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ESG disclosure and firm value: The moderating role of female directors in Indonesian listed firms

Revina Selvia, Irwan Trinugroho

[1]Department of Master of Management, Faculty of Economics and Business,
[2]Department of Management, Faculty of Economics and Business
Sebelas Maret University
Jl. Ir. Sutami No. 36 A, Kentingan, Jebres, Surakarta, Central Java 57126, Indonesia

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Abstract

Growing sustainability awareness has encouraged investors to consider environmental, social, and governance (ESG) factors when evaluating firms. However, evidence regarding the relationship between ESG disclosure and firm value remains mixed. This study examines the association between ESG disclosure and firm value and investigates whether female directors moderate this relationship in Indonesia. The study analyzes secondary data from 67 firms listed on the Indonesia Stock Exchange (IDX) over 2015–2024, yielding 670 firm-year observations. Panel data regression using the Random Effects Model was conducted following the Chow, Hausman, and Lagrange Multiplier tests. ESG disclosure is measured using an index based on the Global Reporting Initiative (GRI) Standards, female board representation using the Female Board Ratio (FBR), and firm value using Tobin's Q. The results indicate that ESG disclosure is not significantly associated with firm value. Female directors exhibit a positive association with firm value when control variables are excluded, but this association becomes insignificant at the 5% level after controls are included. Furthermore, the interaction between ESG disclosure and female board representation is insignificant, a result that remains robust when firm-clustered standard errors are applied. These findings suggest that ESG disclosure alone may not be sufficient to influence firm valuation and that female board representation does not significantly strengthen the relationship between ESG disclosure and firm value.

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✉*Corresponding Author:*
Name: Revina Selvia
E-mail: revinashelvia@gmail.com

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1. Introduction

Businesses keep paying close attention towards environmental, social, and governance (ESG) following the increasing concern over corporate sustainability issues at the global level. In relevance with its development, ESG has emerged as a key non-monetary measure of a firm's long-term outlook, as it reflects a firm's commitment to sustain the environmental and social aspects, through a good corporate governance. Firms with a strong ESG record tend to receive stronger support from their stakeholders, enhance corporate reputation, and create sustainable competitive advantages, thereby increasing long-term firm value (Tang et al., 2024). The value of ESG-based investments across several major markets reached approximately USD 35.5 trillion in 2020, an increase of 55 percent compared to the value in 2016 (Seok et al., 2024). This growth indicates that sustainability considerations have become an integral part of investment decision-making.

In Indonesia, ESG practices and disclosure have gained increasing attention following the issuance of Financial Services Authority (OJK) Regulation No. 51/POJK.03/2017 on Sustainable Finance. The regulation encourages firms, particularly those listed on the Indonesia Stock Exchange (IDX), to improve transparency by reporting sustainability-related information in their annual and sustainability reports. Consequently, investors increasingly expect firms to balance economic, social, and environmental objectives alongside financial performance, consistent with the Triple Bottom Line concept.

Corporate value remains a key priority for management, since it reflects the market's assessment of a company's current condition and its prospects for sustainability. Apart from depending to financial performance, enhancing corporate value can also be achieved through non-financial factors, including ESG disclosure. However, findings regarding the impact of ESG disclosures on corporate value remain mixed. Some studies suggest that ESG disclosures can strengthen a company's reputation, boost investor confidence, and foster closer relationships with stakeholders. Conversely, other studies observed that this impact is not significant. These variations in findings suggest that the relationship between ESG disclosures and corporate value warrants further investigation, particularly within emerging markets such as Indonesia.

In addition to ESG disclosure, board composition may also be associated with corporate value. Upper Echelons Theory explains that the demographic characteristics of executives, including gender, can influence the strategic decision-making process and subsequently, company's performance (Hambrick & Mason, 1984). Women's representation on the board of directors has the potential to broaden perspectives in board-level discussions, as well as influence governance practices and strategic decisions related to ESG issues. However, women remain underrepresented in corporate leadership positions in Indonesia (Mazaya, 2025). The OECD also highlights that the gender gap remains a problem in the representation of women in corporate leadership and senior management positions (Denis, 2022).

Previous studies have reported mixed findings on the relationship between female board representation and corporate performance. While some studies associate female board representation with improved corporate outcomes (Ahmad et al., 2024; Laskar et al., 2024), other studies have found no significant relationship between these two aspects (Natalia & Isnalita, 2023). In the context of Indonesian companies, Aisyah et al. (2024) reported that board gender diversity does not exert a significant moderating effect on the relationship between overall ESG performance and firm value. These variations in findings suggest that the role of board gender diversity may be influenced by the specific ESG indicators employed, the research environment, and the specifications of the analytical models used.

The findings emphasize the need for further study to determine whether the representation of women on boards of directors influences how the market perceives ESG disclosures, particularly when disclosures are measured using an index based on Global Reporting Initiative (GRI) standards. By incorporating the presence of female directors as a moderating variable, this study offers to examine the role of board composition through a comprehensive way; it moves beyond a direct assessment of its link to firm value, exploring instead how it may strengthen or weaken the relationship between GRI-based ESG disclosures and firm value.

