

The Influence of Profitability, Leverage, Liquidity, and ESG Scores on Firm Value of Lq45 Low Carbon Leaders Index Listed Companies for the Period 2021–2024

Arie Gilang Kusuma, Diana Sari

Universitas Widyatama, Indonesia

Email: arie.gilang@widyatama.ac.id, diana.sari@widyatama.ac.id

Abstract.

This study aims to examine the extent to which *Return on Equity* (ROE), *Net Profit Margin* (NPM), *Debt to Equity Ratio* (DER), *Current Ratio* (CR), and *Environmental, Social, and Governance* (ESG) scores influence firm value, as proxied by *Price to Book Value* (PBV), among companies listed in the *LQ45 Low Carbon Leaders Index* during the 2021–2024 period. The study adopts a quantitative approach using panel data regression analysis. The sample consists of 10 companies that consistently reported ESG scores and published both sustainability and financial reports over the four-year observation period. The estimation model employed is the *Random Effect Model* (REM), selected based on Chow, Hausman, and Lagrange Multiplier tests. The individual influence of each independent variable on firm value is assessed through partial t-tests. The findings indicate that ROE and NPM have a positive and significant effect on firm value, underscoring the importance of profitability in building investor confidence. DER shows a significant negative effect, suggesting that high leverage levels tend to reduce market valuation. Meanwhile, CR and ESG scores exhibit no significant effect on firm value, although ESG scores display a positive directional relationship. This implies that sustainability practices are perceived positively but have yet to become a decisive factor in corporate valuation by the market.

Keywords: Return on Equity, Net Profit Margin, Debt to Equity Ratio, Current Ratio, ESG Score, Firm Value, Price to Book Value

INTRODUCTION

Over the past two decades, global economic policy directions have undergone significant shifts, placing sustainability principles at the cornerstone of decision-making processes. The business sector is now required not only to focus on profit achievement but also to actively support sustainable development agendas. In this context, the concept of *Environmental, Social, and Governance* (ESG) has become a crucial indicator for assessing the extent to which companies implement socially and ecologically responsible business practices. ESG has evolved into a primary measuring tool for evaluating the resilience and long-term performance of companies, both in developed and developing countries like Indonesia (Friede et al., 2015). The global transition toward sustainable business practices has been accelerated by increasing awareness of climate change, social inequality, and corporate governance failures, making ESG considerations no longer optional but essential for long-term business viability.

The urgency of addressing environmental challenges has reached unprecedented levels globally. According to the Intergovernmental Panel on Climate Change (IPCC), the world needs to achieve net-zero carbon emissions by 2050 to limit global warming to 1.5°C above pre-industrial levels. This global imperative has prompted governments, regulators, and investors worldwide to prioritize sustainable business practices. Major economies, including the European Union, United States, and China, have implemented comprehensive ESG disclosure requirements and sustainability regulations. The European Green Deal, for instance, aims to mobilize at least €1 trillion in sustainable investments over the next decade, while the U.S. Securities and Exchange Commission has proposed mandatory climate disclosure rules for public companies. These global developments create a cascading effect on emerging markets, including Indonesia, where companies with international exposure must align their practices with global sustainability standards.

Corporate sustainability has entered Indonesia's government policy agenda through various regulations, demonstrating the country's commitment to global sustainability efforts. The Minister of Environment and Forestry Regulation No. 21 of 2022 concerning Carbon Economic Value represents a significant step toward establishing a carbon pricing mechanism in Indonesia. The government has set ambitious targets, aiming for a 31.89% reduction in greenhouse gas emissions independently and up to 43.20% with international support by 2030 (Ministry of Environment and Forestry, 2022). These targets place considerable pressure on the private sector to participate actively in climate change mitigation, making ESG aspects an integral part of corporate operations and reporting strategies. Furthermore, Indonesia's commitment to achieving net-zero emissions by 2060, as announced at COP26, reinforces the importance of sustainable business practices across all sectors of the economy.

As companies in developing countries like Indonesia begin responding to sustainability demands, they are increasingly implementing ESG reporting following energy transition efforts and *Net Zero Emission* targets (Saputro & Sitinjak, 2024). ESG disclosure is no longer considered merely a moral obligation but has evolved into a strategic instrument for creating company value (Van et al., 2025). This paradigm shift reflects a broader understanding that

sustainable business practices can drive competitive advantages, reduce operational risks, and enhance stakeholder relationships. Quality ESG disclosure is believed to enhance market confidence and positively impact company valuation by providing investors with critical information about long-term risks and opportunities that traditional financial metrics may not capture.

