

Driving Sustainable Growth through the Blue Economy: Empirical Evidence from Indonesia's Transport and Logistics Companies

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Abstract

The increasing awareness of environmental degradation has drawn significant attention to sustainable business practices; however, the blue economy concept remains underexplored despite its crucial role in maintaining oceanic balance and supporting national economic growth. This study aims to analyze the effect of blue economy implementation and corporate social responsibility on the financial performance of transportation and logistics companies listed on the Indonesia Stock Exchange during 2022–2024. Using a quantitative panel-data approach with secondary data from annual and sustainability reports, the study measures blue economy implementation through a disclosure index adapted from national sustainability frameworks, while financial performance is proxied by return on assets. The novelty of this research lies in focusing on the transportation and logistics sector, which plays a vital role in maritime-based economic growth but has received limited attention in sustainability accounting studies. The results indicate that blue economy implementation has a positive and significant influence on financial performance, suggesting that environmentally responsible practices enhance corporate accountability and stakeholder trust. Conversely, corporate social responsibility disclosure shows a negative yet significant relationship with financial performance, implying a short-term trade-off between social responsibility efforts and profitability. Firm size and leverage are found to be insignificant, while firm age exhibits a negative tendency toward profitability. These findings underscore the need for companies and regulators to strengthen blue economy practices as a long-term strategy for sustainable financial growth and to develop standardized blue economy disclosure frameworks for future research.

INTRODUCTION

The growing awareness of climate change and environmental degradation has encouraged many businesses to adopt sustainable practices that balance profitability with ecological preservation. While the green economy concept has received considerable global attention, the blue economy, which focused on sustainable utilization of marine and coastal resources, has not yet gained comparable recognition, despite its critical role in maintaining planetary life balance (Syah et al., 2020). Wenhai et al. (2019) define the blue economy as a component of the green economy that emphasizes sustainable production, services, and activities centered on the use and protection of coastal and marine resources.

For a maritime nation like Indonesia, where approximately 70 percent of its territory consists of water and more than 17,000 islands (Badan Pusat Statistik, 2024), the sustainability of ocean resources is essential for long-term economic and environmental stability. Indonesia's vast marine potential positions it as one of the most strategically significant blue economy actors in the ASEAN region (OECD, 2021). However, the country's maritime economy remains dominated by traditional sectors such as fisheries, aquaculture, and coastal tourism, which rely heavily on natural resources vulnerable to depletion (Bappenas, 2023). The transportation and logistics sector represents a critical component of the blue economy, serving as the backbone of inter-island connectivity and trade that supports maritime-based development (UNCTAD, 2024). Despite its strategic importance, this sector also contributes notably to greenhouse gas emissions, highlighting the need for sustainable innovation and environmentally responsible practices to align with blue economy principles (UNCTAD, 2023).

The blue economy framework introduced at the 2012 United Nations Conference on Sustainable Development emphasizes the sustainable management of marine resources to balance economic growth, social inclusion, and environmental protection (UNCTAD, 2014). In line with this principle, The Financial Services Authority (OJK) requires listed companies to disclose environmental and social performance through Sustainable Finance Regulation No. 51/POJK.03/2017 (POJK 51/2017), reinforcing the integration of sustainability and Corporate Social Responsibility (CSR) into corporate governance.

Although sustainability has attracted wide attention, studies that focus on blue-economy disclosure remain sparse in accounting research. Drawing on a disclosure index proposed by Wanta and Gunawan (2021) to capture reporting on ocean-based economic activities, prior evidence on financial outcomes is mixed. Khaddafi et al. (2024) document a positive yet statistically insignificant association on firm profitability, suggesting early-stage implementation. In contrast, Mu'azu et al. (2025) find a significant positive link with return on assets (ROA) in the oil and gas sector, suggesting the potential financial benefits of sustainable maritime practices. These findings highlight an emerging but fragmented understanding of how blue economy implementation influences financial performance, revealing the need for sector-specific evidence, particularly within the transportation and logistics industry.

Building upon this research gap, the present study examines the effects of blue economy implementation and CSR disclosure on the financial performance of transportation and logistics companies listed on the Indonesia Stock Exchange (IDX) during 2022–2024. While prior Indonesian sustainability and CSR studies often operationalize sustainability using broad CSR disclosure scores or generic Environmental, Social, and Governance (ESG) proxies, this study advances the literature by introducing a distinct measurement of ocean-related sustainability practices through a Blue Economy Index. Specifically, the Blue Economy Index is adapted from Indonesian regulatory and maritime governance foundations (e.g., POJK 51/2017 and Law No. 32/2014) and applied to a sector where sustainability challenges are closely linked to maritime connectivity and emissions. In addition to this measurement innovation, integrating blue economy and CSR disclosure within stakeholder and legitimacy

theories enables a clearer assessment of whether marine-oriented sustainability communication reflects value-creating accountability or legitimacy-seeking disclosure. The findings are expected to guide policymakers and practitioners on ways sustainability programs can bolster long-term financial resilience.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The impact of blue economy implementation and CSR on financial performance is grounded in stakeholder theory and legitimacy theory. Stakeholder theory highlights that a company's success depends not only on shareholders but also on a broader group of stakeholders, including employees, customers, regulators, and the community (Freeman, 1984). Mahajan et al. (Mahajan et al., 2023) expand on this by emphasizing that organizations must identify, manage, and respond to the needs and expectations of both internal and external stakeholders. In this study, the implementation of blue economy principles and CSR disclosure is viewed as a form of accountability toward stakeholders, particularly in sectors with high environmental exposure like transportation and logistics.

