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The Effect of Environmental, Social, and Governance (ESG) Performance on Firm Value: The Moderating Role of Institutional Ownership (An Empirical Study of Companies Listed on the SRI-KEHATI Index)

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Abstract

Background: The average market valuation of SRI-KEHATI firms declined during 2020–2024, raising questions about whether investors value environmental, social, and governance performance differently.
Objective: This study examines the separate effects of environmental, social, and governance performance on firm value and whether institutional ownership moderates each of these relationships.
Methods: A balanced panel of 15 SRI-KEHATI companies, comprising 75 firm-year observations from 2020 to 2024, was analyzed using fixed-effects regression with interaction terms. ESG scores were obtained from Refinitiv, while data for Tobin's Q, institutional ownership, firm size, leverage, and return on assets were derived from annual reports, sustainability reports, and Indonesia Stock Exchange publications. White cross-section robust standard errors with a degrees-of-freedom correction were applied.
Results: Environmental performance had no statistically significant effect on firm value (β = −0.000487; p = 0.9642), whereas social performance (β = 0.015321; p = 0.0360) and governance performance (β = 0.008767; p = 0.0342) had significant positive effects. Institutional ownership negatively moderated the relationship between environmental performance and firm value (β = −0.189269; p = 0.0009), while positively moderating the relationships involving social performance (β = 0.116430; p = 0.0171) and governance performance (β = 0.130764; p = 0.0014).
Conclusion: The findings indicate that social and governance performance are more strongly associated with firm value than environmental performance among SRI-KEHATI companies, while institutional ownership has dimension-specific moderating effects.

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INTRODUCTION

Among the sampled SRI-KEHATI firms, mean Tobin's Q declined from 1.23 in 2020 to 0.98 in 2024. This pattern is notable because index constituents are selected based on sustainability, governance, and responsible-business characteristics, yet their market valuations did not increase uniformly. The phenomenon suggests that investors may distinguish among ESG dimensions rather than automatically reward sustainability status. ESG performance can affect firm valuation through several mechanisms. Stakeholder and legitimacy perspectives associate responsible practices with stronger relationships, reputation, and social acceptance, while signaling and agency perspectives emphasize information quality, monitoring, and lower perceived risk. Accordingly, superior ESG performance may command a valuation premium when

investors regard these benefits as credible (Erol, 2023; Gillan et al., 2021).

Nevertheless, the three dimensions need not operate identically. Environmental investments can entail visible short-term costs and delayed benefits; social practices can support employees, customers, and community relations; and governance can reduce agency risk more directly. Prior evidence is correspondingly mixed: Aydoğmuş et al. (2022) and Bashir et al. (2023) report value benefits, whereas Chau et al. (2025) identify nonlinear responses when early implementation costs precede economic returns.

Table 1
Development of Tobin's Q Mean SRI-KEHATI Index Companies in 2020-2024

Year	Red Tobin's Q
2020	1,23
2021	1,14
2022	1,15
2023	1,08
2024	0,98

Source: Authors' calculations from the 15-company sample using annual reports, IDX publications, and Refinitiv data (2025).

Table 1 reports annual means for the 15 sampled companies, representing 75 firm-year observations. Mean Tobin's Q decreased overall from 1.23 to 0.98, with only a slight recovery in 2022. This pattern is descriptive and cannot, by itself, attribute the decline to ESG; contemporaneous macroeconomic conditions, post-pandemic adjustment, sector composition, and market-price corrections may also have contributed. The panel regression therefore controls for firm fundamentals and tests the ESG dimensions separately.

This phenomenon is interesting because firms constituting the SRI-KEHATI Index are generally regarded as entities with commendable sustainability and governance standards. From a theoretical standpoint, the adoption of Environmental, Social, and Governance (ESG) practices is anticipated to bolster corporate reputation, mitigate operational risks, and reinforce investor trust, all of which may eventually increase the firm's market valuation. However, the downward trend in Tobin's Q suggests that markets do not necessarily respond equally to each ESG dimension. This circumstance provides a compelling rationale for investigating how each individual dimension of Environmental, Social, and Governance influences corporate value within the Indonesian equity market context.

SRI-KEHATI was selected because it is Indonesia's longest-established sustainability-oriented equity index and applies sustainability, financial, and governance screening, providing a consistent setting across the full 2020–2024 window. Newer alternatives, including IDX ESG Leaders and ESGQ KEHATI, have different inception dates or screening emphases; using SRI-KEHATI therefore improves temporal comparability rather than implying that it represents all Indonesian listed firms.

In Indonesia, sustainability considerations have garnered growing interest following the publication of the OJK Sustainable Finance Roadmap Phase II 2021–2025, which motivates both corporations and financial entities to embed Environmental, Social, and Governance (ESG) criteria into their operational activities. However, ESG adoption in Indonesia generally remains oriented toward regulatory compliance rather than being strategically directed toward enhancing corporate value. Multiple empirical studies indicate that ESG adoption has not consistently elicited favorable market reactions. Aydoğmuş et al. (2022) reported that ESG-related information disclosure exerts a favorable influence on company valuation, although its impact remains limited. Meanwhile, Dorothy and Endri (2024) show that profitability has not been able to strengthen the effect of ESG practices on the market valuation of firms operating in Indonesia's energy industry.

Table 2
Cumulative Growth of ESG Index vs JCI (2017–2022)

Table of Contents	Cumulative Growth 2017–2022 (%)
ESGSKEHATI	38,48
SRI-KEHATI	31,44

Table of Contents	Cumulative Growth 2017–2022 (%)
JCI	31,28
ESGQKEHATI	29,62
IDXESGL	17,87

Source: Indonesia Stock Exchange (IDX, 2024), compiled by the authors.

Based on the trajectory of ESG-based indices within the Indonesian market, it can be seen that the movement pattern is not fully consistent with the theory of market expectations, which posits that firms demonstrating strong sustainability performance ought to command a greater valuation premium. During the 2017–2022 period, ESG indices did not consistently outperform the overall market in terms of cumulative growth. Although the ESGS-KEHATI Index recorded the highest performance, with growth of 38.48%, other ESG indices, notably SRI-KEHATI and ESGQ KEHATI, recorded growth rates within the range of 29%–31%, which were relatively comparable to or even slightly below the JCI's growth of 31.28%. This phenomenon indicates that the implementation and performance of corporate ESG practices have not always been optimally reflected in investor responses through increased market valuations. In other words, sustainability practices have not consistently translated into significant financial advantages within Indonesia's capital market.

