“The role of gender diversity, board size, and ESG disclosure in improving performance and managing risks”

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THE ROLE OF GENDER DIVERSITY, BOARD SIZE, AND ESG DISCLOSURE IN IMPROVING PERFORMANCE AND MANAGING RISKS

Abstract

This study analyzes the effect of gender diversity, board size, and environmental, social, and governance (ESG) disclosures on firm performance and risk management in the consumer goods sector in Indonesia, targeting companies listed on the Indonesia Stock Exchange from 2020 to 2022. Based on 273 cases and using partial least squares-structural equation modeling (PLS-SEM), this paper tests eight direct and moderating hypotheses. The results reveal that both gender diversity and board size positively impact firm value, while board size successfully reduces firm risk. However, gender diversity does not mitigate risks. The findings indicate that increasing board gender diversity and size are positively related to performance, while only board size contributes effectively to risk reduction. ESG disclosures play a moderating role, enhancing the synergy between gender diversity and performance but showing mixed effects on risk reduction. Overall, the study highlights the importance of integrating gender diversity and strong ESG practices to achieve better performance outcomes, improve transparency, and develop a more competitive corporate strategy.

Keywords risk management, gender, financial performance, firm value, governance

JEL Classification D53, E22, G11, J16

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INTRODUCTION

The composition and characteristics of corporate boards of directors have been studied extensively, particularly in terms of firm performance and risk management. Gender diversity on boards of directors has been shown to affect various aspects of firm performance, including profitability and market performance (Kabir et al., 2023). Prior studies suggest that diverse boards provide a mix of perspectives, leading to enhanced decision-making and innovation (Tejerina-Gaite & Fernández-Temprano, 2021). Furthermore, the size and expertise of board members are key factors that can influence financial results. A balanced board of directors, both in size and experience, can enhance board effectiveness by bringing together a variety of skills and perspectives. A smaller, more experienced board can offer better communication and decision-making efficiency, while a larger board can provide a broader range of knowledge and practical skills (Pucheta-Martínez & Gallego-Álvarez, 2020). ESG practices are increasingly recognized as an important component of corporate strategy that influences investor perceptions and corporate reputation. By integrating ESG disclosure, companies can increase transparency and accountability, potentially moderating the effect of gender variety and size of the board of directors on company performance and risk management.

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1. LITERATURE REVIEW

Agency theory proposed by Jensen and Meckling (1976) underlies the relationship between shareholders and corporate managers. This theory explains that agency conflict arises when managers (agents) make decisions that are not in line with the interests of shareholders (principals). Within this study, agency theory helps illustrate how gender diversity and ESG disclosures can help resolve these conflicts by boosting transparency and accountability in decision-making. Additionally, having gender diversity on the board can reduce company risk by encouraging more cautious and ethical decisions while curbing opportunistic behavior by managers. Gender diversity in corporate boards promotes ethical decision-making, reduces company risk, better aligns with shareholder interests, and improves accountability. ESG disclosures, when combined with gender diversity, will enhance transparency and accountability and reduce agency conflicts.

The resource-based view (RBV) theory by Barney (1991) states that a firm's competitive advantage lies in its unique resources. In this regard, gender diversity and ESG disclosures are seen as strategic resources that enhance corporate reputation, foster innovation, and ultimately generate value through diverse perspectives and capabilities within the board (Fouad et al., 2023). This perspective indicates that diversity and a commitment to social responsibility contribute to long-term competitiveness (Setiani, 2023; Chang et al., 2024). Gender diversity and ESG disclosures are key factors in improving company performance and managing risk. Additionally, the combined insights from agency theory, RBV, and legitimacy theory offer complementary perspectives on how board characteristics affect company outcomes. Specifically, ESG disclosures act as a moderating variable, benefiting company reputation and enhancing stakeholder legitimacy. Both gender diversity and ESG disclosures serve as key strategic resources that improve not only company performance but also stakeholder legitimacy and reputation. Together, these resources contribute to a firm's sustained competitive advantage and enhanced corporate outcomes.

