

ESG COMBINED SCORE AND CORPORATE FINANCIAL PERFORMANCE: THE MODERATING ROLE OF FEMALE DIRECTORS IN INDONESIAN LISTED FIRMS

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ABSTRACT

This study investigates the relationship between Environmental, Social, and Governance Combined Score (ESGC) and corporate financial performance, as well as the moderating role of female directors in Indonesian listed firms. While prior studies predominantly rely on conventional ESG measures, limited evidence exists on whether a controversy-adjusted sustainability measure generates similar financial benefits and how board gender diversity influences this relationship. Using an unbalanced panel of 419 firm-year observations from 101 financial and non-financial firms over the 2020–2024 period, this study employs a one-way firm fixed-effects model with one-year lagged explanatory variables and firm-clustered standard errors. The results show that ESGC is positively associated with corporate financial performance. Furthermore, female directors positively moderate this relationship, indicating that firms with greater female board representation derive stronger financial benefits from sustainability performance. A robustness analysis using the conventional ESG Score yields qualitatively similar evidence for the moderating effect. These findings contribute to the ESG and corporate governance literature by demonstrating that the financial value of sustainability depends not only on sustainability performance itself but also on board gender diversity. The study further highlights the relevance of controversy-adjusted ESG measures for evaluating corporate sustainability in emerging markets.

Keywords: ESG Combined Score, financial performance, female directors, gender diversity, corporate governance.

1. INTRODUCTION

Environmental, Social, and Governance (ESG) has become an increasingly important component of corporate strategy and investment decision-making. Since its introduction through the United Nations' *Who Cares Wins* initiative in 2004, ESG has evolved beyond an ethical framework into a strategic mechanism for managing non-financial risks, strengthening stakeholder relationships, and creating long-term corporate value (Guo et al., 2026; El Mawla et al., 2026). The rapid expansion of sustainable investment assets worldwide further demonstrates that investors increasingly incorporate ESG information into capital allocation

decisions (Global Sustainable Investment Alliance, 2022). Consequently, ESG performance is now widely regarded as an important determinant of corporate reputation, financing conditions, and financial performance.

Despite the growing importance of ESG, empirical evidence regarding its relationship with corporate financial performance remains inconclusive. While numerous studies document a positive association between ESG performance and firm performance (Friede et al., 2015), other studies report insignificant or even negative effects depending on institutional environments, measurement approaches, and governance characteristics. One explanation for these inconsistent findings is that conventional ESG scores primarily capture firms' sustainability disclosures and practices but often overlook sustainability-related controversies that may substantially undermine stakeholder confidence and corporate reputation.

ESG controversies represent adverse environmental, social, or governance incidents that expose firms to reputational damage, litigation risk, regulatory scrutiny, and declining stakeholder trust. Such controversies may substantially reduce the economic benefits generated by sustainability initiatives even when firms report relatively high ESG performance (Elamer & Boulhaga, 2024; Jucá et al., 2024). Consequently, conventional ESG measures may overestimate firms' sustainability quality because they do not fully account for controversy-related risks. To address this limitation, Refinitiv developed the Environmental, Social, and Governance Combined Score (ESGC), which adjusts ESG performance by incorporating ESG controversies into a single sustainability measure. Compared with conventional ESG scores, ESGC provides a more comprehensive assessment of sustainability quality by reflecting not only firms' ESG engagement but also their ability to avoid sustainability-related controversies. Nevertheless, empirical evidence examining whether controversy-adjusted sustainability performance generates superior financial outcomes remains relatively limited, particularly in emerging markets.

In addition to sustainability quality, the effectiveness of ESG initiatives may also depend on internal corporate governance mechanisms. Board gender diversity has attracted increasing attention because female directors are often associated with stronger monitoring, greater stakeholder orientation, and more effective oversight of sustainability-related risks. Previous studies suggest that female directors contribute to reducing ESG controversies and strengthening sustainability governance (Gull et al., 2025). However, existing studies predominantly examine female directors as an independent determinant of ESG performance or financial performance, while considerably less attention has been devoted to understanding whether female directors strengthen the financial benefits generated by sustainability performance. Accordingly, the governance conditions under which ESG creates corporate value remain insufficiently understood.

