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Analysis of Green Financing, ESG Performance, And Financial Performance on Banking Financial Stability in Indonesia

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ABSTRACT

This study aims to analyze the influence of green financing, ESG performance, and financial performance on banking financial stability in Indonesia for the 2015–2024 period. Annual secondary data is obtained from OJK, Bank Indonesia, and national commercial bank sustainability reports. The analysis model uses multiple linear regression (OLS) with the dependent variable Return on Assets (ROA) as a proxy for financial stability. The results show that green financing and CAR have a positive effect on ROA, while ESG performance and NPLs have a significant negative effect. An R^2 value of 0.903 indicates that the model is able to explain 90.3% variation in the bank's financial stability. These findings confirm that green finance and sustainable governance strengthen the resilience of the national financial system.

Keywords: *Green Financing, ESG Performance, Financial Performance, Financial Stability, ROA.*

INTRODUCTION

The transformation of the global economy towards sustainable development places the financial sector as one of the main actors in supporting the achievement of the Sustainable Development Goals (SDGs). The issues of climate change, environmental degradation, and low-carbon energy transitions require financial systems to be not only profitability-oriented, but also resilient to increasingly complex climate and social risks (Dwi Maghfirah et al., 2024). In this context, the concept of green finance and green macroprudential policy emerged as strategic instruments to maintain financial stability while supporting long-term economic sustainability. In the past decade, climate change, energy disruption, and the global environmental crisis have changed the paradigm of the world economy towards a more sustainable system. The financial sector plays a central role in this transformation because it is the main driver of capital allocation towards low-carbon economic activities (Hidalgo-Oñate et al., 2024). Therefore, the concept of green finance is a global strategy to create a balance between profitability and environmental responsibility.

In addition to the green finance aspect, the Environmental, Social, and Governance (ESG) dimension is also a major concern for the global banking world. ESG is not just an instrument for reporting corporate social responsibility, but a tool to measure the extent to which banks are able to manage environmental, social, and governance risks

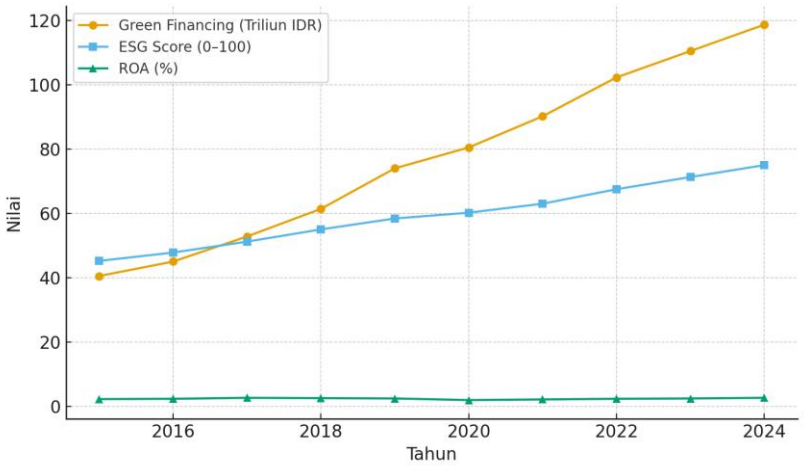
that can affect their financial performance. Good ESG implementation is believed to improve reputation, attract long-term oriented investors, and reduce potential default risk.

However, in the context of developing countries such as Indonesia, the implementation of ESG is often faced with a fairly high transition cost, both in terms of system adaptation, human resource training, and reporting infrastructure. As a result, the benefits of ESG on profitability and financial stability are often only felt in the long term (Rangkuty et al., 2024). This creates a research gap to examine whether improving ESG performance empirically has a positive effect on banks' financial stability in the transition period to a green economy.

Financial stability reflects the ability of the financial sector to withstand internal and external shocks without causing systemic crises. Indicators such as Return on Assets (ROA), Capital Adequacy Ratio (CAR), and Non-Performing Loans (NPL) are the main parameters used to measure a bank's resilience to risk. Some research (Nguyen, 2025); (Tzouvanas et al., 2020) found that green financing is able to reduce systemic risk and increase banks' resilience to economic turmoil.

In the context of green macroprudential policies, green financing and ESG performance are believed to strengthen capital structures and reduce NPL levels, thereby improving overall financial stability. However, there have not been many empirical studies in Indonesia that have examined this relationship using a time series data approach that represents the long-term dynamics of the banking sector (Winsi Fadiah Putri et al., 2024).

