JOGTA Journal of Governance, Taxation and Auditing
P-ISSN - 2830-6392 (PRINT)
E-ISSN - 2962-2522 (ONLINE)
JOURNAL OF GOVERNANCE, TAXATION AND AUDITING
Volume: 4
Number: 3
Page: 699 - 714
Article History:
eceived: 2025-11-22
Revised: 2025-12-08
Accepted: 2026-01-15

IMPACT OF RISK COMMITTEE ON CLIMATE CHANGE DISCLOSURE: THE MODERATING ROLE OF FEMALE BOARD

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Abstract:
This study examines the effect of the presence of a risk committee on climate change disclosure and investigates the moderating role of female board representation. The sample consists of 502 observations of non-financial companies that are listed on the Indonesia Stock Exchange (IDX) and that consistently published sustainability reports during the period 2019–2023. Climate change disclosure is measured using eleven indicators based on the Task Force on Climate-Related Financial Disclosures framework. The analysis employs panel data regression analysis with a moderating variable. The results indicate that the presence of a risk committee alone does not have a significant effect on the level of climate change disclosure. However, companies with female board members exhibit significantly higher levels of climate change disclosure. Furthermore, the moderating analysis reveals that Female Board representation weakens the positive influence of the risk committee on climate change disclosure, suggesting an overlap in monitoring and oversight functions related to environmental issues. This study is motivated by the inconsistent adoption of climate change disclosure practices among Indonesian companies despite increasing regulatory pressure on sustainability reporting. The findings contribute empirical evidence from an emerging market context by integrating corporate governance mechanisms, gender diversity, and climate-related transparency, and provide practical implications for designing more effective governance structures to enhance the quality of climate change disclosure.
Keywords: Climate Change Disclosure, Risk Committee, Female Board

INTRODUCTION

Corporate climate change has become an essential element of business transparency and accountability in the face of increasingly urgent and growing global environmental challenges. Climate-related disclosure functions not only as a medium for environmental impact communication but also as a strategic tool to increase stakeholders' trust, including investors, governments, and the public (TCFD, 2017). Despite increasing global attention, the quality and completeness of climate-related reporting still vary significantly, influenced by differences in corporate governance mechanisms (KPMG, 2022). The composition of the risk committee and the presence of female board members play a significant role in enhancing the credibility of environmental reporting.

The Intergovernmental Panel on Climate Change (IPCC, 2001, 2023) confirms that climate change is primarily driven by human activities such as greenhouse gas emissions, lifestyle, and consumption and production patterns. The widespread impact of climate change threatens ecosystem stability as well as economic and social welfare (Nathalia & Setiawan, 2022). Although various mitigation efforts, such as energy efficiency improvements, have been implemented, persistently high global energy consumption signals the need for stronger and more transparent

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climate change disclosure. Consequently, transparent and credible disclosure is increasingly viewed as a necessary corporate response.

In Indonesia, climate change disclosure practices are still developing and remain largely voluntary, despite increasing regulatory pressure and public awareness. Regulators such as the Financial Services Authority (OJK) have encouraged sustainability reporting through POJK No. 51/POJK.03/2017. The level of detail, consistency, and quality of climate change disclosure among Indonesian companies varies significantly (KPMG, 2022). Many firms still provide a symbolic or generic climate-related information, rather than comprehensive disclosure aligned with international standards such as TCFD or GRI (Ngo et al., 2023). Therefore, climate change disclosure in Indonesia remains an empirical issue that is highly relevant and still open to further investigation, particularly from a corporate governance perspective.

Corporate governance mechanisms play a crucial role in shaping climate change disclosure, especially governance structures related to risk oversight. This mechanism is the risk committee, which is responsible for overseeing corporate risk management policies and disclosures. Prior studies document a positive and significant relationship between the presence of a risk committee and the quality of climate change disclosure, indicating that stronger risk oversight improves transparency and accountability (Al-Hadi et al., 2016; Ararat & Sayedy, 2019). However, other studies report insignificant results, suggesting that the effectiveness of the risk committee may depend on contextual factors such as board characteristics (Ooi et al., 2019). Given that climate change represents a complex and long-term risk, an effective risk committee is expected to provide stronger oversight and encourage more comprehensive climate change disclosure. Thus, the presence and effectiveness of the risk committee are closely linked to companies climate change disclosure practices.

