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Impact of ESG Risk, Free Float, Growth, and Leverage on LQ45 Firm Value Moderated by Size

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Abstract
This study examines the impact of financial factors on firm value, both directly and through the moderation of firm size. Using secondary data from companies listed in the LQ45 index on the Indonesia Stock Exchange from 2021 to 2024, the study analyzes variables such as ESG risk, free float ratio, sales growth, leverage, and firm size. Multiple linear regression analysis was performed with STATA 17 to assess the relationships between these variables and firm value. The findings reveal that ESG risk has no significant effect on firm value but becomes positive when moderated by firm size in large companies. The free float ratio positively impacts firm value, but this effect turns negative for larger companies, indicating a lack of market control. The growth sales ratio shows no significant effect on firm value, and leverage has a positive impact, which turns negative in larger firms due to higher financial risks. This study suggests that large firms should focus on managing ESG risks and leverage carefully, while small companies can use the free float ratio to boost liquidity. Limitations of the study include the focus on LQ45 companies, which may not represent all sectors, and future research should consider broader industry samples

Keywords:
ESG risk;
Sustainable;
Firm Value;
Growth ratio;
Leverage;

1. Introduction

In today's competitive business landscape, investors often assess a company's success through its financial value (Ana & Wibowo, 2025). This value is influenced by factors such as financial performance, corporate reputation, innovation, and competitiveness (Dwiastuti & Dillak, 2019). Tobin's Q is a commonly used metric to evaluate firm value, as it accounts for both tangible and intangible assets (Dzahabiyya et al., 2020). It reflects how efficiently a company utilizes its resources, including equity and debt.

Despite being part of the highly liquid LQ45 index, many firms in this group experienced a decline in earnings during 2023 (Abigail, 2024). This decline can influence investors' perceptions and lead to a Tobin's Q ratio below 1, indicating undervaluation. Quarterly reports were used in this study to capture more detailed fluctuations, which are often missed in annual reports. Findings show that issuers such as INCO, KLBF, INTP, and ITMG had Tobin's Q values below 0.2, suggesting significant undervaluation.

Several factors may contribute to this, including ESG risk, free float ratio, sales growth, and leverage. ESG (Environmental, Social, and Governance) plays a key role in corporate sustainability (Roestanto et al., 2022). Companies today are expected not only to focus on profit (Brealey et al., 2018) but also to manage their environmental impacts responsibly (Adhi & Cahyonowati, 2023).

Neglecting ESG practices can result in reputational damage, as seen in the case of Semen Indonesia, which faced public backlash for environmental mismanagement (Alfajri & Warsini, 2024). This reflects a shift from a shareholder-centric view to a broader stakeholder-oriented perspective (Adhi & Cahyonowati, 2023). Investors now increasingly consider ESG indicators in their valuation process (Lonkani, 2018). Transparent ESG reporting enhances corporate credibility and aligns with sustainable

development goals (Eccles & Youmans, 2015). ESG disclosures are becoming more common as firms aim to meet stakeholder expectations, boost reputation, and manage industry competition (Olsen et al., 2021).

The free float ratio is proportion of shares available for public trading also impacts firm value. Low free float can decrease liquidity and weaken governance if ownership is concentrated (Bostancı & Kılıç, 2010). On the other hand, in developing markets, concentrated ownership may lead to better oversight and long-term decision-making (Li et al., 2018). With more concentrated control, decision-making can be more focused and swifter, potentially leading to improved long-term performance and providing greater profits for the firm, which in turn can increase firm value..

Due to declining profits, this study also examines sales growth as an indicator of performance. Increasing sales, even amid declining profits, may signal strong market potential and influence investor perception positively. Firms focused on sustainable long-term growth often show higher firm value, as stakeholder relationships become central to performance (Li et al., 2018). This aligns with stakeholder theory, which emphasizes the importance of maintaining strong relationships with customers, employees, and communities (Lerskullawat & Ungphakorn, 2024).

Leverage is another important factor. Companies with leverage ratios above 2 such as UNVR, EXCL, and TOWR are considered highly leveraged. Leverage is important to assess the extent to which companies use debt to finance their operations and business activities. Efficient debt management through leverage can have a major effect on firm value, by providing higher potential returns for shareholders, provided that the company can manage its debt obligations properly (Alfajri & Warsini, 2024).

Firm size is used as a moderating variable in this study, as it influences how independent variables affect firm value. Larger firms may experience stronger ESG impacts on firm value (Amato & Falivena, 2020). This relationship also applies to other variables like sales growth and leverage (Abdi et al., 2022). ESG disclosure, as a positive market signal, aligns with signaling theory, which explains how information can influence investor decisions (Spence, 1973). Firm size also moderates relationships involving ownership structure and firm value (Apriliyanti et al., 2019), as well as the effects of sales growth and leverage (Gusty & Novian, 2022). The free float ratio similarly benefits from large firm size due to enhanced liquidity and investor attention (Widianto & Astuti, 2024).