Gender diversity affects performance, boosting both profitability and market valuation (Yahya, 2023). The presence of diverse genders introduces a range of viewpoints that can elevate decision-making quality and spur innovation within the organization. Al-Eid Omri and Alfaleh (2024) observed that companies with a higher diversity of gender on their boards tend to demonstrate higher financial outcomes and higher market valuations. Moreover, gender diversity contributes to greater stakeholder satisfaction and enhances the company's reputation, which positively impacts performance (M. Almashhadani & H. Almashhadani, 2022). Kabir et al. (2023) also support this view. The presence of diverse perspectives creates a more inclusive work environment and improves operational efficiency through better decision-making (Pareek et al., 2023; Borges et al., 2024). Thus, gender diversity on boards is not merely a regulatory requirement or an ethical stance; it is a strategic move that can enhance business success. Simionescu et al. (2021) argue that boards with gender diversity are generally more agile and responsive to shifts in the market, leading to improved overall company performance. Therefore, increasing gender diversity on boards is recommended for companies aiming to achieve superior performance. Li et al. (2022) claim that firms with greater gender diversity in their boards typically face lower risk compared to those with less diverse boards. The inclusion of female directors brings fresh perspectives and distinct decision-making styles, which contribute to more balanced and cautious risk management (Dempere & Abdalla, 2023). This effect is particularly noticeable in countries where there is less emphasis on hierarchical structures and more value is placed on individual input. The presence of gender diversity on corporate boards significantly enhances both financial performance and market valuation through better decision-making and the development of innovative ideas. Companies with greater gender diversity enjoy better stakeholder satisfaction, stronger reputations, and more efficient operations, which translate into higher profitability and lower risk.

Tejerina-Gaite and Fernández-Temprano (2021) observed that directors with extensive experience and multiple board appointments contribute positively to company performance in Spain. Larger board sizes, combined with gender diversity, enhance performance across various countries (Pucheta-Martínez & Gallego-Álvarez, 2020). The size of the board plays a crucial role in company outcomes, as larger boards may help lower agency costs and boost