These issues are particularly relevant in emerging markets such as Indonesia. Compared with developed economies, Indonesian listed firms operate within an institutional environment characterized by concentrated ownership structures, relatively weaker external governance mechanisms, and heterogeneous ESG implementation (Claessens et al., 2002; Aguilera &

Cuervo-Cazurra, 2004; Antwi et al., 2021). Although ESG adoption has accelerated following the implementation of sustainable finance regulations, firms continue to exhibit substantial variation in both sustainability practices and board gender diversity (Rahmadini & Hartanti, 2025; Pernamasari, 2025; Wiguna & Silviani, 2025). These characteristics provide an appropriate setting for examining whether governance mechanisms enhance the effectiveness of sustainability performance in generating corporate financial value.

Against this background, this study investigates the relationship between ESG Combined Score (ESGC) and corporate financial performance among Indonesian listed firms and examines whether female directors moderate this relationship. This study contributes to the literature in three important ways. First, it extends the ESG literature by employing ESGC as a controversy-adjusted measure of sustainability quality rather than relying solely on conventional ESG scores. Second, it contributes to the corporate governance literature by examining female directors as a contingent governance mechanism that strengthens the financial value of sustainability performance rather than merely as an independent governance attribute. Third, it provides new evidence from an emerging market where institutional characteristics may influence the effectiveness of both sustainability initiatives and corporate governance.

2. LITERATURE REVIEW

2.1 Stakeholder Theory

Stakeholder theory provides the primary theoretical foundation for explaining how sustainability performance creates corporate value. Unlike the traditional shareholder perspective, stakeholder theory argues that firms create long-term value by effectively managing relationships with multiple stakeholder groups, including investors, customers, employees, suppliers, regulators, and local communities (Donaldson & Preston, 1995; Freeman et al., 2025). Firms are therefore expected to balance economic objectives with broader stakeholder interests to maintain organizational legitimacy and ensure long-term business sustainability.

From an instrumental perspective, stakeholder theory proposes that firms satisfying stakeholder expectations are more likely to obtain valuable organizational resources, including stakeholder trust, reputational capital, customer loyalty, and investor confidence. These benefits reduce transaction costs, improve operational efficiency, and ultimately enhance financial performance (Theodoulidis et al., 2017). Consequently, sustainability practices should not be viewed merely as ethical obligations but as strategic investments that strengthen stakeholder relationships and contribute to superior firm performance.

Within this perspective, Environmental, Social, and Governance (ESG) activities represent mechanisms through which firms respond to stakeholder expectations regarding environmental responsibility, social welfare, ethical governance, and corporate transparency. Firms demonstrating strong sustainability performance are expected to strengthen legitimacy, reduce non-financial risks, and improve long-term value creation. However, stakeholder theory also

implies that these benefits depend not only on sustainability engagement itself but also on stakeholders' perceptions of the credibility of such engagement.

This distinction is particularly important because firms may report strong ESG performance while simultaneously experiencing environmental, social, or governance controversies that damage stakeholder trust. ESG controversies expose firms to reputational damage, regulatory scrutiny, litigation risk, and declining investor confidence, thereby weakening the value generated by sustainability initiatives. Consequently, stakeholder value creation depends not only on firms' ESG activities but also on their ability to avoid sustainability-related controversies.

This argument suggests that ESG Combined Score (ESGC), which incorporates both ESG performance and ESG controversies, provides a more theoretically appropriate measure of sustainability quality than conventional ESG measures. By accounting for controversy-related risks, ESGC better reflects the extent to which firms successfully maintain stakeholder trust and organizational legitimacy. Therefore, stakeholder theory provides a strong theoretical basis for expecting higher ESGC to be associated with superior corporate financial performance.