This study examines the association between ESG disclosure and firm value and investigates whether female directors moderate this relationship among firms listed on the IDX. ESG disclosure is measured by an index based on Global Reporting Initiative (GRI) standards, while female representation on the board of directors is assessed via the Female Board Ratio (FBR), and firm value is measured using Tobin's Q. The analysis also controls for leverage, measured by the Debt-to-Equity Ratio (DER); profitability, measured by Return on Assets (ROA); and firm size, measured by total assets, to improve the reliability of the estimates. This study is expected to make two key contributions. First, it positions gender diversity on the board of directors as a factor that may influence how the market evaluates ESG disclosures. Second, it provides empirical evidence derived from panel data of companies listed on the IDX between 2015 and 2024, a period that encompasses the implementation of sustainable finance regulations in Indonesia. The findings are intended to serve as a reference for companies, investors, and policymakers when evaluating the quality of ESG disclosures and the composition of boards of directors.

2. Theoretical Framework and Hypotheses Development

Each theory in this study supports a specific relationship in the research model. Stakeholder

Theory, Legitimacy Theory, and the Resource-Based View (RBV) provide complementary explanations for the relationship between environmental, social, and governance (ESG) disclosure and firm value (H_1). Stakeholder Theory suggests that ESG disclosure can strengthen stakeholder trust and corporate reputation. Legitimacy Theory explains that companies disclose ESG information to maintain social legitimacy, while investors' valuation may depend on the perceived credibility of such disclosure. RBV views ESG-related capabilities as strategic resources that can generate competitive advantages.

Upper Echelons Theory underpins the proposed direct association between female directors and firm value (H_2) and their moderating role in the relationship between ESG disclosure and firm value (H_3). It suggests that the characteristics of top decision-makers, including gender, may shape strategic choices and corporate disclosure oversight.

The model also includes profitability, firm size, and leverage as control variables. Signaling Theory explains how firm size and profitability may convey information about corporate prospects to the market (Ross, 1977). Trade-off Theory provides a theoretical basis for including leverage by explaining how firms balance the benefits of debt against its associated financial risks when seeking to maximize firm value (Myers, 1984).

RBV indicates that ESG practices and their disclosure may act as a strategic resource that is highly valuable for firms and has the ability to improve corporate reputation, operational efficiency, stakeholder loyalty, and sustainable competitive advantage. In the long term, therefore, ESG disclosure is expected to increase firm value, as reported by previous studies that stronger ESG performance leads to higher market valuations (Seok et al., 2024; Tang et al., 2024). Inconclusive findings were reported in emerging markets, highlighting the need for further analysis on the relationship. Thus, the first hypothesis is formulated.

H_1: ESG disclosure positively affects firm value.

Board characteristics may influence firm value alongside ESG disclosure. Consistent with Upper Echelons Theory, the demographic characteristics and experiences of executives shape corporate strategic decisions and subsequent performance. Female board representation may be associated with firm value through three aspects. First, monitoring: recent evidence suggests that female directors can strengthen board oversight and constrain earnings management (Alhossini et al., 2024). Second, risk management: Abinzano et al. (2023) and Shakeel & Khawaja (2025) indicate that the relationship between female board representation and corporate risk may vary depending on the proportion of women on the board and the firm's operating environment. Third, board-level decision-making: gender diversity may broaden the range of perspectives considered during strategic discussions.

However, this contribution also depends on the extent to which women are genuinely involved in the decision-making process (Bose et al., 2022; Soesetio et al., 2024). These channels provide theoretical grounds for the proposed relationship but are not tested directly in this study. Thus, the second hypothesis is formulated.

H_2: Female directors positively affect firm value.

While H_2 regards the direct association between female directors and firm value, H_3 concerns whether the firm-value payoff of ESG disclosure depends on the presence of female directors. Female directors are expected to strengthen the relationship between ESG disclosure and firm value, rather than merely increase disclosure, because greater female board representation is often associated with greater transparency, stronger oversight of reporting quality, and a stronger stakeholder orientation. These characteristics may enhance the credibility of ESG disclosure and reduce the likelihood that investors perceive it as symbolic (Aprullah et al., 2025).

Investors may therefore assign a higher value to the ESG disclosure of firms with more gender-diverse boards. Previous studies show that board gender diversity is associated with ESG performance in European banking firms (Paolone et al., 2024) and Indonesian non-financial firms (Sofiati & Mita, 2024). However, these studies treat female directors as a determinant of ESG performance and do not test whether the market values ESG disclosure differently depending on board gender diversity. Therefore, this study examines this moderating role in firms listed on the Indonesia Stock Exchange, without differentiating between financial and non-financial firms.

H_3: Female directors positively moderate the relationship between ESG disclosure and firm value.

3. Methodology

This study collected data from secondary sources of firm's environmental, social, and governance (ESG)

disclosure, board compositions, profitability, firm size, and leverage. Data were collected from sampled firms selected using purposive sampling method for firms listed on the Indonesia Stock Exchange (IDX) in 2015-2024, firms that published annual reports and/or sustainability reports containing complete ESG disclosure data. Based on these criteria, 67 firms were selected, combined with the observation years, this study examined a total of 670 firm-year observations. The ten-year observation period was chosen to provide more reliable estimates and capture corporate sustainability practices surrounding Indonesia's Sustainable Finance Regulation (POJK No. 51/POJK.03/2017). Table 1 outlines the steps used to arrive at the final sample.