Theoretically, the relationship between ESG practices and firm value is strengthened by signaling theory, which posits that companies send signals to the market through credible actions and reporting. ESG disclosure can serve as a positive signal indicating that the company has sustainable prospects and is well-positioned to navigate future challenges (Spence, 1973). Gangwani & Kashiramka (2024) provide empirical evidence that ESG performance significantly reduces systemic risk while increasing firm value in developing countries. Their findings suggest that ESG practices not only contribute to social and environmental benefits but also deliver tangible financial returns to shareholders. Conversely, neglecting ESG issues can trigger negative perceptions from investors, potentially leading to higher costs of capital and reduced market valuation.

Recent empirical research has provided compelling evidence of the positive relationship between ESG performance and financial outcomes. Bai et al. (2024) conducted a comprehensive analysis indicating that companies obtaining ESG certification and engaging in green innovation demonstrate higher market values compared to their conventional counterparts. These findings imply that the market responds positively to real and measurable sustainability commitments, viewing them as indicators of management quality and future profitability. The research suggests that ESG has transcended its role as merely a form of regulatory compliance to become a strategic variable in creating sustainable competitive advantages. Companies that proactively embrace ESG principles are better positioned to attract long-term capital, retain talented employees, and build stronger customer relationships.

In response to global climate issues and the urgent need for clean energy transition, the Indonesia Stock Exchange (IDX) introduced the *LQ45 Low Carbon Leaders* index as part of its commitment to promoting sustainable finance. This innovative index consists of companies categorized in the *LQ45* index but distinguished by their relatively low carbon intensity compared to industry peers. Companies in this index are selected based on rigorous criteria, including market capitalization, liquidity, and demonstrated low-carbon practices, representing their contribution to Indonesia's net-zero emission targets. This initiative is part of IDX's broader strategy to promote environmentally friendly investment and provide clear references for ESG-oriented investors seeking to align their portfolios with sustainability objectives.

The performance of sustainable investment indices provides encouraging evidence of market acceptance of ESG-focused strategies. Data reveal that the *LQ45 Low Carbon Leaders* index experienced remarkable growth of 36.21% during the 2020–2024 period, significantly exceeding the performance of the conventional *LQ45* index (Sarvasti & Widoretno, 2024). This superior performance reflects positive investor response to corporate sustainability practices,

particularly in carbon emission reduction aspects. The outperformance indicates that the market is beginning to assign premiums to companies implementing effective low-carbon strategies, suggesting that sustainability considerations are becoming material factors in investment decision-making processes.

Firm value, as measured by various financial metrics, represents the extent to which the market values a company's capacity to create economic value for stakeholders, especially shareholders. This concept encompasses investor perceptions of growth prospects, operational efficiency, and competitive positioning in the future business environment. Gitman and Zutter (2012) conceptualize firm value as a reflection of management's success in increasing shareholder wealth, which is ultimately reflected in market stock prices and related valuation metrics. In the contemporary business environment, firm value increasingly reflects not only traditional financial performance but also the company's ability to manage ESG-related risks and opportunities that may affect long-term sustainability.

Contemporary firm valuation approaches increasingly recognize the importance of non-financial factors, particularly ESG considerations, in determining long-term value creation potential. *Price to Book Value* (PBV) has emerged as a particularly relevant metric for assessing how the market values companies relative to their book value, with higher PBV ratios often indicating positive market sentiment toward future prospects. According to Brigham and Houston (2014), PBV ratios above 1.0 suggest that the market values the company's intangible assets, growth prospects, and management quality beyond what is reflected in accounting records. In the context of ESG-focused companies, PBV can capture market premiums associated with sustainable business practices and stakeholder trust.

One significant challenge in ESG research within the Indonesian context has been the limited availability of consistent and high-quality data. However, this constraint is being progressively addressed through the introduction of official ESG scores released by IDX in collaboration with internationally recognized rating institutions such as Sustainalytics. The provision of more comprehensive and accurate ESG data opens new opportunities for systematic quantitative approaches to understanding the relationship between sustainability practices and financial performance. This development enables researchers to employ reliable secondary data to test hypotheses about ESG-firm value relationships within Indonesia's specific institutional and economic context.

ESG scores, or sustainability performance ratings, are increasingly viewed as important signals that influence risk perception and company reputation in the eyes of sophisticated investors. Companies with high ESG scores are generally perceived as having superior governance structures, lower environmental risks, and more stable social relationships with stakeholders. Putri and Mulyantini (2025) found that companies actively engaged in ESG disclosure tend to receive valuation premiums from the market, reflecting investor confidence in their long-term prospects. This premium occurs because investors perceive companies with robust sustainability practices as having more promising long-term growth trajectories and lower exposure to regulatory, reputational, and operational risks.

