The Effect Of Interest Rate, Allowance for Impairment Losses, And Credit Risk On Green Finance Interest Income In the Banking Sector 2019-2024 Period

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ABSTRACT
This study aims to analyze the impact of the Interest Rate (BI-Rate), the Allowance for Impairment Losses, and credit risk on finance interest income in the Indonesian banking sector for the period 2019-2024. This study employs a quantitative approach using panel data regression. The sample was selected via purposive sampling, comprising a total of 94 observations from banks listed on the Indonesia Stock Exchange (IDX). The data were analyzed using Eviews software with the Random Effects Model (REM) as the optimal model. The results of this study indicate that the Interets Rate and credit risk do not have a significant effect on green finance interest income. Meanwhile, the Allowance for Loan Losses has a significant effect on green finance interest income. These findings suggest that the management of loan loss reserves plays a crucial role in maintaining the stability of green finance interest income. These findings suggest that the management of loan loss reserves plays a crucial role in maintaining the stability of green finance funding within the banking sector. Meanwhile, credit risk proxied by NPL, does not have a significant effect on green finance interest income. Furthermore, the Allowance for Loan Losses has a significant effect on green finance interest income. The results of this study indicate that the management of loan loss reserve plays a crucial role in maintaining the stability of green finance funding in the banking sector. Furthermore, credit risk has no significant impact on green finance interest income. The results of this study indicate that the management of credit loss reserves plays a crucial role in maintaining the stability of green finance in the banking sector.

Keywords: *Interest Rate, Allowance for Impairment Losses, Credit Risk, Green Finance, Banking Sector.*

1. INTRODUCTION

The global financial sector has experienced significant transformation in response to sustainability challenges and environmental concerns. Financial institutions are increasingly required to align their operational strategies with sustainable development goals, particularly through environmentally oriented financing mechanisms commonly referred to as green finance (Cui et al., 2018). Green finance plays a strategic role in supporting environmentally sustainable projects while simultaneously promoting long term financial system resilience (Muchiri et al., 2025). The banking sector serves as the primary intermediary institution responsible for allocating financial resources to productive economic sectors. In Indonesia, the implementation of green finance has accelerated following the issuance of Financial Services Authority Regulation Number 51/POJK.03/2017 concerning Sustainable Finance Implementation for Financial Service Institutions. This regulation requires financial institutions to integrate sustainability principles into business activities and disclose sustainability performance periodically (Otoritas Jasa Keuangan, 2024).

Green finance creates opportunities for banks to diversify income source through sustainable lending activities. Interest income derived from green financing reflects the financial viability of environmentally responsible investements and contributes to banking profitability. According to Financial Service Authority (2024), sustainable financing distributed by Indonesia's banking sector reached IDR 1,959 trillion in 2023, highlighting the growing relevance of green finance in the national financial system. Despite this growth, green financing interest income remains vulnerable to several macroeconomic and internal banking factors. One important macroeconomic factor is Interest or BI-Rate, an Indonesia's benchmark interest rate that determined by Central Bank of Indonesia. Changes in BI-Rate directly influence lending rates, cost of funds, and banking interest margins (Mishkin, 2018). Previous studies indicate that benchmark interest rate movements significantly affect banking interest income through monetary transmission mechanisms (Simatupang et al., 2023).

Another critical factor in Allowance for Impairment Losses (CKPN). CKPN represents prudential reserves established to anticipate credit losses and ensure banking stability, higher impairment reserves may reduce recognized interest income because a portion of financial returns must be allocated to credit loss provisions (Sinaga et al., 2023). According to PSAK 71, banks are required to recognize expected credit losses through impairment reserves to improve financial reporting quality and risk management practices. Previous studied by (Pratiwi et al., 2024) demonstrated that impairment reserves significantly influence profitability and interest income recognition in the banking sector.

Credit risk, commonly measured by Non-Perfoming Loans (NPL), also influences interest income recognition. High NPL ratios indicate deteriorating loan quality and reduce bank's ability to recognize expected revenue streams (Dithania et al., 2022) and (Maslahatul et al., 2024). Research conducted by (Sutrisno et al., 2024) revealed that credit risk negatively affects banking profitability because increasing non-performing loans require higher reserve allocations and reduce effective lending performance.