Based on the above phenomenon, Indonesia's capital market remains in a transitional phase of incorporating ESG information into investment decision-making, particularly within the developing-country context. The inconsistency between empirical findings and theoretical expectations therefore constitutes a research gap regarding the degree to which ESG performance genuinely influences corporate valuation. Therefore, this investigation is essential for understanding the nexus among ESG, market perception, and corporate valuation, as well as the institutional factors that can strengthen these relationships within the Indonesian equity market.

Recent studies increasingly disaggregate ESG, so separation of the three dimensions alone is not claimed as the novelty. The remaining contribution is contextual and relational: this study estimates dimension-specific effects within a constant Indonesian sustainability-index setting and tests whether institutional ownership changes each E-, S-, and G-to-value relationship. This design identifies whether the same monitoring mechanism produces different valuation consequences across dimensions in an emerging market.

A broader body of evidence confirms that ESG-value relationships vary by sector, market development, disclosure quality, and ownership structure (Behl et al., 2022; Buallay, 2019; Fuadah et al., 2022; Krishnamoorthy, 2021; Li et al., 2024; Naeem et al., 2022; Safitri & Paramita, 2025; Seok et al., 2024; Shiyu et al., 2022; Yoo & Managi, 2022). The present study therefore does not claim a universal gap; it tests whether dimension-level differences persist within one Indonesian index and whether institutional monitoring explains those differences.

KSEI records show that individual investors dominate the number of Single Investor Identification (SID) accounts, whereas institutional accounts constitute only 0.34%. This account-based statistic does not measure ownership value: a limited number of institutional entities can command a considerable proportion of total assets. Accordingly, the moderation analysis uses each company's percentage of institutional share ownership, not the number of investor accounts. The relevance of institutional investors arises from their monitoring capacity and concentrated economic stake rather than from their account count.

Table 3

Composition of Number of Investors (SID) as of December 2023

Categories	Percentage (%)	Remarks
Individual Investors	99,66%	Dominating the number of accounts (SID) in the capital market.
Institutional Investors	0,34%	The number of accounts is relatively small, but it controls assets of much greater value than individual investors.

Source: KSEI (2023), Public Statistics and Press Releases Antara News

Recent research confirms the importance of institutional shareholding in magnifying the

influence of ESG practices on firm value. Giordino et al. (2026) in Europe show that long-horizon institutional investors motivate firms to implement ESG strategies consistently, consequently enhancing market capitalization. In China, the presence of institutional shareholders may amplify the effect of ESG practices on corporate value by constraining managerial opportunistic conduct. However, similar research in Indonesia remains limited, particularly research examining the association between ESG and corporate valuation while incorporating institutional shareholding as a moderating variable among companies comprising the SRI-KEHATI Index.

This study fills the empirical void concerning the linkage between ESG and corporate value in developing market economies by incorporating institutional ownership as a moderating factor. Practically, this study provides input for the OJK and the Indonesia Stock Exchange (IDX) in strengthening regulations governing sustainable finance and broadening the engagement of institutional shareholders. As such, further investigation into how ESG adoption influences firm valuation in Indonesia is warranted, as is an examination of how institutional ownership can strengthen these relationships. This study is relevant because it makes an empirical contribution to the development of sustainable finance theory and provides a basis for more responsible investment decision-making in the Indonesian capital market.

In addition to sustainability and corporate governance factors, firm valuation is also shaped by the company's fundamental attributes. A company's funding structure, reflected in the level of leverage, can influence investors' perceptions of risk, while firm size reflects operational capacity and access to funding sources. On the other hand, profitability, measured through Return on Assets (ROA), indicates a company's ability to manage its assets to generate profits. Companies with high leverage tend to face greater financial risks, while companies with greater size and higher profitability generally have greater market value. Therefore, the variables of leverage, firm size, and ROA need to be controlled in empirical analysis so that the influence of ESG outcomes and institutional shareholding on corporate valuation can be assessed with greater accuracy.

Based on this background, this research analyzes the distinct associations linking environmental, social, and governance outcomes to firm value among entities included in the SRI-KEHATI Index. It also examines whether institutional ownership moderates each dimension-specific relationship. By distinguishing the three ESG dimensions, the present study seeks to provide a more refined understanding of how sustainability outcomes are associated with firm value within Indonesia's capital market.

METHOD

This quantitative, non-experimental study used a balanced firm-year panel of SRI-KEHATI constituents observed from 2020 to 2024. The dependent variable was firm valuation, represented by Tobin's Q. Environmental, social, and governance (ESG) ratings served as the principal explanatory variables; institutional ownership served as the moderator; and firm size, leverage, and return on assets (ROA) served as control variables. Purposive sampling retained 15 companies with complete data for all five years, yielding 75 balanced firm-year observations.

Environmental, social, and governance (ESG) ratings were derived from the Refinitiv database. Tobin's Q, ownership data, and control variables were compiled from annual corporate reports, sustainability disclosure documents, financial filings, official company websites, and IDX information releases. Records were cross-checked across sources, coded consistently, and screened for completeness before the data were analyzed using EViews 12.

Model selection compared pooled ordinary least squares, fixed-effects, and random-effects specifications using the Chow, Hausman, and Breusch-Pagan Lagrange Multiplier diagnostic tests. The Chow and Hausman results favored the fixed-effects specification. Because the Model 1 Hausman probability value (0.0466) was close to the 0.05 threshold, the decision was treated as threshold-sensitive rather than unequivocal; conclusions were therefore interpreted as conditional on the selected specification.

Inference used White cross-sectional robust standard errors with a degrees-of-freedom correction to reduce sensitivity to heteroskedasticity and within-panel error dependence. Robust standard errors address the covariance matrix rather than model misspecification; the absence of separately reported diagnostic statistics and the modest sample size were therefore acknowledged as methodological limitations.

This research design enabled the study to estimate the dimension-specific relationships

between ESG outcomes and firm value and to evaluate the moderating role of institutional ownership among SRI-KEHATI constituent firms. The inclusion of firm size, leverage, and ROA as control variables was intended to reduce potential confounding attributable to differences in firms' fundamental characteristics.