While extensive research has examined the relationship between traditional financial

factors and firm value, the integration of ESG as a primary independent variable alongside financial metrics in a single analytical framework remains relatively uncommon, particularly in the Indonesian market context. This represents a significant gap in the literature, especially considering that Indonesia is still in the early stages of ESG adoption compared to developed markets. Moreover, specialized indices such as the *LQ45 Low Carbon Leaders* have rarely been the subject of academic research, despite presenting a unique combination of financial performance and sustainability practices. The index offers an ideal laboratory for examining how ESG factors interact with traditional financial metrics in determining firm value.

Previous research has provided mixed evidence regarding the relationship between ESG factors and firm value across different markets and contexts. Hikmah and Daljono (2023) found that liquidity and leverage significantly influence firm value, but their research did not specifically examine companies with strong ESG characteristics like those in the *LQ45 Low Carbon Leaders* index. Similarly, while Rahmah and Purwohedi (2024) concluded that high ESG scores can increase company PBV, particularly when profitability is also high, their findings suggest that ESG effects may be contingent on other firm characteristics. These mixed results highlight the need for more context-specific research that considers the unique characteristics of different markets and company types.

The urgency of this research is further emphasized by the growing importance of sustainable finance in Indonesia's capital market development strategy. The Financial Services Authority (OJK) has implemented various regulations promoting sustainable finance, including requirements for sustainable finance roadmaps and ESG disclosure guidelines. As Indonesian companies face increasing pressure to align with global sustainability standards while maintaining competitiveness, understanding the relationship between ESG practices and firm value becomes crucial for strategic decision-making. This research addresses this need by providing empirical evidence specific to Indonesian companies that have demonstrated leadership in low-carbon practices.

This research aims to fill the identified literature gap by empirically examining the influence of profitability variables (*ROE* and *NPM*), leverage (*DER*), liquidity (*CR*), and ESG scores on firm value proxied by *PBV* among *LQ45 Low Carbon Leaders* index companies during the 2021–2024 period. The study employs a quantitative approach using multiple linear regression to identify the partial influence of each variable on firm value while controlling for the unique characteristics of sustainability-focused companies. By focusing specifically on the *LQ45 Low Carbon Leaders* index, this research provides insights into how ESG factors interact with traditional financial metrics in the context of companies that have demonstrated commitment to environmental sustainability.

The novelty of this research lies in its comprehensive integration of traditional financial variables with ESG scores within the specific context of Indonesian companies recognized for their low-carbon leadership. Unlike previous studies that typically examine ESG effects in isolation or focus on general market indices, this research provides a nuanced analysis of how sustainability considerations complement or substitute for traditional financial factors in firm valuation. The four-year observation period (2021–2024) captures a critical period of ESG

mainstreaming in Indonesian capital markets, providing timely insights into evolving investor preferences and market dynamics.

The practical implications of this research extend to multiple stakeholder groups. For corporate management, the findings provide guidance on optimal resource allocation between traditional financial performance improvement and ESG investments. For investors, the research offers evidence-based insights into the value relevance of ESG factors in the Indonesian context, supporting more informed investment decisions. For policymakers, the results contribute to the ongoing development of sustainable finance regulations and market infrastructure. Finally, for academic researchers, this study provides a foundation for future research on ESG-performance relationships in emerging markets.

The research is expected to generate comprehensive findings that can serve as a foundation for more strategic decision-making in the context of corporate sustainability and financial performance. By examining the *LQ45 Low Carbon Leaders* index companies, which represent the intersection of financial success and environmental leadership, this study provides unique insights into the evolving relationship between sustainability practices and market valuation in Indonesia's dynamic capital market environment. The findings will contribute to the growing body of literature on sustainable finance while addressing the specific needs of stakeholders operating within Indonesia's unique institutional and economic context.

RESEARCH METHODS

This study employed a quantitative approach to objectively measure relationships between variables using numerical data. It was explanatory research, aiming to explain the influence of several independent variables—Return on Equity (ROE), Net Profit Margin (NPM), Debt to Equity Ratio (DER), Current Ratio (CR), and ESG scores—on the dependent variable, firm value, proxied by the Price to Book Value (PBV) ratio.

The research objects were companies included in the *LQ45 Low Carbon Leaders* (IDX LQ45 LCL) index listed on the Indonesia Stock Exchange (IDX) during the 2021–2024 period. The study focused on companies that published complete financial reports and had available ESG scores throughout that period.

Sample selection used a purposive sampling technique, a non-probabilistic method that selects samples based on criteria set to meet research objectives. The criteria were: (1) companies consistently included in the *LQ45 Low Carbon Leaders* index and listed on IDX with consecutive financial reports from 2021 to 2024; and (2) companies that published complete annual financial and sustainability reports for each year and had official ESG scores from IDX or Sustainalytics.

Based on these criteria, 10 companies were selected from the 34 in the *LQ45 Low Carbon Leaders* index that consistently had ESG score assessments from Sustainalytics during the 2021–2024 period. Data were collected through documentation, gathering information from annual reports, sustainability reports, and publicly available ESG data.