Although ESG has been widely discussed, empirical studies that specifically examine ESG risk remain limited, particularly in the context of LQ45 firms. Moreover, ESG-related risk exposure among LQ45 companies has received relatively little scholarly attention, as most studies focus on ESG disclosure or performance rather than ESG risk itself. In addition, firm size is generally treated as a control variable and is rarely tested as a moderating factor. Therefore, this study differs from previous research by simultaneously analysing ESG risk, free float ratio, sales growth, and leverage in LQ45 firms. Furthermore, this study uses quarterly data to improve data quality and capture short-term market responses more accurately, which are often overlooked in studies using annual data.

2. Literature review

2.1. LQ45 index

The LQ45 index represents 45 stocks with the highest liquidity and largest market capitalisation on the Indonesia Stock Exchange (IDX) and is reviewed every six months based on trading activity and market value criteria. Consequently, LQ45 firms are generally classified as blue-chip companies with relatively strong performance, transparency, and governance quality (Tandelilin, 2017). Due to these characteristics, LQ45 companies provide a relevant context for analysing firm value and corporate financial policies, as their stock prices tend to reflect information more efficiently in highly liquid markets. In addition, LQ45 firms attract investors who are more responsive to ESG disclosure and ownership structure, suggesting that ESG performance and free float ratio are likely to have stronger valuation implications in this group than in less liquid firms (Ariasinta et al., 2024). Although considered stable, LQ45 firms remain exposed to financial and reputational risks, particularly related to sustainability issues (Gani et al., 2025).

2.2. Stakeholder Theory

Stakeholder theory states that the development of the company depends on the interests of all parties affected by the company's activities, both from within and outside the company, such as customers, suppliers, employees, shareholders, and society (Freeman, 2010). Companies should not only focus on shareholder returns, but should also pay attention to the impact on other stakeholders, which can increase competitiveness and support the company's long-term goals (Friedman & Miles, 2006).

This theory also underlies the disclosure of sustainability reports, which provide stakeholders with information about the company's economic, social and environmental performance. This disclosure helps companies meet information needs and maintain relationships with stakeholders, which can support the continuity of the company (Adams & González, 2007; Michelon & Parbonetti, 2012).

2.3. Legitimacy Theory

Legitimacy theory focuses on the relationship between organizations and society, emphasizing the importance of companies to ensure that their activities are in accordance with prevailing norms in society (Safitri et al., 2024). Companies seek to have their activities accepted by society as legitimate and in accordance with existing social values (Deegan, 2014). In this context, the sustainability report serves to demonstrate that the company carries out social and environmental responsibilities that are acceptable to society, while maintaining the legitimacy of the company's operations (Bukhori & Sopian, 2017).

2.4. Firm value

Firm value, or entity value, includes the market value of a company's assets, both those related to operations and non-operating assets. Although investors can claim firm value, lenders have priority (Brigham & Houston, 2019). Lonkani (2018) argue that firm value is related to all stakeholders, in line with the concept of corporate sustainability. Tobin's Q is one way to measure firm value, with a comparison of market value to book value.

2.5. Environmental, social, and governance risks

Environmental, Social, and Governance (ESG) is a set of standards that evaluates a company's sustainability based on three key pillars (Pamungkas & Risman, 2024). Morningstar Sustainalytics introduced the ESG Risk Rating in 2018 to assess both the exposure and management of material ESG risks (Garz & Volk, 2018). This rating consists of two core dimensions: ESG Risk Exposure, which reflects the company's inherent risk based on sector, location, and activities; and ESG Risk Management, which measures how effectively the company handles those risks. Companies with strong emission control or sustainability initiatives tend to score better in the management dimension. The overall ESG risk is calculated from the unmanaged risk score, including any management gaps or unmanageable risks (Pamungkas & Risman, 2024). The ESG Risk Rating is categorized into five levels: 0–10 (negligible), 10–20 (low), 20–30 (medium), 30–40 (high), and 40+ (severe), each indicating different degrees of ESG risk and management effectiveness

2.6. Free Float ratio

Free float can be defined as the number of shares available for trading in the market, after deducting shares that are restricted from trading or owned by parent companies to control subsidiaries, cross-holdings between companies, and shares owned by the government (Kerestecioğlu & Caliskan, 2013). (Ding et al., 2016) state that free float is the outstanding shares that are not owned by management, government, other companies, or strategic investors. In other words, free float is shares issued for sale to ordinary investors and institutions. El-Nader (2018) also defines free float as the total shares available for trading by the public

