P-ISSN : 2685-4309
E-ISSN : 2597-9434
Jurnal Kajian Ekonomi dan Perbankan Syariah
**Profit : Jurnal Kajian Ekonomi dan Perbankan Syariah**
Vol. 9 No. 1 (2025) : 129-145
Available online at https://ejournal.unuja.ac.id/index.php/profit/index

# THE EFFECT OF GREEN BANKING IMPLEMENTATION AND OPERATING COST EFFICIENCY ON FINANCIAL PERFORMANCE AT ISLAMIC COMMERCIAL BANKS IN INDONESIA FOR THE 2019-2023 PERIOD

**Karexa Selvia Yundari[1], Femei Purnamasari[2], Ahmad Hazas Syarif[3]**
[1,2,3] Universitas Islam Negeri Raden Intan Lampung, Indonesia
Email : karexaselvia@gmail.com[1] femeipurnamasari@radenintan.ac.id[2] hazassyarif@radenintan.ac.id[3]

DOI : https://doi.org/10.33650/profit.v9i1.11281

| Received: May 2025 | Revised: May 2025 | Accepted: June 2025 |
|---|---|---|

**Abstract :**

Environmental problems such as climate change and natural disasters are now increasingly frequent. Banking operations that pay less attention to environmental aspects contribute to worsening this situation, because the drive for profit often makes the negative impact of business on the environment ignored. This study aims to analyze the application of green coin rating (GCR) and Operational Cost Efficiency (BOPO) to return on equity (ROE) as an indicator of financial performance at Islamic Commercial Banks in Indonesia for the 2019-2023 Period. The population in this study are all financial reports from 13 BUSs that have been published until 2023. The sample of this study used purposive sampling with a sample of 6 BUS, namely BCA Syariah, Bank Aceh Syariah, Bukopin Syariah, NTB Syariah, Bank Panin Dubai Syariah, and Bank Muamalat, using annual report data and sustainability reports for the 2019-2023 period. The data analysis technique uses panel data regression analysis through the E-Views10 program. The results showed that partially, the application of GCR has a negative and insignificant effect on ROE with a sig value. 0.5845>0.05, while BOPO shows a positive significant effect on ROE with a sig value. 0,0000<0,05. Simultaneously GCR and BOPO have a significant effect with a sig value. 0.000001 <0.05 on ROE at Islamic Commercial Banks in Indonesia for the 2019-2023 Period.

**Keywords**: *Green Banking, Operating Cost Efficiency, Financial Performance, Islamic Commercial Bank*

**Abstrak :**

Permasalahan lingkungan seperti perubahan iklim dan bencana alam kini semakin sering muncul. Kegiatan operasional perbankan yang kurang memperhatikan aspek lingkungan turut memperburuk situasi ini, sebab dorongan untuk meraih keuntungan kerap membuat dampak negatif bisnis terhadap lingkungan diabaikan. Penelitian ini bertujuan untuk menganalisis penerapan green coin rating (GCR) dan Efisiensi Biaya Operasional (BOPO) terhadap return on equity (ROE) sebagai indikator kinerja keuangan pada Bank Umum Syariah di Indonesia Periode 2019-2023. Populasi dalam penelitian ini yaitu seluruh laporan keuangan dari 13 BUS yang telah di publikasikan sampai dengan tahun 2023. Sampel penelitian ini menggunakan purposive sampling dengan sampel 6 BUS, yaitu BCA Syariah, Bank Aceh Syariah, Bukopin Syariah, NTB Syariah, Bank Panin Dubai Syariah, dan Bank Muamalat, menggunakan data laporan tahunan dan laporan

keberlanjutan periode 2019-2023. Teknik analisis data menggunakan analisis regresi data panel melalui program E-Views10. Hasil penelitian menunjukkan bahwa secara parsial, penerapan GCR berpengaruh negatif dan tidak signifikan terhadap ROE dengan nilai sig. 0,5845>0,05, sedangkan BOPO menunjukkan pengaruh signifikan positif terhadap ROE dengan nilai sig. 0,0000<0,05. Secara simultan GCR dan BOPO berpengaruh secara signifikan dengan nilai sig. 0,000001<0,05 terhadap ROE pada Bank Umum Syariah di Indonesia Periode 2019-2023.
**Kata kunci**: *Green Banking, Efisiensi Biaya Operasional, Kinerja Keuangan, Bank Umum Syariah*

## INTRODUCTION

In the era of globalization and increasing environmental awareness, the banking sector faces the challenge of adapting to sustainability principles. Green banking is a solution that integrates environmental considerations into bank operations and business strategies. The aim is to support sustainable development and enhance the bank's image and competitiveness in the marketplace.(Ria et al., 2023) Environmental challenges such as climate change, deteriorating health, rising mortality rates, dwindling habitable land, declining food production and increasingly frequent natural disasters are caused by environmentally unfriendly human activities.(Yusri, 2020) The banking sector as one of the pillars of the economy has an important role in supporting sustainable development and combating climate change. To overcome the negative impacts that occur in banking, the implementation of green banking has been introduced and adopted by financial institutions around the world.(Donath et al., 2023)