The analytical technique was multiple linear regression with panel data. Panel data regression was chosen because it provides more comprehensive data and reduces collinearity between variables by combining cross-sectional and time-series data. The analysis included descriptive statistics, model determination, panel data regression modeling, classical assumption tests, multiple regression, hypothesis testing, and calculation of the coefficient of determination.

RESULTS AND DISCUSSION

General Overview and Descriptive Data of Research Objects

This research examines companies included in the LQ45 Low Carbon Leaders (IDX LQ45 LCL) index listed on the Indonesia Stock Exchange (IDX) during the 2021-2024 period. The LQ45 LCL index represents a development from the LQ45 index that not only considers financial aspects of companies but also emphasizes corporate commitment to reducing carbon emissions and conducting sustainable business. From a total of 34 companies indexed in LQ45 LCL, sample selection using purposive sampling technique resulted in 10 companies that consistently had ESG score assessments from Sustainalytics during the 2021-2024 period.

Table 1. List of Research Sample Companies

No	Company Code	Company Name
1	AKRA	AKR Corporindo Tbk.
2	BBCA	Bank Central Asia Tbk.
3	BBNI	Bank Negara Indonesia Tbk.
4	BBRI	Bank Rakyat Indonesia Tbk.
5	BMRI	Bank Mandiri Tbk.
6	CTRA	Ciputra Development Tbk.
7	EXCL	XL Axiata Tbk.
8	JSMR	Jasa Marga Tbk.
9	MAPI	Mitra Adiperkasa Tbk.
10	TOWR	Sarana Menara Nusantara Tbk.

The research utilizes secondary data obtained from sources published previously, without direct data collection by researchers. Data collection was conducted through documentation technique, gathering data from official company documents including annual financial reports and sustainability reports published through respective company official websites or through the official Indonesia Stock Exchange (IDX) website.

Variable Overview Analysis

Return on Equity (ROE) Variable Overview

ROE (Return on Equity) represents one of the profitability indicators for calculating profit or return levels on capital. This ratio is also used to measure the rate of return from shareholder investments (Andriani et al., 2023). Increasing ROE ratios can indicate good and efficient company performance, meaning company equity value increases along with ROE increases.

Table 2. ROE Data for 2021-2024 Period

Company	2021	2022	2023	2024	Average
AKRA	0.12	0.22	0.25	0.19	0.20
BBCA	0.18	0.19	0.21	0.21	0.20
BBNI	0.12	0.16	0.17	0.18	0.16
BBRI	0.15	0.18	0.21	0.20	0.19
BMRI	0.14	0.20	0.22	0.24	0.20
CTRA	0.08	0.10	0.12	0.12	0.11
EXCL	0.07	0.09	0.10	0.11	0.09
JSMR	0.05	0.06	0.07	0.07	0.06
MAPI	0.17	0.21	0.20	0.19	0.19
TOWR	0.29	0.28	0.26	0.24	0.27
Average					0.17

Based on Table 2, the highest ROE value during 2021-2024 was achieved by Sarana Menara Nusantara (TOWR) at 0.27. This value represents the company's ability to optimally utilize equity (capital) to generate maximum profit. This positive performance is supported by TOWR's business model focusing on telecommunications tower leasing, allowing the company to obtain recurring revenue with relatively fixed operational costs.

Net Profit Margin (NPM) Variable Overview

NPM (Net Profit Margin) represents a profitability ratio used to determine the margin of revenue that becomes net profit. According to Nenobais et al. (2022), NPM serves as a ratio to measure company capability in obtaining profit, describing the company's overall net income. Through NPM, company management effectiveness can be seen from financial performance reports.

Table 3. NPM Data for 2021-2024 Period

Company	2021	2022	2023	2024	Average
AKRA	0.04	0.08	0.07	0.06	0.06
BBCA	0.41	0.42	0.43	0.43	0.42
BBNI	0.22	0.25	0.25	0.25	0.24
BBRI	0.24	0.29	0.30	0.29	0.28
BMRI	0.23	0.27	0.28	0.29	0.27
CTRA	0.19	0.20	0.22	0.22	0.21
EXCL	0.05	0.06	0.07	0.07	0.06
JSMR	0.13	0.15	0.15	0.16	0.15
MAPI	0.06	0.07	0.07	0.06	0.07
TOWR	0.40	0.40	0.38	0.37	0.39
Average					0.21

Based on the table above, the average NPM from sample companies during the research period obtained very good values. This means that generally, companies included in the LQ45 Low Carbon Leaders index demonstrate very good financial performance in terms of operational efficiency and cost management. Bank Central Asia (BBCA) shows the highest NPM

value with an average of 0.42, followed by Sarana Menara Nusantara (TOWR) with an average of 0.39.