2.7. Sales growth ratio

Growth, according to Fahmi (2012), is a ratio that measures a company's ability to sustain its position within the industry and the broader economy. This can be assessed through various indicators, particularly sales. Widarjo & Setiawan (2009) state that sales growth illustrates the company’s long-term development capability, where a higher growth rate signifies the effectiveness of its business strategy. Meanwhile, Cashmere (2014) notes that growth ratios evaluate a company’s consistency in

maintaining its economic and business standing by analyzing metrics such as sales growth, net income, earnings per share, and dividends. Fahmi (2012) also highlights that high sales growth typically reflects strong profitability, suggesting financial stability and a low risk of financial distress due to continually increasing sales performance

2.8. Leverage

The solvency ratio, also known as the leverage ratio, indicates the portion of a company's total assets that is financed through debt (Fraser & Ormiston, 2001). Brigham & Houston (2019) explain that this ratio measures the extent to which a company relies on debt in financing its assets, highlighting the financial burden compared to total assets. It reflects how debt influences the company's asset management and also illustrates the balance between debt and capital. The leverage ratio thus shows the company's dependency on external funding relative to its own capital strength capital (Brigham & Houston, 2019). In this study, the leverage ratio is assessed using the debt-to-equity ratio.

2.9. Firm Size

Firm size is commonly classified as large or small, and can be measured using indicators such as total assets, total sales, or the number of employees (Brigham & Houston, 2019). Total assets at the end of the financial year are often used as a standard measure, while total sales also reflect a company's operational scale and capital strength. Higher sales typically indicate greater production capacity and asset ownership, which can positively influence firm value. Larger firms tend to have stronger reputations, making it easier to attract investors and build stakeholder trust. Additionally, firm size plays a role in a company's ability to generate profits (Jaya, 2020).

2.10. Influence between variables

Investors increasingly recognize that investing to mitigate environmental and social risks can enhance firm value (Cohen, 2023). Good ESG performance is associated with higher firm value, while poor ESG scores may increase uncertainty and reduce market valuation (Hales, 2018). The risk portfolio theory supports that investors prefer stable companies with lower volatility, often indicated by good ESG performance (Albuquerque et al., 2019). Several studies support this view, including Adhi & Cahyonowati (2023); Alfajri & Warsini (2024); Aydoğmuş et al. (2022); Ferriani & Natoli (2021); Lerskullawat & Ungphakorn (2024); Maiti (2020), which all find a positive effect of ESG on firm value. However, Fatemi et al. (2018) argue that excessive ESG engagement can harm firm value. Similarly, Younas & Zafar (2019) suggest that high ESG scores might reflect higher ESG-related risks, increasing market uncertainty. This is supported by Hermanda & Wijaya (2020); Eriandani & Winarno (2024) Aziz et al. (2016), who report a negative impact of ESG on firm value. Other studies, such as Ahmad et al. (2021) and Fachrezi et al. (2024), suggest that ESG effects vary by firm size and sector, and may not significantly impact firm value in all cases.
H_1 = EGS risk has a significant positive effect on firm value

Free float represents the proportion of shares available for public trading and reflects a company's ownership structure. A low free float suggests concentrated ownership, which may weaken governance and reduce stock liquidity, negatively impacting firm value (Bostancı & Kılıç, 2010). Conversely, studies by Nurhaeda (2019) and Fitriani et al. (2020) found that a higher free float improves liquidity and positively influences firm value. However, Ibrahim & Hanggraeni (2021) argue that increased free float boosts trading volume and investor interest, potentially stabilizing prices and enhancing firm value, while Rhee & Wang (2009) found a negative relationship. Dian (2019) concludes that higher free float does not necessarily impact liquidity or firm value.
H_2 = Free float ratio has a significant positive effect on firm value

Sales growth reflects a company's ability to increase its sales over time, indicating competitiveness in the market (Handayani & Handayani, 2024). Higher sales growth is viewed positively by investors, as it may lead to increased profits and improved firm value (Ducassy & Montandrau, 2015). Studies by Dolontelide & Wangkar (2019), Fitriani et al. (2020), Nurhaeda (2019) support view that sales growth has a significant positive effect on firm value. However, Paniagua et al.

(2018) caution that aggressive sales growth can raise operational costs or increase debt, potentially harming firm value. This is in line with Lerskullawat & Ungphakorn (2024), Saona & Martín (2018) who found a negative relationship. Meanwhile, Kao et al. (2019) argue that in some industries or economic conditions, sales growth is not a strong determinant of firm value. Siahaan & Muslih (2020) found no significant relationship, highlighting that other factors like efficiency and profitability may play a more dominant role.
H_3 = Sales growth has a significant positive effect on firm value.