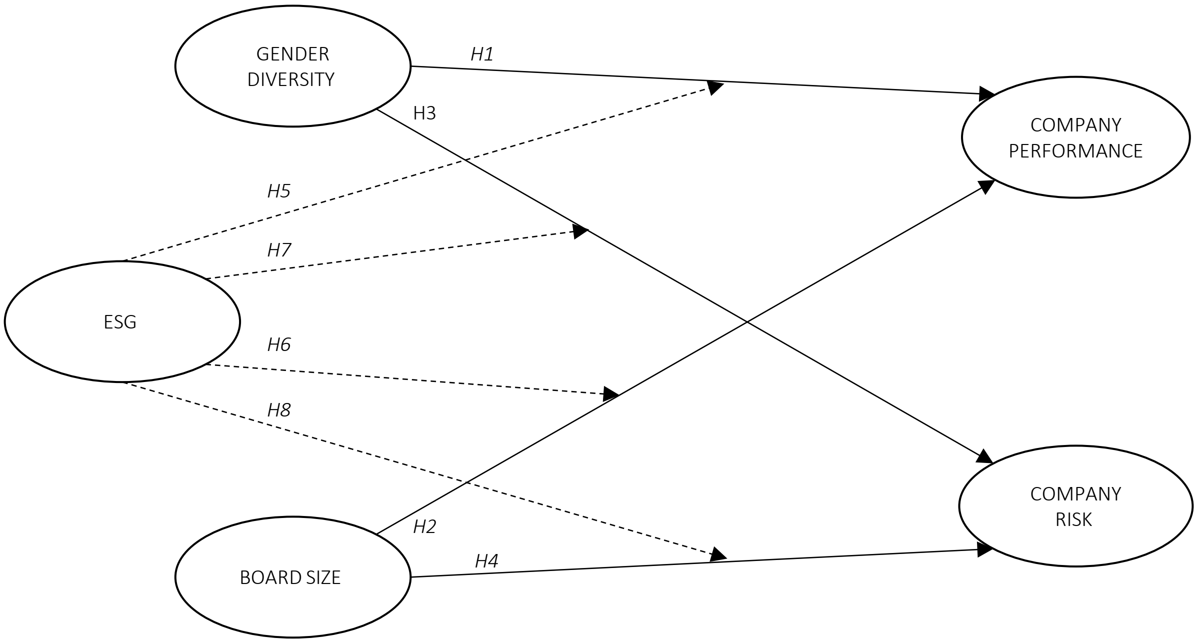

Figure 1. Research framework

board capital, leading to improved performance (Lee et al., 2024). In general, both the size and the collective experience of the board significantly impact company results. Boards that are larger and composed of experienced members tend to make better decisions, which ultimately drives company success. Recent studies suggest that the size and expertise of a company's board significantly influence its risk profile. Riyadha et al. (2024) reported that characteristics like board size and financial expertise are linked to reduced liquidity risk for companies. In contrast, Wang (2012) stressed that smaller boards tend to place greater pressure on CEOs, pushing them to take on more significant risks compared to larger boards. This suggests that firms with smaller boards are more inclined toward higher investment risks, even if they maintain lower leverage. As a result, companies with smaller boards may face greater risk exposure in the long run.

Paolone et al. (2024) found that gender-diverse boards combined with ESG disclosures are associated with improved ESG outcomes in the European banking industry. Likewise, Saleh and Maigoshi (2024) revealed that gender diversity enhances the relationship between ESG scores and environmental sustainability performance in Asian firms. Employing the GMM approach, they demonstrated that gender diversity strengthens the contribution of ESG scores to sustainability outcomes (Gavana et al., 2024). Moreover, cross-country evidence found that the positive effects of ESG disclosures on firm performance are strengthened by gender-diverse boards (Li et al., 2024; Noja et al., 2021). Consistently, Khornida et al. (2024) provided additional evidence from Indonesian firms where ESG disclosures strengthen the association between boardroom gender diversity and firm performance, supporting the argument that diversity at the top, combined with transparency, results in better outcomes (Khemakhem et al., 2023). Erben Yavuz et al. (2024) showed that, in both the banking and non-banking sectors of the Istanbul Stock Exchange, ESG disclosures are positively related to company performance, especially when boards are larger and include diverse external members. The study highlights that robust ESG reporting strengthens the connection between board attributes and company performance. Additionally, Ihbal et al. (2024) found that ESG disclosures enhance the relationship between board size and performance across different industries, particularly when board members regularly attend meetings. This extensive dataset demonstrated that comprehensive ESG reporting improves the effectiveness of larger boards. Abdelmoneim and El-Deeb (2024) concluded that companies with higher levels of ESG disclosure exhibit better risk management. Boards with greater size and experience are better equipped to leverage ESG disclosures for effective risk mitigation.

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This study aims to examine the effects of gender diversity, board size, and ESG (environmental, social, and governance) disclosures on the performance and risk of companies in Indonesia (Figure 1). The proposed hypotheses are as follows:

H_1: *Gender diversity affects company performance.*

H_2: *Board size affects company performance.*

H_3: *Gender diversity affects company risk.*

H_4: *Board size affects company risk.*

H_5: *ESG disclosures moderate the effect of gender diversity on company performance.*

H_6: *ESG disclosures moderate the effect of board size on company performance.*

H_7: *ESG disclosures moderate the effect of gender diversity on company risk.*

H_8: *ESG disclosures moderate the effect of board size on company risk.*

2. METHODS

This study targets firms in the consumer goods sector listed on the Indonesia Stock Exchange (IDX) from 2020 to 2022. The sample includes 273 panel data observations, chosen using purposive sampling based on specific criteria: (1) Companies that submitted comprehensive financial reports and ESG disclosures throughout the study period and (2) Companies that provided the required data for key variables, including gender diversity, board size, company performance, and company risk. Purposive sampling was employed to ensure that the chosen companies met characteristics that were aligned with the research objectives.

Gender diversity on the board of directors is measured by the proportion of female board members, which has been shown to positively impact company performance by introducing diverse perspectives and fostering innovative decision-making (Kabir et al., 2023; Al-Eid Omri & Alfaleh, 2024). Board size and experience refer to the number of board members and their collective expertise, which have been linked to better company performance, particularly in areas of risk management and operational efficiency (Haniyyah, 2024; Tejerina-Gaite & Fernández-Temprano, 2021). ESG disclosure acts as a moderating factor that affects the relationship between board characteristics and both company performance and risk. Strong ESG practices are known to boost transparency and build stakeholder trust (Paolone et al., 2024; Khornida et al., 2024).