Furthermore, stakeholder theory emphasizes that the effectiveness of sustainability strategies depends on corporate governance mechanisms responsible for overseeing their implementation. Board characteristics influence how sustainability initiatives are designed, monitored, and executed. Among these governance mechanisms, female directors are frequently associated with stronger stakeholder orientation, greater ethical sensitivity, and more effective oversight of sustainability-related risks (Adams & Ferreira, 2009; Post & Byron, 2015). Accordingly, stakeholder theory also provides the theoretical rationale for expecting female directors to strengthen the relationship between ESGC and corporate financial performance.

2.2 ESG Combined Score and Corporate Financial Performance

Corporate sustainability has increasingly become an important determinant of long-term firm value. Firms with strong sustainability performance are expected to establish stronger relationships with stakeholders, improve corporate reputation, reduce non-financial risks, and enhance operational efficiency, thereby contributing to superior financial performance (Eccles et al., 2014). Consistent with stakeholder theory, firms that successfully respond to stakeholder expectations regarding environmental responsibility, social welfare, and corporate governance are more likely to strengthen organizational legitimacy and create sustainable competitive advantages.

Although numerous studies report a positive relationship between ESG performance and corporate financial performance (Friede et al., 2015), empirical evidence remains mixed. While some studies document positive financial outcomes associated with ESG engagement, others report insignificant or inconsistent findings across institutional settings and industries. One explanation for these inconsistent results is that conventional ESG measures primarily evaluate

firms' sustainability performance without adequately accounting for sustainability-related controversies that may substantially undermine stakeholder confidence.

ESG controversies, including environmental accidents, labor disputes, governance failures, product safety issues, and regulatory violations, expose firms to reputational damage, litigation risk, regulatory sanctions, and declining stakeholder trust (Elamer & Boulhaga, 2024; Jucá et al., 2024). Consequently, firms with relatively high ESG scores may still experience adverse financial consequences if sustainability-related controversies weaken the credibility of their ESG practices. This limitation suggests that conventional ESG scores may not fully capture the overall quality of corporate sustainability performance.

To address this limitation, Refinitiv developed the Environmental, Social, and Governance Combined Score (ESGC), which incorporates both ESG performance and ESG controversies into a single sustainability measure. Unlike conventional ESG scores, ESGC adjusts firms' sustainability assessments by considering controversy-related risks, thereby providing a more comprehensive evaluation of sustainability quality. Firms with high ESGC not only demonstrate strong ESG practices but also successfully avoid major sustainability-related controversies that could erode stakeholder trust and corporate legitimacy.

From the perspective of stakeholder theory, stakeholder support depends not only on firms' sustainability initiatives but also on the credibility of those initiatives. ESG controversies may signal inconsistencies between corporate sustainability commitments and actual business practices, thereby weakening stakeholder confidence and reducing the economic benefits associated with ESG engagement. Because ESGC reflects both sustainability performance and controversy-related risks, it provides a more theoretically appropriate proxy for stakeholder value creation than conventional ESG measures.

Accordingly, firms with higher ESG Combined Scores are expected to experience stronger stakeholder trust, lower reputational risk, improved operational efficiency, and greater financial performance. Compared with firms that merely achieve high ESG scores, firms with high ESGC demonstrate superior sustainability quality by effectively integrating ESG practices while minimizing sustainability-related controversies. Therefore, the following hypothesis is proposed:

H1: ESG Combined Score (ESGC) is positively associated with corporate financial performance.

2.3 Female Directors as a Governance Mechanism

Corporate governance plays a critical role in determining whether sustainability initiatives are effectively translated into corporate value. While ESG performance reflects firms' sustainability commitments, the financial benefits of these initiatives largely depend on the quality of board oversight and strategic decision-making. From the perspective of stakeholder theory, boards of directors are responsible for balancing the interests of multiple stakeholder groups and ensuring that sustainability strategies are implemented consistently with corporate

objectives. Consequently, governance mechanisms may influence the extent to which sustainability performance contributes to corporate financial performance.

Among various governance characteristics, board gender diversity has received increasing attention because female directors are often associated with stronger monitoring, greater ethical sensitivity, and a stronger stakeholder orientation. Previous studies suggest that female directors enhance board effectiveness by encouraging more comprehensive discussions, improving decision quality, and increasing attention to long-term organizational objectives (Adams & Ferreira, 2009; Post & Byron, 2015). These characteristics enable boards to oversee sustainability initiatives more effectively and strengthen firms' commitment to responsible business practices.