In addition to gender diversity on boards, the presence of female board members has been increasingly recognized as a governance attribute that enhances board effectiveness and sustainability orientation. Female board members are generally considered more risk-averse, more ethically sensitive, and more supportive of transparent and comprehensive environmental disclosure (Fauzi et al., 2017; Gonenc & Krasnikova, 2022). Their presence may foster more rigorous discussions and improve the quality of board oversight related to environmental risks. Therefore, the female board is expected to strengthen the effectiveness of the risk committee by reinforcing its role in promoting credible and transparent climate change disclosure.

This study aims to investigate the moderating role of female board members on the relationship between the risk committee and climate change disclosure, particularly in Indonesia. This research integrates governance mechanisms with gender diversity perspectives. Which is expected to contribute to corporate governance and sustainability, and provide practical implications for policymakers and companies in improving climate-related accountability and transparency.

Climate change disclosure can be explained through agency theory, legitimacy theory, and stakeholder theory, which can provide a comprehensive foundation in understanding corporate environmental reporting. Agency theory suggests that disclosure reduces information asymmetry between managers and stakeholders (Yadav, 2024). Legitimacy theory argues that companies disclose environmental information to align and maintain their operations with social acceptance (Deegan, 2002). Meanwhile, stakeholder theory highlights that companies are accountable to a broad range of stakeholders who increasingly demand transparency regarding climate change disclosure and impacts (Eccles et al., 2014). Within this framework, climate change disclosure has emerged as a critical governance mechanism to ensure transparency and accountability.

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The emphasis on climate change disclosure has encouraged research into several factors that affect the quality, depth, and transparency of such disclosures. Corporate governance, particularly the composition of risk committees, has emerged as a determinant of the importance of disclosure practices. These issues can be explained through agency theory, stakeholder theory, and legitimacy theory, which emphasize the importance of corporate governance in influencing climate change disclosure. In this context, risk committee and female board play an important role in strengthening oversight, improving transparency, and helping companies meet stakeholder expectations and maintain legitimacy through credible climate related reporting.

Growing concerns over climate change disclosure have prompted public awareness of environmental protection and encouraged companies to gradually adopt environmentally responsible practices. One of the main responses to this pressure is expansion of CCD, which allows firm to communicate the environmental impact of their operations (Giannarakis et al., 2017). CCD provides a clear picture of corporate transparency regarding the environmental impacts of business activities. When aligned with internationally recognized framework such as the TCFD and the GRI, such disclosure improve the credibility, comparability, and usefulness of information for stakeholders (Global Reporting Initiative (GRI), 2022; Meng et al., 2014; TCFD, 2017). In addition to strengthening corporate reputation, CCD signals a firm commitment to sustainability while helping stakeholders. Which is in line with legitimacy theory, where CCD serves as a strategic response to social and regulatory pressure, enabling companies to maintain legitimacy by aligning with environmental norms and public expectations.

The importance of CCD is especially clear in countries that are highly vulnerable, such as Indonesia. As a country made up of many islands, Indonesia faces significant threats from rising temperatures and sea level rise, which may endanger public assets if proper adaption measures are not implemented (Lukito et al., 2019). According to IPCC, Indonesia is among more than 100 countries that have adopted, announced, or discussed commitments to achieve zero greenhouse gas emissions, including through the submission and periodic updates of its Nationally Determined Contribution (NDC) in 2015 under the Paris Agreement. Furthermore based on Third National Communication (TNC) report, Indonesia has set emission reduction targets of 29% unconditionally and up to 41% with international support by 2030, with mitigation efforts focused on the forestry, land-use, and energy sectors that account for the majority of national emissions (Government of Indonesia, 2022). In this context, CCD serves as an important mechanism linking public climate policy with corporate accountability, as clear and transparent disclosure aligned with global standards not only strengthens corporate reputation but also reflects firm's commitment to sustainability. Therefore, encouraging greater transparency as part of corporate environmental responsibility (Iriyadi & Antonio, 2021; Siew, 2020).