Documentary sources were used to collect annual quantitative data. The final dataset combined 15 cross-sectional units and five annual periods and was checked for completeness and consistency before estimation.

RESULTS AND DISCUSSION

Results

Data Analysis Results

Estimation of *the Main Effects Model (*Baseline Model)

Inferential analysis begins by constructing panel data regression specifications according to the analytical framework outlined in Chapter III. Estimation was primarily conducted using Model 1, which includes the control variables, to evaluate the direct effects of the three ESG dimensions (environmental performance (EP), social performance (SP), and governance performance (GP)) on firm value.

In the initial phase, the specification was estimated using three panel data regression methods: the Common Effect Model (CEM), the Fixed Effect Model (FEM), and the Random Effect Model (REM). Estimates from these three methods formed the basis for a preliminary evaluation of differences in coefficient estimates, directional relationships between variables, and statistical significance, as well as for selecting the panel data regression specification most appropriate for the characteristics of the sample data.

Throughout the panel data regression estimation procedure in this study, robust standard errors using the White cross-section method were employed. This method addresses common issues frequently encountered in financial panel datasets, such as heteroscedasticity within individual entities and residual correlation across observations. The use of robust standard errors makes the estimated standard errors, t-statistics, and resulting probability values more reliable, thereby improving the reliability of statistical inference derived from the estimates.

Preliminary estimation results showed differences in coefficient magnitudes and significance levels across the CEM, FEM, and REM specifications, emphasizing the need to select an appropriate panel data regression model before conducting subsequent hypothesis testing. Therefore, in the next phase of the inferential analysis, the focus was on identifying the optimal panel data regression specification through the Chow test, Hausman test, and Lagrange Multiplier (LM) test, as detailed in the following sections.

Baseline Model Pair Test

1. Chow Test

The Chow test is designed to identify the most appropriate panel data regression specification between the Common Effect Model (CEM) and the Fixed Effect Model (FEM) when estimating the effects of EP, SP, and GP on firm value. The evaluation was conducted using the cross-section F-statistic and cross-section chi-square statistic, followed by the formulation of the following hypotheses.

H_0: The Common Effect Model is more appropriate than the Fixed Effect Model.

H_1: The Fixed Effect Model is more appropriate than the Common Effect Model.

If the probability values (Prob.) of the cross-section F-statistic and cross-section chi-square statistic are below $\alpha = 0.05$, H_0 is rejected and H_1 is supported. This indicates that the Fixed Effect Model is more appropriate than the Common Effect Model for estimating the panel data regression specification.

Table 0

Chow Test Result for Model 1

Effectiveness Test	Statistics	D.F.	Probably.
Cross-sectional area F	1.986024	(14, 54)	0.0368
cross-sectional area chi-square	31.150967	14	0.0053

Source: EViews Version 12, 2026 data processing results

Based on the Chow test results shown in Table 4, the probability value for the cross-section F-statistic was 0.0368, while the probability value for the cross-section chi-square statistic was 0.0053. Both probability values were below the significance threshold of 0.05 (5%). Therefore, H_0 was rejected and H_1 was supported, indicating that the Fixed Effect Model (FEM) was more appropriate than the Common Effect Model (CEM) for this study.

2. Hausman Test

The choice between the Fixed Effect Model and the Random Effect Model was determined using the Hausman test. The hypotheses of the Hausman test are as follows.

H_0: The Random Effect Model is more appropriate than the Fixed Effect Model.

H_1: The Fixed Effect Model is more appropriate than the Random Effect Model.

If the probability value (Prob.) of the cross-section random statistic in the Hausman test is less than $\alpha = 0.05$ (5%), H_0 is rejected and H_1 is supported. This indicates that the Fixed Effect Model provides a more appropriate specification than the Random Effect Model for the panel data regression. Conversely, if the probability value exceeds 0.05 (5%), H_0 is not rejected and the Random Effect Model is considered more appropriate than the Fixed Effect Model for the model estimation.

Table 5

Hausman Test Model 1 Test Data Processing

Test Overview	Chi Square. Statistics	Chi Square D.F.	Probably.
cross-sectional random number	4.978283	6	0.0466

Source: EViews Version 12, 2026 data processing results

Based on the results of the Hausman test in Table 5, the cross-section random chi-square statistic was 4.978283, with a probability value of 0.0466. Because this probability value was less than the significance level of $\alpha = 0.05$ (5%), H_0 was rejected and H_1 was supported. Therefore, it was concluded that the Fixed Effect Model (FEM) was more appropriate than the Random Effect Model (REM) for estimating the research model.

3. Lagrange Multiplier Test

The appropriate specification between the Common Effect Model and the Random Effect Model was determined using the Breusch–Pagan Lagrange Multiplier (LM) test. The hypotheses for this test are as follows.

H_0: The Common Effect Model is more appropriate than the Random Effect Model.

H_1: The Random Effect Model is more appropriate than the Common Effect Model.

The Breusch–Pagan Lagrange Multiplier test compares the Common Effect Model and the Random Effect Model. If the Breusch–Pagan probability value is less than 0.05, the null hypothesis is rejected and the Random Effect Model is preferred. Conversely, if the probability value exceeds 0.05, the null hypothesis is not rejected and the Common Effect Model is preferred.

Table 6

Lagrange Multiplier Test Data Processing Model 1

Test Method	cross-sectional area	Time	both
Broisch Pagan	2.031066	0.548090	2.579156
	(0.1541)	(0.4591)	(0.1083)
Honda	1.425155	-0.740331	0.484243
	(0.0771)	(0.7705)	(0.3141)
King Woo	1.425155	-0.740331	0.018914
	(0.0771)	(0.7705)	(0.4925)
Standardization	2.303064	-0.263215	-2.430912
Honda	(0.0106)	(0.6038)	(0.9925)
Standardization	2.303064	-0.263215	-2.631680
King Woo	(0.0106)	(0.6038)	(0.9958)

Gourieroux and others.	–	–	2.031066 (0.1676)

Source: EViews Version 12, 2026 data processing results

Based on the results of the Lagrange Multiplier (LM) test, the probability value of the Breusch–Pagan cross-section statistic was 0.1541, which was greater than 0.05. Therefore, the null hypothesis was not rejected. It can thus be concluded that the Common Effect Model (CEM) was more appropriate than the Random Effect Model (REM) for estimating Model 1.