In the context of ESG, female directors are also associated with stronger sustainability governance and lower exposure to ESG-related controversies. Gull et al. (2025) argue that female directors contribute to more effective oversight of environmental, social, and governance issues, thereby reducing sustainability-related risks and improving the credibility of corporate ESG practices. By strengthening board monitoring and promoting greater accountability, female directors may help ensure that sustainability initiatives are implemented substantively rather than merely disclosed symbolically.

From the perspective of stakeholder theory, stronger board oversight enhances firms' ability to maintain stakeholder trust and organizational legitimacy. Female directors may therefore strengthen the effectiveness of sustainability initiatives by ensuring that ESG commitments are consistently translated into actual corporate practices. Because ESG Combined Score (ESGC) reflects both sustainability performance and firms' ability to avoid ESG controversies, effective governance becomes particularly important in preserving the credibility of sustainability initiatives and maximizing their economic benefits.

Accordingly, firms with greater female board representation are expected to derive stronger financial benefits from high ESG Combined Scores than firms with lower female representation. Rather than exerting a direct influence on financial performance, female directors are expected to enhance the effectiveness of sustainability performance in creating corporate value by improving governance quality, strengthening stakeholder confidence, and reducing sustainability-related risks. Therefore, the following hypothesis is proposed:

H2: Female directors positively moderate the relationship between ESG Combined Score (ESGC) and corporate financial performance.

3. METHODS

3.1 Sample and Data

This study employs a quantitative research design using an unbalanced panel dataset of firms listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period. The sample consists of both financial and non-financial firms with available ESG data from Refinitiv. Firms with incomplete financial, governance, or ESG information were excluded from the final

sample. Financial and firm-level data were obtained from Refinitiv and annual reports. ESG data were collected from Refinitiv ESG Database, while information on female directors and sustainability committees was manually collected from firms' annual reports. The final sample consists of 419 firm-year observations from 101 listed firms. To mitigate potential reverse causality and strengthen temporal ordering, ESGC and female directors variables are measured with a one-year lag. The analysis is conducted using firm fixed-effects regression to control for time-invariant firm-specific heterogeneity.

3.2 Variable Measurement

Table 1 presents the definitions of all variables used in this study. Corporate financial performance is measured using Return on Assets (ROA). ESG Combined Score (ESGC) serves as the main explanatory variable, while female directors (FD PRO) act as the moderating variable. Following prior literature, firm size (SIZE), leverage (DER), board size (BSIZE), and sustainability committee (SUSCOM) are included as control variables.

Table 1. Variable Definitions

Variable	Definition
ROA	Net income divided by total assets
ESGC	ESG Combined Score (ESGC), calculated using Refinitiv ESG Score and ESG Controversies Score data
FD PRO	Number of female directors divided by total directors
ESGC × FD PRO	Interaction between ESGC and FD PRO
SIZE	Natural logarithm of total assets
DER	Total liabilities divided by total assets
BSIZE	Total number of directors on the board
SUSCOM	Dummy variable equal to 1 if the firm has a sustainability committee, and 0 otherwise

Notes: ESGC and FD PRO are measured using one-year lagged values ($t - 1$).

ESGC is calculated by the authors using ESG Score and ESG Controversies Score data obtained from Refinitiv. Following the LSEG ESG Scores Methodology, ESG controversies are incorporated into the overall sustainability assessment through an adjustment mechanism that accounts for controversy-related risks. Table 2 illustrates the ESGC calculation mechanism based on the LSEG ESG Scores Methodology.

Table 2. ESG Combined Score (ESGC) Construction

Scenario	ESG Controversies Score	ESG Score	ESGC Score
If ESG Controversies Score $\geq$ ESG Score, ESGC equals ESG Score	100	89	89
If ESG Controversies Score $<$ ESG Score, ESGC equals the average of ESG Score and ESG Controversies Score	48	49	48.5

Source: Adapted from *LSEG ESG Scores Methodology* (2024).