Legitimacy theory on the other hand, suggests that companies seek societal acceptance by aligning their actions with prevailing social norms and values (Maurer, 1971; Mousa, et. al., 2015). Firms in environmentally sensitive sectors tend to disclose more social and environmental information to maintain legitimacy (Permatasari & Setyastri, 2019). In this study, blue economy and CSR disclosures serve as a legitimacy strategy, signaling corporate commitment to marine sustainability. Transparent disclosures in sustainability reports help maintain public trust and justify a company's continued social license to operate.

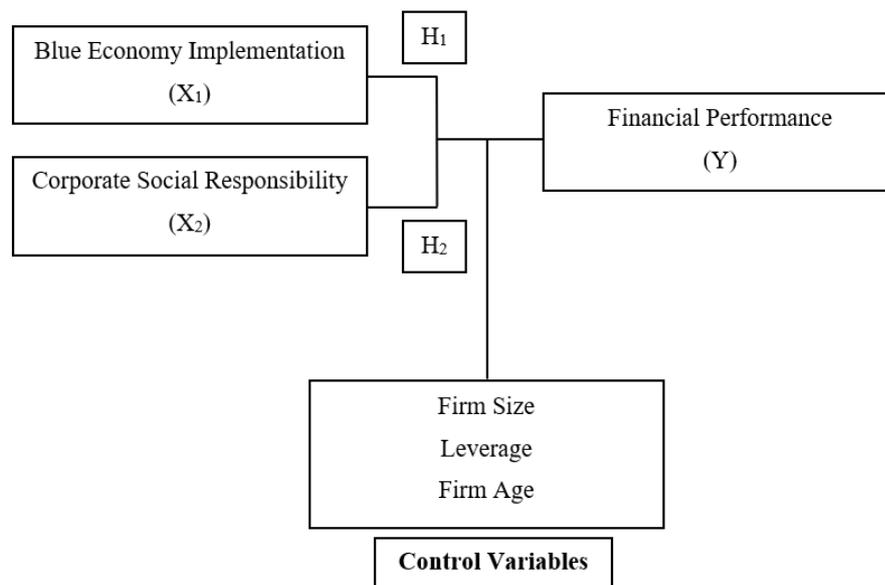


Figure 1. Study Framework

Blue Economy and Financial Performance

The blue economy emphasizes sustainable marine resource use that integrates economic, environmental, and social objectives (Bappenas, 2023). Despite its growing policy relevance, empirical research on blue economy disclosure remains scarce. Linking blue economy with sustainability is not just economic and political, but a social responsibility and obligation to states (Smith-Godfrey, 2022). Wanta and Gunawan (Wanta & Gunawan, 2021) developed a Sustainability Blue Disclosure (SBD) Index tailored to Indonesian industry, combining regulatory indicators from POJK 51/2017 with principles from Law No. 32/2014, and expert insights.

Studies in related domains have demonstrated varying results. Khaddafi et al. (Khaddafi et al., 2024) found a positive but statistically insignificant relationship between blue accounting and firm performance in maritime companies listed on the IDX, while Mu'azu et al. (Mu'azu et al., 2025) reported a significant positive association in the oil and gas sector. These findings suggest that the relationship between blue economy practices and financial performance may be context-dependent and influenced by the specific characteristics of each industry.

In Indonesia's logistics industry, governance practices, internal control, and corporate reputation have been shown to enhance employee engagement (Haryanto et al., 2022, 2023). This finding suggests that sustainability disclosures, such as CSR and blue economy initiatives, can strengthen corporate reputation and transparency, which in turn may support better financial performance. In addition, ESG readiness is not solely determined by regulatory compliance or firm size but reflects how global standards are interpreted and translated within national institutions and sectoral logics (Setiawan et al., 2025).

Taken together, the literature highlights a fragmented but emerging understanding of how blue economy implementation affects profitability, particularly in logistics and shipping companies. Therefore, this study formulates the following hypothesis:

Hypothesis 1 (H₁): Blue economy implementation has a significant effect on financial performance.

Corporate Social Responsibility and Financial Performance

CSR represents a firm's commitment to social and environmental responsibility beyond legal requirements. Empirical evidence indicates that CSR disclosure can improve financial performance by strengthening stakeholder relations, brand value, and regulatory compliance (Okafor et al., 2021; Shawing Yang & Mkrangsiman, 2023). Several studies have reported a positive and significant relationship between CSR and financial performance (Ahyani & Puspitasari, 2019; Enyuan et al., 2024; Priyamanda & Jayanti, 2021). However, study by Cho et al. (2019) found that although CSR is positively associated with ROA, not all CSR activities have a significant impact. Similarly, Parengkuan (2017) found that CSR doesn't have a significantly positive effect on ROA. Study by Inoue et al. (2011) also suggest that CSR has non-positive effect on financial performance

In Indonesia, CSR is governed by POJK 51/2017 and its reporting structure is aligned with global standards such as Global Reporting Initiative (GRI), enhancing both local accountability and international comparability. This study isolates CSR indicators from the SBD index to avoid overlapping measurement and to ensure an independent assessment of CSR's influence on ROA.

