

Climate Change Disclosure and Firm Value: The Moderating Role of Environmental Performance

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Abstract: This study investigates the influence of climate change disclosure on firm value, with environmental performance as a moderating variable. The sample consists of 63 industrial sector companies listed on the Indonesia Stock Exchange during 2021–2023. Climate change disclosure is measured using indicators adapted from the Task Force on Climate-Related Financial Disclosure (TCFD). Data were collected from annual reports, sustainability reports, and PROPER ratings, and analyzed using Moderated Regression Analysis (MRA). The findings reveal that climate change disclosure has a negative effect on firm value, indicating that disclosure alone may raise investor concerns by exposing risks, compliance costs, or environmental liabilities. However, environmental performance significantly and positively moderates this relationship, reducing the negative effect of disclosure. These results highlight that disclosure, when supported by strong environmental performance, serves as a credible signal of accountability and resilience, thereby improving firms' market perception of sustainability practices.

Keywords : Climate Change Disclosure; Environmental Performance; Firm Value; TCFD; PROPER

I. INTRODUCTION

Global warming and climate change represent two of the most pressing challenges confronting the world today. The planet currently faces what the United Nations (2023) and the World Health Organization (2024) describe as a “triple planetary crisis”: climate change, biodiversity loss, and environmental pollution. These interrelated issues are not only ecological but also social and economic in nature, demanding urgent responses from governments, businesses, and civil society at both local and global levels. Indonesia, as an archipelago nation endowed with rich biodiversity yet highly vulnerable to climate-related risks, bears a significant responsibility to contribute to mitigation and adaptation efforts. Policy frameworks such as Law No. 32 of 2009 on Environmental Protection and Management, Presidential Regulation No. 98 of 2021 on the implementation of carbon economic value, and Regulation No. 21 of 2022 on greenhouse gas reduction strategies demonstrate Indonesia’s commitment to align national actions with international frameworks such as the Paris Agreement.

Climate change has been identified as one of the six global priority areas of business sustainability (United Nations 2023). Rising levels of greenhouse gases (GHGs), including CO₂, CH₄, and

N₂O, resulting from industrial activities, transportation, and deforestation, have contributed to rising global temperatures. The Intergovernmental Panel on Climate Change (IPCC) reports that GHG concentrations are now at their highest levels in 800,000 years, largely due to human activities (AR6 Synthesis Report 2023). The effects are already visible: extreme weather events, floods, droughts, rising sea levels, wildfires, and biodiversity decline. These disruptions create direct risks for businesses across sectors, particularly those with intensive natural resource use, such as the industrial sector, which contributes significantly to deforestation, pollution, and resource depletion (Naseer et al., 2023).

In parallel, awareness of the environmental impacts of corporate activities has grown significantly. NGOs, environmental activists, and stakeholders demand accountability from companies (Daromes, 2020; Nurzaman & Muslim, 2023). Investors increasingly require transparency on environmental, social, and governance (ESG) risks, seeing them as material factors for long-term corporate value creation. In this context, climate change disclosure (CCD) has emerged as a vital communication mechanism. CCD refers to the voluntary or mandated reporting of a company’s exposure to climate risks, its

mitigation and adaptation strategies, and the opportunities created by the transition to a low-carbon economy. The Task Force on Climate-related Financial Disclosures (TCFD 2017) recommends four key components including governance, strategy, risk management, and metrics/targets that guide how companies should disclose such information. Unlike traditional carbon emission disclosure (CED), which focuses narrowly on reporting CO₂ emissions, CCD provides a broader view of how firms integrate climate concerns into strategic planning (Papa et al. 2016)

The importance of disclosure is underlined by legitimacy theory, which posits that companies seek to align their activities with societal norms and expectations to maintain public acceptance (Dowling and Pfeffer 1975; Gray, Adams, and Owen 1996). Disclosing climate-related risks and strategies allows firms to demonstrate compliance with societal values, thereby protecting their social “license to operate.” Complementarily, stakeholder theory suggests that businesses must address the needs and concerns of multiple stakeholders, ranging from shareholders to regulators and communities to ensure long-term survival (Freeman and Evan 1979; Gray et al. 1996) Both theories converge in explaining why disclosure has become a strategic necessity: it strengthens trust, reduces information asymmetry, and helps

firms secure legitimacy and resources from stakeholders.