3.3 Empirical Model

To examine the relationship between ESGC and corporate financial performance, the following baseline model is estimated:

$$PERF_{it} = \alpha + \beta_1 ESGC_{i,t-1} + \beta_2 Z_{it} + \gamma_i + \varepsilon_{it}$$

where PERF represents firm financial performance, ESGC represents the lagged ESG Combined Score, Z denotes the vector of control variables, γ_i captures firm fixed effects, and ε_{it} is the error term.

To test the moderating role of female directors, the following interaction model is estimated:

$$PERF_{it} = \alpha + \beta_1 ESGC_{i,t-1} + \beta_2 FD PRO_{i,t-1} + \beta_3 (ESGC_{i,t-1} \times FD PRO_{i,t-1}) + \beta_4 Z_{it} + \gamma_i + \varepsilon_{it}$$

The coefficient on the interaction term (β_3) captures whether female directors moderate the relationship between ESGC and corporate financial performance.

3.4 Data Analysis Technique

The analysis begins with model specification tests, including the Chow, Hausman, and Lagrange Multiplier tests, to determine the most appropriate panel data estimation approach. Based on the results of these tests, the one-way firm fixed-effects model is selected as the preferred estimation approach. This approach is appropriate because it controls for unobserved time-invariant firm characteristics, such as organizational culture, managerial capability, and governance quality, that may be correlated with both sustainability performance and corporate financial performance, thereby reducing omitted variable bias.

Although dynamic panel estimators, such as the Generalized Method of Moments (GMM), are often employed to address dynamic endogeneity, the firm fixed-effects estimator is considered more appropriate for the present study. The panel consists of a relatively short time dimension ($T = 5$), and the research focuses on estimating the effect of one-year lagged ESGC on subsequent corporate financial performance rather than modelling the dynamic persistence of financial performance itself. Moreover, the application of GMM in short panels may increase the risk of instrument proliferation, potentially weakening estimator efficiency and statistical reliability.

To mitigate potential reverse causality and strengthen temporal ordering, all explanatory variables are measured using one-year lagged values, ensuring that sustainability and governance characteristics precede financial performance. Furthermore, to address potential heteroscedasticity and within-firm serial correlation, standard errors are clustered at the firm level, providing robust statistical inference in the presence of within-firm dependence.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

This section presents the empirical results of the study. The analysis begins with descriptive statistics and correlation analysis, followed by regression results and discussion of the proposed hypotheses. Table 3 reports the descriptive statistics of the study variables.

Table 3. Descriptive Statistics

Variable	N	Mean	Std Dev	Median	Min	Max
ROA	419	0,06	0,08	0,04	-0,15	0,37
ESGC	419	51,03	18,20	50,86	9,69	88,9
FD PRO	419	0,13	0,15	0,10	0	0,75
SIZE	419	21,72	1,58	21,68	16,53	25,74
DER	419	0,66	0,96	0,36	0	5,67
BSIZE	419	5,78	2,50	5	2	21
SUSCOM	419	0,67	0,47	1	0	1

The average ROA is 0.06, indicating positive profitability among sampled firms. The mean ESG Combined Score (ESGC) is 51.03, suggesting a moderate level of sustainability performance after accounting for ESG controversies. Meanwhile, female directors represent approximately 13% of corporate directors on average, indicating relatively low female participation in board leadership positions. The mean value of SUSCOM is 0.67, implying that approximately 67% of the sampled firms have established a sustainability committee. Overall, the descriptive statistics indicate considerable variation in ESGC, female director representation, and firm characteristics across firms, suggesting sufficient variability for subsequent regression analysis.