Increasingly vigorous economic development for the sake of creating economic growth accompanied by negative impacts resulting from these activities is the reason for the issuance of sustainable development, which not only prioritizes the harmony of economic aspects, but also social and environmental aspects.(Hayati & Yulianto, 2020) The Financial Services Authority (OJK) has a role to succeed this commitment through the sustainable financing program. This program is carried out through the cooperation of various parties so as to create financing support for institutions that apply sustainable finance principles. The sustainable finance program not only seeks to increase the portion of financing but also to increase the resilience and competitiveness of financial services institutions.(Keuangan, 2019)

In accordance with Law Number 32 of 2009 concerning Environmental Protection and Management. Where every economic development is carried out in an optimal sustainable manner, the activities carried out must be balanced with efforts to protect the environment and the social environment from negative possibilities arising from these activities. What is an important point and must be considered is that in every planning and implementation of economic strategies, it should prioritize environmental sustainability for future generations. Not only from the economic sector of course, but also from all sectors of government, social culture must uphold environmental sustainability, in order to create sustainable natural resources.(Kadarudin et al., 2021)

The implementation of green banking in Indonesia is driven by the Financial Services Authority (OJK) regulation NUMBER 51 /POJK.03/2017 which requires financial institutions to implement sustainable finance. Sustainable finance is the comprehensive support of the financial services sector to create sustainable economic growth by harmonizing economic, social and environmental interests.

This is in line with the government's efforts to achieve sustainable development goalss. (Keuangan, 2017) The implementation of green banking not only provides benefits to the environment but also increases the efficiency of banking operations. By focusing on environmentally friendly projects banks can attract new customers and retain existing customers thereby improving their financial performance. The integration of sustainability principles in the banking sector is a strategic step in facing global challenges and supporting a green economy in Indonesia.

Islamic banking in Indonesia is committed to involving all stakeholders in achieving sustainable performance, focusing on three components of sustainability, namely profit (economy), people (social aspects), and manners (environment) in a balanced manner. Islamic banking in Indonesia prioritizes real contributions to improve the welfare of the Indonesian people by preserving the environment and supporting sustainable national development.(Nurdin, 2019)

The green economy concept encourages every economic activity to minimize its impact on the environment and is also adopted by the banking sector. One of them is through the concept of green banking. This greening movement in the banking sector is known as green banking, this term has a broader scope than just (green) relating to environmental development.(Park & Kim, 2020) The concept of green banking not only includes channeling funds to environmentally friendly industries, but also implementing go green practices in bank operations, such as the use of recycled paper to reduce paper usage and the construction of environmentally friendly buildings that are designed to be environmentally friendly and equipped with greenery. This has a positive impact in the form of fresh air and beautiful scenery. In addition, through green banking, the bank plays a role in supporting the concept of green economy by being an intermediary between the government and investors in developing new regulations.(Ajizi, 2024) Besides having a positive impact on the environment, green banking can also have an impact on banking performance. By implementing green banking, banks can mitigate financing risks and save operational costs. The involvement of banks in formulating sustainability policies can improve the bank's reputation. A good reputation can affect the bank's financial performance, especially profitability.

Banking can be said to have good performance if a bank is able to maintain its level of profitability. Profitability reflects the ability of a business to generate profits by utilizing all available resources. Profitability can be measured using the ROE ratio. A higher ROE indicates that management can utilize shareholders' equity effectively and efficiently to generate adequate profits for the company and a lower ROE indicates that company management uses less shareholders' equity.(Arhinful & Radmehr, 2023) This ratio examines the extent to which a company uses its resources to provide a return on equity. The ROE ratio measures how much profit the capital owners are entitled to. A high ROE indicates that less capital is required to earn a large profit.(Juwita & Diana, 2020)

In the current era, banks must be committed to protecting the environment, one of which is through the implementation of green banking. This method not only has a positive impact on the environment, but can also affect financial performance.(Pratiwi et al., 2023) This performance can be seen from the green banking aspects in the operational activities or daily activities of the company that

support the bank to be more environmentally friendly. The implementation of green banking can help prevent environmental damage by encouraging investment in products and services that support sustainability.(Khan et al., 2024)