Data were collected from financial, annual, and sustainability reports available on the official IDX and company websites. ESG disclosure details were obtained from sustainability reports aligned with the Global Reporting Initiative (GRI) standards. The analysis was performed using WarpPLS software. This approach is well-suited for evaluating relationships between latent variables, especially when dealing with relatively small sample sizes. It is also effective in identifying the moderating influence of ESG disclosure on the relationship between board attributes and company performance and risk.

3. RESULTS

The findings highlight several important points regarding the impact of key variables such as gender diversity, board size and experience, company performance, company risk, and the environmental, social, and governance disclosure interactions on both performance and risk. The analysis reveals how these factors influence the overall outcomes of the companies studied.

Table 1. Results of model fit

Criterion	Value	Admission	Conclusion
Av.PC	0.124	≤ 0.05	Good Fit
Av.RS	0.014	≤ 0.05	Good Fit
Av.ARS	0.022	≤ 0.05	Good Fit
Av.VIF	1.301	Ideally if ≤ 3.3	Ideal
Av.FVIF	1.164	Ideally if ≤ 3.3	Ideal
GoF	0.332	Medium ≥ 0.25	Medium
SPR	1.000	≥ 0.7	Acceptable
RSCR	1.000	≥ 0.9	Acceptable
SSR	1.000	≥ 0.7	Acceptable
NLBCDR	1.000	≥ 0.7	Acceptable

Table 1 presents a summary of the key metrics used to assess the model's fit and data quality;

Table 2. Latent variable coefficients outputs

Metrics	GENDER	BOARD	ESG	PERFORMANCE	COMRISK	ESG * GENDER	ESG * BOARD
R^2				0.173	0.060		
Adj R^2				0.161	0.045		
CR	1.000	1.000	1.000	0.775	1.000	1.000	1.000
CA	1.000	1.000	1.000	0.421	1.000	1.000	1.000
AVE	1.000	1.000	1.000	0.633	1.000	1.000	1.000
VIF	1.209	1.141	1.328	1.106	1.031	1.209	1.127
Q^2				0.173	0.064		

Note: GENDER = gender diversity, BOARD = board size and experience, PERFORMANCE = company performance, COMRISK = company risk, and ESG = environmental, social, and governance disclosure.

all indicators were good and fit. This result also indicates a good model fit and suggests that the relationships among the variables are well-represented. These results confirm that the model is reliable and free from statistical inconsistencies, supporting the validity of the analysis.

Table 2 provides the metrics for most variables, indicating exceptional reliability and validity. Specifically, the composite reliability and average variance extracted (AVE) values for gender diversity, board size, and ESG disclosure are all reported as 1.000, highlighting strong consistency and robust measurement accuracy. This suggests that these constructs were well-defined and the data collected effectively captured the intended characteristics. However, the composite reliability (CR) for the company performance variable is notably lower, with a Cronbach's Alpha (CA) of only 0.421. This lower value indicates potential instability or inconsistency in how company performance was measured, suggesting that the variable may need further refinement or that the data collected did not fully capture the breadth of performance indicators.

The *R*-squared values reflect the proportion of variance explained by the independent variables in the model. The *R*-squared value for company performance is 0.060, meaning that gender diversity, board size, and ESG disclosures collectively explain only 6% of the variation in company performance. This relatively low figure implies that other unexamined factors are likely influencing performance, indicating room for further exploration. On the other hand, the *R*-squared for company risk is higher at 0.173, suggesting that the model captures 17.3% of the variance in company risk. While still modest, this indicates a better explanatory capacity for predicting risk compared to performance, potentially due to the more direct influence of governance factors on risk management.

Variance inflation factor (VIF) values provide insights into the degree of multicollinearity among the independent variables. In this model, all VIF values are well below the threshold of 3.3, with the highest being 1.328 for ESG disclosure. This indicates minimal multicollinearity, meaning the independent variables are not excessively correlated. Low multicollinearity is a positive sign, as it ensures that each variable contributes uniquely to the model without redundancy, allowing for a more accurate interpretation of the relationships between variables.

The assessment of composite reliability and AVE for most variables highlights strong measurement quality (Figure 2). The high reliability scores (close to 1.000) for gender diversity, board size, and ESG disclosure suggest that these constructs were measured consistently across the dataset. However, the lower reliability and AVE values for the performance variable indicate potential issues with how performance data were captured, which could be due to varying definitions of performance metrics across different companies or industries.