4.2 Correlation Analysis

Table 4. Correlation Analysis

Variable	ROA	ESGC	FD PRO	SIZE	DER	BSIZE	SUSCOM
ROA	1	0,188	0,026	-0,126	-0,099	-0,069	0,254
ESGC	0,188	1	-0,046	0,511	-0,024	0,406	0,486
FD PRO	0,026	-0,046	1	-0,182	-0,073	-0,190	0,002
SIZE	-0,126	0,511	-0,182	1	0,070	0,528	0,167
DER	-0,099	-0,024	-0,073	0,070	1	0,113	-0,045
BSIZE	-0,069	0,406	-0,190	0,528	0,113	1	0,130
SUSCOM	0,254	0,486	0,002	0,167	-0,045	0,130	1

Table 4 reports the Pearson correlation matrix among the study variables. ESGC is positively correlated with corporate financial performance (ROA) ($r = 0.188$), providing preliminary evidence that firms with higher sustainability performance tend to exhibit better financial performance. In addition, the presence of a sustainability committee (SUSCOM) is positively associated with ROA ($r = 0.254$), while firm size (SIZE), leverage (DER), and board size (BSIZE) show relatively weak correlations with financial performance. The correlation between FD PRO and ROA is relatively weak ($r = 0.026$), suggesting that the influence of female directors may operate through mechanisms other than a direct association with firm performance.

Among the explanatory variables, the highest correlation is observed between firm size (SIZE) and board size (BSIZE) ($r = 0.528$), followed by the correlation between ESGC and firm size ($r = 0.511$). Since all pairwise correlation coefficients remain well below the commonly accepted threshold of 0.80, multicollinearity is unlikely to pose a serious concern in the regression analysis.

4.3 Regression Results and Discussion

Table 5 presents the baseline and moderation regression results. Model (1) estimates the direct relationship between ESG Combined Score (ESGC) and corporate financial performance, whereas Model (2) incorporates the interaction between ESGC and female directors to examine whether board gender diversity moderates this relationship.

Table 5. Baseline and Moderation Regression Results

Variables	(1) ROA	(2) ROA
$ESGC_{t-1}$	0.0011** (0.0005)	0.00002 (0.0005)
$FD\ PRO_{t-1}$		0.0058 (0.1320)
$ESGC_{t-1} \times FD\ PRO_{t-1}$		0.0037* (0.0021)
SIZE	0.0056 (0.0289)	0.0153 (0.0256)
DER	0.0047 (0.0102)	0.0041 (0.0112)
BSIZE	0.0037* (0.0021)	0.0028 (0.0022)
SUSCOM	-0.0014 (0.0110)	-0.0011 (0.0103)
Firm Fixed Effects	Yes	Yes
Clustered SE	Firm	Firm

Observations	419	419
Within R ²	0.041	0.131

Notes: Standard errors are reported in parentheses. All models are estimated using one-way firm fixed-effects regressions with standard errors clustered at the firm level. ESGC and FD PRO are measured using one-year lagged values. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

The results from Model (1) indicate that ESG Combined Score (ESGC) is positively associated with corporate financial performance ($\beta = 0.0011$, $p < 0.05$), thereby supporting Hypothesis 1. This finding suggests that firms with stronger sustainability performance, after accounting for ESG-related controversies, are more likely to achieve superior financial performance. Economically, the estimated coefficient implies that a 10-point increase in ESGC is associated with an approximately 1.1 percentage-point increase in Return on Assets (ROA), indicating that improvements in sustainability quality generate not only statistically significant but also economically meaningful financial benefits.

Unlike conventional ESG measures, ESGC incorporates controversy-related risks into the evaluation of sustainability performance. Consequently, the positive association suggests that firms derive financial benefits not only from engaging in ESG activities but also from maintaining the credibility of those activities by minimizing sustainability-related controversies. This finding reinforces the argument that the quality and credibility of sustainability practices are critical determinants of value creation.

From the perspective of stakeholder theory, firms create long-term value by effectively addressing the expectations of multiple stakeholder groups. However, stakeholder support depends not only on firms' sustainability initiatives but also on stakeholders' perceptions of their credibility. Because ESG Combined Score incorporates both sustainability performance and ESG controversy-related risks, it more accurately reflects firms' ability to maintain stakeholder trust and organizational legitimacy. Firms with higher ESGC are therefore more likely to strengthen stakeholder relationships, reduce reputational risk, improve operational efficiency, and ultimately enhance financial performance. These findings extend stakeholder theory by suggesting that stakeholder value creation depends not only on sustainability engagement itself but also on the credibility and consistency with which sustainability commitments are implemented.