Risk committee is a committee that supports the board in overseeing corporate risk policies, risk identification, and risk management practices, including sustainability related risk (Erin et al., 2023). The existence of a risk committee is widely regarded as a governance mechanism that enhances oversight by focusing on risk mapping and determination of corporate risk (Ganesan et al., 2019). In the context of corporate reporting, risk committee can promote greater transparency by identifying

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material risks that should be disclosed to stakeholders (Ayuningtyas & Harymawan, 2022). Empirical studies show that companies with risk committee tend to provide risk disclosures more explicit in their reports. Furthermore, the effcectiveness of risk committee play a critical role in determining risk disclosure quality. Consistent wiht legitimacy theory, an effective risk committee enhances transparency and accountability, in helping companies maintain legitimacy in managing material risks.

Female board representation has been increasingly recognized as an important corporate governance mechanism influencing CCD practices (Naciti et al., 2022). Prior literature suggests that FEMBOARD tend to be more stakeholder oriented, more risk averse, which enhances board attention to CCD and enviromental accountability (Muttakin et al., 2019). Consequently, corporate with greater FEMBOARD participation are more likely to disclose CCD in more transparent and comprehensive manner to meet stakeholder expectations. Thus, FEMBOARD tend to provide clearer CCD, which helps reduce information gaps related to enviromental and CCD.

Risk Committee and Climate Change Disclosure

An improvement in corporate governance is highly dependent on the role of the risk committee, with RC that meet quality standards effectively and efficiently can help the company in achieving business objectives and improving the quality of financial statements and maintaining the Company's reputation (Subramaniam et al., 2009).

The risk committee plays a strategic role in strengthening board oversight by systematically identifying, monitoring, and evaluating corporate risks, including those related to CCD. RC improves transparency and reduces information gaps in corporate reporting, thereby limiting potential conflicts of interest in CCD practices (Muqorobin et al., 2024). Empirical evidence consistently demonstrates that corporate with a dedicated and independent RC exhibit higher quality and more extensive on CCD, as such committees elevate board level attention to environmental risk management and accountability (Ardianto et al., 2023; Jia et al., 2019). In addition, when risk oversight is assigned to a focused RC rather than a joint committee, responsibility allocation becomes clearer and monitoring is more effective by supporting faster and more comprehensive adoption of CCD (Hossain & Farooque, 2019). Therefore, we propose the following hypothesis:

H1: There is positive association between risk committee and climate change disclosures.

Female board and climate change disclosure

Board that includes a higher proportion of female representation are generally associated with stronger commitments to environmental reporting, as their presence often encourages more comprehensive practices and greater transparency, particularly when it comes to disclosing climate change disclosure. A higher proportion of female board is significantly and positively associated with voluntary CCD among companies (Gonenc & Krasnikova, 2022). Companies that follow the TCFD framework shows that having more FEMBOARD has a positive association with CCD (Dias et al., 2024). A company with at least three FEMBOARD tend to achieve much higher ESG, particularly in the environmental aspect, which also supports stronger CCD and in contrast having

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only one or two FEMBOARD is less effective. This indicates that FEMBOARD bring values, risk sensitivity that pushes companies toward greater transparency in climate issues. Therefore, we propose the following hypothesis:

H2: There is positive association between female board and climate change disclosures.

Moderating Role of Female Board on Risk Committee and Climate Change Disclosure

The presence of FEMBOARD has the potential to influence how RC promote transparency CCD (Pucheta-Martínez & Gallego-Álvarez, 2024). Boards with higher proportion of FEMBOARD are likely to engage in sustainability practices, including RC (Gonenc & Krasnikova, 2022). Companies with higher FEMBOARD tend to produce a clearer and more accurate climate change disclosure (Anand et al., 2023). These findings highlight that FEMBOARD play an important role in developing clear and transparent strategies for sharing information about CCD. The moderating effect of having FEMBOARD on becomes especially clear when companies disclose information about CCD.