Variable Measurement

The measurement of variables in this study follows the studies conducted by Seok et al. (2024) and Aisyah et al. (2024), both of whom investigated the relationships among ESG performance, board gender diversity, and firm value, with board gender diversity acting as a moderator. Firm's ESG disclosure is measured using an ESG Disclosure Index developed from the Global Reporting Initiative (GRI) Standards (Seok et al., 2024). Female Board Ratio (FBR) is adopted to measure women participation in the board of director. It illustrates the share of women among directors and their potential role in strengthening strategic decision-making (Peng & Chandarasupsang, 2023). Tobin's Q, which reflects market valuation relative to firm assets (Chung & Pruitt, 1994). Leverage, firm size, and profitability, as the control variables, are measured using DER, total assets, and Return on Assets (ROA), respectively. These variables are included as control variables because they are commonly associated with firm value (Utami et al., 2024). Table 2 presents the detailed measurement of each variable.

The ESG Disclosure Index was built from a content analysis of firms' annual reports and/or sustainability reports using indicators taken from the GRI Standards. The GRI framework was chosen since it offers a consistent basis for evaluating sustainability disclosure across the environmental, social, and governance dimensions. Each indicator was coded 1 if the relevant information was disclosed in a firm's report and 0 otherwise. For every firm-year, the index equals the number of applicable indicators disclosed divided by the total number of applicable indicators, yielding a score between 0 and 1.

Under this pooled-item approach, each indicator contributed equally to the overall index, and the environmental, social, and governance

Table 1. Steps in constructing the sample

Screening Stages	Firms Excluded	Firms Retained
Initial population: firms listed on the IDX as of 31 December 2024	–	943
Firms not listed on the IDX consistently throughout 2015–2024	464	479
Firms without annual reports and/or sustainability reports containing complete ESG disclosure data for 2015–2024	412	67
Final sample (firms)	–	67
Final observations (67 firms × 10 years)	–	670

Table 2. Variable measurement

Variables	Abbreviation	Definition	Source
Firm Value	Tobin's Q	(Market Value of Equity + Total Debt) / Total Assets	IDX, Annual Report
ESG Disclosure	ESG	ESG Disclosure Index based on GRI Standards: number of GRI-based items disclosed divided by total applicable items (range 0–1)	Sustainability Report
Female Directors	FBR	Ratio of female directors to total board members	Annual Report
Profitability	ROA	Net income divided by total assets	Annual Report, Financial Statements
Firm Size	SIZE	Natural logarithm of total assets	Annual Report, Financial Statements
Leverage	DER	Total debt divided by total equity	Annual Report, Financial Statements

dimensions were not weighted separately. The coding framework comprised 35 indicators, consisting of 13 environmental indicators, 15 social indicators, and 7 governance indicators. These indicator counts were applied consistently across firm-year observations. The index measures the extent of ESG-related information disclosed rather than the quality of disclosure or firms' actual ESG performance. The findings are therefore interpreted as associations between ESG disclosure and firm value.

Model Specification

The relationships among ESG disclosure, female directors, and firm value, including the moderating role of female directors, were tested using panel data regression combined with Moderated Regression Analysis (MRA). This study utilizes panel data from companies listed on the IDX for the 2015-2024 period. Variables such as profitability, firm size, and leverage are included in the regression model as control variables to account for differences in firm characteristics that may influence estimation results. Baltagi (2005) explains that the panel data method can yield more efficient estimates by accounting for unobserved heterogeneity across firms.

Equation (1) (Direct Effect Model):

$$Yit = \alpha + \beta1ESGit + \beta2FBRit + \beta3ROAit + \beta4SIZEit + \beta5DERit + \varepsilon i \quad (1)$$

Equation (2) (Moderating Effect Model):

$$Yit = \alpha + \beta1ESGit + \beta2FBRit + \beta3(ESGit \times FBRit) + \beta4ROAit + \beta5SIZEit + \beta5DERit + \varepsilon it \quad (2)$$

In this model, Yit is Tobin's Q score to measure firm i value at year t; ESGit is the ESG Disclosure Index; FBRit is the proportion of female directors on the board; (ESGit X FBRit) is the interaction term between ESG disclosure and female directors; ROAit represents profitability; SIZEit represents firm size; DERit represents leverage; α represents the constant term; β represents the regression coefficients; and εit represents the error term. Equation (1) corresponds to Model 2 and Equation (2) to Model 3 in Table 6; Model 1 (without control variables) and Model 4 (Model 3 with robust standard errors) are reported as additional steps of the hierarchical estimation.

The hypotheses were tested using panel data regression, including individual significance tests (z-tests in the Random Effects Model), joint significance tests (Wald chi-square tests), the coefficient of determination (R^2), and Moderated Regression Analysis (MRA) (Gujarati & Porter, 2009). Individual z-tests assess the statistical significance of each independent variable's coefficient, using a p-value threshold of 0.05. The Wald chi-square test evaluates the joint significance of the explanatory variables. R^2 measures the proportion of variation in firm value explained by the model. MRA incorporates the interaction term (ESG × FBR) to assess whether female board representation moderates the relationship between ESG disclosure and firm value. A positive and statistically significant interaction coefficient indicates that female board representation strengthens this relationship, whereas a negative and statistically significant coefficient indicates that it weakens the relationship.