4. Model Conclusion

The Chow test favored the Fixed Effect Model over the Common Effect Model, while the Hausman test favored the Fixed Effect Model over the Random Effect Model. The Breusch–Pagan LM test supported the Common Effect Model over the Random Effect Model; however, this comparison does not override the results of the Chow and Hausman tests. Therefore, the Fixed Effect Model was selected for Model 1. Nevertheless, because the Hausman test probability value of 0.0466 is close to the 0.05 threshold, the model selection results should be interpreted with appropriate caution.

Table 7

Conclusion of panel regression testing for the main effects model

No	Methods	Exam	Results
1	*Chow test*	*Differences between Common Effect and Fixed Effect*	*fixation effect*
2	*Hausman Test*	*Differences Between Fixed Effect and Random Effect*	*fixation effect*
3	*Lagrange Multiplication - BP*	*Differences between Common Effect and Random Effect*	*Common Effect*

Sources: Table 4, Table 5, Table 6

Analysis of Main Effects Model Estimation

Based on the selection of the panel data regression model using the Chow and Hausman tests, the Fixed Effect Model (FEM) was selected as the optimal model for estimating and analyzing the main effects model in this study. The main effects model was used to investigate the relationships between environmental performance (EP), social performance (SP), governance performance (GP), and firm value as measured by Tobin's Q. Firm size, leverage, and return on assets (ROA) were incorporated as control variables.

Partial estimation of panel data regression models

The baseline model estimates and statistical tests were conducted to evaluate the effects of EP, SP, and GP on firm value, as measured by Tobin's Q (TQ), using control variables such as firm size (SIZE), leverage (LEV), and profitability (ROA). The results of the panel data regression estimated using the Fixed Effect Model (FEM) are presented in the table below.

```
Estimation Command:
=========================
LS(?, CX=F, COV=CXWHITE) TQ C EP SP GP SIZE LEV ROA

Estimation Equation:
=========================
TQ = C(1) + C(2)*EP + C(3)*SP + C(4)*GP + C(5)*SIZE + C(6)*LEV + C(7)*ROA + [CX=F]

Substituted Coefficients:
=========================
TQ = 3.785038851 - 0.00048706862471*EP + 0.01532184740322*SP + 0.00876776290394*GP - 0.184087858882*SIZE +
0.2746265905708*LEV + 25.376685122504*ROA + [CX=F]
```

Table 8

Estimation of the principal effects model: Fixed Effect method

dependent variable	**TQ**			
Methods	Panel least squares			
Date	05/24/2026			
Time	03:18			
Sample	2020–2024			
Included period	5			
Included cross-sections	15			
Total Panel (Balance) Observation	75			
Standard error method	White cross-sectional area (periodic cluster) standard error and covariance (corrected)			
adjust	Standard error and t-statistical probability adjusted for clustering			
variable	coefficient	Standard error	t statistic	Probably.
C	3.785038	6.965276	0.543415	0. 5886
EP	-0.000487	0.010819	-0.045014	0. 9642
SP	0.015321	0.007160	2.139940	0. 0360
GP	0.008767	0.004056	2.161498	0. 0342
Size	-0.184087	0.194694	-0.945519	0. 3477
LEV	0.274626	0.074494	3.686545	0. 0005
ROA	25.37668	3.844201	6.601291	0. 0000
Statistics	Value	Statistics	Value	
R-squared	0.768023	Mean dependent variable	1. 949918	
Adjusted R-squared	0.747555	S.D. dependent variable	2. 686947	

The S.E. of Return	1.3500 28	Akaike Information Standards	3. 526814
Sum Square Residual	123.93 52	Schwartz criterion	3. 743113
Log likelihood	-125.25 55	Hanan Quynh Krister.	3. 613180
F statistic	37.522 13	Dervin Watson's statistics	1. 703556
Probability (F-statistic)	0.0000 00		

Source: Processed data (2026)

From Table 8, the effects of environmental performance (EP), social performance (SP), governance performance (GP), firm size (SIZE), leverage (LEV), and profitability (ROA) on firm value, as measured by Tobin's Q (TQ), were examined for the period 2020–2024 using the Fixed Effect Model. *t*-tests were used to evaluate the regression coefficient of each explanatory variable, and the significance of the individual effects on the firm value of companies listed in the SRI-KEHATI Index during 2020–2024 was assessed at a 95% confidence level, corresponding to a 5% significance level ($\alpha = 0.05$). For variables with statistically significant effects, the magnitude and direction of the effects were interpreted based on the regression coefficients obtained from the panel data specification.

Results of the Effect of Environmental Performance on Tobin's Q

Based on the panel data regression results using the Fixed Effect Model (FEM) in Table 8, the coefficient of the environmental performance (EP) variable was -0.000487, the *t*-statistic was -0.045014, and the probability value was 0.9642. Because the probability value was greater than 0.05, environmental performance did not have a statistically significant effect on firm value as measured by Tobin's Q.

Based on these results, the hypothesis proposing a positive effect of environmental performance on firm value was not empirically supported. The negative coefficient indicates that improvements in environmental performance were associated with a slight decline in firm value; however, the effect was extremely small and statistically insignificant. These results suggest that Indonesia's capital market may not yet sufficiently recognize companies' environmental practices and performance as factors that enhance firm value. Market participants may be more focused on short-term financial performance than on the long-term economic benefits associated with environmental commitments. Furthermore, environmental initiatives among Indonesian companies may be perceived primarily as compliance-based activities rather than value-driven strategies, limiting their contribution to investors' positive evaluations of firms.

The Effect of Social Performance on Tobin's Q

Based on the panel data regression results using the Fixed Effect Model (FEM) in Table 8, the social performance (SP) variable had a coefficient of 0.015321, a *t*-statistic of 2.139940, and a probability value of 0.0360. Because the probability value was below 0.05, social performance had a positive and statistically significant effect on firm value as measured by Tobin's Q.