Based on these previous studies, the second hypothesis was formulated as follows:

Hypothesis 2 (H₂): Corporate social responsibility has a significant effect on financial performance.

Control Variables and Financial Performance

Firm characteristics such as size, leverage, and age can significantly influence a company's financial performance and sustainability behavior. Firm size (SIZE) is generally associated with stronger financial performance, as larger firms tend to have greater resources, better access to capital, and a higher capacity to implement sustainability reporting and environmental initiatives (Afifah & Syafruddin, 2021; Enyuan et al., 2024). However, Kartikasari & Merianti (2016) offer a counterargument by identifying a negative relationship between total assets and ROA. This paradox arises from the mathematical structure of ROA, where total assets are in the denominator, hence, a rise in assets may reduce ROA if net income remains constant.

Leverage (LEV), on the other hand, may limit a firm's ability to pursue long-term sustainability investments, since higher debt levels often prioritize short-term profitability and financial stability over environmental commitments, resulting in a negative relationship with financial performance (Dawar, 2014; Govindan et al., 2021; Le & Phan, 2017). However, other studies have identified a positive linkage between leverage and profitability, suggesting that financial leverage can enhance firm performance through the benefits of tax shields and increased capital efficiency (Dalci, 2018; Detthamrong et al., 2017).

Lastly, firm age (AGE) can capture the firm's accumulated experience, stakeholder relationships, and environmental reputation. Older firms generally face stronger stakeholder expectations to demonstrate sustainable performance due to their longer operational history and public visibility (D'Amato & Falivena, 2019), though some studies have found mixed evidence regarding the consistency of this relationship (Wuttichindanon, 2017). Several studies even document a negative link between firm age and financial performance (Afifah & Syafruddin, 2021; Rahman & Yilun, 2021)

Three hypotheses regarding control variables are, therefore, proposed

Hypothesis 3 (H₃): Firm size has a significant effect on financial performance.

Hypothesis 4 (H₄): Leverage has a significant effect on financial performance.

Hypothesis 5 (H₅): Firm age has a significant effect on financial performance.

METHODOLOGY

Sample and Data Collection

This study focuses on transportation and logistics companies listed on the Indonesia Stock Exchange (IDX) during 2022–2024. The sector was chosen because its operational activities, including shipping, land, and air transport, have direct and indirect environmental impacts. The selection of the 2022–2024 period is based on both institutional and economic considerations. The year 2022 marks the phase of post-pandemic stabilization in Indonesia, allowing firm performance and sustainability practices to be observed under relatively normalized operating conditions. In addition, this period reflects the strengthened implementation of sustainable finance regulations, particularly POJK No. 51/POJK.03/2017 and SEOJK No. 16/SEOJK.04/2021, which enhanced the structure and comparability of sustainability reporting among listed firms. Therefore, the chosen timeframe provides a consistent and methodologically relevant basis for examining the relationship between Blue Economy implementation, CSR disclosure, and financial performance.

A quantitative explanatory design was applied, using secondary data from company annual reports, sustainability reports, and financial statements published on the IDX website and official company portals. The sample was determined using purposive sampling based on the following criteria:

- a. the company has operated for at least three years;
- b. annual and sustainability reports for 2022–2024 are publicly available;
- c. financial statements are presented in Indonesian Rupiah (IDR); and
- d. data are free from extreme outliers identified during initial screening.

Variable Operationalization

This study involves three types of variables: one dependent variable (Financial Performance), two independent variables (Blue Economy Implementation and Corporate Social Responsibility), and three control variables (Firm Size, Leverage, and Firm Age). Each variable is defined conceptually and measured quantitatively to ensure objectivity and replicability.

Table 1. Operational Variables

Variable	Reference	Measurement Formula	Scale
Financial performance (Y)	Brigham dan Houston (2019)	$ROA = \frac{Net\ Income}{Total\ Assets} \times 100\%$	Ratio
Implementasi Blue Economy (X ₁)	Wanta dan Gunawan (Wanta & Gunawan, 2021)	$BEI = \frac{Items\ Disclosed}{Total\ Indicators} \times 100\%$	Ratio
Corporate Social Responsibility (X ₂)	Enyuan et al. (Enyuan et al., 2024)	$CSR\ Index = \frac{Items\ Disclosed}{Total\ Indicators} \times 100\%$	Ratio
Firm Size (SIZE)	Afifah & Syafruddin (Afifah & Syafruddin, 2021)	$SIZE = \ln Size_{it}$	Ratio
Leverage (LEV)	Afifah & Syafruddin (Afifah & Syafruddin, 2021)	$Leverage = \frac{Total\ Liabilities}{Total\ Assets}$	Ratio
Firm Age (AGE)	Enyuan et al. (Enyuan et al., 2024)	$AGE = \ln Age_{it}$	Ratio

Financial Performance

Return on Assets (ROA) is used in this study as a proxy for financial performance. ROA measures how efficiently a firm uses its assets to generate profit, and is widely applied in sustainability accounting research (Cho et al., 2019; Mustofa et al., 2020). ROA is especially relevant in capital-intensive industries like transport and logistics, as it reflects the firm's ability to allocate assets toward sustainable initiatives without compromising profitability (Mu'azu et al., 2025).