The leverage ratio reflects a firm's reliance on debt relative to equity in financing its assets (Harahap et al., 2023). High leverage can increase financial risk and potentially lower firm value due to instability and the risk of default (Fraser & Ormiston, 2001, Jihadi et al., 2021, Rejeki & Haryono, 2021). Conversely, optimal leverage may enhance firm value by effectively balancing risk and return (Santoso & Junaeni, 2022). However, several studies indicate leverage may have no significant effect on firm value, suggesting that its impact can depend on factors like profitability or firm size (Alfajri & Warsini, 2024; Kristofel et al., 2023; Lerskullawat & Ungphakorn, 2024)
H_4: Leverage has a significant positive effect on firm value.

Firm size positively influences ESG disclosure and firm value, as larger firms have greater visibility, financial capacity, and resources to adopt sustainable practices (Adhi & Cahyonowati, 2023). This aligns with findings by Abdi et al. (2022) and Fatemi et al. (2018), which indicate that firm size strengthens the link between ESG disclosure and firm value. However, Gunarsih (2024) notes that poor ESG management may lead to negative market responses, even in large firms. Similarly, Firmansyah et al. (2022) and Wibawa & Khomsiyah (2022) argue that firm size does not guarantee effectiveness in ESG practices or investor appeal, suggesting no moderating effect of firm size on the ESG firm value relationship.
H_5: Firm size moderate the influence between ESG and company value

Although specific studies on the effect of the free float ratio on firm value moderated by firm size are limited, existing literature offers relevant insights. The free float ratio enhances firm value by increasing stock liquidity and market visibility (Widianto & Astuti, 2024). Managerial ownership tends to reduce the free float ratio, while institutional ownership increases it, thereby attracting investor interest. Firm size may moderate this relationship, as larger firms with higher free float ratios provide greater opportunities for market participation, reinforcing investor perceptions of stability and growth. Thus, the influence of managerial and institutional ownership on firm value through the free float ratio can be moderated by firm size (Gusty & Novian, 2022).
H_6: Firm size moderate the influence between free float ratio and company value

The effect of sales growth on firm value is influenced by company size. Large companies have a more significant impact on firm value because they have more resources and investment opportunities (Apriliyanti et al., 2019). Herdiani et al. (2021) revealed that company size has a positive effect on firm value. Large company size strengthens the impact of sales growth on firm value, in accordance with signal theory which states that large companies provide positive signals to investors (Sugiharto & Hendratno, 2022). With a larger size, these companies often experience greater market confidence, which translates into better stock performance and investor perceptions.
H_7 = Firm size moderate the influence between sales growth ratio and company value

When leverage is moderated by firm size, large firms can utilize debt to strengthen their financial structure, improve operational efficiency, and create more value for shareholders. Thus, higher leverage in large companies can produce a positive influence on firm value (Anjani & Yuliana, 2023). Another study conducted by Rizky (2021) explains something different where ethics is moderated by company size because large companies tend to have higher financial stability and more resources to manage debt better. Large company size provides flexibility in financing, which reduces dependence on debt and minimizes the negative impact of leverage on firm value.
H_8 = Firm size moderate the influence between leverage and company value

2.11. Research framework

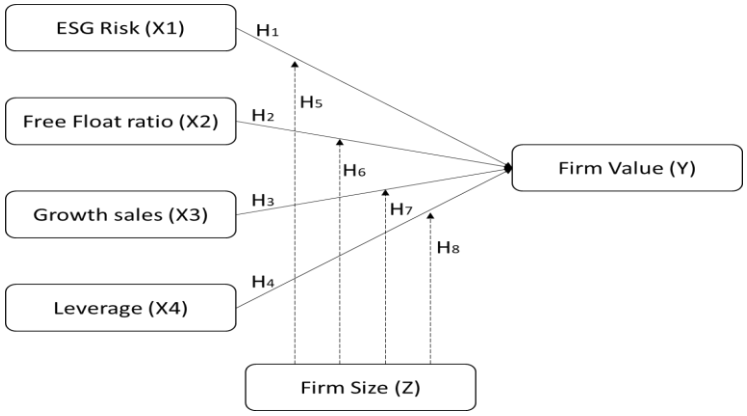

Figure 1 Research framework

3. Method

This study employs a comparative causal approach using quantitative methods to examine cause-and-effect relationships and assess the influence of independent variables on the dependent variable. The analytical method used is multiple linear regression with moderation, processed using STATA 17. The data source is secondary data obtained from the annual financial reports of LQ45 companies listed on the Indonesia Stock Exchange (IDX) for the period Q1 2021 to Q3 2024, accessed via company websites and idx.co.id. Since this study uses secondary data, the research instrument is a structured data extraction sheet used to systematically collect numerical information from audited financial statements and ESG disclosures based on predefined operational definitions.

The research population includes 45 LQ45 companies, and the sample was selected through non-probability purposive sampling, excluding firms in the banking sector due to their unique characteristics. Based on these criteria, 19 companies were selected, resulting in 285 observations across 15 quarters. The study variables include firm value, ESG, free float ratio, sales growth, leverage, and firm size (as a moderating variable). All data were sourced from audited financial statements available on the IDX website. The operational definitions of the variables used in this study are described in detail in table 1.