Debt to Equity Ratio (DER) Variable Overview

According to Wesso et al. (2022), Debt to Equity Ratio represents a ratio to measure how much companies utilize debt compared to their own capital from company owners. The lower the Debt to Equity ratio a company has, the smaller the total debt owned by the company and the lower the company's financial risk in terms of debt repayment capability (Kusumaningrum & Iswara, 2022).

Table 4. DER Data for 2021-2024 Period

Company	2021	2022	2023	2024	Average
AKRA	0.92	1.28	1.24	1.26	1.18
BBCA	6.4	6.8	6.6	6.7	6.63
BBNI	5.98	6.25	6.43	6.6	6.32
BBRI	6.2	6.5	6.3	6.4	6.35
BMRI	6.12	5.89	5.67	5.45	5.78
CTRA	0.73	0.7	0.65	0.61	0.67
EXCL	0.5	0.56	0.59	0.6	0.56
JSMR	2.2	2	1.85	1.75	1.95
MAPI	1.58	1.52	1.4	1.04	1.39
TOWR	4.45	4.15	3.91	3.74	4.06
Average					3.49

Based on Table 4, the highest average DER is owned by Bank Central Asia (BBCA) with a value of 6.63, followed by Bank Rakyat Indonesia (BBRI) at 6.35, and Bank Negara Indonesia (BBNI) at 6.32. In the banking sector, high DER values are common because the banking sector is indeed focused on managing funds in the form of loans, so high DER does not always indicate negative risk in this industry context.

Current Ratio (CR) Variable Overview

Current Ratio (CR) relates to the company's ability to pay short-term obligations. According to Febrian et al. (2022), current ratio is used to measure company capability in meeting short-term obligations when due or in operational activities. Current Ratio that can be fulfilled shows that the company has good performance in its operational activities, which affects company value increase (Tsaniatuzaima & Maryanti, 2022).

Table 5. CR Data for 2021-2024 Period

Company	2021	2022	2023	2024	Average
AKRA	1.29	1.40	1.44	1.56	1.42
BBCA	1.09	1.12	1.11	1.13	1.11
BBNI	1.14	1.12	1.11	1.09	1.12
BBRI	1.11	1.13	1.14	1.15	1.13
BMRI	1.08	1.08	1.05	1.04	1.06
CTRA	2.11	2.24	2.36	2.42	2.28

Company	2021	2022	2023	2024	Average
EXCL	0.37	0.40	0.42	0.43	0.40
JSMR	1.31	1.40	1.46	1.52	1.42
MAPI	1.23	1.33	1.36	1.44	1.34
TOWR	0.30	0.35	0.37	0.40	0.36
Average					1.16

Based on average CR data above, companies during 2021-2024 included in the LQ45 Low Carbon Leaders index show that Ciputra Development (CTRA) has the highest CR value of 2.28. This value indicates that the company has very good liquidity capability. Meanwhile, companies with the lowest CR values are Sarana Menara Nusantara (TOWR) with CR of 0.36, followed by XL Axiata (EXCL) at 0.40.

ESG Score Variable Overview

Environmental, Social, and Governance (ESG) has been widely used as an indicator to assess whether business practices conducted by a company have been socially and ecologically responsible. According to Noviantanti (2020), ESG is a measure for a company that wants to conduct investment practices. ESG consists of three concepts: environmental, social, and governance. These three concepts are considered as main aspects that impact the ability to manage finance and company value itself (Finrely, 2024).

Table 6. ESG Score Data for 2021-2024 Period

Company	2021	2022	2023	2024	Average
AKRA	26.73	26.73	26.77	21.09	25.33
BBCA	27.24	26.91	26.03	21.51	25.42
BBNI	27.51	25.06	25.70	23.17	25.36
BBRI	25.34	20.94	18.84	17.83	20.74
BMRI	29.71	29.28	29.00	28.20	29.05
CTRA	27.03	27.03	19.12	24.16	24.34
EXCL	25.50	25.50	27.60	25.62	26.06
JSMR	14.08	14.08	15.15	10.73	13.51
MAPI	21.90	21.90	21.90	23.32	22.26
TOWR	27.65	27.65	26.78	24.17	26.56
Average					23.86

Based on ESG data above, companies included in the LQ45 Low Carbon Leaders index during 2021-2024 show the highest ESG score achieved by Bank Mandiri (BMRI) with an average score of 29.05, followed by Sarana Menara Nusantara (TOWR) with a score of 26.56, and XL Axiata (EXCL) at 26.06. High scores indicate that these companies consistently maintain sustainability practices in their operations.