Blue Economy Implementation

The implementation of blue economy principles is measured using a Blue Economy Disclosure Index developed in reference to Wanta and Gunawan (2021). However, due to the unavailability of the complete 72-item SBD list in the original publication, full replication was not possible. Therefore, this study reconstructs and refines the index framework to ensure methodological transparency and sectoral relevance.

The index was developed through the integration of three sources: (1) marine-related sustainability indicators within POJK No. 51/POJK.03/2017, (2) blue economy principles outlined in Law No. 32/2014 on Maritime Affairs, and (3) three expert-based indicators reported by Wanta and Gunawan (2021). Indicators unrelated to marine sustainability or overlapping with CSR measurement were excluded to avoid conceptual redundancy.

The construction process involved identifying blue economy principles from national maritime regulation, screening POJK 51 environmental indicators directly related to marine ecosystems, biodiversity, emissions, and waste in maritime contexts, and incorporating expert-derived indicators concerning efficiency and value creation from marine resource utilization. After eliminating duplication and ensuring contextual suitability for transportation and logistics firms, the final index consists of 18 dichotomous indicators (1 if disclosed, 0 otherwise). The score is calculated as the proportion of disclosed items to the total applicable indicators.

Corporate Social Responsibility

Content analysis is commonly used to examine CSR disclosures (Enyuan et al., 2024). In this study, CSR is measured using 44 disclosure indicators from POJK 51/2017, which broadly reflect a company's social and environmental responsibilities. Each indicator is scored

dichotomously (1 if disclosed, 0 if not), and the total score is normalized into an index ranging from 0 to 1. This index reflects the extent of transparent and structured CSR communication to stakeholders.

Firm Size

Firm size reflects the scale of an entity's operations, typically indicated by total assets. To ensure standardization and reduce extreme variability, firm size is measured using the natural logarithm of total assets at the end of the observation period. This approach is commonly adopted in financial analysis to provide a more proportional and stable representation of firm scale (Afifah & Syafruddin, 2021).

Leverage

Leverage describes a firm's capital structure, specifically the proportion of financing sourced from liabilities relative to total assets. It indicates the firm's reliance on external funding and its ability to meet long-term obligations. Higher leverage may reflect greater financial risk (Afifah & Syafruddin, 2021).

Firm Age

Firm age refers to the number of years a company has been operating as of the observation year. It serves as a proxy for the firm's accumulated experience, managerial maturity, and operational stability. Older firms are generally expected to have more established systems and stakeholder relationships (Enyuan et al., 2024).

Data Analysis

The data were analyzed using panel data regression with EViews 13 software, which accommodates the combination of time-series and cross-sectional data. The analysis began with descriptive statistics to summarize the distribution of each variable, followed by classical assumption tests to validate the regression model. Normality was tested using the Jarque-Bera test, multicollinearity through the Variance Inflation Factor (VIF), heteroskedasticity using the White test, and autocorrelation via the Durbin-Watson statistic. Panel regression models were estimated to determine the most appropriate model based on the Chow and Hausman tests. Hypothesis testing was then performed using the t-test to assess the partial significance of each variable and the F-test for joint significance. The Adjusted R² was used to evaluate the explanatory power of the model while accounting for the number of predictors. All statistical inferences were made at a 5% significance level. These procedures were conducted to evaluate the relationship between the Blue Economy Disclosure Index and CSR Disclosure Index on the financial performance (ROA), while controlling for firm size, leverage, and firm age.

RESULTS

The initial population consisted of 38 transportation and logistics firms listed as of August 2025. After applying sampling criteria, 19 firms met the requirements, resulting in a total of 57 firm-year observations. A detailed list of the sample firms can be found in Appendix 1.

Descriptive Statistics

The results of descriptive statistics processed using EViews 13 can be explained by presenting the mean, median, maximum, minimum, and standard deviation values for each variable used in this study as follows:

The dependent variable, financial performance as proxied by ROA, shows maximum value of 0.198980, recorded by PT Habco Trans Maritima Tbk in 2022, while the minimum value is -0.094840, recorded by PT Eka Sari Lorena Transport Tbk in the same year. The average ROA across all observations is 0.039716, with a standard deviation of 0.063349, indicating relatively low profitability with moderate variation among companies.

The independent variable, BEI, has a maximum value of 0.777778, obtained by PT Pelayaran Nasional Ekalya Purnama in 2024, and a minimum value of 0, recorded by PT Steady Safe Tbk in 2022. The average BEI value is 0.295322 with a standard deviation of 0.177913, suggesting a wide variation in blue economy disclosure levels across the sample.

The independent variable, CSR, shows a maximum score of 1 (full disclosure), consistently achieved by companies such as PT Blue Bird Tbk, PT Adi Sarana Armada Tbk, and PT Satria Antaran Prima Tbk. The minimum value is 0.500000, observed in PT Steady Safe Tbk and PT Krida Jaringan Nusantara Tbk. The mean CSR value is 0.862440, with a standard deviation of 0.166093, indicating relatively high and consistent CSR disclosure among companies.

The control variable, SIZE, calculated as the natural logarithm of total assets, ranges from a minimum value of 24.695140 (PT Trimuda Nuansa Citra Tbk) to a maximum of 31.012380 (PT Indomobil Multi Jasa Tbk). The average SIZE is 27.103350, with a standard deviation of 1.692812, reflecting a moderate spread in company size across the sample.

