fully reflect undisclosed positions held by CEOs in private companies, government bodies, or political organizations. Third, the relatively short observation period may limit the ability to capture long-term trends in climate change disclosure.

Future studies could integrate qualitative methods, such as interviews to capture managerial judgment and behavioral factors not observable through secondary data. Improving measurement approaches for instance, by using alternative disclosure indices or machine-learning-based text analysis may also help reduce potential reporting bias. Additionally, extending the observation period or examining regulatory changes over time would provide offer deeper insights into long-term trends in climate change disclosure.

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