Yet, disclosure alone may not be sufficient. Information without credible action risks being perceived as symbolic or “greenwashing.” This is where environmental performance plays a moderating role. Strong environmental performance provides tangible evidence that disclosures are backed by concrete action. (Koh, Li, and Tong 2023) defines environmental performance as encompassing principles, processes, and outcomes related to corporate environmental responsibilities. In practice, environmental performance is demonstrated through compliance with environmental regulations, implementation of sustainable practices, and attainment of certifications or awards (Bose et al., 2025; Daromes, 2020; Lukman & Nata, 2024). Environmental performance in this study is measured using the Company Performance Rating Program (PROPER) issued by the Ministry of Environment and Forestry, which evaluates firms on a five-color scale: gold (excellent), green (beyond compliance), blue (compliant), red (non-compliant), and black (environmentally damaging). (Gunawan and Berliyanda 2024). These ratings are publicly disclosed and have direct reputational consequences for firms. Higher PROPER ratings enhance corporate image, increase stakeholder trust, and potentially strengthen the link

between disclosure and firm value (Toumi 2025).

Firm value itself is a critical measure in corporate finance and sustainability discussions. According to Modigliani & Miller (1963), a firm's value is determined by its capacity to generate future profits and reflected in the market price of its shares. Market-based measures, such as Price to Book Value (PBV) which reflects investor perceptions of a company's performance and future prospects.(Hidayat, Triwibowo, and Vebrina Marpaung 2021; Rahmanita 2020). Because investors increasingly incorporate sustainability information into their decisions, disclosure and environmental performance have become central to explaining variations in firm value.

Prior empirical research, however, reveals inconsistent findings. Studies such as Vestrelli et al. (2024) and Pratama & Wijayanti, (2020) report a positive relationship between climate change disclosure and firm value, suggesting that transparency enhances investor confidence. Similarly, Said et al., (2024) find that disclosure strengthens financial reporting transparency, particularly when supported by institutional investors. In contrast, Anggraini (2019) reports that CCD negatively affects company performance, as disclosure may expose risks, compliance costs, or environmental liabilities that worry investors. Other studies highlight

moderating effects: Rahmanita, (2020) finds that environmental performance weakens the relationship between CCD and firm value, while Hardianti & Mulyani (2023) show that it strengthens the influence of firm size on value. Damas et al., (2021) further demonstrate that environmental performance moderates the negative effect of eco-efficiency on firm value. Collectively, these mixed results suggest that the impact of disclosure depends on contextual factors, such as environmental performance, institutional frameworks, and industry-specific risks.

This study builds on these theoretical and empirical foundations by examining the relationship between climate change disclosure and firm value, with environmental performance as a moderating factor. Hence, the study proposes two hypotheses:

H1: Climate change disclosure negatively affects firm value.

H2: Environmental performance positively moderates the effect of climate change disclosure on firm value.

Unlike much of the prior research that has focused broadly on corporate environmental disclosure (CED), this study emphasizes climate change disclosure as a distinct and multidimensional construct. Moreover, it investigates the moderating role of environmental performance using PROPER ratings

as a credible institutional measure in the Indonesian context. The industrial sector is chosen as the focus due to its significant contribution to emissions, environmental degradation, and exposure to climate-related risks (Naseer et al., 2023). The study period (2021–2023) is particularly relevant, as it coincides with Indonesia's introduction of major climate-related policies, including the carbon economic value framework and national action plans for greenhouse gas reduction.

Accordingly, this research makes three main contributions. First, it extends the literature by isolating CCD from broader CED or CSR constructs, providing a more precise analysis of climate-related reporting. Second, this study contributes to the literature by clarifying the moderating role of environmental performance, demonstrating that disclosure alone may not be sufficient to enhance firm value unless supported by tangible sustainability outcomes. These findings advance legitimacy and stakeholder theories by showing that credibility of disclosure depends on actual performance. Third, it enriches empirical evidence from emerging markets, particularly Indonesia, where climate policy, institutional enforcement, and market dynamics differ significantly from those in developed economies. These contributions are expected to provide both theoretical insights and practical guidance for regulators, investors,

and corporate managers navigating the challenges of climate change and sustainability.

II. RESEARCH METHOD

This research adopts a quantitative study of an associative-causal type relying on secondary data derived from publicly available corporate reports and government rating.