The following figure shows the trend of increasing *green financing* and national banking ESG scores that continue to rise from year to year, followed by fluctuations in ROA that show the dynamics of financial system stability.



Graph 1. Green Finance ESG Trends – ROA (2015 – 2024)

Some previous studies (Nguyen, 2025); (Tzouvanas et al., 2020); (Wahyu Indah Sari et al., 2024) shows that green finance is able to strengthen banking stability in the ASEAN region and Europe through reducing systemic risks. However, most of these studies use cross-country or interbank panel data, while research based on national aggregate data (time series) is still very limited, especially in the Indonesian context.

Based on these conditions, this study seeks to empirically analyze the influence of Green Financing, ESG Performance, and Financial Performance (CAR, NPL) on Banking Financial Stability in Indonesia during the period 2015–2024. Using the multiple linear regression (OLS) model, this study is expected to make an empirical and

policy contribution to national regulators and financial industries in strengthening the synergy between economic sustainability and financial stability.

LITERATURE REVIEW

Green *Finance Theory*

Green finance is a concept that integrates environmental aspects into financing and investment activities. Conceptually, this theory explains that the allocation of funds to green sectors can reduce long-term systemic risks, as they tend to be more resilient to economic volatility due to climate change (Zhao et al., 2024).

According to the International Monetary Fund (IMF, 2022), green finance not only drives energy efficiency and technological innovation, but also contributes to financial stability through improved asset quality and better credit risk management. In the context of Indonesian banking, the shift of the portfolio towards green financing is a real implementation of green macroprudential policies regulated in the OJK Sustainable Finance Roadmap (OJK, 2022).

Financial Intermediation Theory

According to this theory, banks function as intermediary institutions that connect surplus and deficit funds. The financial stability of banks depends on the effectiveness of the intermediation function.

When a bank's credit portfolio is dominated by low-risk green projects, the rate of non-performing loans (NPLs) can decrease, thereby increasing the bank's profitability and stability (Ebrahimi Kahou & Lehar, 2017). Therefore, the implementation of good green financing can strengthen the capital position and maintain the sustainability of the bank's intermediation function in the long term.

Legitimacy and ESG Theory

The theory of legitimacy explains that companies seek to gain public trust by demonstrating high social and environmental responsibility. The implementation of Environmental, Social, and Governance (ESG) is an instrument to achieve this legitimacy (Moshood et al., 2022).

Companies or banks that have high ESG performance are considered more responsible and transparent, which can ultimately reduce reputational risks, attract long-term oriented investors, and increase market value. However, in the early stages of implementation, an increase in ESG score is often followed by high transition costs, which can depress short-term profits (Masciandaro & Russo, 2024).

Financial Stability Theory

Financial stability describes a condition in which the financial system is able to function efficiently and is not vulnerable to systemic crises. The main indicators of stability include Return on Assets (ROA), Capital Adequacy Ratio (CAR), and Non-Performing Loans (NPL). According to (Punzi, 2024), macroprudential instruments such as the green capital buffer can improve financial stability by taking into account climate risks in determining the minimum capital ratio.

MATERIALS & METHODS

This study uses an explanatory quantitative research approach that aims to explain the causal relationship between *green financing variables*, *ESG performance*, and *financial performance* on banking financial stability in Indonesia.

The quantitative approach was chosen because this study used annual numerical data and measured the influence between variables through inferential statistical analysis. The analysis model used is multiple linear regression (Ordinary Least Squares / OLS), which is commonly used in economic and financial research to measure the linear relationship between independent variables and dependent variables.

To test the influence between variables, the Multiple Linear Regression (OLS) model was used with the following specifications:

$ROAt = \alpha + \beta 1GFt + \beta 2ESGt + \beta 3CARt + \beta 4NPLt + \varepsilon t$

Information:

- ROA_t: financial stability of the bank in the twentieth year.
- GF_t: Total green financing for the third year.
- ESG_t: ESG performance score for the year t.
- CAR_t: Capital adequacy ratio for the twentieth year.
- NPL_t: Ratio of non-performing loans in the year t.
- α: constant.
- ϵ_t: Error term.

This model is used because it is simple, interpretive, and able to capture the direct influence of each independent variable on the bank's financial stability without involving dynamic or cross-entity effects as in the panel model. The analysis is carried out in several stages:

1. Descriptive Statistics – to see trends and characteristics of data such as mean, minimum, maximum, and standard deviation of each variable.
2. Pearson Correlation – to identify the strength and direction of relationships between variables.
3. Multiple Linear Regression (OLS) – to test hypotheses simultaneously and partially.
4. The t-test and the F-test – to determine the influence of each independent variable as well as the overall significance of the model.