4. Results

Descriptive Statistics of Samples

Panel data collected from of firms listed on the IDX annual and sustainability reports during the period 2015-2024. Sixty-seven firms fulfilled the purposive sampling criteria of this study, which when combined with the 10 years observation period yielded a total of 670 firm-year observations (67 firms for 10 years). The sample covers various industrial sectors, including financial services, healthcare, property, energy, technology, manufacturing, consumer goods, basic materials, and infrastructure. This diverse observed sector provides a comprehensive representation of ESG practices and female board representation among Indonesian listed firms. Table 3 provides a comprehensive list of industry sectors and number of firms observed from the sector.

Descriptive Statistics of Variables

Descriptive statistics analysis of the variables is presented in Table 4 provides information about the research variables.

The descriptive statistics show that the sampled firms have a mean Tobin's Q of 1.8656, with considerable variation across firms. The mean ESG disclosure index is 0.5017, suggesting a moderate level of disclosure. The average Female Board Ratio (FBR) is 12.97 percent, indicating that women remain underrepresented on Indonesian corporate boards. Profitability, measured by Return on Assets (ROA), averages 7.56 percent. Firm size and leverage also vary considerably across the sample.

Classical Assumption Tests

The normality of the regression residuals is assessed using the skewness-kurtosis test applied to residuals from the pooled regression model to determine whether they follow a normal distribution. The result shows that the residuals are not normally distributed with an adjusted chi-square value of 323.98 and a probability value of 0.0000 ($p < 0.05$). However, given the large panel dataset consisting of 670 observations, the violation of normality is not considered critical because, in large samples, the Central Limit Theorem supports valid inference on the estimated coefficients. Model 4 therefore additionally reports standard errors clustered by firm as a robustness check. The results of VIF analysis shows that even the highest VIF between the interaction variable ESG×FBR (6.42) and FBR (5.61) are still far below the threshold of 10 with a mean of 2.84. Thus, the regression model does not contain multicollinearity problems. Heteroscedasticity and within-firm serial correlation are common in panel data and can bias conventional standard errors. The Breusch-Pagan Lagrange Multiplier test reported in Table 5 (chibar²).

Panel Data Model Selection

This study conducted Chow test, Hausman test, and Breusch-Pagan Lagrange Multiplier (LM) test to determine the appropriate panel regression model (Table 5). The result of Chow test leans to FEM as appropriate model, while Hausman test shows no significant preference between FEM and REM, but suggests that REM provides a more efficient estimation. Lastly, LM test supports the use of REM to analyze the proposed model. Hence, this study selects REM to examine the proposed hypotheses.

Panel Regression Analysis

The examination of the relationship between ESG disclosure, female directors, and firm value was conducted through four estimation stages using a Random Effects Model (REM). The first model analyzes the direct effects of ESG and the Female Board Ratio (FBR). In the second model, the analysis is expanded by incorporating profitability (ROA), firm size (SIZE), and leverage (DER) as control variables. The third model introduces an ESG×FBR interaction term to determine whether the presence of female directors moderates the relationship between ESG disclosure and firm value. The fourth model employs robust standard errors to re-examine the results of the moderation estimation.

The test results presented in Table 6 indicate that ESG disclosure does not yet show a significant relationship with firm value. This is reflected by a coefficient of 0.101 with a p-value of 0.698 in Model 2. Upon the inclusion of the ESG×FBR interaction term in Model 3, the ESG coefficient shifts to −0.002, with a p-value of 0.995. These findings suggest that,

Table 3. Industry sector

Industry Sectors	Number of Firms	Percentage (%)
Financial Services	18	26.87
Consumer Goods	12	17.91
Energy and Mining	10	14.93
Infrastructure and Telecommunication	8	11.94
Industrial and Manufacturing	7	10.45
Property and Real Estate	5	7.46
Healthcare and Pharmaceutical	4	5.97
Technology and Media	3	4.47
Total	67	100

Table 4. Descriptive statistics

Variables	N	Mean	Std. Dev.	Min	Max
Tobin's Q	670	1.8656	3.0078	0.0002	19.2224
ESG	670	0.5017	0.2382	0.1083	0.9491
FBR	670	0.1297	0.1465	0.0000	0.6667
ROA	670	0.0756	0.0877	0.0002	0.8668
SIZE	670	19.8041	4.8163	12.0208	32.4545
DER	670	2.0467	2.4780	0.0003	16.0786

for the companies included in the research sample, it cannot be demonstrated that an increase in ESG disclosure is associated with an increase in the firm's market value. In contrast, a positive and significant effect of female directors on firm value was found before control variables were included in the model (Model 1: β = 2.132; p = 0.015). However, the FBR coefficient is no longer statistically significant at the 5% level once control variables are included (Model 2: β = 1.657, p = 0.054; Model 3: β = 1.252, p = 0.334; Model 4: p = 0.385 with robust standard errors), so the positive association between female directors and firm value is not robust.

No interaction effect was found in Model 3 despite the positive interaction coefficient between ESG and FBR (β = 0.816; p = 0.671; p = 0.773 with robust standard errors). Therefore, there is no evidence that female directors moderate the relationship between ESG disclosure and firm value. Among the control variables, firm value is positively associated with profitability (ROA; β = 3.993 in Model 2 and β = 4.095 in Model 3, both p < 0.001), although the ROA coefficient is significant only at the 10% level once robust standard errors are used (Model 4; p = 0.071), and negatively associated with firm size (SIZE; β = -0.135, p < 0.01 in all models), while leverage (DER) is not significant at the 5% level in any model (p = 0.079 in Model 4).