The analysis of path coefficients reveals the degree to which the independent variables affect the dependent variables within the research model. The results from the model's fit indices, covering both direct and indirect relationships between the independent and dependent variables, are detailed in Tables 3 and 4.

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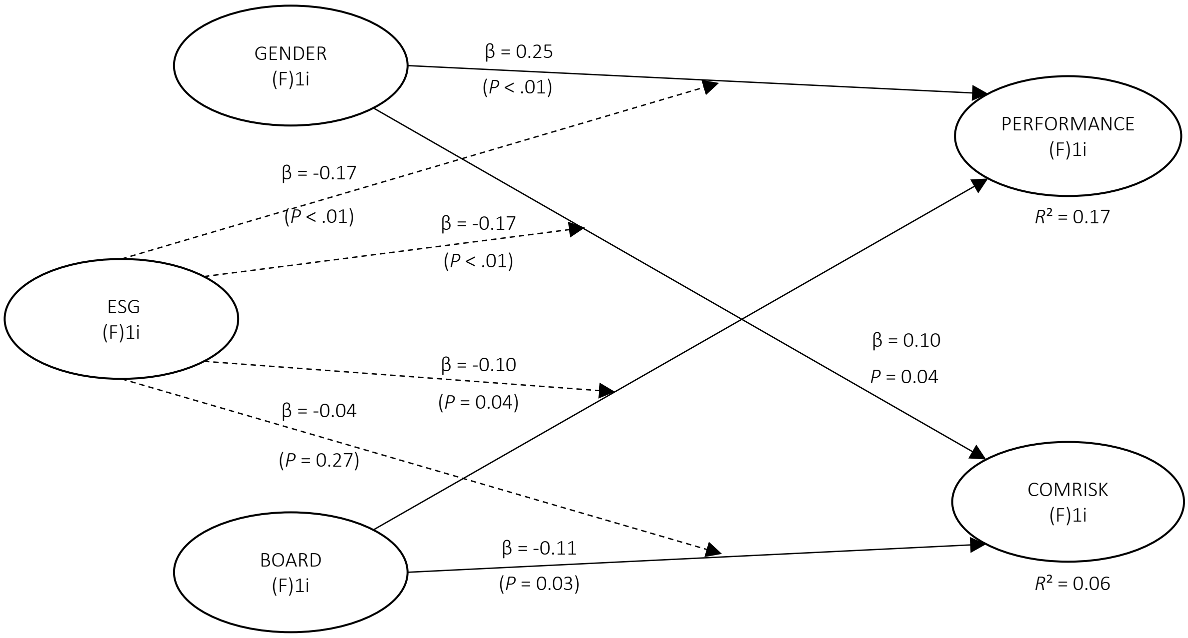

Note: GENDER = gender diversity, BOARD = board size and experience, PERFORMANCE = company performance, COMRISK = company risk, and ESG = environmental, social, and governance disclosure.

Figure 2. Model output

H1 is supported. The path coefficient is 0.248 with $P < 0.00$ (Table 3). H2 is supported. The path coefficient is 0.106 with $P = 0.040$, indicating a significant positive effect. This means that board size and experience can contribute to improving company performance. H3 is not supported. The path coefficient is 0.042 with $P = 0.245$. H4 is supported. The path coefficient value is –0.111 with $P = 0.033$. This means that larger or more experienced boards tend to be able to manage and reduce risk more effectively.

Based on the results of the indirect testing in Table 4, it can be seen that H5 is supported since the coefficient value is –0.171 and $P = 0.002$. This indicates that ESG disclosure moderates the effect of gender diversity on company performance with a negative effect, reflecting the challenges or complexities in implementing ESG related to gender diversity. Next, H6 is supported because the coefficient value is –0.103 with $P = 0.045$, indicating that ESG disclosure moderates the effect of board

Table 3. Direct effect testing

Hypothesis	Direct Effect	Path Coefficients	P Values	Conclusion
H_1	GENDER → PERFORMANCE	0.248	P<0.001	Accepted
H_2	BOARD → PERFORMANCE	0.106	0.040	Accepted
H_3	GENDER → COMRISK	0.042	0.245	Rejected
H_4	BOARD → COMRISK	–0.111	0.033	Accepted

Note: GENDER = gender diversity, BOARD = board size and experience, PERFORMANCE = company performance, COMRISK = company risk, and ESG = environmental, social, and governance disclosure.