The control variable, LEV, shows a minimum value of 0.023504 (PT Habco Trans Maritima Tbk, 2022) and a maximum of 3.104133 (PT Satria Antaran Prima Tbk, 2022). The average LEV is 0.459472, with a relatively high standard deviation of 0.518446, indicating substantial differences in capital structure and debt levels among the observed firms.

The control variable, AGE, calculated as the natural logarithm of the years since establishment, has a minimum value of 1.098612, recorded by PT Habco Trans Maritima Tbk (established in 2019), and a maximum of 3.970292, recorded by PT Steady Safe Tbk (established in 1971). The average AGE is 2.890425, with a standard deviation of 0.632175, suggesting a mix of newer and more established companies in the dataset.

Classic Assumption Testing Results

This section presents the results of the classical assumption tests carried out to validate the regression model, which include tests for normality, multicollinearity, heteroskedasticity, and autocorrelation.

Normality Test Results

The normality test was performed using the Jarque-Bera method, which evaluates the skewness and kurtosis of the standardized residuals. The test results are presented in Table 2.

Table 2. Normality Test Results

<i>Series: Standardized Residuals</i>	
<i>Sample 2022 2024</i>	
<i>Observations 57</i>	
<i>Mean</i>	4.43E-17
<i>Median</i>	-0.00106
<i>Maximum</i>	0.130528
<i>Minimum</i>	-0.09268
<i>Std. Dev.</i>	0.050694

<i>Skewness</i>	0.647328
<i>Kurtosis</i>	2.943633
<i>Jarque-Bera</i>	3.98837
<i>Probability</i>	0.136125

Based on the results above, the Jarque-Bera probability value is 0.136125, which is greater than the 5% significance level ($\alpha = 0.05$). Therefore, the null hypothesis cannot be rejected, indicating that the residuals of the regression model are normally distributed.

Multicollinearity, Heteroskedasticity, and Autocorrelation Test Results

To assess multicollinearity, both the Variance Inflation Factor (VIF) and the correlation matrix were analyzed. All independent variables in the model showed VIF values below the threshold of 10, with the highest being 1.681064 for the CSR variable. This indicates that the regression model does not suffer from multicollinearity. Similarly, the correlation matrix revealed no strong linear relationships among the independent variables. The highest correlation coefficient was 0.536353 between BEI and CSR, which is considered moderate and acceptable.

Heteroskedasticity was tested using the White test. The results yielded a probability value of 0.2076 for the F-statistic and 0.2211 for the Obs*R-squared, both greater than the 5% significance level. These results indicate that the residuals have constant variance, and thus the model is free from heteroskedasticity.

Autocorrelation was assessed using the Durbin-Watson (DW) statistic. The obtained DW value was 1.636734, which falls within the acceptable range, suggesting no evidence of autocorrelation. Therefore, the regression model is considered valid and reliable for further hypothesis testing.

Panel Model Regression Results

Prior to the classical assumption tests, model estimation was conducted to determine the most appropriate regression model. Based on the results of the Chow and Hausman tests, the Random Effects Model (REM) was selected as the most suitable approach for this study.

The multiple linear regression analysis was performed to examine the effect of independent variables on the dependent variable (ROA). The results are summarized as follows:

$$ROA = 0.166271 + 0.160847 \cdot BEI - 0.149716 \cdot CSR + 0.003561 \cdot SIZE - 0.008079 \cdot LEV - 0.047651 \cdot AGE + \varepsilon$$

The constant value (α) is 0.166271, which means that when all independent variables, namely blue economy implementation, corporate social responsibility, firm size, leverage, and firm age, are at zero or in a constant state, the predicted value of the financial performance variable is 0.166271.

For the regression coefficient of the blue economy implementation variable, the value is 0.160847, indicating a positive (unidirectional) influence. This means that for every 1 unit increase in blue economy implementation, the financial performance is predicted to increase by 0.160847, assuming other variables remain constant.

For the regression coefficient of the corporate social responsibility variable, the value is 0.149716, indicating a negative (opposite direction) influence. This suggests that every 1 unit increase in CSR is predicted to decrease ROA by 0.149716, assuming other variables remain constant.

For the regression coefficient of the firm size variable, the value is 0.003561, which shows a positive effect. This means that a 1 unit increase in firm size is predicted to increase financial performance by 0.003561, holding other variables constant.

For the regression coefficient of the leverage variable, the value is 0.008079, indicating a negative influence. This means that every 1 unit increase in leverage is predicted to decrease financial performance by 0.008079, assuming the other variables are held constant.

For the regression coefficient of the firm age variable, the value is -0.047651 , also indicating a negative effect. This means that each 1 unit increase in firm age is predicted to decrease financial performance by -0.047651 , with other variables held constant.

Hypothesis Testing Results

Coefficient of Determination (R^2)

The adjusted R-squared value of 0.112502 indicates that 11.25% of the variation in the dependent variable can be explained by the independent variables: Blue Economy Index (BEI), Corporate Social Responsibility (CSR), firm size (SIZE), leverage (LEV), and firm age (AGE). The remaining 88.75% is explained by other factors outside the model.