Table 5. Panel data model selection

Tests	Statistic	P-value	Decision
Chow Test (PLS vs FEM)	F(66,597) = 21.79	0.0000	FEM
Hausman Test (FEM vs REM)	$\chi^2(6) = 6.12$	0.4096	REM
LM Test (PLS vs REM)	chibar² = 1334.54	0.0000	REM

Table 6. Random effect model

	(1) Tobin's Q	(2) Tobin's Q	(3) Tobin's Q	(4) Tobin's Q
ESG	-0.034	0.101	-0.002	-0.002
	(-0.13)	(0.39)	(-0.01)	(-0.01)
FBR	2.132*	1.657	1.252	1.252
	(2.44)	(1.92)	(0.97)	(0.87)
ROA		3.993***	4.095***	4.095
		(4.11)	(4.08)	(1.81)
SIZE		-0.135**	-0.135**	-0.135***
		(-3.04)	(-3.01)	(-3.54)
DER		-0.066	-0.066	-0.066
		(-1.34)	(-1.34)	(-1.76)
ESG □ FBR			0.816	0.816
			(0.43)	(0.29)
Constant	1.606***	4.115***	4.145***	4.145***
	(4.41)	(4.26)	(4.25)	(4.35)
N	670	670	670	670
Number of firms	67	67	67	67
Wald χ^2	5.95	36.49	36.49	19.10
R^2 within	0.012	0.038	0.038	0.038
R^2 between	0.002	0.192	0.192	0.192
R^2 overall	0.000	0.149	0.149	0.149
Cluster-robust SE	No	No	No	Yes

Note: z statistics in parentheses (standard errors in Model 4 are clustered by firm); * p < 0.05, ** p < 0.01, *** p < 0.001

Hypothesis Testing

Partial significance tests (t-test), simultaneous significance tests (Wald/F-test), coefficient of determination (R^2), and moderation analysis were conducted to test the proposed hypotheses. The Random Effect Model shows a significant simultaneous effect, with a Wald chi-square value of 36.49 and a probability value of 0.0000 in Model 3 (19.10 and 0.0040 with robust standard errors in Model 4). The overall R^2 shows that the proposed model explains 14.87 percent of the variation in firm value (Model 2). With including the interaction variable ESG×FBR, the overall R^2 is 14.88 percent (Model 3), indicating virtually no additional explanatory power from the moderating variable; the within and between R^2 are 0.038 and 0.192, respectively. H_1 and H_2 are tested using Model 2 (Equation 1), and H_3 using the interaction coefficient in Model 3 (Equation 2). Hypotheses are tested using two-tailed p-values at the 5% significance level, which is the more conservative criterion. Because H_1 to H_3 are directional, one-tailed p-values are also reported in Table 7 as a sensitivity check.

The conclusions for H_1 and H_3 do not depend on the choice of test. Both remain insignificant under one-tailed tests (p = 0.349 and p = 0.336, respectively). For H_2, the one-tailed p-value (0.027) falls below 5%; however, this result is sensitive to the specification, as the FBR coefficient is insignificant once standard errors are clustered by firm (Model 4; one-tailed p = 0.193). H_2 is therefore treated as not supported according to the main two-tailed test.

Overall, the findings show no significant effect of ESG disclosure on firm value, while the positive association between female directors and firm value is not robust to the inclusion of control variables. The moderating effect of female directors is also statistically insignificant. These results suggest that female board representation may be more relevant to firm value through its potential direct governance role than through strengthening the market's response to ESG disclosure. However, this governance-based mechanism falls outside the scope of the current study.

5. Discussion

The Effect of Environmental, Social, and Governance (ESG) Disclosure on Firm Value

The test results in Table 7 indicate that ESG disclosure does not have a significant effect on firm value, with a coefficient of 0.101 and a p-value of 0.698. Consequently, the first hypothesis (H_1) does not receive empirical support from the results, suggesting that ESG information is not necessarily a primary consideration for investors when determining the market value of companies in Indonesia. This situation may be linked to uneven levels of investor understanding regarding ESG, varying quality of sustainability disclosures, and differences in institutional conditions between developing and developed countries (Naeem et al., 2022).

According to stakeholder theory, the implementation of ESG has the potential to enhance firm value by strengthening stakeholder trust and corporate reputation. However, these benefits depend on the extent to which ESG information is understood and acted upon by relevant parties. ESG disclosure practices in Indonesia are still developing; thus, it is possible that some companies engage in these practices merely to comply with regulatory requirements rather than as part of a long-term business strategy (Aprullah et al., 2025). As a result, investors may not necessarily perceive ESG information as a signal that reflects the creation of firm value.

Table 7. Hypothesis testing results

Hypotheses	Statement	Coefficient	P-value (two-tailed)	P-value (one-tailed)	Conclusion
H_1	ESG positively affects firm value	0.101	0.698	0.349	Not supported
H_2	Female directors positively affect firm value	1.657	0.054	0.027	Not supported (two-tailed, main test)
H_3	Female directors moderate ESG-firm value relationship	0.816	0.671	0.336	Not supported

Note: H_1 and H_2 are tested in Model 2 and H_3 in Model 3 of Table 6 (Random Effect Model). The decision is based on two-tailed p-values at the 5% level. One-tailed p-values are reported as a sensitivity check because H_1 to H_3 are directional hypotheses; each equal half of the two-tailed p-values, since all estimated coefficients are positive. Under a one-tailed test, H_2 would be significant at the 5% level (p = 0.027), but then the association is not robust: with standard errors clustered by firm (Model 4), the FBR coefficient is insignificant (p = 0.385 two-tailed; p = 0.193 one-tailed), and the interaction term remains insignificant (p = 0.773 two-tailed; p = 0.387 one-tailed).