Empirical evidence regarding the relationship between BI-Rate, CKPN, credit risk, and green finance interest income remains limited, particularly in indonesia's banking context. Existing studies primarily focus on the impact of green finance on profitability rather than the determinants of interest income recognition (Han, 2025). This creates a research gap that requires further investigation (Zhang et al., 2022). Therefore, this study aims to analyze the effect of BI-Rate, CKPN, and credit risk on green finance interest income in Indonesia's banking sector during 2019-2024. The findings are expected to enrich sustainable finance literature and provide practical insights for banking institutions and regulators in optimizing green finance implementation.

2. RESEARCH METHODS

This study employed a quantitative research approach with an associative design to examine the relationship between BI-Rate, Allowence for Impairment Losses (CKPN), and credit risk on green finance interest income in Indonesia's banking sector. Quantitative research was selected because this study aimed to measure the effect of independent variabels on the dependent variable using statistical analysis.

The population of this study consisted of banking companies listed on the Indonesia Stock Exchange (IDX) during the 2019-2024 period. The sampling technique used was purposive sampling based on several criteria: (1) banks consistently listed on the IDX during the observation period, (2) banks publishing annual and sustainability reports consecutively from 2019 to 2024, and (3) banks providing complete data related to green finance interest income, BI-Rate, CKPN, and Non-Performing Loans (NPL). Based on these criteria, 94 observations were obtained.

This study used secondary data derived from annual reports, sustainability reports, Central Bank of Indonesia publications, Financial Services Authority (OJK) reports, and Indonesia Stock Exchange documentation. Data collection was conducted using documentation techniques by collecting and reviewing financial reports related to the research variables.

The dependent variable in this study was green finance interest income. Meanwhile, the independent variables consisted of BI-Rate, Allowance for Impairment Losses (CKPN), and credit risk proxied by Non-Performing Loans (NPL). The operational definitions of variables are presented in table 1.

Tabel 1. Operational Definition of Variabels

Variable	Measurement
Green Finance Interest Income	Interest income generated from sustainable financing activies
BI-Rate	Benchmark interest rate issued by Bank Indonesia
CKPN	Allowance for impairment losses reported by banks
Credit Risk (NPL)	Non-Performing Loan ratio

The Chow test, Hausman test, and Lagrange Multiplier test, to determine the most appropriate regression model. The Random Effect Model (REM) was identified as the best model for this study. Hypothesis testing was conducted using the coefficient of determination test (Adjusted R2), simultaneous (F-test), and partial significance test (t-test) with a significance level of 5%.

3. RESULTS AND DISCUSSION

3.1 Descriptive Statistics

Descriptive statistic were used to provide an overview of the research variables, including BI-Rate, Allowance for Impairment Losses (CKPN), credit risk proxied by Non-Performing Loans (NPL), and green finance interest income. The descriptive statistical analysis includes minimum values, maximum values, mean values, and standard deviations for each variable.

The results indicate that the banking sector experienced fluctuations in BI-Rate during the observation period due to monetary policy adjustments implemented by Bank Indonesia in response to economic conditions. Meanwhile, CKPN showed varying values among banking companies, indicating differences in risk management policies and loan quality assessment. The NPL ratio also fluctuated during the research period, reflecting changes in banking creding risk conditions.

Green finance interest income generally showed positive growth throughout the observation period. This condition indicated that sustainable financing activities in Indonesia's banking sector have continued to develop and contribute to banking income generation.

3.2 Panel Data Regression Model Selection

Before conducting panel data regression analysis, several model selection tests were performed to determine the most appropriate estimation model.

3.2.1 Chow Test

The chow test was conducted to determine whether the Common Effect Model (CEM) or Fixed Effect Model (FEM) was more appropriate. The test results showed that the probability value was below 0.05, indicating that the Fixed Effect Model was preferable to the Common Effect Model.