Partial Significance Test (t-Test)

The result of t-Test is presented in Table 3 as follows:

Table 3. Partial Significance Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.166271	0.187565	0.886470	0.3795
BEI	0.160847	0.066574	2.416065	0.0193
CSR	-0.149716	0.073164	-2.046306	0.0459
SIZE	0.003561	0.006634	0.536772	0.5938
LEV	-0.008079	0.015275	-0.528906	0.5992
AGE	-0.047651	0.017602	-2.707084	0.0092

The results of the t-test indicate that several independent variables significantly affect ROA on an individual basis. BEI demonstrates a statistically significant positive influence on ROA, as evidenced by a p-value of 0.0193, which is below the 0.05 significance level. This finding supports the hypothesis that the implementation of blue economy practices contributes positively to a firm's financial outcomes. Conversely, CSR shows a significant negative relationship with ROA, with a p-value of 0.0459, suggesting that increased CSR disclosure may be associated with short-term cost burdens that reduce profitability. In contrast, the variables firm size ($p = 0.5938$) and leverage ($p = 0.5992$) do not exhibit statistically significant effects on ROA, indicating that variations in these structural characteristics do not meaningfully influence financial performance in this context. However, firm age is found to significantly and negatively affect ROA ($p = 0.0092$), implying that older firms may face diminishing financial returns, possibly due to increased operational rigidity or reduced adaptability in implementing sustainability initiatives. These findings highlight the nuanced role of sustainability and firm characteristics in shaping financial performance.

Table 4. Summary of Hypothesis Testing Results

Hypothesis	Statement	Result
H ₁	Blue economy implementation significantly affects financial performance	Accepted
H ₂	CSR significantly affects financial performance	Accepted
H ₃	Firm size significantly affects financial performance	Rejected
H ₄	Leverage significantly affects financial performance	Rejected
H ₅	Firm age significantly affects financial performance	Accepted

Simultaneous Significance Test (F-Test)

The result of F-Test is presented in Table 5 as follows.

Table 5. F-Test Results

57 Observations	
<i>F-statistic</i>	2.419740
<i>Prob. (F-statistic)</i>	0.048173

The F-test was conducted to examine the joint significance of all independent variables on the dependent variable. The results presented in Table 5 show an F-statistic value of 2.419740 with a corresponding probability of 0.048173. Since this p-value is lower than the 5% significance threshold, the null hypothesis is rejected. This indicates that, collectively, the independent variables have a statistically significant effect on financial performance at the 95% confidence level. Thus, the model provides meaningful explanatory power in capturing the variation in ROA across firms in the sample.

DISCUSSIONS

Effect of Blue Economy Implementation on Financial Performance

The first hypothesis suggested that blue economy implementation significantly affects financial performance. The results support this hypothesis, as evidenced by the t-test result ($p = 0.0193 < 0.05$), indicating that blue economy implementation positively influences firm profitability. The positive regression coefficient confirms that greater disclosure of blue economy practices is associated with higher ROA. This aligns with Mu'azu et al. (Mu'azu et al., 2025), who reported a significant positive relationship between the blue economy index and profitability in Nigerian oil and gas firms. Similar conclusions were drawn by Haninun et al. (2018) and Nor et al. (2016), who observed that broader environmental disclosure enhances financial performance as it reflects managerial efficiency and responsiveness to environmental risks. The result emphasizes that environmental stewardship and marine sustainability are not merely ethical imperatives but strategic assets that can improve firm value.

From a stakeholder theory perspective, these results highlight how fulfilling environmental and community expectations strengthens stakeholder support, which, in turn, enhances long-term profitability (Mahajan et al., 2023). The transport and logistics sector, with its direct and indirect dependence on marine and terrestrial ecosystems, faces increasing

stakeholder scrutiny regarding its environmental footprint. Therefore, transparent blue economy practices can strengthen stakeholder relationships.

Moreover, legitimacy theory suggests that disclosing blue economy initiatives helps firms maintain their social legitimacy, particularly in environmentally impactful industries like transportation and logistics (Mousa, et. al., 2015). In Indonesia, this is particularly relevant given the national emphasis on sustainable ocean governance as outlined in the Bappenas (Bappenas, 2023) Blue Economy Roadmap. Firms that communicate clear commitments to sustainable maritime operations signal conformity with national and global environmental objectives, thus preserving their social license to operate. This legitimacy, once earned, can translate into reduced regulatory risks, improved public perception, and better access to financing opportunities.

Overall, the findings affirm that adopting blue economy principles contributes positively to both corporate accountability and economic performance. For the transportation and logistics sector, where marine resources and environmental resilience are critical for long-term operations, integrating blue economy practices represents a strategic approach to sustainability that simultaneously enhances financial outcomes. This evidence suggests that environmental disclosure and sustainability-driven management should be viewed not as costs but as investments that reinforce long-term profitability and corporate resilience.

Effect of Corporate Social Responsibility on Financial Performance

The second hypothesis proposed a significant relationship between CSR and financial performance. The results confirm that CSR disclosure significantly influences financial performance ($p = 0.0459 < 0.05$), yet the direction of the relationship is negative. Unlike prior studies such as Okafor et al. (Okafor et al., 2021) and Yang & Mkrangsiman (Shawing Yang & Mkrangsiman, 2023), which found a positive association between CSR and profitability, this finding is more consistent with Parengkuan (Parengkuan, 2017), who found no significant effect of CSR on ROA in Indonesian manufacturing firms.