Boards with a higher proportion of FEMBOARD are more likely to strengthen the effectiveness of RC in fostering a transparent CCD due to their enhanced oversight and ethical orientation (Dias et al., 2024). FEMBOARD is associated with greater attention to climate related reporting practices and sustainability frameworks, highlighting the positive role in improving the quality and transparency of CCD. Thus, the presence of FEMBOARD may not only enhance independence and ethical orientation but also helps deal with CCD. Therefore, we propose the following hypothesis:

H3: The presence of female board positively moderates the relationship between risk committee and climate change disclosure.

METHODS

The dependent variable in this research is the climate change disclosure. These disclosures are measured by an index recommended by the TCFD, which includes 11 main types of disclosures. The complete list of 11 main types of disclosure can be found in Table 1. The disclosure is grouped into four main dimensions, namely

- Governance (G1 and G2) describes the corporate governance structure in dealing with the issue of climate change.
- Strategy (S1, S2, and S3) contains the company's strategy in anticipating the impact of climate change on its business.
- Risk management (R1, R2, and R3), explain the company's approach to identifying, assessing, and managing climate change-related risks.
- Metrics and targets (M1, M2, and M3) contain the metrics and targets that companies use to measure and monitor climate change-related performance.

Table 1. Climate Change Disclosure

CCD	Indicator	Measurement
Governance	Board Oversight (G1)	Disclosure of the board's oversight of climate related risks
	Management Role (G2)	Disclosure of management role in managing climate related risks

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Strategy	Risk and Opportunities (S1)	Identification of climate related risks and opportunities across different time short, medium, and long term
	Organizational Impact (S2)	Disclosure of the impact of climate related issues on business strategy and operations
	Resilience of Strategy (S3)	Disclosure of strategic resilience under climate related scenarios
Risk Management	Risk ID (R1)	Disclosure of processes to identify and assess climate related risk
	Risk Management Processes (R2)	Disclosure of processes to manage climate related risk
	Integration into Overall Risk Management (R3)	Disclosure of the integration of climate related risks into overall risk management
Metrics and Targets	Climate Related Metrics	Disclosure of metrics used to assess climate related risk and opportunities
	Scope 1, 2, and 3 GHG	Disclosure of Scope 1, Scope 2, and relevant Scope 3 GHG Emissions.
	Climate Related Targets	Disclosure of targets related to climate related risks and performance

Source: Research Data (2025)

Independent variables in this research are the risk committee. This variable was measured using the dummy method, where RC is rated 1 if the company has a separate risk committee, and 0 if there is none. This method is used to facilitate the analysis of the influence of the presence of RC on climate change disclosure.

Female board as a moderating variable is measured using a dummy variable that equals 1 if the company has at least one female board member during the observation year, and 0 if there is none. This measurement approach is commonly used in prior corporate governance and sustainability studies to capture the presence of gender diversity at the board level and its influence on disclosure practices.

Lastly, this study includes five control variables: firm size (SIZE), return on assets (ROA), leverage (LEV), firm age (FAGE), and commissioner independent (COMIND). SIZE is measured using the natural logarithm of the company's total assets. ROA measures a company's profitability. LEV represents the company's financial leverage, measured by dividing total liabilities by total assets. FAGE indicates the length of time a company has been in operation, calculated by deducting the year of establishment from the year of observation. COMIND is determined based on the proportion of independent commissioners in the board of commissioners (Heykal et al., 2024).

The sample selection process started by gathering annual report data from 902 firms listed on the Indonesia Stock Exchange (IDX) that have a sustainability report and annual report for the period 2019-2023. The research conducted is quantitative. However, this research does not involve companies engaged in the financial sector due to the unique characteristics of financial ratios. The sample data taken is company data that has a sustainability report for 5 consecutive years.

To ensure the accuracy of the variables used, data related to CCD, RC, and other measurements were collected manually from the company's annual reports. This method offers a greater reliability compared to using external financial databases, which may have incomplete information. Using direct source documents, this study can obtain comprehensive and detailed

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insights into financial information. That can ensure a more accurate understanding of the information presented.