3.2.2 Hausman Test

The hausman test was then conducted to compare the Fixed Effect Model (FEM) and Random Effect Model (REM). The test results indicated that the probability value exceeded 0.05, suggesting that the Random Effect Model was more appropriate for this study.

3.2.3 Lagrange Multiplier Test

The Lagrange Multiplier test was used to compare the Common Effect Model and Random Effect Model. The results supported the use of the Random Effect Model as the best estimation model for data regression analysis.

Based on the three model selection tests, the Random Effect Model (REM) was selected as the most appropriate regression model in this study.

3.3 Regression Analysis

The panel data regression was conducted to examine the effect of BI-Rate, CKPN, and credit risk on green finance interest income.

The regression equation is as follows:

$$Y = \alpha + \boldsymbol{\beta_1 X_1} + \boldsymbol{\beta_2 X_2} + \boldsymbol{\beta_3 X_3} + \boldsymbol{e}$$

The regression results indicate that BI-Rate does not significantly affect green finance interest income. This finding suggests that changes in benchmark interest rates do not directly influence interest income generated from green finance activities. Green financing tends to be more strongly influenced by sustainability-orinted banking policies and long-term investment considerations rather that short-term monetary fluctuations.

The result also show that Allowance for Impairment Losses (CKPN) significantly affects green finance interest income. Higher impairment reserves influence bank's income recognition beause a portion of earnings must be allocated to reserve formation. This finding indicates that prudent credit reserve management is essential is maintaining sustainable financing stability.

Meanwhile, credit risk proxied by Non-Performing Loans (NPL) does not significantly affect green finance interest income. This finding suggests that green finance implementation in Indonesia's banking sector remains relatively stable despite fluctuations in credit risk levels, sustainable financing activities are generally supported by government regulations and bank's long-term sustainability commitments.

3.4 Hypothesis Testing

Hypothesis testing in this study was conducted using the partial test (t-test), simultaneous test (F-test), and coefficient of determination test (Adjusted R2) with a significance level of 5% (0.05). The t-test results indicate that BI-Rate does not significantly affect green finance interest income hecause the probability value exceeds 0.05. therefore, the first hypothesis (H1) is rejected. This finding suggests that changes in benchmark interest rates do not directly influence sustainable financing interest income in Indonesia's banking sector.

Meanwhile, Allowance for Impairment Losses (CKPN) significantly affects green finance interest income with a probability value below 0.05. Thus, the second hypothesis (H2) is accepted. This result demonstrates that impairment reserve allocation significantly influences banking interest income recognition. The formation of impairment reserves reduces the amount of income that can be recognized because banks are required to allocate reserves to anticipate potential future credit losses. Furthermore, credit risk proxied by Non-Performing Loans (NPL) does not significantly affect green finance interest income because the significance value exceeds 0.05. therefore, the third hypothesis (H3) is rejected. This finding indicates that fluctuations in non-performing loan levels do not directly influence sustainable financing interest income.

In addition, the simultaneous test (F-test) shows that BI-Rate, CKPN, and Credit Risk jointly affect green finance interest income because the probability value of the F-statistic is below 0.05. these findings indicate that monetary policy, impairment reserve management, and credit risk collectively contribute to sustainable financing income performance in Indonesia's banking sector. The coefficient of determination test (Adjusted R2) indicates that BI-Rate, CKPN, and Credit Risk are able to explain green finance interest income. While the remaining variation is explained by other variables outside this research model. This suggests that sustainable financing income is also influenced by other factors such as sustainability policies, operational efficiency, banking business strategies, and macroeconomic conditions.

Table 2. Structural Model Testing Result (Path Coefficient)

Hypothesis	Relationship	Coefficient	t-Statistic	Probability	Result
H1	BI-Rate → Green Finance Interest Income	-0.021	0.842	0.402	Rejected
H2	CKPN → Green Finance Interest Income	0.387	2.756	0.007	Supported
H3	Credit Risk → Green Finance Interest Income	-0.114	1.221	0.225	Rejected

3.4 Discussion

3.4.1 The Effect of BI-Rate on Green Finance Interest Income

The hypothesis testing result indicate that BI-Rate does not significantly affect green finance interest income. Therefore, the first hypothesis (H1) is rejected. This result suggest that sustainable financing activities are relatively less sensitive to benchmark interest rate fluctuations because green finance emphasizes long-term sustainability objectives. However, BI-Rate remains an important monetary instrument affecting banking interest rates and landing activities.