Several interpretations are possible. CSR programs can be costly and compete with limited financial resource for core business activities like operations and advertising (Bhardwaj et al., 2018). In the short term, CSR expenditures may increase costs without generating immediate financial returns, thereby reducing ROA. Additionally, the negative coefficient could reflect diminishing returns or symbolic CSR practices that prioritize compliance or public image over operational impact.

To further interpret the negative CSR coefficient, we examined the composition of CSR disclosure items in the transportation and logistics sector. POJK 51 disclosure items includes both substantive sustainability content and reporting-structure disclosures. In our sample, baseline narrative disclosures on community and general environmental responsibility are nearly universal, suggesting limited cross-firm variation in philanthropy-oriented and high-level commitments. By contrast, variation is concentrated in operational and credibility-oriented items such as quantified energy/emissions indicators and external assurance/verification disclosures. Accordingly, in an emissions-exposed sector, firms facing higher environmental risk or stakeholder scrutiny may achieve higher CSR scores primarily through more extensive disclosure on operational metrics and assurance and incur higher compliance burdens. Therefore, the CSR coefficient may capture short-run implementation costs or a legitimacy-driven disclosure pattern among higher-exposure firms, rather than implying that CSR is inherently detrimental to profitability. This aligns with legitimacy theory, which suggests that CSR disclosure may serve more as a legitimizing tool than a strategic performance enhancer (Mousa, et. al., 2015).

Further, in capital-intensive and highly regulated sectors like logistics, the market may perceive CSR initiatives as inefficient cost allocations, especially when firms fail to

communicate clear performance linkages or lack stakeholder engagement in CSR decision-making. CSR have greater effect on the service and consumption industries because of public perception, but contrastingly, industrial and manufacturing businesses are not significantly affected by public perception (Cho et al., 2019). Consistent with this interpretation, Enyuan et al. (2024) found similar skepticism, with CSR showing a positive correlation with ROA and EPS but a negative link to Tobin's Q, reflecting market's perception of CSR investments as potentially detracting short-term profitability.

In conclusion, while CSR has a statistically significant impact, its negative effect signals the need for more strategic alignment. Firms should ensure CSR programs go beyond regulatory compliance and deliver tangible, shared value that contributes to long-term financial objectives (Shoukat Malik & Nadeem, 2014). These insights contribute to CSR literature by emphasizing that program substance matters more than disclosure alone.

Effect of Firm Size on Financial Performance

The third hypothesis proposed that firm size has a significant influence on financial performance. However, the partial test results revealed a p-value of 0.5938, exceeding the 0.05 significance level. This finding indicates that the hypothesis is rejected. Firm size does not significantly affect ROA. Although the coefficient for SIZE is positive (0.003561), it is statistically insignificant, suggesting that within this sample, the variation in firm scale does not result in meaningful differences in financial performance.

This finding suggests that larger firms do not necessarily generate proportionally higher ROA. In capital-intensive industry like logistics and transportation sector, even firms with vast infrastructure and resources may face high operational and overhead costs. If large-scale assets are underutilized, asset efficiency declines, which dampens ROA. This diverges from Afifah and Syafruddin (Afifah & Syafruddin, 2021) and Enyuan et al. (Enyuan et al., 2024) who found a significant positive relationship between firm size and financial performance, attributing it to greater resource availability and financial stability in larger firms. The inconsistency may stem from sectoral differences or performance metrics used as this study's use of ROA is highly sensitive to asset size, where larger assets as denominators can diminish performance if profit growth does not keep pace (Kartikasari & Merianti, 2016).

From the stakeholder perspective, the non-significance of firm size suggests that stakeholders may prioritize asset efficiency and growth potential over sheer scale. D'Amato and Falivena (D'Amato & Falivena, 2019) argue that larger firms often face rigid structures and diminishing flexibility, whereas smaller firms, though resource-constrained, may demonstrate greater adaptability and innovation. Moreover, in Indonesia's logistics sector, larger firms may benefit from scale in volume but suffer from higher asset maintenance and regulatory compliance costs. In contrast, smaller firms may operate more efficiently in niche markets with leaner cost structures. Therefore, within the 2022–2024 timeframe, firm size appears not to be a dominant determinant of financial performance.

Effect of Leverage on Financial Performance

The fourth hypothesis posited that leverage significantly influences financial performance. The t-test produced a p-value of 0.5992, well above the 0.05 threshold, leading to rejection of the hypothesis. The regression coefficient is negative (-0.008079) but statistically insignificant, implying that variations in leverage within the sample do not have a discernible effect on ROA.

This suggests that debt levels among Indonesian transportation and logistics firms during the study period do not show a clear pattern in relation to asset profitability. While in theory, higher leverage increases financial risk and interest obligations, the absence of significance here may indicate that firms manage their debt cautiously or remain within optimal

leverage thresholds. The sample displayed wide variation in debt ratios, possibly due to differing corporate strategies as some firms might be in aggressive expansion phases, while others remain conservative.

From a stakeholder theory viewpoint, high leverage is often interpreted as a risk factor that may limit future sustainability investments. Govindan et al. (Govindan et al., 2021) found leverage negatively affects financial performance due to management's prioritization of debt obligations over long-term value creation. However, the absence of a significant relationship in this study may suggest that such risks are mitigated, potentially through effective financial governance, access to refinancing options, or governmental policy support.