The population of this study consists of all industrial sector companies listed on the Indonesia Stock Exchange (IDX) during the period 2021–2023. The sample was determined using purposive sampling in order to obtain firms with complete and relevant data for analysis (Sugiyono 2018). The criteria applied are as follows: (1) Industrial sector companies that were consistently listed on the IDX between January 2021 and December 2023. (2) Companies that received a PROPER rating during the observation period. (3) Companies that published complete financial statements with a reporting period ending on December 31. (4) Companies that disclosed both annual reports and sustainability reports for the years 2021–2023. Based on these criteria, 21 firms were selected as the research sample. With three years of observation, the study resulted in 63 firm-year observations. This sampling approach ensures data completeness and comparability across the research variables.

Data were collected from secondary sources. Annual reports, financial statements, and sustainability reports were accessed through the official IDX website and corporate websites. Environmental performance data were obtained from the Ministry of Environment and Forestry's Program for Pollution Control, Evaluation, and Rating (PROPER) adopted from KLHK, (2021), which is also disclosed in corporate sustainability reports.

The independent variable in this study is climate change disclosure (CCD), which refers to the extent of corporate reporting on climate-related governance, strategy, risk management, and performance metrics. Measurement of CCD follows the disclosure index developed by the Task Force on Climate-related Financial Disclosures TCFD (2017). The TCFD framework is structured around four thematic pillars: (1) governance, (2) strategy, (3) risk management, and (4) metrics and targets, which collectively comprise 11 recommended disclosure items. In this study, each disclosure item is assigned a score of "1" if reported and "0" if not, with the disclosure index calculated as the total score divided by the maximum possible score.

The dependent variable is firm value, which captures the market perception of a company's worth and growth prospects. Firm value was measured using the Price to Book

Value (PBV) ratio, calculated as the market price per share divided by the book value per share. A higher PBV indicates greater investor confidence and stronger valuation of the company in the capital market.

The moderating variable is environmental performance (EP), which reflects a company's achievements in managing environmental responsibilities. Environmental performance was measured using the PROPER rating system issued by the Ministry of Environment and Forestry. The PROPER program categorizes companies into five performance levels represented by colors that are quantified into scores: Gold (5), Green (4), Blue (3), Red (2), and Black (1). These scores are used in this study to measure environmental performance (EP).

Data analysis was conducted using Moderated Regression Analysis (MRA), carried out with the aid of SPSS software. This method was chosen because it allows testing of the direct impact of climate change disclosure on firm value while also assessing whether environmental performance moderates the relationship (Ghozali 2018). Before conducting hypothesis testing, several classical assumption checks were performed, including tests for normality, multicollinearity, heteroscedasticity, and autocorrelation, to ensure that the

regression model met statistical requirements.

III. RESULTS AND DISCUSSION

The results of the descriptive statistical test from the research data are presented in the table below:

Descriptive Statistics					
	N	Min	Max	Mean	Std. Deviation
CCD	63	0.00	1.00	0.2587	0.27111
ROE	63	-0.38	1.15	0.2527	0.27022
ROA	63	-0.07	0.59	0.1597	0.16185
Value	63	0.35	22.3	1.9330	3.75373
PROPER	63	3.00	5.00	3.6984	0.79585
Valid N (listwise)	63				

Table 1. Descriptive Statistics

Table 1 presents the descriptive statistics of the study variables. Climate Change Disclosure (CCD) ranges from 0.00 to 1.00 with a mean of 0.2587, indicating that most firms disclose only limited climate-related information. Return on Equity (ROE) has a mean of 0.2527, ranging from -0.38 to 1.15, reflecting variations in profitability among firms. Return on Assets (ROA) averages 0.1597, with values between -0.07 and 0.59, suggesting differences in firms' efficiency in utilizing assets. Firm Value (PBV) shows the widest variation, from 0.35 to 22.30 with a mean of 1.9330, indicating substantial disparities in market valuation. Environmental Performance (PROPER) averages 3.6984, ranging from 3.00 (blue) to 5.00 (gold), showing that most firms fall within the compliance to superior categories. Overall, the results highlight low climate disclosure

practices, wide variation in firm value, and generally moderate to strong environmental performance among Indonesian industrial firms.