Table 2. Sample collected from the industry

IDX Industry	Observations
Energy	68
Basic Materials	89
Industrials	27
Consumer non-cyclicals	84
Consumer Cyclicals	52
Healthcare	35
Properties & Real Estate	26
Technology	4
Infrastructures	97
Transportation & Logistic	20
Total Observation	**502**

Source: Research Data 2025

The process of determining the final sample was conducted through a series of systematic steps to ensure the data used in this study were accurate and relevant. Initially, companies that were newly listed during the observation period were excluded, as they did not provide sufficient historical data for observations. In addition, companies that did not publish or were unavailable in the public domain for five years straight were omitted from the observation model, while those operating in the financial sector were also excluded as sample observations. After applying these criteria, a total of 502 observations were used for this study.

This study uses three regression models, as shown below, to examine the direct and moderating effects such as below.

Climate Change Disclosure.

$$CCD = \beta0 + \beta1CCD + \beta2RC + \beta3FSIZE + \beta4ROA + \beta5LEV + \beta6FAGE + \beta7COMIND + \beta8FIRMAGE + \varepsilon$$

Climate Change Disclosure with FEMBOARD.

$$CCD = \beta0 + \beta1CCD + \beta2RC + \beta3FEMBOARD + \beta4FSIZE + \beta5ROA + \beta6LEV + \beta7FAGE + \beta8 COMIND + \varepsilon$$

Regression with moderating variables.

$$CCD = \beta0 + \beta1CCD + \beta2RC + \beta3FEMBOARD + \beta4RCXFEMBOARD + \beta5FSIZE + \beta6ROA + B7LEV + \beta8FAGE + \beta9COMIND + \varepsilon$$

RESULT AND DISCUSSION

Table 3 presents descriptive statistics of all research variables utilized in this study. The analysis shows that CCD had an average value of 0.390, indicating a variation in the level of disclosure of information related to climate change among the companies studied. It indicates that

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there are still companies with very low disclosure rates, although some others have implemented full disclosure. The company size (FSIZE) has an average value of 29,462, which reflects that there is a significant difference in size between companies. It reflects that the companies in the sample have quite diverse asset scales, ranging from small companies to large companies, indicating a significant difference in company size that may influence the extent to which they are able to disclose information, including on climate change issues. The profitability variable measured through Return on Assets (ROA) showed an average value of 0.035, indicating a considerable difference in the level of financial performance among the sample companies.

Table 3. Descriptive statistics of model variables

	N	Mean	Standard Deviation	Minimum	Median	Maximum
CCD	502	0.390	0.323	0.091	0.091	1.000
FSIZE	502	29.462	1.887	24.570	28.087	33.731
ROA	502	0.035	0.142	-1.277	0.003	1.000
LEV	502	0.479	0.294	0.003	0.293	2.400
FAGE	502	35.299	19.889	4.000	19.000	110.000
COMIND	502	0.438	0.114	0.200	0.333	1.000

Source: Research Data 2025

Furthermore, the leverage (LEV) has an average of 0.479 with a standard deviation of 0.294, indicating the existence of variations in capital structure where some companies have a high debt dependency. The average firm age (FAGE) is approximately 35,299 years, with values spanning from a minimum of 4 years, a median of 19 years, and a maximum of 110 years, which indicates that the sample consists of companies with varying levels of operational maturity, ranging from new companies to those that have been operating for quite some time. Meanwhile, the proportion of independent committees (COMIND) has an average of 0.438, ranging from 0.200 to 1,000, indicating that most companies have independent committees of about 43.8% of the total committee members.

Table 4. Descriptive statistics of model variables

Variable	Category	Frequency	Percentage (%)
RC	Non-RC	352	70.12
	RC	150	29.88
FEMBOARD	Non-Femboard	249	49.60
	Femboard	253	50.40

Source: Research Data 2025

Table 4 summarizes the descriptive statistics for dummy variables. Approximately 29.88 percent of the companies in the sample have an RC, while the remaining 70.12 percent do not. It indicates that most companies have not yet established a specific risk committee, but a considerable number of companies have started to include RC management as part of their governance practices. Regarding FEMBOARD, only 50.40 percent of firms have at least one female member on the board of directors, while 49.60 percent do not. This nearly balanced distribution, it indicates that gender diversity at the board of directors' level is increasingly recognized in corporate governance practices. Overall, these results suggest that the establishment of RC is still relatively limited among companies, while the presence of FEMBOARD shows positive signs of improvement.