This finding stands in contrast with studies such as Le & Phan (Le & Phan, 2017) and Dawar (Dawar, 2014), which reported a significant negative association between leverage and ROA. These discrepancies may arise from differences in industry characteristics, timeframes, or macroeconomic conditions. The capital-intensive nature of logistics may justify higher leverage as a norm, which investors may already price in as an operational necessity. Therefore, while leverage theory posits a trade-off between debt benefits and risks, in this sample, such dynamics do not translate into significant differences in financial outcomes.

Effect of Firm Age on Financial Performance

The fifth hypothesis suggested that firm age significantly affects financial performance. The statistical test produced a p-value of 0.0092, well below the 0.05 level, thereby supporting the hypothesis. Notably, the regression coefficient is negative (-0.047651), indicating that older firms in the sample tend to have lower ROA compared to younger ones.

This contradicts traditional assumptions that longevity equates to better financial performance due to operational stability, brand recognition, and stakeholder trust (D'Amato & Falivena, 2019; Roberts, 1992). Instead, the results suggest that younger firms may be more agile and operationally efficient. They often employ modern business models that enhance profit margins. Conversely, older firms may be burdened by legacy systems, higher maintenance costs, and bureaucratic inefficiencies that suppress asset returns.

These results are in line with Afifah & Syafruddin (Afifah & Syafruddin, 2021) and Rahman & Yilun (Rahman & Yilun, 2021) who found a negative correlation between firm age and financial performance, attributing it to business cycle maturity, reduced innovation, and decreased efficiency. As companies age, growth slows and operational rigidity may increase, while newer firms aggressively pursue expansion and efficiency gains.

CONCLUSION

This study examines the influence of blue economy implementation, corporate social responsibility, and firm characteristics (size, leverage, and age) on the financial performance of transportation and logistics companies listed on the Indonesia Stock Exchange during 2022–2024. The findings reveal that blue economy disclosure has a positive and significant effect on financial performance, supporting the idea that environmental sustainability efforts can enhance firm value. CSR disclosure also shows a statistically significant impact, but with a negative coefficient, suggesting that in the short term, CSR activities may incur costs that outweigh their immediate financial benefits. Among the firm characteristics, only firm age demonstrates a significant relationship with financial performance, and the effect is negative, implying that younger firms tend to exhibit higher ROA compared to older firms. Meanwhile, firm size and leverage were not found to significantly influence financial performance within the observed sample.

While the study provides meaningful insights, it is not without limitations. First, the blue economy index and CSR disclosures were measured using a content analysis approach, which

may be subject to subjectivity and variations in disclosure quality across companies. Second, the study relies on secondary data from annual and sustainability reports, which may not capture the full extent of a company's internal practices or strategic priorities. Third, the analysis is limited to a three-year period and focuses exclusively on the transportation and logistics sector, with a relatively small sample (19 firms; 57 firm-year observations), which potentially limit statistical power and the generalizability of the findings to other sectors or timeframes. Lastly, external macroeconomic factors, regulatory changes, and environmental incidents during the observation period were not explicitly controlled for, which may influence financial outcomes.

Future studies are encouraged to extend the observation period and conduct cross-sectors comparisons to enhance the external validity and test whether blue economy and CSR effects differ across industries. Furthermore, mixed-method approaches combining panel data analysis with interviews or case studies may provide deeper insight into how blue economy and CSR initiatives are operationalized and linked to financial performance.

For policymakers, regulators such as OJK can improve blue economy reporting by providing practical guidance that shifts disclosure from broad narratives to a small set of comparable, ocean-relevant indicators, implemented gradually through an optional template, clearer evidence standards, and examples of acceptable disclosure. Where feasible, proportionate third-party assurance can be encouraged to enhance credibility. In parallel, relevant ministries such as Ministry of Marine Affairs and Fisheries can support consistency by publishing shared definitions and priority themes for blue economy actions, improving interpretability and comparability across firms and years.

For companies, aligning blue economy and CSR programs with core business strategies is essential to ensure long-term value creation and stakeholder trust. Firms should focus on outcome-oriented sustainability reporting that links environmental performance with financial results, rather than treating it as a compliance formality.

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APPENDIX

Appendix 1. List of Sample Firms

No	Code	Firme Name
1	AKSI	Mineral Sumberdaya Mandiri Tbk
2	ASSA	Adi Sarana Armada Tbk.
3	BIRD	Blue Bird Tbk.
4	IMJS	Indomobil Multi Jasa Tbk.
5	MITI	Mitra Investindo Tbk.
6	TNCA	Trimuda Nuansa Citra Tbk.
7	BPTR	Batavia Prosperindo Trans Tbk.
8	SAPX	Satria Antaran Prima Tbk.
9	JAYA	Armada Berjaya Trans Tbk.
10	PURA	Putra Rajawali Kencana Tbk.
11	PPGL	Prima Globalindo Logistik Tbk.
12	TRJA	Transkon Jaya Tbk.
13	HAIS	Hasnur Internasional Shipping
14	HATM	Habco Trans Maritima Tbk.
15	ELPI	Pelayaran Nasional Ekalya Purn
16	LRNA	Eka Sari Lorena Transport Tbk.
17	SAFE	Steady Safe Tbk
18	TRUK	Guna Timur Raya Tbk.
19	KJEN	Krida Jaringan Nusantara Tbk.