These results support the hypothesis that social performance positively influences a company's market valuation. The positive coefficient indicates that improvements in corporate social performance were associated with improvements in firm value. These results suggest that investors increasingly place importance on companies that prioritize social aspects such as employee welfare, labor safety, corporate social responsibility (CSR), and constructive engagement with communities and other stakeholders. Strong social performance may enhance a

company's reputation, strengthen stakeholder loyalty, and mitigate social risks that could threaten long-term business continuity. This finding is consistent with stakeholder theory, which states that companies that satisfy stakeholders' social expectations can gain broader support and greater legitimacy, thereby contributing positively to firm value.

Results of the Effect of Governance Performance on Tobin's Q

Based on the panel data regression results presented in Table 8 using the Fixed Effect Model (FEM), the governance performance (GP) variable had a coefficient of 0.008767, a *t*-statistic of 2.161498, and a probability value of 0.0342. Because the probability value was below 0.05, governance performance had a positive and statistically significant effect on firm value as measured by Tobin's Q.

These results support the hypothesis that governance performance positively affects firm value. The positive coefficient indicates that stronger governance practices were associated with higher firm valuation. These results suggest that investors place considerable importance on the quality of corporate governance, including transparency, accountability, board independence, supervisory effectiveness, and regulatory compliance. Strong governance may reduce agency conflicts, improve the quality of managerial decisions, and strengthen investor confidence in corporate sustainability. These findings are consistent with agency theory, which argues that effective governance structures reduce conflicts between management and shareholders, thereby increasing firm value. Furthermore, the results support signaling theory, which holds that sound governance practices send favorable signals to the market regarding management quality and a company's future prospects.

Estimation of the Panel Data Regression Model

Model adequacy, or model fit, was evaluated to assess the validity of the panel data regression specification before conducting individual hypothesis tests. This evaluation aimed to determine whether the estimated regression specification adequately explained the relationship between the explanatory variables and the dependent variable.

Based on the Fixed Effect Model (FEM) estimates presented in Table 8, the probability value of the F-statistic for Model 1 was 0.000000, which was below the 5% significance threshold. These results indicate that the explanatory and control variables included in the specification jointly had a statistically significant effect on firm value. Therefore, the regression model was considered statistically significant and adequately fit for the analysis.

In addition to the F-test, model fit was evaluated using the coefficients of determination. In Model 1, the R-squared value was 0.7680, while the adjusted R-squared value was 0.7476. Therefore, approximately 74.76% of the variation in Tobin's Q within the estimated model was explained by the explanatory variables and Fixed Effect. Although these results indicate relatively strong explanatory power within the sample, they do not establish a causal relationship.

Moderation Model Estimation

The moderation specification was developed to examine whether institutional ownership (IO) moderates the relationships between environmental performance, social performance, governance performance, and Tobin's Q. The model includes the interaction terms EP × IO, SP × IO, and GP × IO, together with the corresponding main effects and control variables for firm size, leverage, and ROA.

In the initial phase, the moderation specification was estimated using three panel data regression methods: the Common Effect Model (CEM), the Fixed Effect Model (FEM), and the Random Effect Model (REM). Estimates from these three methods were compared to select the panel data regression specification most appropriate for the sample and to obtain preliminary insights into differences in regression coefficient estimates, directional relationships among variables, and significance levels across the three methods.

All panel data regression estimations within the moderation specification used robust standard errors calculated using the White cross-section method. This approach addresses common issues in financial panel data, such as heteroscedasticity and residual dependence across observations within the same firm. By using robust standard errors, the standard error estimates, *t*-statistics, and resulting probability values become more robust and reliable, thereby improving the reliability of statistical inference derived from the estimates.

Preliminary estimation results showed differences in coefficient magnitudes, directional relationships, and significance levels across the CEM, FEM, and REM specifications. These

differences highlight the need to identify the panel data regression specification that best fits the characteristics of the research data before conducting subsequent moderation hypothesis tests. Therefore, in the next stage of the inferential analysis, the focus was on determining the most appropriate panel data regression specification through the Chow test, Hausman test, and Lagrange Multiplier test, as detailed in the following subsections.

Moderation Model Pairwise Tests

1. Chow Test

The Chow test was used to determine the most appropriate panel data regression specification for estimating the effects of EP, SP, GP, and institutional ownership on firm value by comparing the Common Effect Model (CEM) and the Fixed Effect Model (FEM). The test was conducted using the cross-section F-statistic and cross-section chi-square statistic based on the following hypotheses.

H_0: The Common Effect Model is more appropriate than the Fixed Effect Model.

H_1: The Fixed Effect Model is more appropriate than the Common Effect Model.

If the probability value (Prob.) of the cross-section F-statistic and cross-section chi-square statistic is less than $\alpha = 0.05$, H_0 is rejected and H_1 is supported. This indicates that the Fixed Effect Model is more appropriate than the Common Effect Model for estimating the panel data regression model.

The Chow test compares the Common Effect Model (CEM) and the Fixed Effect Model (FEM). The null hypothesis (H_0) states that the Common Effect Model is the more appropriate specification, whereas the alternative hypothesis (H_1) states that the Fixed Effect Model is more appropriate.

Table 9

Chow Test Model 2 Data Processing

Test	**Redundancy Fixed Effect Test**		
equation	Untitled		
Test Types	Cross-sectional area fixation effect		
Effectiveness Test	Statistics	D.F.	Probably.
Cross-sectional area F	2.375841	(14, 50)	0.0128
cross-sectional area chi-square	38.247487	14	0.0005

Source: EViews Version 12, 2026 data processing results

Based on the results of the Chow test, the probability value for the cross-section chi-square statistic was 0.0005, which was less than 0.05. Therefore, the null hypothesis was rejected. It was concluded that the Fixed Effect Model (FEM) was more appropriate than the Common Effect Model (CEM) for estimating Model 2.

2. Hausman Test

The choice between the Fixed Effect Model and the Random Effect Model was determined using the Hausman test. The hypotheses of the Hausman test are as follows.

H_0: The Random Effect Model is more appropriate than the Fixed Effect Model.

H_1: The Fixed Effect Model is more appropriate than the Random Effect Model.

If the probability value (Prob.) of the cross-section random statistic in the Hausman test is less than $\alpha = 0.05$ (5%), H_0 is rejected and H_1 is supported. This indicates that the Fixed Effect Model is more appropriate than the Random Effect Model for the panel data regression. Conversely, if the probability value exceeds 0.05 (5%), H_0 is not rejected and the Random Effect Model is considered more appropriate than the Fixed Effect Model for estimating the model.