Table 4. Indirect effect testing

Hypothesis	Indirect Effect	Path Coefficients	P Values	Conclusion
H_5	GENDER → ESG → PERFORMANCE	–0.171	0.002	Accepted
H_6	BOARD → ESG → PERFORMANCE	–0.103	0.045	Accepted
H_7	GENDER → ESG → COMRISK	–0.175	0.002	Accepted
H_8	BOARD → ESG → COMRISK	–0.037	0.274	Rejected

Note: GENDER = gender diversity, BOARD = board size and experience, PERFORMANCE = company performance, COMRISK = company risk, and ESG = environmental, social, and governance disclosure.

size on firm performance. This negative effect may indicate that ESG disclosure weakens the positive influence of board size on performance because a large board size and ESG will increase costs which will ultimately reduce performance.

H7 is accepted, because the coefficient value is –0.175 with $P = 0.002$, indicating that ESG disclosure has a significant and negative moderating effect on the relationship between gender and corporate risk. This means that ESG implementation can help reduce risk in companies that have gender diversity. Last, H8 is not accepted. The coefficient value is –0.037 with $P = 0.274$.

4. DISCUSSION

A diverse board offers a strategic advantage by incorporating a wide range of perspectives in decision-making processes. Boards with gender diversity often show increased innovation, bringing new ideas that enhance the quality of strategic decisions. According to Kabir et al. (2023), Matsa and Miller (2022), and Simionescu et al. (2021), gender diversity contributes to richer board discussions and more comprehensive analysis, which ultimately leads to improved company performance. Furthermore, gender-diverse boards not only increase profitability but also exhibit greater flexibility in responding to market changes. Al-Eid Omri and Alfaleh (2024) demonstrate that companies with gender-diverse boards achieve higher market valuations, highlighting gender diversity as a crucial component of sustainable business practices. This finding is further reinforced by Laskar et al. (2024), who argue that the presence of women on the board can enhance a company's reputation and strengthen stakeholder trust, both of which are vital for achieving long-term success.

The analysis supports the assumption that larger board size has a positive effect on company performance. A larger board can better distribute roles, leveraging a broader array of skills and experience that improves oversight and enhances decision-making. According to agency theory, larger boards are typically more effective in monitoring management and safeguarding shareholder interests (Jensen & Meckling, 1976). Rashid, (2018) also found that larger boards help reduce conflicts of interest by ensuring more comprehensive monitoring of company strategies. However, some studies warn that excessively large boards may encounter issues with communication and coordination, which can hinder performance (Arango & Gaitan, 2021).

The analysis shows that gender diversity within the board of directors does not significantly impact company risk. This finding may be influenced by external factors such as organizational culture and the broader industry context, which can affect how gender diversity influences risk management practices (Tamasiga et al., 2024). For example, in cultures with a more individualistic orientation, boards may place a higher value on diverse perspectives in risk evaluation, potentially enhancing the role of gender diversity in mitigating risks (Mohsni et al., 2021). However, Li et al. (2022) suggest that while gender-diverse boards can significantly lower risk in certain business contexts, their impact is diminished in cultures less receptive to diverse viewpoints. This highlights the importance of considering cultural and environmental factors when evaluating the relationship between gender diversity and risk.

The findings show that a larger board size can significantly reduce company risk. This result is consistent with existing literature suggesting that well-sized boards offer more rigorous oversight of strategic decisions, which helps in minimizing risk exposure (Wang, 2012). Larger boards tend to provide a broader range of insights and can help prevent decision-making errors that may lead to increased risk. Xu et al. (2023) reinforce this view, showing that larger boards have a greater capacity to evaluate and respond effectively to strategic risks. From an agency theory perspective, a larger board acts as an effective control mechanism, curbing opportunistic behavior by management that could elevate risk.

The study finds that ESG disclosure negatively moderates the relationship between gender diversity and company performance. This may be due to the additional challenges faced by gender-diverse companies when implementing ESG standards, which are often complex and resource-intensive. While a commitment to ESG can enhance transparency and accountability, it also requires signif-

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icant investment and adaptation to meet stricter requirements (Sanseverino et al., 2024). Jeyhunov et al. (2025) suggest that companies with high levels of gender diversity might take longer to fully integrate ESG practices due to the need for extensive adjustments. Paolone et al. (2024) also found that gender-diverse boards face greater difficulties in meeting ESG expectations, especially in highly regulated sectors like banking. As a result, while ESG initiatives ultimately build reputation and trust, their impact on company performance may be negative in the short term.