The result is also consistent with legitimacy theory, which explains that ESG disclosure in emerging markets may be driven by external legitimacy requirements rather than by long-term value creation strategies. Furthermore, differences in ESG measurement methods may contribute to inconsistent empirical findings, as ESG ratings vary across providers due to differences in indicators and assessment approaches (Berg et al., 2022). This finding differs from Seok et al. (2024), Aydoğmuş et al. (2022), and Surya et al. (2026), who found a positive relationship between ESG and firm value. The difference may arise because those studies were conducted in markets with stronger ESG ecosystems and higher investor awareness. Therefore, the insignificant relationship in this study does not imply that ESG is irrelevant, but may reflect that ESG disclosure is not yet fully valued by investors in Indonesia, an explanation that is not tested in this study.

The Effect of Female Directors on Firm Value

The coefficient of female directors on firm value (β = 1.657; p = 0.054 in Model 2) does not support H_2 at the 5% level under a two-tailed test. Under a one-tailed test consistent with the directional hypothesis, the association is statistically significant at the 5% level (p = 0.027), However, this result is not robust to the inclusion of control variables across model specifications (Table 6, Models 2-4), so it should be interpreted with caution. This result aligns with the Upper Echelons Theory on the notion that board characteristics influence firm's strategic decisions and organizational outcomes (Hambrick & Mason, 1984). Female directors may provide broader perspectives, stronger risk awareness, and more stakeholder-oriented decision-making, which could improve corporate governance quality and firm performance (Huang & Holding, 2024).

This result can be explained by the positive impact of representation of women which has been reported to bring diversity of knowledge, experience, and perspectives among board members. This diversity may reduce the risk of groupthink in homogeneous groups, thereby supporting more objective and higher-quality decision-making (Leonita et al., 2025). The presence of women may enrich the strategic discussion by introducing diverse experiences, perspectives, and approaches to solving organizational problems. This diversity could raise the quality of managerial oversight and decrease the chance of biased decisions. Consequently, firms may be better placed to develop more effective strategies for creating value for shareholders (Chang et al., 2024). These mechanisms are plausible explanations and are not tested in this study.

As a complementary perspective, though not used as a basis for formulating the hypotheses, Resource Dependence Theory views board diversity as a means for a company to gain broader access to knowledge, experience, and external connections. Previous studies indicates that the inclusion of women on boards of directors is associated with better financial performance and increased firm value. A gender-diverse board composition also has the potential to enhance information transparency, strengthen oversight of management, and build stakeholder trust. On this basis, the presence of female directors can be understood as a strategic resource with the potential to contribute to the creation of firm value (Huang & Holding, 2024; Peng & Chandarasupsang, 2023).

The Moderating Role of Female Directors in the ESG-Firm Value Relationship

The interaction between ESG and female directors (ESG × FBR) yields a positive but statistically insignificant coefficient (β = 0.816; p = 0.671), which remains insignificant under cluster-robust standard errors (p = 0.773), thus H_3 is not supported. There is no evidence that female directors moderate the relationship between ESG disclosure and firm value, and the positive sign of the coefficient is not interpreted as a moderating tendency. While female directors are positively associated with firm value in some specifications, their presence on the board does not appear to strengthen the market valuation of ESG disclosure. This finding may be explained by the low share of female directors in Indonesian firms, with an average FBR of only 12.97 percent. According to the critical mass perspective, board diversity requires sufficient representation before minority members can significantly influence strategic decisions (Herciu et al., 2026).

As a post-hoc interpretation, Critical Mass Theory suggests that female directors can influence corporate strategy when their representation reaches a level sufficient to support active participation and collective influence. The low proportion of female directors in Indonesian firms may therefore explain the insignificant moderating effect. This interpretation is consistent with Zhang et al. (2026), who found that female directors played a more

prominent role in financially constrained and non-family firms. However, this explanation remains speculative because the critical-mass threshold was not tested in this study.

The level of ESG disclosure development in Indonesia may also limit the role of female directors in strengthening the relationship between ESG disclosure and firm value. When ESG disclosure is not significantly associated with firm value, the moderating role of female directors may be more difficult to detect empirically. An insignificant interaction coefficient further indicates insufficient statistical evidence to conclude the existence of a moderating effect. Therefore, the results of this study cannot serve as a basis for predicting future changes in this relationship without further investigation.

Control Variables

A company's financial characteristics are linked to its firm value. Profitability, as measured by Return on Assets (ROA), shows a positive and significant coefficient in relation to Tobin's Q in Models 2 and 3. However, when estimated using robust standard errors in Model 4, its significance persists only at the 10% These findings suggest that companies with greater profitability tend to command higher market valuations. Conversely, firm size (SIZE) exhibits a negative association with firm value, which may indicate that larger firms experience relatively slower growth or receive lower market premiums. A similar pattern has also been observed among manufacturing firms in Indonesia (Utami et al., 2024). Meanwhile, leverage measured by the Debt-to-Equity Ratio (DER) shows a negative coefficient and it is not statistically significant at the 5% level across any of the models. A p-value of 0.079 in Model 4 indicates only marginal significance at the 10% level, which is insufficient to draw a robust conclusion regarding its relationship with firm value.