Table 2. One-Sample Kolmogorov-Smirnov

N	Asymp. Sig (2-tailed)	Explanation
63	0.065	Normal

Test

Based on the results presented in Table 2, the study utilized 63 observations. The normality test produced a statistic of 0.123 with a significance value of 0.065, which exceeds the 5% significance threshold ($\alpha = 0.05$). Accordingly, the residuals can be considered normally distributed, and the regression model meets the assumption of normality.

Table 3. Multicollinearity Test

Variable Name	Collinearity Statistics		Explanation
	Nilai Tolerance	VIF	
CCD	0.824	1.214	No Multicollinearity Occurred
ROE	0.141	7.089	
ROA	0.139	7.193	
PROPER	0.834	1.199	

As shown in Table 3, all independent variables exhibit tolerance values above 0.10 and VIF values below 10, indicating the absence of multicollinearity. Specifically, Climate Change Disclosure (CCD) has a tolerance of 0.824 and a VIF of 1.214, Return on Equity (ROE) has a tolerance of 0.141 and a VIF of 7.089, Return on Assets (ROA) has a tolerance of 0.139 and a VIF of 7.193, and Environmental

Performance (PROPER) has a tolerance of 0.834 and a VIF of 1.199. Since all values meet the commonly accepted thresholds, it can be concluded that the regression model is free from multicollinearity problems.

Table 4. Heteroscedasticity Test

Variable Name	Sig.	Explanation
CCD	0.328	No Heteroscedasticity Occurred
ROE	0.940	
ROA	0.960	
PROPER	0.569	

The results presented in Table 4 indicate that none of the independent variables significantly affect the absolute residuals (ABS_RES), as all significance values exceed the 0.05 threshold. This suggests that the regression model does not exhibit heteroscedasticity. In other words, the residuals are homoscedastic, and the model is considered appropriate for further analysis.

Table 5. Autocorrelation Test

Total Cases	Asymp. Sig (2-tailed)	Explanation
63	0.631	No Autocorrelation Occurred

As shown in Table 5, the run test yields a significance value of 0.631, which is greater than the 0.05 threshold. This result indicates that the residuals are randomly distributed, suggesting the absence of autocorrelation in the regression model.

Table 6. Simultaneous Test

Model	Df	F	Sig.
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Regression	5	11.117	0.000
Residual	57		
Total	63		

As presented in Table 6, the simultaneous test yields a significance value of 0.000, which is below the 0.05 threshold. This indicates that the regression model is statistically appropriate for predicting firm value. In other words, climate change disclosure, financial performance, and the interaction between climate change disclosure and environmental performance collectively exert a significant

Model	R	R Square	Adjusted R Square
1	.703 ^a	0.494	0.449

influence on firm value.

Table 7. Coefficient of Determination Test (R²)

As shown in Table 7, the Adjusted R² value is 0.449, meaning that climate change disclosure, financial performance, and environmental performance explain 44.9% of the variation in firm value. The remaining 55.1% is influenced by factors outside the model. Overall, the relationship between the independent and dependent variables can be considered moderate.

The results show in Table 8 states that Climate Change Disclosure (CCD) has a significant negative effect on firm value ($\beta = -19.705$, $t = -2.914$, $p = 0.005$). It shows a

Model	B	T	Sig
CCD	-19.705	-2.914	0.005
ROE	15.01	3.977	0.000
ROA	-12.086	-1.94	0.057
PROPER	-2.252	-3.275	0.002
CCD*PROPER	4.408	2.516	0.015

negative and significant relationship, supporting H1.

Table 8. Partial Test Results (t-Test)

The moderating role of Environmental Performance is also supported. The interaction term between CCD and Environmental Performance is positive and significant ($\beta = 4.408$, $t = 2.516$, $p = 0.015$). The finding indicates that Environmental Performance (EP) functions as a buffering moderator in the relationship between Climate Change Disclosure (CCD) and Firm Value, indicating that strong environmental performance mitigates the negative effect of disclosure and enhances market perception. Thus, H2 is accepted.

The Effect of Climate Change Disclosure on Firm Value

The findings of this study reveal that climate change disclosure (CCD) has a negative effect on firm value, thereby supporting the first hypothesis (H1). This result presents an important theoretical nuance.