Firm Value Variable Overview

Firm value represents a description of factors related to financial health and growth potential of a company (Nasution et al., 2024). Increasing firm value affects easier access and

lower costs for obtaining new capital, both through stocks and debt. In this research, performance assessment toward companies is proxied through Price to Book Value (PBV).

Table 7. PBV Data for 2021-2024 Period

Company	2021	2022	2023	2024	Average
AKRA	2.25	2.69	3.15	2.87	2.74
BBCA	4.86	5.12	5.35	5.01	5.09
BBNI	1.21	1.45	1.63	1.72	1.50
BBRI	2.15	2.32	2.58	2.44	2.37
BMRI	1.45	1.67	1.83	2.91	1.97
CTRA	0.92	1.08	1.15	1.22	1.09
EXCL	1.02	1.15	1.21	1.26	1.16
JSMR	1.10	1.20	1.25	1.30	1.21
MAPI	3.10	4.20	3.80	3.50	3.65
TOWR	2.80	2.60	2.30	2.10	2.45
Average					2.32

Based on Table 7, companies with the highest average PBV are Bank Central Asia (BBCA) at 5.09, Mitra Adiperkasa (MAPI) at 3.65, and AKR Corporindo (AKRA) at 2.74. High PBV values can indicate that the market has very high growth and performance expectations toward companies, which can also reflect consistent investor confidence from year to year.

Data Analysis

Descriptive Statistical Analysis

Descriptive statistics provide an overview of sample data characteristics based on mean, minimum, maximum values, and standard deviation from all research variables during the 2021-2024 period.

Table 8. Descriptive Statistics of Research Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation
ROE (X1)	40	4.33	28.49	15.039	6.58
NPM (X2)	40	2.28	56.2	23.908	16.23
DER (X3)	40	0.54	6.62	3.201	2.07
CR (X4)	40	0.18	2.69	1.662	0.95
ESG Score (X5)	40	10.73	29.71	23.862	4.58
PBV (Y)	40	0.55	4.80	2.421	1.31

Based on descriptive analysis results in Table 8, Variable X1 (ROE) has an average value of 15.039% with standard deviation 6.58, lowest value 4.33%, and highest value 28.49%. Variable X2 (NPM) has an average value of 23.908% with standard deviation 16.22, lowest value 2.28%, and highest value 56.2%. Variable X3 (DER) has an average value of 3.201 with standard deviation 2.07, lowest value 0.54, and highest value 6.62. Variable X4 (CR) has an average value of 1.662 with standard deviation 0.95, lowest value 0.18, and highest value 2.69. Variable X5 (ESG) has an average value of 23.862 with standard deviation 4.58, lowest value 10.73, and

highest value 29.71. Variable Y (PBV) has an average value of 2.421 with standard deviation 1.31, lowest value 0.55, and highest value 4.80.

Panel Data Model Selection

The regression analysis used in this research is panel data regression analysis that combines time series and cross-section data types. Panel data regression method is chosen because it can provide more comprehensive data and has lower collinearity levels between variables by using two data types (Tasya & Warsini, 2023).

Panel data regression analysis has three main models that can be used to estimate relationships between variables: Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). Model selection between these three is typically conducted through several tests, including Chow test to compare CEM and FEM, Hausman test to compare FEM and REM, and Lagrange Multiplier (LM) test to compare CEM and REM.

Chow Test Results

Chow test is conducted to determine the most appropriate model between CEM and FEM in panel data estimation (Tambunan, 2025).

Table 9. Chow Test Results

Effects Test	Statistic	d.f.	Prob.
Cross-section F	89.504054	9,25	0.000
Cross-section Chi-square	140.127841	9	0.000

Chow test results in Table 9 show Cross-section Chi-square probability value of $0.000 < 0.05$, then the common effect model is rejected, so the more appropriate model to use is Fixed Effect Model (FEM).

Hausman Test Results

Hausman test is conducted to determine the more appropriate model between REM and FEM in panel data estimation (Tambunan, 2025).

Table 10. Hausman Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.000228	5	0.9625

Hausman test results in the table above show Cross-section random probability value of 0.9625. From these results, it can be interpreted that Cross-section random probability value of $0.9625 > 0.05$. This indicates that H_0 is accepted. Therefore, the more appropriate model to use is Random Effect Model (REM), because Fixed Effect Model (FEM) is not significantly better than REM.

Lagrange Multiplier Test Results

Lagrange Multiplier (LM) test is used to determine the more appropriate model between Random Effect compared to Common Effect model.

Table 11. Lagrange Multiplier Test Results

Alternative	Cross-section	Time	Both
Breusch-Pagan	52.05528 (0.000)	1.670602 (-0.1962)	53.72588 (0.000)
Honda	7.214934 (0.000)	-1.292518 (-0.9019)	4.187781 (0.000)

Lagrange Multiplier test results in Table 11 show Cross-section Breusch-Pagan value of 52.05528 with probability 0.000, meaning there are significant random effects between companies. Therefore, the most appropriate panel regression model to use is Random Effect Model (REM) by considering random effects on cross-section.