These findings highlight that financial fundamental remain critical factors influencing firm valuation beyond sustainability-related factors. The positive association between ROA and firm value aligns with the findings of Utami et al. (2024), who reported a positive correlation between profitability and Tobin's Q in Indonesian manufacturing firms. On the other hand, the influence of leverage lacks sufficient statistical support at the 5% significance level. Consequently, profitability, firm size, and leverage should be included as control variables, allowing for an analysis of the relationship between ESG disclosure, the presence of female directors, and firm value that accounts for variations in financial conditions across companies

6. Conclusion

This study provides empirical evidence on the relationships among environmental, social, and governance (ESG) disclosure, female directors, and firm value in Indonesian listed firms over 2015-2024. Based on panel regression and Moderated Regression Analysis (MRA) analysis, this study reveals that ESG disclosure is not significantly related to firm value, which may indicate that ESG disclosure is not fully reflected in firm's market valuation in Indonesia; several possible explanations, such as ESG maturity, disclosure quality, and investor awareness, are not tested in this study. Female representation on the board of directors shows a positive association with firm value in models that do not include control variables. However, this relationship loses its statistical significance once the firm's financial characteristics are included. Further analysis finds no evidence that female directors moderate the relationship between ESG disclosure and firm value. These results suggest that the potential contribution of female directors to firm value is likely linked to their direct role in corporate governance, rather than an ability to strengthen the relevance of ESG disclosures for market valuation though this specific mechanism is not explicitly tested in this study.

Theoretically, this study expands the discourse on corporate governance and sustainability in emerging markets by examining gender diversity on the board of directors as a potential factor influencing the relationship between ESG disclosure and firm value in Indonesia. From a practical perspective, these findings should be interpreted with caution. Given the observational nature of the study and the absence of a significant moderating effect, it cannot be concluded that increasing the number of women on the board of directors is an effective strategy for increasing firm value. Instead, these findings highlight the importance of companies and regulators prioritizing the credibility and quality of ESG information rather than merely increasing the volume of disclosures.

Several limitations have been observed in this study. The ESG metrics used are based on an internally constructed index rather than ratings from external ESG agencies. Current observational design, therefore, cannot rule out the possibility of

endogeneity or reverse causality. Other limitations include the relatively small sample size and the exclusion of qualitative aspects of board dynamics. Future studies are encouraged to utilize standardized ESG ratings, extend the observation period, and incorporate a larger sample. In addition, the use of lagged independent variables or an instrumental variable approach are also encouraged to address potential endogeneity issues. In addition, an analysis of each ESG dimension could be developed to gain a deeper understanding of the mechanisms regarding gender diversity and sustainability practices to the creation of corporate value.

References

Abinzano, I., Martinez, B., & Poletti-Hughes, J. (2023). Women in power with power: The influence of meaningful board representation on default risk. *International Review of Financial Analysis*, *89*, 102771. https://doi.org/10.1016/j.irfa.2023.102771

Ahmad, M., Abdirahman, S. A., & Annuar, H. A. (2024). Women on board: The impact on financial performance of companies listed on Bursa Malaysia. *Asian Journal of Accounting Perspectives, 17*(1), 26-45. https://doi.org/10.22452/AJAP.vol17no1.2

Aisyah, F. S. N., Haryati, T., & Vendy, V. (2022). Does Board gender diversity moderate ESG, dividend policy, and firm value relationships? *Jurnal Riset Akuntansi dan Keuangan*, *12*(2), 901-918. https://doi.org/10.17509/jrak.v12i2.69390

Alhossini, M. A., Zalata, A. M., Samaha, S. E., & Hessian, M. (2024). Monitoring female directors and earnings management, does corporate governance matter? *Cogent Business & Management*, *11*(1), 2396538. https://doi.org/10.1080/23311975.2024.2396538

Aprullah, M. P., Diantimala, Y., Arfan, M., & Irsyadillah, I. (2025). The role of ESG committee on Indonesian companies in promoting sustainable practice to creditors: Symbolic or substantive?. *International Journal of Financial Studies*, *13*(4), 180. https://doi.org/10.3390/ijfs13040180

Aydoğmuş, M., Gülay, G., & Ergun, K. (2022). Impact of ESG performance on firm value and profitability. *Borsa Istanbul Review*, *22*, S119-S127. https://doi.org/10.1016/j.bir.2022.11.006

Baltagi, B. H. (2005). *Econometric analysis of panel data* (3rd ed.). John Wiley & Sons.

Berg, F., Kölbel, J. F., & Rigobon, R. (2022). Aggregate confusion: The divergence of ESG ratings. *Review of Finance*, *26*(6), 1315-1344. https://doi.org/10.1093/rof/rfac033

Bose, S., Hossain, S., Sobhan, A., & Handley, K. (2022). Does female participation in strategic decision making roles matter for corporate social responsibility performance? *Accounting & Finance*, *62*(3), 4109-4156. https://doi.org/10.1111/acfi.12918

Chang, Y., Wu, K. T., Lin, S. H., & Lin, C. J. (2024). Board gender diversity and corporate social responsibility. *International Journal of Corporate Social Responsibility*, *9*(1), 7. https://doi.org/10.1186/s40991-024-00095-x

Chung, K. H., & Pruitt, S. W. (1994). A simple approximation of Tobin's Q-Financial management. *Financial Management*, *23*(3), 70–74. https://doi.org/10.2307/3665623

Denis, E. (2022). Enhancing gender diversity on boards and in senior management of listed companies. In *OECD Corporate Governance Working Papers* (Issue 28). https://doi.org/10.1787/92b8fc03-en

Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics*. McGraw-Hill.