The results show that ESG disclosure moderates in a negative direction. This means that ESG reduces or weakens the influence of board size on performance. The explanation is that large board size and ESG will increase costs for the company which can ultimately reduce performance. ESG disclosures are utilized by investors and stakeholders to quantify the sustainability and social responsibility of a firm. Gender diversity, not being self-evident via improved ESG performance, is expected to be viewed negatively by investor sentiment and the market and dilute perceived benefits of gender diversity on firm performance. According to legitimacy theory, companies that are transparent and follow strong ESG practices tend to gain greater public acceptance, which can lead to improved performance (Khandelwal et al., 2023). This finding does not align with Ihbal et al. (2024), who show that ESG disclosures enhance the positive relationship between board size and company performance across different industries. The study's findings suggest that ESG disclosure significantly and negatively moderates the relationship between gender diversity and company risk. By enhancing transparency and upholding high ethical standards, ESG disclosure helps gender-diverse companies manage risks more effectively. Dias et al. (2024) support this conclusion, demonstrating that ESG practices strengthen the risk management capabilities of firms with gender-diverse boards, leading to better overall risk mitigation.

The analysis shows that ESG disclosure does not significantly affect the relationship between board size and company risk. This suggests that ESG initiatives alone may not be enough to lower risk in companies with larger boards (Li & Rasiah, 2024). Although ESG practices contribute to transparency, effective risk management also requires strong governance and efficient coordination within the board. Abdelmoneim and El-Deeb (2024) indicate that the effectiveness of ESG disclosures in reducing risk depends on the presence of robust governance structures and well-coordinated board activities.

CONCLUSION

This study explores the impact of gender diversity, board size, and ESG (environmental, social, and governance) disclosures on the performance and risk management of companies within Indonesia's consumer goods sector. The findings reveal that these factors play a critical role in shaping business outcomes and provide key insights for corporate governance strategies. Gender diversity on the board emerges as a significant factor in enhancing company performance. By including diverse viewpoints, gender-diverse boards contribute to more robust decision-making processes, driving better financial results. This suggests that having women on the board is not merely a matter of regulatory compliance but a strategic approach that enhances competitiveness and fosters innovation.

The analysis also highlights the positive role of board size in managing risk. Larger boards, composed of members with varied expertise and experience, are better equipped to provide effective oversight and control over strategic decisions. However, it is crucial to strike a balance in board size, as overly large boards can encounter challenges related to communication and decision-making efficiency.

ESG disclosures play a moderating role in weakening the relationship between gender diversity and company performance. Large board size and ESG activities can increase firm costs, which in turn can weaken performance. The market and stakeholders use ESG disclosures to analyze a firm's social responsibility and sustainability. If gender diversity does not enhance ESG performance, it will be perceived by the market as well as the investors negatively, undermining the intangible benefits gender diversity has on firm performance. However, the moderating impact of ESG disclosures on company risk is less pronounced, indicating that effective risk management may also depend on strong internal governance structures and processes beyond ESG initiatives alone.

A noted limitation of this study is the reliance on available sustainability reports to assess ESG disclosures, which may not capture the full extent of ESG practices implemented by each company. Future research should consider a longitudinal approach to examine the evolving relationship between gender diversity, board size, and company performance over time. Additionally, exploring the influence of contextual factors, such as organizational culture and regulatory frameworks, could offer deeper insights into how board characteristics shape business outcomes.

This study contributes to the theoretical frameworks of agency theory, resource-based view, and legitimacy theory by demonstrating that gender diversity and ESG disclosures are strategic assets that enhance company performance. The practical implications of these findings suggest that companies and policymakers should prioritize gender diversity and transparent ESG practices as integral components of a comprehensive business strategy, helping to secure a competitive advantage and promote long-term success.

AUTHOR CONTRIBUTIONS

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Formal analysis: Muazaroh, Wiwik Lestari, Linda Purnama Sari.
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Writing – review & editing: Muazaroh, Wiwik Lestari, Linda Purnama Sari.

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