Classical Assumption Tests

Classical assumption tests are conducted to ensure that the regression equation used is appropriate and valid, or in other words, to ensure the regression model has estimation accuracy, is unbiased and consistent (Sholihah et al., 2023).

Normality Test Results

The normality test using Jarque-Bera shows a probability value of $0.161208 > 0.05$, so it can be concluded that residual data are normally distributed.

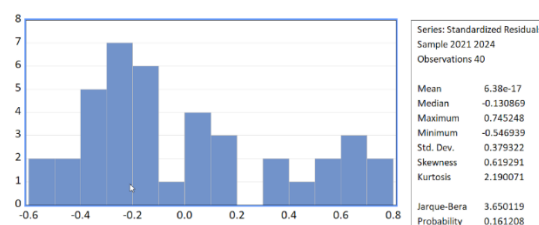


Figure 1. Jarque-Bera Normality Test

Source: EViews 13 output, processed

Multicollinearity Test Results

Multicollinearity test is conducted before regression estimation to ensure that relationships between independent variables do not show multicollinearity symptoms.

Table 12. Multicollinearity Test Results

Variable Pair	Pearson Correlation	Interpretation
ROE and NPM	0.5060	No multicollinearity indication
ROE and DER	0.4452	No multicollinearity indication
ROE and CR	-0.3323	No multicollinearity indication
ROE and LOG(ESG)	0.4329	No multicollinearity indication
NPM and DER	0.7726	Weak multicollinearity indication

NPM and CR	-0.2036	No multicollinearity indication
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Based on Table 12, correlation values between independent variables are below 0.80, indicating no multicollinearity occurs between independent variables in the model.

Autocorrelation Test Results

Autocorrelation test using Durbin-Watson shows a value of 1.759981. This value indicates that the Durbin Watson value is in the range > 1.5 and < 2.5 , meaning there is no autocorrelation.

Multiple Linear Regression Analysis

After conducting Chow Test, Hausman Test, and Lagrange Multiplier Test, the panel data regression model obtained in this research is Random Effect Model (REM). The multiple linear regression analysis using Random Effect Model produced the following regression equation:

$$\text{PBV} = -0.023101 + 3.833374 \times \text{ROE} + 0.905524 \times \text{NPM} - 0.031271 \times \text{DER} + 0.015943 \times \text{CR} - 0.000872 \times \log(\text{ESG}) + \mu_i + \varepsilon_{it}$$

The regression equation shows relationships between independent variables and dependent variable in this research, namely firm value (PBV). The constant value of -0.023101 shows PBV value when all independent variables equal zero. Coefficient 3.833374 shows that every 1 unit increase in ROE will increase PBV by 3.833374, assuming other variables are constant. Similarly, NPM positively affects PBV with coefficient 0.905524. Conversely, DER has negative influence on firm value, shown by coefficient -0.031271, indicating that higher leverage leads to lower firm value.

Model Feasibility and Significance Interpretation

The Adjusted R-Square value of 0.636617 shows that the regression model built has quite good capability in explaining firm value (PBV) variation based on independent variables used: ROE, NPM, DER, CR, and ESG. The F-test results show F-calculated $>$ F-table with p-value < 0.05 , so this regression model is statistically significant in explaining firm value.

Table 13. Model Feasibility Test

Metric	Value	Interpretation
Adjusted R-Square	0.636617	Independent variables simultaneously affect
F-stat	14.66496	Variables significant simultaneously
Prob (F-stat)	0.000	Independent variables simultaneously affect

Hypothesis Testing Results

Individual variable influence interpretation is conducted using t-test to determine individual influence of independent variables on dependent variable.

Table 14. Partial Test Results (t-test)

Variable	Coefficient	t-statistic	Significance	Interpretation
Constant	0.455	0.556	0.582	-
ROE	19.324	5.925	<0.001	Significant
NPM	7.889	3.059	0.005	Significant
DER	-0.325	-2.570	0.015	Significant
CR	-0.738	-1.810	0.080	Not Significant
ESG	-0.060	-1.681	0.103	Not Significant

Discussion

The Influence of Return on Equity (ROE) on Firm Value (PBV)

Based on research results conducted, Return on Equity (ROE) obtained significance value of $0.001 < \alpha = 0.05$. This means there is significant positive influence between Return on Equity (ROE) on firm value (PBV). This means that higher profitability values will increase firm value. Profitability affects firm value where higher profits generated by companies lead to better company development that affects firm value. In line with research by Maryono & Setiawan (2024), high profitability positively affects firm value, particularly high stock demand from investors implementing ESG practices.