Table 1 Operational Variable

Type of variable	Variable studied	Indicator
Variable dependent	Firm Value (Y)	Tobin Q = (MVE + Debt) / Total assets Rosmita Rasyid (2019)
Variable independent	ESG Risk (X_1)	ESG Risk = IDX Risk ESG Score Aydoğmuş et al. (2022)
	Free Float ratio (X_2)	FFR = POS/NSO Sari & Rachman (2021)
	Growth sales ratio (X_3)	GSR = (SR_t – SR_{t-1}) / SR_{t-1} Lerskullawat & Ungphakorn (2024)
	Leverage (X_4)	Leverage = Total debt/total equity Lerskullawat & Ungphakorn (2024)
Moderator variable	Firm Size (Z)	FZ = Log Total Assets (Aydoğmuş et al., 2022)

Note: MVE = Market Value of Equity; ESG = Environmental, Social, Governance; POS = Public Ownership Shares; NSO = Number of Shares Outstanding; GSR = Growth sales ratio; SR = Sales Revenue; FZ = Firm size

Based on the operational variables, the researcher made a research model:

Model 1: $Tobin\ Q = \alpha + \beta_1 EGSRisk + \beta_2 FFR + \beta_3 GSR + \beta_4 Lev + e$

Model 2: $Tobin\ Q = \alpha + \beta_1 EGSRisk + \beta_2 FFR + \beta_3 GSR + \beta_4 Lev + \beta_5 EGSRisk*FZ + \beta_6 FFR*FZ + \beta_7 GSR*FZ + \beta_8 Lev*FZ + e$

Data analysis in research can be done with several techniques, starting with descriptive analysis to describe data characteristics, such as mean and standard deviation (Sekaran, 2021). Before performing linear regression, it is necessary to perform classical assumption tests, such as skewness and kurtosis tests for normality tests (Orcan, 2020), VIF and 1/VIF to test for multicollinearity, Breusch-Pagan/Cook-Weisberg test for heteroscedasticity and Breusch-Godfrey LM test for autocorrelation (Sekaran, 2021), which ensure the regression model is valid. Furthermore, multiple linear regression uses two stages. The first stage is to determine the effect of the independent variable on the dependent variable. The second stage is to determine the effect of the independent variable on the dependent variable which is moderated by the moderator variable.

4. Results and Discussion

4.1. Results - Descriptive analysis

The results of descriptive analysis are presented in Table 2.

Table 2. Descriptive Analysis

Variable	Obs	Mean	Std. dev	Min	Max
Tobin Q (Y)	285	.4246751	.1805774	.1124905	.8552022
ESG Risk (X_1)	285	33.44189	7.622516	17.42	62.02
FFR (X_2)	285	.3717232	.0970611	.1443	.4957
GSR (X_3)	285	.0371687	.1538431	-.3277086	.8916706
Lev (X_4)	285	1.01457	.9766904	.1267485	5.90618
FZ (Z)	285	12.76037	1.868346	9.079706	14.67155

Based on Table 2, the descriptive analysis indicates that Tobin Q (Y), ESG Risk (X1), FFR (X2), and Firm Size (Z) have relatively homogeneous data distributions, as shown by their mean values exceeding the standard deviations. In contrast, GSR (X3) and Leverage (X4) exhibit higher variability, indicating heterogeneity. The lowest Tobin Q value is 0.1125 (INCO, 2024q1), while the highest is 0.8552 (UNVR, 2024q2). The ESG Risk ranges from 17.42 (UNVR, 2021q1) to 62.02 (INCO, 2021q2). The FFR spans 0.1443 (UNVR, 2021q1) to 0.4957 (INDF, 2021q3). GSR varies between –0.3277 (ITMG, 2023q1) and 0.8917 (ADRO, 2022q2). Leverage ranges from 0.1267 (INCO) to 5.9062 (UNVR, 2024q2), and Firm Size ranges from 9.0797 (ITMG, 2021q1) to 14.6716 (ASII, 2024q3).

4.2. Classical assumption tests

Multiple linear regression is considered ideal if it satisfies the BEST (Best Linear Unbiased Estimator) criteria, meaning the model produces unbiased and efficient estimates. Therefore, classical assumption tests are applied to ensure that the regression model meets the BLUE requirements and that the estimated coefficients are valid and reliable. The normality test is selected to confirm whether the residuals are normally distributed, the heteroskedasticity test is used to examine whether the error variance is constant, the multicollinearity test is conducted to detect high correlations among the independent variables, and the autocorrelation test is performed to identify potential correlation of residuals over time. To meet these standards, it is essential that the classical assumption tests of normality, heteroscedasticity, multicollinearity, and autocorrelation are fulfilled (Sekaran, 2021).