The present findings are consistent with prior studies documenting a positive relationship between ESG performance and corporate financial performance (Eccles et al., 2014; Friede et al., 2015). However, this study extends the existing literature by demonstrating that the positive financial effects of sustainability remain evident even after adjusting for ESG-related controversies through ESG Combined Score. This evidence suggests that previous inconsistencies in the ESG–financial performance literature may partly reflect differences in sustainability measurement. By incorporating controversy-related risks, ESGC provides a more comprehensive assessment of sustainability quality and offers additional insight into how credible sustainability practices contribute to corporate value creation.

Model (2) further demonstrates that board gender diversity strengthens the relationship between ESG Combined Score and corporate financial performance. The interaction between ESGC and female directors is positive and statistically significant ($\beta = 0.0037$, $p < 0.10$), supporting Hypothesis 2. This result indicates that firms with greater female board representation derive stronger financial benefits from sustainability performance than firms with lower female representation. Rather than directly improving financial performance, female directors appear to enhance the effectiveness with which sustainability initiatives are translated into corporate value.

Female directors may strengthen the financial benefits of ESGC by enhancing board oversight over sustainability-related risks and ensuring that ESG commitments are implemented consistently with actual business practices. Stronger monitoring reduces the likelihood of ESG controversies, thereby preserving the credibility of sustainability initiatives and enabling firms to realize greater stakeholder support and financial benefits.

One possible explanation is that female directors are associated with stronger monitoring, greater stakeholder orientation, and closer attention to sustainability-related risks. Previous studies suggest that women on corporate boards tend to exhibit greater ethical sensitivity, stronger oversight, and a longer-term orientation in strategic decision-making. These characteristics may improve the quality of sustainability governance and facilitate the more effective implementation of ESG initiatives, enabling firms to translate sustainability investments into superior financial performance.

This finding is particularly relevant in the Indonesian context, where ownership concentration remains relatively high and external governance mechanisms are comparatively weaker than in many developed markets. Under such conditions, board-level governance plays a more important role in ensuring that sustainability strategies are effectively implemented. Female directors may therefore complement sustainability initiatives by strengthening board oversight and improving the alignment between corporate sustainability strategies and stakeholder expectations. Consequently, the effectiveness of ESG implementation depends not only on the quality of sustainability practices themselves but also on the governance mechanisms responsible for overseeing their execution.

The findings also contribute to the growing literature on board gender diversity by highlighting an indirect mechanism through which female directors influence corporate outcomes. Rather than exerting a direct effect on financial performance, female directors appear to enhance the effectiveness of sustainability practices. This perspective helps explain why previous studies have reported mixed evidence regarding the relationship between board gender diversity and firm performance, suggesting that the value of female directors may arise through their interaction with firms' strategic initiatives rather than through a purely independent effect.

To examine whether the main findings are sensitive to the measurement of sustainability performance, an additional robustness analysis is conducted by replacing ESG Combined Score

(ESGC) with the conventional ESG Score while maintaining the same empirical specification. The corresponding estimation results are presented in Table 6.

Table 6. Robustness Analysis Using ESG Score

Variables	(3) ROA
ESG_{t-1}	0.00016 (0.00058)
$FD\ PRO_{t-1}$	-0.0093 (0.1336)
$ESG_{t-1} \times FD\ PRO_{t-1}$	0.0039* (0.0021)
SIZE	0.0143 (0.0254)
DER	0.0042 (0.0111)
BSIZE	0.0029 (0.0021)
SUSCOM	-0.0022 (0.0106)
Firm Fixed Effects	Yes
Clustered SE	Firm
Observations	419
Within R2	0.135

Notes: Standard errors are reported in parentheses. All models are estimated using one-way firm fixed-effects regressions with standard errors clustered at the firm level. ESG and FD PRO are measured using one-year lagged values. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

As reported in Table 6, the interaction between ESG Score and female directors remains positive and statistically significant, although the direct effect of ESG Score is no longer statistically significant. These findings indicate that the moderating role of female directors is robust to an alternative measure of sustainability performance, suggesting that the main conclusions of this study remain qualitatively unchanged regardless of whether sustainability performance is measured using ESG Combined Score (ESGC) or the conventional ESG Score.