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, *9*(2), 193-206. https://doi.org/10.2307/258434

Herciu, M., Ogrean, C., Vinerean, S., îmbalari, C., Radu, A., & 'erban, R. (2026). Women ' s Studies International Forum Women on corporate boards in developed markets. *Women's Studies International Forum*, *117*, 103335. https://doi.org/10.1016/j.wsif.2026.103335

Huang, W. (2024). Female board representation and firm value: International evidence. *Finance Research Letters*, *68*, 105998. https://doi.org/10.1016/j.frl.2024.105998

Laskar, N., Sahu, J. P., & Choudhury, K. S. (2024). Impact of gender diversity on firm performance: empirical evidence from India. *Managerial Finance*, *50*(3), 614-633. https://doi.org/10.1108/MF-02-2023-0126

Leonita, C., & Soei, C. T. L. (2025). Pengaruh proporsi direksi wanita terhadap nilai perusahaan Tbk di BEI periode 2017-2021. *Parahyangan Management Science and Practices Review*, *2*(1), 1-10.

Mazaya, N. (2025). Board gender diversity: Evidence from Indonesia. *Junior Management Science (JUMS)*, *10*(3), 609-630. https://doi.org/10.5282/jums/v10i3pp609-630

Myers, S. C. (1984). The Capital Structure Puzzle. *The Journal of Finance*, *39*(3), 574–592. https://doi.org/10.1111/j.1540-6261.1984.tb03646.x

Naeem, N., Cankaya, S., & Bildik, R. (2022). Does ESG performance affect the financial performance of environmentally sensitive industries? A comparison between emerging and developed markets. *Borsa Istanbul Review*, *22*, S128-S140. https://doi.org/10.1016/j.bir.2022.11.014

Natalia, I., & Isnalita, I. (2023). Do females on boards enhance firm performance? evidence from Indonesia manufacturing firm. *Contaduria y Administracion*, *69*(1), 213–246. https://doi.org/10.22201/fca.24488410e.2024.4983

Paolone, F., Pozzoli, M., Chhabra, M., & Di Vaio, A. (2024). Cultural and gender diversity for ESG performance towards knowledge sharing: empirical evidence from European banks. *Journal of Knowledge Management*, *28*(11), 106-131. https://doi.org/10.1108/JKM-05-2023-0445

Peng, H., & Chandarasupsang, T. (2023). The effect of female directors on ESG practice: Evidence from China. *International Journal of Financial Studies*, *11*(2), 66. https://doi.org/10.3390/ijfs11020066

Ross, S. A. (1977). The determination of financial structure: The incentive-signalling approach. *The Bell Journal of Economics*, 23-40. https://doi.org/10.2307/3003485

Seok, J., Kim, Y., & Oh, Y. K. (2024). How ESG shapes firm value: The mediating role of customer satisfaction. *Technological Forecasting and Social Change*, *208*, 123714. https://doi.org/10.1016/j.techfore.2024.123714

Shakeel, S., & Khawaja, M. (2025). Gender diversity in corporate boards and firm risk-taking: Evidence from Pakistan. *Economics and Business Review*, *11*(3), 119-142. https://doi.org/10.18559/ebr.2025.3.2135

Soesetio, Y., Rudiningtyas, D. A., Winarta, W., & Dhevi, C. (2024). Gender diversity on commissioner board and decision making: Evidence using capital raised through IPOs. *Ekuilibrium: Jurnal Ilmiah Bidang Ilmu Ekonomi*, *19*(1), 122-135. https://doi.org/10.24269/ekuilibrium.v19i1.2024.pp122-135

Sofiati, I., & Mita, A. F. (2024). The role of gender diversity In increasing ESG performance through intellectual capital. *Jurnal Akuntansi*, *28*(1), 184-205. https://doi.org/10.24912/ja.v28i1.1861

Surya, R. A. S., Andreas, Halim, E. H., & Zarefar, A. (2026). ESG performance and firm value in Indonesia: Do political connections and external assurance matter? *Journal of Risk and Financial Management*, *19*(2), 131. https://doi.org/10.3390/jrfm19020131

Tang, H., Xiong, L., & Peng, R. (2024). The mediating role of investor confidence on ESG performance and firm value: Evidence from Chinese listed firms. *Finance Research Letters*, *61*, 104988. https://doi.org/10.1016/j.frl.2024.104988

Utami, W., Nugroho, L., Chairunesia, W., & Mulyani, S. D. (2024). Profitability, leverage, and company size: A comparative analysis of manufacturing firm value in Indonesia and Malaysia during COVID-19. *Economics & Islamic Finance Journal (ECIF)*, *1*(3), 165-185. https://doi.org/10.70550/ecif.v1i3.71

Zhang, X., Biswas, P. K., Ranasinghe, D., & Roberts, H. (2026). Board gender diversity and investment efficiency: Evidence from UK private firms. *Accounting in Europe*, 1-27. https://doi.org/10.1080/17449480.2026.2622079