Based on this explanation, it can be concluded that Return on Equity (ROE) has positive and significant influence on firm value. High ROE reflects company capability in generating profit from owned capital, ultimately creating healthy and prospective company image in investors' eyes. High profitability becomes an important indicator for investors in assessing company growth potential and sustainability, thus increasing investment interest and directly impacting firm value increase in capital markets.

The Influence of Net Profit Margin (NPM) on Firm Value

Based on research results, Net Profit Margin (NPM) shows significance value of $0.005 < \alpha 0.05$. This indicates that NPM has significant influence on firm value. Positive coefficient shows that net profit margin increase contributes positively to firm value increase. This indicates that company efficiency in generating net profit from sales is valued well by the market. This research result is supported by research from Christie et al. (2021) and Hertina, D. (2024) stating that Net Profit Margin has significant influence on firm value.

Based on the explanation above, it can be concluded that Net Profit Margin (NPM) is an important indicator in assessing company financial performance, particularly regarding capability to generate profit from sales. Empirical testing results show that NPM significantly and positively affects firm value, meaning higher net profit margin obtained by companies leads to higher firm value in investors' eyes. This relationship reflects that company operational efficiency in generating profit becomes a factor considered by the market in assessing prospects and investment attractiveness of the company.

The Influence of Debt to Equity Ratio (DER) on Firm Value

Based on research results, DER shows significance value of $0.015 < \alpha = 0.05$. This indicates that leverage (DER) negatively and significantly affects firm value. This means higher company debt ratios lead to lower market values given to the company, or in other words, decreasing the company's value.

Based on this explanation, it can be concluded that Debt to Equity Ratio (DER) has significant influence on firm value. Research results show that DER negatively affects, meaning higher debt proportion compared to equity tends to decrease firm value. This indicates that markets respond negatively to high debt burdens because they are considered to increase financial risk. However, in certain contexts, high DER can also be perceived positively if companies can manage and pay their debts efficiently, as this reflects aggressive financing strategy to support growth and expansion.

The Influence of Current Ratio (CR) on Firm Value

Based on this research, significance value for Current Ratio (CR) is $0.080 > \alpha = 0.05$. This means there is no significant influence between liquidity level on firm value, although relationship direction shows negative tendency.

Based on this explanation, it can be concluded that liquidity measured through Current Ratio (CR) does not significantly influence firm value. Although CR plays a role in showing company capability to pay short-term obligations, this research result indicates that excess liquidity is not always considered as an advantage by investors. Negative coefficient direction strengthens the possibility that liquidity that is too high without optimal current asset management does not add company value. This shows that efficiency in asset use becomes a factor more considered by markets compared to merely high liquidity ratios.

The Influence of ESG Score on Firm Value

Based on research results, significance level of ESG score independent variable is $0.103 > \alpha = 0.05$. This means ESG score does not significantly affect firm value. Although not statistically significant, positive coefficient direction still reflects potential ESG contribution toward firm value increase. This strengthens understanding that commitment toward sustainability, particularly in environmental, social, and governance aspects, is viewed as positive signal by markets.

Based on the explanation above, it can be concluded that ESG disclosure and implementation have strategic roles in shaping investor perceptions and increasing firm value. Although in this research ESG score does not show statistically significant influence, positive coefficient direction still reflects potential ESG contribution toward firm value increase. This strengthens understanding that commitment toward sustainability, particularly in environmental, social, and governance aspects, is viewed as positive signal by markets. Therefore, ESG is not merely a form of compliance but also long-term strategy in creating competitive advantages and attracting investor interest in capital markets.

CONCLUSIONS

Based on the research results and hypothesis testing regarding the influence of profitability, leverage, liquidity, and ESG scores on firm value of LQ45 Low Carbon Leaders companies during 2021-2024, it can be concluded that Return on Equity (ROE) and Net Profit Margin (NPM) have positive and significant effects on firm value, emphasizing the importance of profitability in building investor confidence. Debt to Equity Ratio (DER) shows a significant negative effect, suggesting that high leverage levels tend to reduce market valuation. Current Ratio (CR) and ESG scores do not significantly affect firm value, although ESG scores show a positive directional relationship, implying that sustainability practices are perceived positively but have not yet become a decisive factor in corporate valuation by the market. These findings suggest that internal company factors related to profitability and capital structure have more influence on firm value compared to liquidity and sustainability (ESG). However, the positive direction of ESG influence cannot be ignored as it shows strategic potential in the long term. Therefore, companies are advised to maintain healthy financial performance while integrating ESG principles as part of sustainable firm value strategy. Future research could expand the sample size, extend the observation period, or include other variables such as company size, industry type, or macroeconomic factors to provide more comprehensive insights into firm value determinants in the context of sustainable business practices.

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