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Table 5 presents the Pearson correlation results. The results show that CCD is positively correlated with FEMBOARD (r = 0.118, p < 0.01). Suggesting that companies with FEMBOARD have a higher probability to engage in climate change disclosure (Ararat & Sayedy, 2019b). Meanwhile, RC (r = -0.093, p < 0.01) is negatively correlated with CCD. These results imply that the presence of RC tends to disclose less information related to climate change and does not necessarily translate into greater transparency in sustainability reporting. Meanwhile, are positively correlated with CCD.

Regarding control variables, COMIND is positively associated with CCD (r = 0.075, p < 0,1). It indicates that the higher the proportion of independent commissioners on the board, the greater the tendency of companies to disclose information related to CCD (Ararat & Sayedy, 2019). Return on assets (ROA) also has a positive and significant relationship with CCD (r = 0.078, p < 0.1), which means the higher the ROA, the more likely a company is to conduct climate change disclosures (Saraswati et al., 2021). Conversely, both FSIZE and LEV (r = -0.155, p < 0.01) and (r = -0.086, p <0.1) are negatively correlated with CCD. It shows that larger companies with high levels of debt tend to limit the disclosure of climate information due to organizational complexity, financial burdens, and prudence to avoid the spotlight and reputational risks. In contrast, variables such as FAGE do not show consistent or meaningful correlations with CCD.

Overall, the results of these descriptive statistics show considerable variation in each variable, which gives an idea that the research sample consists of companies with diverse characteristics, both in terms of size, profitability, capital structure, company age, and proportion of independent committees, so that the next analysis can provide more representative results on the relationship between the research variables.

Table 5. Pearson Correlation

	CCD	RC	FEMBOARD	RCXFEMBOARD	FSIZE	ROA	LEV	FAGE	COMIND
CCD	1.000								
RC	-0.093**	1.000							
	(0.036)								
FEMBOARD	0.118***	-0.005	1.000						
	(0.008)	(0.907)							
RCXFEMBOARD	-0.071	0.642***	0.416***	1.000					
	(0.112)	(0.000)	(0.000)						
FSIZE	-0.155***	0.379***	-0.066	0.244***	1.000				
	(0.000)	(0.000)	(0.138)	(0.000)					
ROA	0.078*	-0.031	0.139***	0.002	0.191***	1.000			
	(0.082)	(0.482)	(0.002)	(0.972)	(0.000)				
LEV	-0.086*	0.270***	-0.098**	0.061	0.260***	-0.282***	1.000		
	(0.054)	(0.000)	(0.028)	(0.175)	(0.000)	(0.000)			
FAGE	-0.007	0.251***	0.134***	0.331***	0.425***	0.129***	0.171***	1.000	
	(0.872)	(0.000)	(0.003)	(0.000)	(0.000)	(0.004)	(0.000)		
COMIND	0.075*	0.168***	0.056	0.101**	0.015	0.039	0.166***	0.139***	1.000
	(0.092)	(0.000)	(0.211)	(0.024)	(0.730)	(0.387)	(0.000)	(0.002)	

p-values in parentheses
* p < 0.1, ** p < 0.05, *** p < 0.01
Source: Research Data 2025

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JOURNAL OF GOVERNANCE, TAXATION AND AUDITING

Table 6. Regression Results

	(1) CCD	(2) CCD	(3) CCD
RC	-0.003	-0.002	0.086*
	(-0.08)	(-0.06)	(1.87)
FSIZE	-0.038***	-0.035***	-0.034***
	(-3.81)	(-3.58)	(-3.46)
ROA	0.269	0.228	0.158
	(1.54)	(1.32)	(0.90)
LEV	-0.040	-0.036	-0.066
	(-0.69)	(-0.61)	(-1.15)
FAGE	0.001	0.001	0.001
	(1.10)	(0.72)	(1.21)
COMIND	0.282**	0.279**	0.266**
	(2.10)	(2.08)	(2.04)
FEMBOARD		0.064**	0.115***
		(2.30)	(3.34)
RCxFEMBOARD			-0.175***
			(-2.68)
_cons	1.392***	1.295***	1.224***
	(4.69)	(4.40)	(4.20)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
r2	0.110	0.119	0.132
r2_a	0.075	0.082	0.095
N	502	502	502

t statistics in parentheses
* p < 0.1, ** p < 0.05, *** p < 0.01
Source: Research Data 2025

Table 6 presents the regression analysis of how the independent variables influence CCD, with FEMBOARD as a moderating variable. The findings are discussed below for each propose hypothesis.