To assess whether the data are normally distributed, the skewness and kurtosis test was chosen because it provides a formal statistical measure of deviation from normality based on residual distribution. The results of the normality test are presented in Table 3

Table 3. Skewness and kurtosis test for normality

Variable	Obs	Pr (Skewness)	Pr (Kurtosis)	Chi2(2)	Prob>chi2
ABS_Res	285	.0485	.1603	5.86	.0533

Classical assumption tests begin with the normality test, which refers to the criteria proposed by Orcan (2020), stating that data are considered normally distributed if the Prob > chi2 value on the ABS_Res variable exceeds 0.05. Based on the test results, the obtained value of 0.0533 is greater than 0.05,

indicating that the data meet the assumption of normality. Following the normality test, the heteroskedasticity test was conducted, and the results are presented in Table 4.

Table 4. Breusch – Pagan/Cook – Weisberg test for heteroskedasticity
Variable: ABS_Res
H_0: Constant variable
Chi2(1) = 0.72
Prob > chi2 = 0.3978

The heteroskedasticity test refers to the method proposed by Sekaran (2021), which utilizes the Breusch–Pagan/Cook–Weisberg test. This test is chosen because it effectively detects whether variance of the residuals changes across observations, which may bias standard errors if present. The test results indicate that the Prob > Chi2 value for the ABS_Res variable is 0.3978, exceeding the threshold of 0.05. This result confirms that the data are free from heteroskedasticity. Subsequently, the classical assumption tests proceed to the multicollinearity test, which is conducted using the Variance Inflation Factor (VIF) and 1/VIF values. The detailed outcomes are presented in Table 5.

Table 5. VIF and 1/VIF Multicollinearity test

Variable	VIF	1/VIF
ESG Risk (X_1)	1.51	0.661423
FFR (X_2)	1.18	0.848485
GSR (X_3)	1.02	0.981091
Lev (X_4)	1.73	0.578468
FZ (Z)	1.20	0.830822

The results of the multicollinearity test demonstrate that there is no indication of serious multicollinearity within the regression model, as all VIF values are below 5 and all 1/VIF values exceed 0.1. This suggests that the independent variables do not exhibit excessive correlation, ensuring the reliability of the coefficient estimates in the model (Sekaran, 2021). The classical assumption tests then continue with the autocorrelation test, which is conducted using the Breusch–Godfrey LM test. The results are presented in the following table 6.

Table 6. Breusch – Godfrey LM test for autocorrelation

Lags(p)	chi2	df	Prob > chi2
1	2.004	1	0.1569

The result of the autocorrelation test using the Breusch-Godfrey LM test at lag 1 shows a p-value of 0.1569. Since this value is greater than 0.05, the null hypothesis stating that there is no autocorrelation at lag 1 cannot be rejected. This test is chosen because it is suitable for detecting serial correlation in regression models that include lagged variables or use panel data across time periods. Therefore, test indicates that there is no significant autocorrelation problem (Sekaran, 2021).

4.3. Multiple linear regression without moderation

Based on the results of the research without moderation, the findings of the multiple linear regression analysis are presented in Table 7.

Table 7. Multiple linear regression without moderation

Tobin Q	Coefficient	Std. err.	t	P > |t|	[95% conf.	interval	Decision
ESG (X_1)	-.0000793	.0007022	-0.11	0.910	-.001675	.0010492	H_1 Rejected
FFR (X_2)	.248167	.0462912	5.36	0.000	.157044	.33929	H_2 Accepted
GSR (X_3)	.0058869	.0286985	0.21	0.838	-.050605	.0623791	H_3 Rejected
Lev (X_4)	.1726086	.0055679	31.00	0.000	.1616484	.1835689	H_4 Accepted
_cons	.1597361	.0333413	4.79	0.000	.0941046	.2253675	-

Based on table 8 multiple linear regression without moderation, a multiple linear regression model is obtained as follows:
Tobin Q = 0.1597 + -.0007 ESG + 0.2481 FFR + 0.0058 GSR + 0.1726 Lev

The regression results show that constant value is 0.1597, representing predicted Tobin's Q when all independent variables are zero. ESG Risk (X1) has a coefficient of –0.0007, indicating a very weak negative effect, and due to its high p-value, **H1 is rejected**. GSR (X3) also shows a minimal positive effect with a coefficient of 0.0058, but it is not statistically significant, thus **H3 is rejected**. On the other hand, FFR (X2) has a significant positive effect on Tobin's Q with a coefficient of 0.2481, so **H2 is accepted**. Similarly, leverage (X4) has a significant coefficient of 0.1726, leading to **acceptance of H4**. In summary, only FFR and leverage significantly affect Tobin's Q, while ESG Risk and GSR do not.