This finding differs from the study conducted by Windsor et al. (2023), which stated that changes in interest rates significantly affect banking interst margins globally. Similiarly, Simatupang et al. (2023) found that BI-Rate significantly influences banking intermediation and interest margin in Indonesia. Tsabitha Nur' et al. (2025) also explained that BI-Rate significantly affect affects Net Interest Margin (NIM) through changes in lending and funding rates.Nevertheless, the findings of this study indicare that green finance activities may be more influenced by sustainability commitments and long-term financing policies that short-time benchmark interest rate movements. This supports the argumemnt proposed by Widya et al. (2025), which emphasized that green finance implementation has become part of banks's long-term business strategies aligned with Environmental, Social, and Governance (ESG) principles.

3.4.2 The Effect of CKPN on Green Finance Interest Income

The hypothesis testing results show Allowance for Impairment Losses (CKPN) significantly affects green finance interest income. The second hypothesis (H2) is supported. This finding indicates that impairment reserve formation influences banking income recognition because higher reserves reduce the amount of interest income recognized by banks.

This finding is consistent with Citrahayu et al. (2025), who found that the implementation of PSAK 71 increased CKPN and reduced banking profit and interest income. Purba et al. (2025) also demonstrated that CKPN significantly affects banking profitability due to reserve credit loss implementation encourages higher impairment reserves, thereby affecting internest income recognition. The findings also support the prudential banking principle, where banks are required to maintain reserve adequacy to anticipate potential future credit losses. Therefore, effective CKPN management becomes essential in maintaining sustainable financing performance and banking stability.

3.4.3 The Effect of Credit Risk on Green Finance Interest Income

The hypothesis testing result indicate that credit risk proxied by Non-Performing Loans (NPL) does not significantly affect green finance interest income. The third hypothesis (H_3) is rejected. This suggests that green financing ectivities remain relatively stable despite fluctuations in banking credit risk conditions. Sustainable financing projects generally undergo stricter screening and monitoring procedures to minimize default risk.

This findings differs from Yulyanti et al. (2023), who found that NPL negatively affects banking profitability and interest income. Similarly, Rumianti et al. (2024) explained that increasing credit risk weakens banking financial performance. Chandran et al. (2025) also found that rising NPL levels significantly reduce bank's net income. However, in the context of green finance, sustainable financing projects generally undergo stricter screening and monitoring processes. This finding is supported by Andriani (2023), who explained that green finance implementation is closely associated with long-term risk management strategies. Sutrisno et al. (2024) also emphasized that credit risk management is an important factor in maintaining banking stability and profitability in sustainable finance implementation.

4. CONCLUSION

This study aims to analyze the effect of BI-Rate, Allowance for Impairment Losses (CKPN), and credit risk on green finance interest income in Indonesia's banking sector during 2019-2024. Based on the panel data regression analysis using the Random Effect Model (REM), several conclusion can be drawn. First, BI-Rate does not significantly affect green finance interest income. This finding indicates that changes in benchmark interest rates do not directly influence income generated from sustainable financing activities because green finance tends to emphasize long-term sustainability objectives rather than short-terms monetary fluctuatuions.

Second, Allowance for Impairment Losses (CKPN) significantly affects green finance interest income. This result demonstrates that impairment reserve management plays an important role in maintaining banking financial stability and influencing income recogntion from sustainable financing activities. Third, credit risk proxied by Non-Performing Loans (NPL) does not significantly affect green finance interest income. This finding suggests that green finance implementation in Indonesia's banking sector remains relatively stable despite fluctuations in banking credit risk conditions. Overall, this study contributes to development of sustainable finance literature, particularly regarding factors influencing green finance interest income in the banking sector. The findings are expected to provide insights for banking institutions and regulators in imporving sustainable financing policies and risk management practices.

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