According to Legitimacy Theory (Dowling and Pfeffer 1975), companies disclose environmental information to demonstrate conformity with social expectations and to safeguard their social license to operate. Similarly, Stakeholder Theory posits that disclosure serves as a mechanism to address the demands and concerns of various stakeholders including investors, regulators, communities, and civil society groups who exert influence over corporate survival and value creation (Freeman, 1984). Prior studies confirm this perspective, showing that disclosure is often associated with enhanced legitimacy and increased investor confidence (Pratama & Wijayanti, 2020; Vestrelli et al., 2024)

However, the present study provides evidence that in the industrial sector, disclosure is instead associated with a decline in firm value. From the perspective of Legitimacy Theory, this suggests that disclosure may not always achieve the intended goal of securing legitimacy, rather, it can expose the extent of a firm's environmental footprint and compliance risks, thereby reinforcing negative perceptions (Naseer et al., 2023). From the perspective of Stakeholder Theory, these findings reflect the heterogeneous expectations of stakeholders. While regulators and communities may demand disclosure to ensure accountability, investors as key stakeholders may interpret it as

exposing potential risks and liabilities. This illustrates the diverse stakeholder responses, where climate change disclosure can reduce confidence in firm performance.

This study finds that climate change disclosure reduces firm value in the industrial sector, indicating that stakeholders interpret such disclosure as highlighting environmental risks. This outcome is consistent with legitimacy and stakeholder theories, as disclosure alone may not restore legitimacy when a company's operations are closely linked to environmental degradation. In contrast, studies on non-industrial firms (Pratama and Wijayanti, 2020) report a positive effect, since in those sectors disclosure is more likely to be perceived as a genuine commitment to sustainability.

The contrast underscores that stakeholder responses depend on industry characteristics: in environmentally sensitive industries, disclosure may amplify concerns, whereas in less resource-intensive sectors it tends to enhance legitimacy and trust.

This result is consistent with stakeholder skepticism in environmentally sensitive industries, where disclosures may amplify concerns about environmental risks. For example, PT Aneka Tambang Tbk (ANTM) experienced a 5–8% decline in share price in June 2025 following environmental allegations against its subsidiary PT GAG Nickel

in Raja Ampat. Investors reacted negatively after operations were suspended, reflecting concerns over reputational and operational risks (Asnawi and Salman 2025; Kurnia 2025; Makki 2025). This case illustrates how disclosure of environmental issues can be perceived as a threat rather than reassurance, thereby reducing firm value. From a Stakeholder Theory lens, this illustrates how failure to meet stakeholder expectations, particularly local communities and regulators can generate reputational and financial consequences. From a Legitimacy Theory lens, the incident demonstrates that disclosures and external scrutiny can sometimes erode rather than reinforce legitimacy when stakeholders perceive corporate actions as environmentally destructive.

The negative effect of climate change disclosure on firm value in this study can be conceptually understood by examining the industrial sector's characteristics. Climate-related disclosures often draw attention to the firm's substantial environmental footprint, such as emissions, energy intensity, and natural resource exploitation. Rather than being viewed as a positive form of transparency, such disclosures may increase investor concerns regarding regulatory pressures, potential litigation, reputational damage, or future operational costs. Consequently, the

market interprets these disclosures as indicators of higher risk exposure, leading to a decline in firm value.

This outcome is consistent with legitimacy theory (Dowling and Pfeffer 1975), which argues that firms strive to maintain alignment with societal expectations. In environmentally sensitive industries, however, disclosure may instead highlight legitimacy gaps and amplify public scrutiny. Likewise, from the perspective of stakeholder theory (Freeman 1984), firms depend on the support of multiple stakeholder groups. If climate-related disclosures raise skepticism or heighten perceptions of environmental harm, stakeholders, particularly investors and affected communities may withdraw their support, resulting in reduced firm value.

The Moderating Role of Environmental Performance

The findings of this study indicate that environmental performance positively moderates the relationship between climate change disclosure and firm value, thereby supporting the second hypothesis (H2). This suggests that in the absence of strong environmental performance, climate change disclosure is perceived negatively by the market. However, when disclosure is accompanied by credible environmental performance, the negative effect is mitigated, and in

some cases, reversed into a positive impact on firm value.

This result highlights the importance of aligning symbolic disclosure with substantive environmental action. As Damas et al. (2021) emphasized, environmental disclosure without real performance can be counterproductive, signaling risks and liabilities. Conversely, disclosure backed by tangible environmental practices signals accountability, resilience, and long-term sustainability, which stakeholders reward with higher confidence and valuation.