Table 10

Hausman Test Model 2 Data Processing

Test	**Correlation Random Effect – Hausman Test**
equation	Untitled
Test Types	Random effect of cross-sectional area

Test Overview	Chi Square. Statistics	Chi Square D.F.	Probably.
cross-sectional random number	7.533255	10	0.047432

Source: EViews Version 12, 2026 data processing results

Based on the results of the Hausman test, the cross-section random chi-square statistic was 7.533255, with a probability value of 0.0474. Because this probability value was less than 0.05, the null hypothesis was rejected. Therefore, it was concluded that the Fixed Effect Model (FEM) was more appropriate than the Random Effect Model (REM) for estimating Model 2.

3. Lagrange Multiplier Test

The appropriate specification between the Common Effect Model and the Random Effect Model was determined using the Breusch–Pagan Lagrange Multiplier (LM) test. The hypotheses for this test are as follows.

H_0: The Common Effect Model is more appropriate than the Random Effect Model.

H_1: The Random Effect Model is more appropriate than the Common Effect Model.

The Breusch–Pagan Lagrange Multiplier test compares the Common Effect Model and the Random Effect Model. If the Breusch–Pagan probability value is less than 0.05, the null hypothesis is rejected and the Random Effect Model is preferred. Conversely, if the probability value exceeds 0.05, the null hypothesis is not rejected and the Common Effect Model is preferred.

Table 11

Lagrange Multiplier Test Data Processing Model 2

Test	**Lagrange Multiplier Test for Random Effect**		
null hypothesis	No effect		
alternative hypothesis	Alternatives to Double-sided (Breuish-Pagan) and One-sided (All Others)		
Test Hypothesis	**cross-sectional area**	**Time**	**both**
Broisch Pagan	2.277098 (0.1313)	1.633606 (0.2012)	3.910704 (0.0480)
Honda	1.509006 (0.0656)	-1.278126 (0.8994)	0.163257 (0.4352)
King Woo	1.509006 (0.0656)	-1.278126 (0.8994)	-0.415849 (0.6612)
Standardization Honda	2.588734 (0.0048)	-0.936466 (0.8255)	-2.765245 (0.9972)
Standardization King Woo	2.588734 (0.0048)	-0.936466 (0.8255)	-3.118095 (0.9991)
Grill and others.	–	–	2.277098 (0.1457)

Source: EViews Version 12, 2026 data processing results

Based on the results of the Lagrange Multiplier (LM) test, the probability value of the Breusch–Pagan cross-section statistic was 0.1313, which was greater than 0.05. Therefore, the null hypothesis was not rejected. It was concluded that the Common Effect Model (CEM) was more appropriate than the Random Effect Model (REM) for estimating Model 2.

Model Conclusion

Based on the results of the Chow, Hausman, and Lagrange Multiplier tests, the Fixed Effect Model (FEM) was identified as the most appropriate panel data regression specification for Model 2. Model 2 was designed to evaluate whether institutional ownership moderates the relationships between the three ESG dimensions and firm value. Therefore, all inferential analyses for Model 2, including model adequacy assessment, evaluation of the effects of the explanatory variables, and

moderation-effect analysis, were conducted using the Fixed Effect Model (FEM).

Table 12
Test panel regression for moderation model Conclusion

No	Methods	Exam	Results
1	*Chow test*	*Differences between Common Effect and Fixed Effect*	***fixed effect***
2	*Hausman Test*	*Differences Between Fixed Effect and Random Effect*	***fixed effect***
3	*Lagrange Multiplication - BP*	*Differences between Common Effect and Random Effect*	*Common Effect*

Sources: Table 9, Table 10, Table 11

Panel Data Regression Model Estimation Analysis

The moderation specification examines the relationship between Tobin's Q and the three ESG dimensions, as well as the moderating role of institutional ownership among companies included in the SRI-KEHATI Index during the period 2020–2024. The Fixed Effect Model estimates are presented in Table 13.

Partial estimation of panel data regression models

The moderation model includes the interaction terms EP × IO, SP × IO, and GP × IO. Table 13 presents the coefficient estimates, standard errors, t-statistics, and probability values obtained from the panel data regression. Because the coefficients of EP and GP change substantially after the introduction of the interaction terms, the conditional main effects and interaction coefficients must be interpreted carefully. The absence of reported multicollinearity diagnostics is recognized as a limitation of the analysis.

The results of the panel data regression estimated using the Fixed Effect Model (FEM) are presented in Table 13.

```
Estimation Command:
==========================
LS(?, CX=F, COV=CXWHITE) TQ C EP SP GP IO EPIO SPIO GPIO SIZE LEV ROA

Estimation Equation:
==========================
TQ = C(1) + C(2)*EP + C(3)*SP + C(4)*GP + C(5)*IO + C(6)*EPIO + C(7)*SPIO + C(8)*GPIO + C(9)*SIZE + C(10)*LEV +
C(11)*ROA + [CX=F]

Substituted Coefficients:
==========================
TQ = -0.9484414602 + 0.1103810750548*EP + 0.0096204493216*SP - 0.0678689178358*GP - 0.189269830576*EPIO +
0.1161430205935*SPIO + 0.1307648586747*GPIO - 0.080482484644*SIZE + 0.1385952824038*LEV + 22.37652250092*ROA
+ [CX=F]
```

Table 13
Estimation of mitigation effect models using Fixed Effect methods

dependent variable	TQ
Methods	Panel least squares
Date	05/24/2026
Time	02:00
Sample	2020–2024
Included period	5
Included cross-sections	15
Total Panel (Balance) Observation	75
Standard error method	White cross-sectional area (periodic cluster) standard error and covariance (corrected)

adjust	Standard error and t-statistical probability adjusted for clustering

variable	coefficient	Standard error	t statistic	Probably.
C	-0.948441	10.42283	-0.090996	0.9319
EP	0.110381	0.017806	6.199049	0.0034
SP	0.009620	0.034703	0.277216	0.7954
GP	-0.067868	0.007803	-8.697793	0.0010
EPIO	-0.189269	0.021491	-8.807062	0.0009
SPIO	0.116430	0.016066	7.246962	0.0171
GPIO	0.130764	0.016513	7.918893	0.0014
Size	-0.080482	0.234522	-0.343172	0.7849
LEV	0.138595	0.101981	1.262139	0.2755
ROA	22.37652	2.253563	9.929398	0.0006