Column 1 presents the relationship between CCD and RC. The coefficient of RC is negative and statistically insignificant (β = -0.003, t = -0.08). These findings show that the presence of RC alone does not significantly influence companies to increase transparency related to CCD. It may occur because RC remains heavily oriented toward managing operational and financial risk, causing environmental considerations to receive less attention. Existing studies also highlight that numerous RCs still operate using traditional approaches and have not yet incorporated CCD into their governance and oversight functions. It is consistent with evidence that climate governance integration remains limited in many companies (Amran et al., 2014). Overall, the insignificant effect indicates that without explicit climate governance responsibilities, RC alone may not drive improvements in climate change disclosure.

Column 2 shows that RC remains negative (β = -0.002, t = -0.06), while the coefficient of FEMBOARD is positive and statistically significant (β = 0.064, t = 2.30). This finding indicates that boards with higher female representation are more likely to produce a comprehensive and transparent CCD. FEMBOARD is usually more sensitive to ethical issues and more aware of

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environmental matters, which can improve their climate-related reporting (Liao et al., 2015). The results support the view that FEMBOARD contributes positively to the company's commitment to climate change reporting. The presence of FEMBOARD weakens the influence of RC on CCD. Interpretively, these findings indicate a potential overlap in functions between FEMBOARD and RC in terms of sensitivity to environmental issues. When companies have a FEMBOARD with high representation of women, sensitivity and encouragement for sustainability issues arise naturally from the board level, so the role of RC is no longer dominant.

Table 7. Hypothesis Testing (Direct Effects)

Hypotheses	Path	Predicted Sign	Decision
H1	RC → CCD	+	Unsupported
H2	FEMBOARD → CCD	+	Supported

Source: Research Data (2025)

Column 3 shows that RC becomes positively associated with CCD and statistically significant (β = 0.086, t = 1.87). It indicates that RC may play a more active role in CCD when climate issues are integrated into a broader risk framework. Furthermore, FEMBOARD maintains a positive and significant influence on CCD (β = 0.115, t = 3.34). Indicating that FEMBOARD contributes to more detail on climate reporting. Meanwhile, the moderation effect of RCXFEMBOARD is negative and statistically significant (β = -0.175, t = -2.688). These findings indicate that FEMBOARD representation weakens the positive effect of RC. Although both variables enhance climate transparency, their combination may lead to overlapping monitoring behaviours regarding climate reporting. Gender diverse boards tend to adopt cautious, risk-averse, and highly ethical decision-making styles (Glass & Cook, 2018; Pletzer et al., 2015). As a result, when there are already many FEMBOARDs, the RC role in improving CCD becomes less important.

Table 8. Moderation Analysis

Hypothesis	Interaction	β	p-value	Decision
H3	RC x FEMBOARD → CCD	-0.175		Supported

Source: Research Data (2025)

To address concerns related to potential endogeneity and sample imbalance, an additional analysis was conducted using the Coarsened Exact Matching (CEM) technique. This method enhances the comparability between treatment and control groups by matching companies with similar observable characteristics. By reducing bias from observable differences across companies, the CEM method provides a more rigorous setting to reassess the relationship between corporate governance mechanisms and climate change disclosure.