4.4. Multiple linear regression with firm size as moderation

In this study, firm size is employed as a moderating variable to examine whether it strengthens or weakens the relationship between the independent variables and the dependent variable. The results of the multiple linear regression analysis incorporating firm size as a moderator are presented in Table 8.

Table 8 Multiple linear regression with firm size as moderation

Tobin Q	Coefficient	Std. errs.	t	P > |t|	[95% conf.	interval	Decision
c.ESG#c.FZ	.0006494	.0003182	2.04	0.042	.0000231	.0012757	H_5 Accepted
c.FFR#c.FZ	-.0949702	.032506	-2.92	0.004	-.158962	-.030977	H_6 Accepted
c.GSR#c.FZ	-.0082804	.0125042	-0.66	0.508	-.032896	.0163356	H_7 Rejected
c.Lev#c.FZ	-.0229414	.0077465	-2.96	0.003	-.038191	-.007691	H_8 Accepted
_cons	-.2643728	.189767	-1.39	0.165	-.637953	.1092078	-

Based on table 8 multiple linear regression with firm size as moderation, a multiple linear regression model is obtained as follows:

Tobin Q = – 2.643 – .007 ESG + 1.385 FFR + 0.102 GSR + 0.473 Lev + 0.034 FZ + 0.0006 ESG*FZ – .094 FFR*FZ – .008 GSR*FZ – .022 Lev*FZ

Based on the table above, it is found that the interaction between independent variables and FZ (moderation) shows that the effect of FZ on the relationship between independent variables and Tobin's Q varies. The ESG*FZ interaction shows a very small effect (0.0006) and significant (P = 0.042), which means hypothesis H5 is accepted, because an increase in ESG accompanied by an increase in FZ slightly affects Tobin's Q. The FFR*FZ interaction shows a negative effect (-0.094) which is significant (P = 0. 004), which means hypothesis H6 is accepted, because the higher the FZ, the smaller the positive effect of FFR on Tobin's Q. The GSR*FZ interaction shows a small negative effect (-0.008) and is not significant (P = 0.508), which means hypothesis H7 is rejected, because FZ slightly reduces the positive effect of GSR on Tobin's Q. Meanwhile, the Lev*FZ interaction shows a small negative effect (-0.022) which is significant (P = 0.003), meaning hypothesis H8 is accepted, where FZ reduces the positive effect of Lev on Tobin's Q.

4.5. Discussion

The analysis indicates that ESG risk does not influence firm value. ESG risk evaluates a company's exposure to environmental, social, and governance-related threats and its ability to manage them (Pamungkas & Risman, 2024). This lack of impact is attributed to the variation in ESG risk across firms (Ahmad et al., 2021). Larger firms typically possess better resources to mitigate these risks, lessening their effect on firm value. INCO in Q2 2021 had a high ESG risk rating categorized as severe. According to Sustainalytics, a score above 40 indicates significant ESG concerns that could harm reputation or financial outcomes. At the same time, INCO's Tobin's Q stood at 0.12, reflecting an undervalued status. These variations in ESG risk among LQ45 firms help explain the lack of influence on firm value. This finding is consistent with Ahmad et al. (2021); Fachrezi et al. (2024), while it contrasts with the conclusions of Adhi & Cahyonowati (2023); Albuquerque et al. (2019); Alfajri & Warsini (2024); Aydoğmuş et al. (2022); Aziz et al. (2016); Eriandani & Winarno (2024); Ferriani & Natoli (2021); Hermanda & Wijaya (2020); Lerskullawat & Ungphakorn (2024); Maiti (2020).

Similarly, the growth sales ratio is also found to have no effect on firm value. Fahmi (2012) defines this ratio as a measure of the company's ability to sustain its market position through sales performance. A high sales growth rate typically reflects financial strength and distance from distress. However, this research suggests the ratio has no significant influence, possibly due to sectoral differences in minimum sales thresholds, making growth comparisons across the index less relevant. These results support Kao et al. (2019), who argue that industry variation in sales growth reduces its direct impact on firm value. The findings also agree with Siahaan & Muslih (2020), while opposing studies by Dolontelide & Wangkar (2019); Ducassy & Montandrau (2015); Fitriani et al. (2020); Nurhaeda, (2019); Rosyidani et al. (2024).

Whereas, free float ratio has a significantly positive effect on firm value. A higher free float ratio indicates a larger portion of shares is available for public trading, enhancing liquidity and transparency. This greater openness is generally seen as favorable by investors, offering them more flexibility to trade, increasing accessibility to capital markets, and ultimately improving investor confidence and firm value (Nurhaeda, 2019). This conclusion supports the findings of Fitriani et al. (2020), who observed a significant positive relationship between free float and firm value, while it contradicts the findings of Dian (2019); Ibrahim & Hanggraeni (2021); Rhee & Wang (2009).