Statistics	Value	Statistics	Value
R-squared	0.814600	Mean dependent variable	1.949918
Adjusted R-squared	0.785631	S.D. dependent variable	2.686947
The S.E. of Return	1.244056	Akaike Information Standards	3.409359
Sum Square Residual	99.05118	Schwartz criterion	3.749257
Log likelihood	-116.8510	Hanan Quynh Krister.	3.545077
F statistic	28.11996	Dervin Watson's statistics	1.967870
Probability (F-statistic)	0.000000		

Source: Processed data (2026)

Subsequently, the regression coefficients from the Fixed Effect Model were examined to evaluate the effects of environmental performance (EP), social performance (SP), and governance performance (GP) on firm value, as measured by Tobin's Q (TQ), as well as the moderating role of institutional ownership (IO) among companies included in the SRI-KEHATI Index during 2020–2024. The moderation model was formed using the independent variables and their interaction terms (EP × IO, SP × IO, and GP × IO), together with control variables consisting of firm size (SIZE), leverage (LEV), and profitability, measured by return on assets (ROA).

The t-test was used to evaluate the regression coefficients of each independent variable and interaction term, thereby measuring the significance of their partial effects on the firm value of companies included in the SRI-KEHATI Index during 2020–2024 at a 95% confidence level, corresponding to a 5% significance level ($\alpha = 0.05$). For variables with statistically significant effects, the magnitude and direction of their effects were interpreted based on the regression coefficients obtained from the moderation panel data specification.

The Role of Institutional Ownership in Mitigating Environmental Performance Impacts Results of Tobin's Q

Based on the results of the moderated regression analysis (MRA), the interaction variable between environmental performance and institutional ownership (EP × IO) had a coefficient of -0.189269, a t-statistic of -8.807062, and a probability value of 0.0009. Because the probability value was below 0.05, institutional ownership significantly moderated the relationship between environmental performance and firm value. The negative interaction coefficient indicates that institutional ownership weakened the positive effect of environmental performance on firm value within the moderation specification.

Based on these results, the hypothesis that institutional ownership strengthens the effect of environmental performance on firm value was not supported. These results suggest that institutional investors in Indonesia may not fully support environmental investment as a driver of improved firm valuation. Institutional investors may prioritize short-term financial returns and perceive corporate expenditures on environmental initiatives as additional costs that reduce short-term profitability. These results suggest that, although institutional investors theoretically

function as monitoring mechanisms that can promote sustainability practices, in emerging-market contexts such as Indonesia, institutional investors may not fully recognize the long-term economic benefits of corporate environmental investments.

The Role of Institutional Ownership in Mitigating the Impact of Social Performance on Tobin's Q

Based on the results of the moderated regression analysis (MRA), the interaction variable between social performance and institutional ownership (SP × IO) had a coefficient of 0.116430, a *t*-statistic of 7.246962, and a probability value of 0.0171. Because the probability value was below 0.05, institutional ownership significantly moderated the relationship between social performance and firm value. The positive interaction coefficient indicates that institutional ownership strengthened the effect of social performance on Tobin's Q.

The results in Table 13 support the hypothesis that institutional ownership strengthens the effect of social performance (SP) on firm value (Tobin's Q/TQ). This is indicated by the SP × IO interaction coefficient of 0.116430, the *t*-statistic of 7.246962, and the probability value of 0.0171, which is below the significance level of $\alpha = 0.05$. These results indicate that institutional ownership can amplify the beneficial effect of social performance on a company's market value.

A positive interaction coefficient indicates that, as the proportion of institutional ownership increases, the effect of a company's social performance on firm value becomes stronger. Institutional investors are considered to have an interest in corporate sustainability, including social aspects such as CSR programs, community development, stakeholder relationships, and employee welfare. Under institutional investor oversight, the implementation of a company's social initiatives may become more effective and more highly valued by the market.

These results suggest that institutional investors are not limited to short-term financial outcomes but are gradually integrating social factors into long-term assessments of corporate sustainability. Furthermore, the presence of institutional investors may enhance the credibility and effectiveness of corporate social programs, thereby generating positive signals for investors and other stakeholders.

These findings support stakeholder theory and signaling theory, which argue that companies demonstrating strong social responsibility and benefiting from institutional investor oversight mechanisms may enhance market legitimacy and stakeholder trust. Therefore, the findings provide empirical evidence that institutional ownership can strengthen the effect of social performance on firm value.

The Moderating Role of Institutional Ownership in the Effect of Governance Performance on Tobin's Q

Based on the results of the moderated regression analysis (MRA), the interaction variable between governance performance and institutional ownership (GP × IO) had a coefficient of 0.130764, a *t*-statistic of 7.918893, and a probability value of 0.0014. Because the probability value was below 0.05, institutional ownership significantly moderated the relationship between governance performance and firm value. The positive interaction coefficient indicates that institutional ownership strengthened the effect of governance performance on firm value.

These results support the hypothesis that institutional ownership strengthens the effect of governance performance on firm value. The findings indicate that institutional investors may place considerable emphasis on the quality of corporate governance relative to other ESG dimensions. The presence of institutional investors may enhance the effectiveness of governance systems and ensure that sound corporate governance practices are more highly valued by the market. Institutional investors generally recognize sound governance as an important mechanism for mitigating agency conflicts, improving transparency, and maintaining long-term corporate stability and sustainability. These findings are consistent with agency theory, which argues that institutional ownership can function as an external monitoring mechanism that constrains managerial opportunism and enhances investor confidence.

Estimation of the Panel Data Regression Model

Model fit was evaluated to assess the adequacy of the panel data regression model before conducting the partial hypothesis tests. This assessment aimed to determine whether the estimated regression model adequately explained the relationship between the independent

variables and the dependent variable.

Based on the Fixed Effect Model (FEM) estimates presented in Table 13, the probability value of the F-statistic for Model 2 was 0.000000, which was below the 5% significance level. These results indicate that the independent and control variables included in the model jointly had a statistically significant effect on firm value. Therefore, the regression model was considered statistically significant and adequately fit for the analysis.