Coefficient of Determination (R^2) – to measure how much of the variation in financial stability is explained by the model.

RESULT

To test the influence of *green financing*, *ESG performance*, *CAR,* and *NPL* on the bank's financial stability, multiple linear regression was carried out with the following results:

Variable	Coefficient	T-Statistics	Probability	Direction of Influence
Constant	3.5329	3.094	0.027	–
Green Financing (GF)	0.0153	2.084	0.092	Positive
ESG Performance	-0.1664	-3.877	0.012	Significant negatives
Capital Adequacy Ratio (CAR)	0.4183	4.269	0.008	Significant positives
Non-Performing Loan (NPL)	-1.0207	-4.761	0.005	Significant negatives

The value of R^2 = 0.903 indicates that 90.3% of the variation in financial stability (ROA) is explained by these four independent variables, while the remaining 9.7% is explained by other factors outside the model such as macroeconomic conditions, monetary policy, and external risks. The F-statistical value = 11.63 with p-value = 0.00957 (<0.05) indicates that the model is simultaneously significant, so that independent variables together affect the financial stability of banking in Indonesia.

DISCUSSION

Results of multiple linear regression analysis:

1. **The Effect of Green Financing on Financial Stability**

A positive coefficient of 0.0153 indicates that an increase in green financing has the potential to increase banking financial stability, although its significance is still moderate (p = 0.092). These results are in line with the findings (Nguyen, 2025) and (Pacelli et al., 2025) which explain that green finance can suppress systemic risks through portfolio diversification and sustainable financing. However, its insignificant impact shows that the transformation of green financing in Indonesia is still in its early stages. The implementation of green policies still faces obstacles in terms of financing infrastructure, fiscal incentives, and the integration of climate risks into credit assessments. (Wang & Xu, 2025)

Practically, major banks have begun to channel financing to the renewable energy and energy efficiency sectors, but their contribution to total national credit is still below 10%, so the direct impact on profitability has not been optimal.

2. The Effect of ESG Performance on Financial Stability

ESG performance has a negative and significant influence on ROA (coefficient -0.1664, p = 0.012). These results indicate that the increasingly stringent implementation of ESG has not had a direct effect on increasing profitability and short-term stability. These findings strengthen the argument for the transition cost hypothesis, where the initial costs of ESG implementation such as sustainability audits, HR training, and non-financial reporting depress short-term financial efficiency (Masciandaro & Russo, 2024). However, in the long term, ESG implementation has the potential to create a competitive advantage through higher investor reputation and trust, as expressed by (Tzouvanas et al., 2020). Therefore, the negative results in this analysis period can be seen as a temporary effect of the transition period to full sustainability practices.

3. The Effect of Capital Adequacy Ratio (CAR) on Financial Stability

A positive and significant coefficient (0.4183, p = 0.008) indicates that the bank's capital has an important influence on financial stability. The higher the CAR, the stronger the bank's ability to absorb credit and market risk. These results are consistent with the Risk Buffer theory, where adequate capital is a buffer against economic shocks and liquidity crises. (Meng et al., 2024) The fact that the average CAR of Indonesian banks is well above the minimum requirements shows the readiness of the national financial system in the face of global risks such as the energy crisis, high inflation, and fluctuations in international interest rates.

4. The Effect of Non-Performing Loans (NPLs) on Financial Stability

The regression results showed that NPL had a significant negative effect on ROA (coefficient -1.0207, p = 0.005). This means that every 1% increase in the non-performing loan ratio will reduce the bank's profitability by 1.02%. These findings reinforce the research (Wahyu Indah Sari et al., 2024) and (IMF, 2022) that credit risk is one of the main factors causing fluctuations in financial system stability. Good bank performance in managing non-performing loans is an important prerequisite for the sustainability of the banking sector, especially in the midst of global economic uncertainty.

CONCLUSION

In general, the results of this study show that the financial stability of banking in Indonesia during the period 2015–2024 is greatly influenced by a combination of conventional factors (CAR, NPL) and sustainability factors (green financing, ESG). Although the influence of ESG is negative in the short term, the transformation towards green and sustainable finance still provides a positive direction for a resilient and adaptive national financial system that is adaptive to climate risks. Overall, this study proves that the integration of the sustainability dimension into the national banking system is not only a moral or social necessity, but also an economic strategy that can strengthen the resilience of the financial system to long-term shocks.

Declaration by Authors

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