Meanwhile, the leverage ratio reflects the proportion of debt to equity in a firm's capital structure, indicating how much the company relies on external funding (Harahap et al., 2023). This study finds a significant positive relationship between leverage and firm value, suggesting that higher leverage when managed effectively can enhance firm value by optimizing capital use (Santoso & Junaeni, 2022). UNVR demonstrates high leverage (value = 5) but maintains a strong firm value (0.85), implying that debt, if controlled wisely, contributes positively to value creation. The same thing applies across companies with sound debt strategies. These findings contradict the results of Alfajri & Warsini (2024); Failisa et al. (2024); Jihadi et al. (2021); Kristofel et al. (2023); Lerskullawat & Ungphakorn (2024).

Firm size can act as a moderating variable that affects the relationship between ESG risk and firm value. Before moderation, ESG risk has no significant effect on firm value. However, when firm size is included as a moderator, large companies, which have more resources to manage ESG risk, can reduce the negative impact of such risks. These companies typically have better risk management practices, sustainability programs, and greater market credibility, which together enhance investor confidence. As a result, ESG risk turns into a positive influence on firm value when managed properly by large firms. This statement is supported by research conducted by Abdi et al. (2022); Adhi & Cahyonowati (2023); Fatemi et al. (2018), which suggest that firm size strengthens and changes the influence of ESG risk on firm value to become significantly positive. On the other hand, this finding contradicts studies by Fachrezi et al. (2024); Gunarsih (2024); Wibawa & Khomsiyah (2022), who found no such effect.

Building on this, firm size also moderates the relationship between the free float ratio and firm value. While a high free float ratio typically increases firm value by enhancing liquidity and investor access, its effect differs when firm size is considered. In smaller firms, a high free float ratio can attract more investors and signal transparency, thus positively affecting firm value. Conversely, in large firms, a high free float ratio may indicate dispersed ownership and less control, which could increase perceived risk and reduce firm value. Therefore, firm size alters the direction and strength of the free float ratio's effect on firm value, highlighting how investor perception and corporate structure interact. This conclusion aligns with Gusty & Novian (2022). and is also supported by Widianto & Astuti (2024), who emphasized the importance of ownership structure in influencing firm valuation, particularly in different firm sizes.

Furthermore, the moderating role of firm size is also evident in the relationship between leverage and firm value. In smaller firms, leverage can be seen as a growth-enabling tool, signaling the firm's potential to expand using external funding. However, in larger firms, high leverage may be interpreted negatively, as it increases financial risk, interest burdens, and potentially weakens investor confidence. This shift in perception suggests that firm size changes the effect of leverage from positive to negative, depending on how the market assesses financial stability across different firm sizes. These findings are consistent with studies by Jihadi et al. (2021); Rejeki & Haryono (2021), while contradicting results found by Anjani & Yuliana (2023); Rizky (2021).

However, this moderating effect of firm size does not hold in the case of sales growth ratio and firm value. Despite the addition of firm size as a moderator, the relationship between sales growth and

firm value remains statistically insignificant. This may indicate that, for both small and large firms, short-term fluctuations in sales growth are not sufficient indicators for investors when valuing the firm. Especially in larger companies, where sales increases may be marginal relative to overall operations, the market may not interpret sales growth as a strong signal of improved value (Kao et al., 2019). Therefore, firm size fails to alter or strengthen this relationship. These findings stand in contrast to previous studies by Apriliyanti et al. (2019); Herdiani et al. (2021); Sugiharto & Hendratno (2022), which suggested a more direct impact of sales growth on value.

5. Conclusion

This study concludes that the effect of several financial factors on firm value, both directly and through moderation of firm size, varies. ESG risk has no significant effect on firm value, but when moderated by firm size, the effect becomes positive in large firms, which have more resources to manage ESG risk. Free float ratio has a significant positive effect on firm value, but the effect becomes negative in large firms, where high free float indicates a lack of control over the market. Growth sales ratio has no significant effect on firm value, both before and after moderated by firm size. Leverage shows a significant positive effect on firm value, but after being moderated by firm size, the effect becomes negative in large companies due to higher financial risk.

Companies, especially large ones, are advised to focus more on managing ESG risk with more mature policies, given their ability to handle this risk. Large companies should also be careful in managing leverage to avoid financial instability that may affect the value of the company. On the other hand, small companies can utilize the high free float ratio to increase liquidity and transparency to attract more investors. For companies with stable sales growth, it is recommended to focus more on other factors such as risk management and leverage.

This study has limitations in terms of samples that only include companies listed in the LQ45 index, which may not represent the overall condition of the industrial sector in Indonesia. Therefore, the results of this study could be different if conducted on companies from a wider industrial sector. Future research is recommended to expand the sample to include companies outside LQ45 and take into account the industrial sector as a variable that can affect the relationship between financial variables and firm value.

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