In Model 2, the R-squared value was 0.8146, while the adjusted R-squared value was 0.7856. Therefore, approximately 78.56% of the variation in Tobin's Q within the estimated model was explained by the explanatory variables and Fixed Effect. However, these results should be interpreted together with the model specification constraints, particularly the substantial changes in the main-effect coefficients after the introduction of the interaction terms.

Discussion

These findings reveal dimension-specific valuation mechanisms. Social and governance performance are associated with higher firm value, whereas environmental performance does not exhibit a statistically significant direct relationship with firm value. Institutional ownership strengthens the relationships involving social and governance performance but weakens the relationship involving environmental performance. These contrasts constitute central theoretical contributions of the study rather than evidence concerning only an aggregate ESG score.

Table 14
Overview of Research Results

Hypothesis	variable relation	coefficient β	t statistic	Probably.	Direction and Significance	Hypothetical Results
H1	EP → TQ	-0.000487	-0.04501	0.964	Negative and unimportant	rejection
H2	SP → TQ	0.015321	2.13994	0.036	Positive and important	accept
H3	GP → TQ	0.008767	2.16150	0.034	Positive and important	accept
H4	EP × IO → TQ	-0.189269	-8.80706	0.001	negative, important	rejection
H5	SP × IO → TQ	0.116430	7.24696	0.017	Positive and important	accept
H6	GP × IO → TQ	0.130764	7.91889	0.001	Positive and important	accept

Source: EViews Version 12, 2026 data processing results

Hypothesis 1: Environmental Performance Has a Positive Effect on Tobin's Q

Although environmental initiatives often require immediate expenditures, their benefits in terms of efficiency, risk reduction, and reputation may materialize over the long term. During the five-year observation period in an emerging-market context, investors may have treated environmental scores primarily as indicators of regulatory compliance rather than as short-term signals of future cash flows. This timing mismatch may explain why the expected legitimacy and signaling effects were not simultaneously reflected in firm value.

In the context of companies included in the SRI-KEHATI Index, these results suggest that Indonesia's capital market may still be in a transitional phase in evaluating environmental factors as determinants of firm value. Theoretically, legitimacy theory and signaling theory suggest that environmental performance can serve as an indicator of a company's commitment to sustainability. However, the effectiveness of such signals depends on investors' ability to assess the economic returns associated with environmental practices. Therefore, environmental initiatives should be communicated not merely as compliance activities but also as strategic mechanisms for improving operational efficiency, mitigating risk, and creating sustainable value.

Hypothesis 2: Social Performance Positively Affects Tobin's Q

Social performance can affect firm value more immediately through employee retention,

customer trust, community acceptance, and reduced operational disruption. These visible stakeholder outcomes may make social performance signals easier for market participants to interpret than the longer-term benefits associated with environmental investments.

Hypothesis 3: Governance Performance Has a Positive Effect on Tobin's Q

Governance is closely related to transparency, board oversight, shareholder protection, and the control of managerial opportunism. Therefore, its positive valuation effect is consistent with agency theory, allowing investors to link governance quality more directly to lower monitoring risk and more reliable decision-making.

In the context of companies included in the SRI-KEHATI Index, governance performance appears to be more readily understood by investors than environmental performance. This may be because its benefits are directly associated with reduced agency risk and improved decision-making quality. These results support agency theory, which explains that governance functions as a monitoring mechanism for reducing conflicts between management and shareholders. Furthermore, from a signaling perspective, governance performance communicates favorable signals about management quality and corporate reliability, thereby enhancing market evaluations of firms.

Hypothesis 4: Institutional Ownership Moderates the Effect of Environmental Performance on Tobin's Q

The negative interaction between environmental performance and institutional ownership suggests that institutional monitoring does not uniformly strengthen the valuation effects of sustainability performance. When the financial benefits of environmental investments are uncertain or distant, institutional investors may scrutinize environmental expenditures more closely. This interpretation should remain cautious because the introduction of interaction terms substantially changes the coefficients of the main effects, and multicollinearity diagnostics based on variance inflation factors (VIFs) were not reported.

Hypothesis 5: Institutional Ownership Moderates the Effect of Social Performance on Tobin's Q

Institutional monitoring can enhance the credibility of social commitments by constraining symbolic programs and encouraging measurable policies for employees, consumers, and communities. Greater credibility can reduce information asymmetry and help market participants translate social performance into higher firm valuations.

Hypothesis 6: Institutional Ownership Moderates the Effect of Governance Performance on Tobin's Q

Institutional ownership can complement internal governance mechanisms by providing informed external oversight. This combination can strengthen signals of transparency and accountability, providing a plausible mechanism through which governance quality receives a stronger response from the market.

CONCLUSION

This study shows that ESG dimensions are not valued uniformly among companies included in the SRI-KEHATI Index. Environmental performance has no statistically significant direct relationship with Tobin's Q, whereas social and governance performance exhibit positive associations with firm value. Institutional ownership weakens the relationship between environmental performance and firm value but strengthens the relationships involving social and governance performance. These results extend agency, stakeholder, legitimacy, and signaling perspectives by demonstrating that the role of institutional monitoring is dimension-specific: institutional ownership reinforces ESG attributes with clearer near-term stakeholder and governance consequences but does not automatically translate environmental performance into higher market value.

From a practical perspective, managers should connect environmental programs to

measurable efficiency and risk outcomes while maintaining credible social policies and effective governance controls. Investors should evaluate the E, S, and G dimensions separately rather than relying solely on aggregate ESG scores. The Financial Services Authority (OJK) and the Indonesia Stock Exchange (IDX) could improve comparability by encouraging dimension-level disclosure, outcome-based environmental metrics, and transparent reporting of institutional ownership. These conclusions are limited to 15 SRI-KEHATI companies and 75 observations over the 2020–2024 period, rely on secondary data, and are sensitive to a borderline Hausman test result and an interaction model for which raw-data VIF diagnostics were unavailable. Future research should employ broader ESG indices, longer observation periods, sectoral comparisons, alternative estimators, mean-centered interaction terms, formally reported heteroscedasticity and multicollinearity diagnostics, and robustness checks for potential outliers.

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AUTHOR CONTRIBUTION STATEMENT

Venny Ratnasari Narulita and Endri contributed to the conceptualization, methodological design, data analysis, interpretation of outcomes, and composition of the manuscript. Both contributors evaluated and approved the definitive version of this work.

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