A practical example is provided by PT Aneka Tambang Tbk (ANTAM), which has implemented concrete initiatives such as land reclamation, revegetation, biodiversity conservation, and responsible management of energy, emissions, water, and waste. These initiatives are not only disclosed in sustainability reports but are also externally verified through the PROPER program by the Ministry of Environment and Forestry. ANTAM's receipt of two Gold and two Green PROPER awards in 2023 (PT Aneka Tambang Tbk 2023) demonstrates that its environmental disclosures are backed by measurable performance and government recognition. This external validation strengthens the credibility of ANTAM's disclosures, reduces stakeholder skepticism, and enhances legitimacy, as stakeholders can trust

that the company's reporting reflects actual environmental practices rather than symbolic communication.

This finding aligns with stakeholder theory, which posits that a company's survival depends on fulfilling the expectations of diverse stakeholders, including communities, regulators, and investors (Freeman, 1984; Gray et al., 1996). Strong environmental performance demonstrates concrete actions that reassure stakeholders of the company's accountability (Daromes, 2020; Kelvin et al., 2017; Hardianti & Mulyani, 2023). In this sense, PROPER certification becomes an institutionalized symbol of trustworthiness and commitment to sustainable practices (Gunawan and Berliyanda 2024).

Legitimacy theory also helps explain this result. By aligning disclosure with real environmental performance, companies reduce public skepticism and mitigate legitimacy gaps that often arise when disclosures are perceived as symbolic or "greenwashing." Environmental performance not only strengthens legitimacy in the eyes of regulators and communities but also enhances investor confidence.

The results show that climate change disclosure (CCD) tends to reduce firm value unless supported by strong environmental performance (EP). Conceptually, disclosure makes environmental risks and liabilities more visible, which investors may

interpret as potential regulatory costs, reputational threats, or operational constraints. This explains why CCD alone can trigger negative market responses. However, when disclosure is accompanied by credible EP, it demonstrates that the firm is actively managing these risks, thereby enhancing the credibility of the disclosure and reducing its adverse impact on value.

This finding is consistent with legitimacy theory (Dowling and Pfeffer 1975), which highlights that firms must not only report but also align actions with societal expectations to maintain legitimacy. Disclosures unsupported by performance may be viewed as symbolic and undermine legitimacy, whereas performance-backed disclosures restore credibility. Similarly, under stakeholder theory (Freeman 1984) meeting stakeholder expectations requires both transparent communication and demonstrable responsibility. Thus, EP reinforces stakeholder trust and helps transform disclosure from a potential liability into a source of value creation.

IV. CONCLUSION

This study investigates the effect of climate change disclosure (CCD) on firm value and the moderating role of environmental performance, using evidence from 63 firm-year observations of industrial sector companies listed on the

Indonesia Stock Exchange during 2021–2023. The findings show that CCD has a significant negative effect on firm value, suggesting that investors perceive disclosure as an indication of environmental risk and potential regulatory or reputational costs. However, when CCD is accompanied by strong environmental performance as reflected in PROPER ratings the negative impact is mitigated, and the market response becomes more favorable. These results confirm that disclosure alone may be insufficient; substantive performance is required to generate positive stakeholder and market perceptions.

These findings provide both theoretical and practical contributions. From a theoretical perspective, they extend the application of Legitimacy Theory and Stakeholder Theory by demonstrating that disclosure alone may be perceived as symbolic, but when combined with credible environmental performance, it strengthens legitimacy and stakeholder trust. From a practical standpoint, the results highlight the importance for companies, particularly in resource-intensive industries, to align disclosure with substantive environmental actions to maintain competitiveness and enhance firm value.

The conclusions of this research are drawn within specific boundaries. CCD was measured using

the Task Force on Climate-Related Financial Disclosure (TCFD, 2017) framework, environmental performance was proxied by PROPER ratings, and the sample was restricted to the Indonesian industrial sector. These boundaries were chosen deliberately to ensure focus and consistency, yet they also open avenues for further research. Future studies may broaden the scope by employing alternative disclosure measures like carbon emission intensity or narrative disclosure analysis, comparing across sectors that are less resource-intensive such as financial or healthcare industries, or extending the setting to cross-country analysis. Additionally, incorporating other theoretical perspectives such as signaling theory or agency theory may enrich the understanding of how markets interpret climate-related disclosure and environmental performance.

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