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Table 9. Coarsened Exact Matching Test

	(1) CCD
RC	0.166**
	(2.51)
FEMBOARD	0.163***
	(2.97)
RCxFEMBOARD	-0.272***
	(-2.96)
FSIZE	-0.048**
	(-2.31)
ROA	0.744
	(1.55)
LEV	0.238*
	(1.89)
FAGE	0.002
	(1.03)
COMIND	0.239
	(0.86)
_cons	1.442**
	(2.34)
F	3.150
r2_a	0.071
N	226

t statistics in parentheses
* p < 0.1, ** p < 0.05, *** p < 0.01
Source: Research Data (2025)

As presented in Table 8, the CEM-based regression results indicate that the main effects remain consistent with the baseline findings. Specifically, RC shows a positive and statistically significant association with CCD (β = 0.166, t = 2.51), suggesting that firms with a stronger risk committee tend to provide more extensive climate-related disclosure. Similarly, FEMBOARD exhibits a positive and significant effect on CCD (β = 0.163, t = 2.97), supporting the role in enhancing transparency and sustainability reporting practices.

However, the interaction RCXFEMBOARD is negative and statistically significant effect on CCD (β = -0.272, t = -2.96), indicating that FEMBOARD weakens the positive effect of the risk committee on CCD. This finding suggests a potential substitution effect between governance mechanisms, where overlapping monitoring roles may reduce the marginal influence of RC on CCD.

CONCLUSION

The results of this study show that several corporate governance factors play an important role in shaping climate change disclosure. Although the presence of a risk committee (RC) does not significantly increase CCD on its own, this finding suggests that many RCs still focus on traditional operational and financial risk rather than integrating environmental risk (Josiah Oyekale et al., 2022). In contrast, female board members consistently demonstrate a positive influence on CCD, supporting the view that women tend to display stronger ethical awareness and greater sensitivity

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toward sustainability issues (Caby et al., 2024; Gonenc & Krasnikova, 2022). At the same time, the moderating analysis reveals that FEMBOARD presence weakens the positive effect of RC on CCD, likely due to overlapping monitoring functions between the board and the committee, which reduces the additional value that RC could provide. These findings highlight the need for a company to assign who is responsible for climate-related reporting so that tasks do not overlap and oversight can run more efficiently. Overall, this study emphasizes the importance of gender diversity and well-structured governance mechanisms in improving climate transparency and encourages companies to strengthen their climate reporting as part of broader sustainability efforts.

In addition, the findings show that CCD is more effective when corporate governance mechanisms are well coordinated, rather than simply being formally established. The negative moderating effect of FEMBOARD on the relationship between RC and CCD suggests that different governance mechanisms can replace each other in promoting sustainability. FEMBOARD may directly encourage climate transparency through discussions at the board level, which reduces the additional role of a specialized committee such as RC. It indicates that companies with strong ethical values and high sustainability awareness may not need to rely heavily on RC to improve disclosure (Ardianto et al., 2023). From a theoretical perspective, this finding supports stakeholder and legitimacy theories, which emphasize that shared values and norms within governance can be as important as formal monitoring mechanisms in shaping disclosure practices.

This study examines the role of corporate governance mechanisms in shaping CCD among non-financial companies listed on the Indonesia Stock Exchange (IDX). The findings indicate that the presence of RC alone does not significantly enhance the level of CCD, which shows that many RC continue to focus primarily on traditional operational and financial risks rather than fully integrating environmental and climate-related issues into their governance framework. In contrast, FEMBOARD representation shows a consistently positive and significant influence on CCD, highlighting the importance of gender diversity in strengthening ethical awareness, stakeholder orientation, and transparency in sustainability reporting (Gonenc & Krasnikova, 2022). These results provide strong empirical evidence that gender diversity plays a more decisive role in promoting climate transparency than the mere existence of specialized governance committees.

Furthermore, the moderating analysis reveals that FEMBOARD weakens the relationship between RC and CCD, indicating a potential overlap or substitution in monitoring functions related to climate issues. When awareness of sustainability is already strong at the board level, the role of RC becomes less critical, as many climate-related decisions are already addressed by the board itself. These findings highlight the importance of clearly dividing responsibilities between the board and committees so that tasks do not overlap and oversight can be carried out more efficiently. For companies, this means that clear accountability for climate-related reporting is needed, while for regulators, the results point to the need for clearer guidance on the roles of governance bodies in managing and disclosing climate-related issues. Overall, this study shows that the effective CCD depends not only on having a formal governance structure but also on strong leadership and commitment to sustainability at the board level.

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