The robustness analysis also provides an important insight. While the direct financial effect of the conventional ESG Score disappears, the interaction effect remains significant, indicating that board gender diversity consistently enhances the value generated by sustainability initiatives. This finding suggests that governance quality plays a stable role in strengthening the relationship between sustainability performance and corporate financial performance, whereas the direct financial benefits appear to depend on how sustainability quality is measured.

Overall, the robustness analysis reinforces the main conclusion that the financial value of sustainability depends not only on sustainability performance itself but also on governance mechanisms that enable firms to translate sustainability initiatives into superior corporate financial performance.

5. CONCLUSION AND LIMITATION

This study examines the relationship between Environmental, Social, and Governance Combined Score (ESGC) and corporate financial performance, as well as the moderating role of female directors in Indonesian listed firms during the 2020–2024 period. Using a firm fixed-effects model with one-year lagged explanatory variables and firm-clustered standard errors, the findings reveal that ESGC is positively associated with corporate financial performance. Furthermore, female directors strengthen the positive relationship between ESGC and corporate financial performance, indicating that board gender diversity enhances the effectiveness with which sustainability initiatives are translated into corporate value.

The findings make several important contributions to the literature. Theoretically, this study extends stakeholder theory by demonstrating that stakeholder value creation depends not only on firms' engagement in sustainability activities but also on the credibility of those activities, as reflected in the ESG Combined Score (ESGC). Unlike conventional ESG measures, ESGC incorporates sustainability-related controversies, providing a more comprehensive assessment of sustainability quality and offering additional insight into how credible sustainability practices contribute to corporate financial performance. This study also contributes to the corporate governance literature by showing that female directors function as an important governance mechanism that strengthens the financial benefits of sustainability performance rather than directly influencing financial performance.

From a managerial perspective, the findings suggest that firms should focus not only on improving ESG performance but also on maintaining the credibility of sustainability practices by minimizing ESG-related controversies. In addition, increasing female representation on corporate boards may strengthen board oversight, improve stakeholder confidence, and enhance the financial value generated by sustainability initiatives. From a policy perspective, the findings support initiatives encouraging greater board gender diversity and the adoption of controversy-adjusted sustainability measures to improve the effectiveness of corporate sustainability practices.

Despite these contributions, this study has several limitations. First, the analysis covers the 2020–2024 period, which may not fully capture the long-term financial effects of corporate sustainability initiatives. Future studies may extend the observation period to examine whether the observed relationships remain consistent over a longer time horizon. Second, although ESG Combined Score provides a more comprehensive measure of sustainability performance by incorporating ESG controversies, it does not allow the individual effects of the environmental, social, governance, and controversy dimensions to be examined separately. Future research

may investigate these dimensions individually to identify which aspects of sustainability contribute most strongly to corporate financial performance.

Third, this study focuses exclusively on female directors as the moderating governance mechanism. Future studies may examine whether other governance characteristics, such as board independence, board expertise, ownership structure, CEO duality, or board sustainability expertise, similarly influence the effectiveness of sustainability initiatives. Finally, although the use of firm fixed effects, one-year lagged explanatory variables, and clustered standard errors helps mitigate endogeneity concerns, the possibility of residual endogeneity cannot be entirely eliminated. Future research may employ alternative identification strategies, such as instrumental variables, difference-in-differences, or dynamic panel estimators where appropriate, to further strengthen causal inference.

Overall, this study highlights that the financial value of corporate sustainability depends not only on firms' sustainability performance but also on governance mechanisms that enhance the credibility and effective implementation of sustainability initiatives. These findings provide important implications for researchers, corporate managers, and policymakers seeking to strengthen the long-term value of sustainable business practices.

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