The profitability achieved by an organization is also influenced by its operating costs. Operating costs include expenses incurred by the company to carry out its daily activities, such as salaries, sales, marketing, and maintenance and repairs. One way to measure the ability and effectiveness of banks in managing operational activities is to use the Operating Expenses-Operating Income (BOPO) ratio. If operating costs are too high, the company will experience a decrease in profitability. The lower the operating costs, the more profitable the company is.(Sitompul & Gunawan, 2022) The company's net profit will decrease if operating costs increase without being offset by an increase in revenue. Therefore, operating cost managers need to consider the impact on profit growth. Banks must be able to control the distribution of operating costs among various expenses related to increasing profits.(Ge'e et al., 2023)

A bank can assess how efficiently it manages its business by comparing Operating Expenses and Operating Income. The profitability value will decrease if operating costs increase. Conversely, if the BOPO value is lower, it will have a positive impact on increasing profitability. If the company can control and reduce its operating costs well, then its profitability will increase. This increase in profitability can be considered a positive signal for investors, because generally investors are interested in companies that are able to generate solid profits.(Hasibuan et al., 2021)

With the concept of green banking, it is hoped that it can optimize the distribution of funds to the community with an environmentally friendly design, so that banks continue to present the best performance to benefit both parties and preserve the environment of course. Because profit or profitability as a measure of banking has performed well or not. With the application of green banking, it is expected to make bank operations more efficient and profitable.(Siahaan et al., 2021)

As the research conducted by (Hanif et al., 2020) that the application of green banking not only has a positive impact on the environment and social, but is also able to affect the profitability of Islamic commercial banks in Indonesia, then all indicators of green banking are in line with the Islamic perspective, reinforced by arguments about protecting nature and preventing natural damage. In line with the research of Hanif et al, research conducted by (Siregar & Haryono, 2023) stated that green banking, NPF, NOM, BOPO, Audit Committee and DPS have a positive effect on the financial performance of Islamic commercial banks, so that the implementation of green banking must be fully supported in terms of strengthening the use of electronic information technology to support paperless activities in banking operations. Furthermore, research conducted (Mahardika & Fitanto, 2023) stated that green banking has a positive effect on the profitability of Islamic banks, the positive relationship generated by CSR funds can be used as an alternative both in operations and regulations related to the concept of green banking.

In contrast to the research of hanif, siregar and mahardika, the research conducted by (Nurmalia, 2021) which states that green banking policy has a

significant negative effect, partial tests show that there is no influence between green banking and CAR on profit growth. This happened because the new bank optimally implemented green banking in 2019, and the bank too maintained the stability of CAR above 8% but profit growth decreased every year and there were even negative numbers.

This research is important to do because from previous research there is still a knowledge gap research gap, namely the existence of gaps in certain topics that have not been widely researched. Although there have been many studies on green banking and financial performance, there are still few that examine financial performance using the return on equity (ROE) ratio. This research seeks to fill the gap so that it can provide a new perspective and complement existing research. Furthermore, research that discusses green banking as measured using the green coin rating is still relatively small so that researchers choose green banking and operational cost efficiency as independent variables.

## RESEARCH METHODS

This research uses a quantitative approach, this research uses secondary data analysis with panel data type. Panel data is a combination of time series data and cross sectional data. Time series data is data from the same object with several specific time periods, while cross sectional data is data from one or more objects in the same period. (Hutagalung & Darnius, 2022) This study uses secondary data in the form of financial reports and sustainability reports that have been published through the official website in 2019-2023. The population in this study are all financial reports from 13 Islamic Commercial Banks that have been published until 2023.

This study uses purposive sampling, this sample data retrieval technique is based on predetermined criteria and qualifies for use as a research sample. The following are the sample criteria in the research to be carried out: 1) Banks that have officially published annual financial reports on their respective bank websites starting in the 2019-2023 period. 2) Banks that have met the Green Coin Rating indicators. Based on the sample selection that has been carried out using purposive sampling from 13 Islamic commercial banks in Indonesia, the sample in this study is 6 Islamic commercial banks in Indonesia that have met the criteria, namely BCA Syariah, Bank Aceh Syariah, Bank Bukopin Syariah, Bank NTB Syariah, Bank Panin Dubai Syariah and Bank Muamalat.

This study uses statistical tests with Eviews10 for windows software, which consists of: descriptive statistical analysis, which presents data that describes or provides further information about the sample and research data. Furthermore, using the panel data regression estimation method consists of three approaches, namely the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). To determine the right model from the three regression models to manage panel data, there are 3 model selection tests. First, the chow test is used to determine whether the CEM or FEM model is appropriate. Second, the hausman test is used to determine the model between FEM or REM. Third, the langrange multiplier test is used to determine the CEM or REM model. Based on the test results, the best model in this study is the random effect model (REM). So the

assumption test used in this study uses the multicollinearity test.(Agus Tri Basuki, 2014)

**Table 1 Operational Definition of Variables**

| No | Variable | Variable Definition | Variable Indicator | Measurement | Scale |
|---|---|---|---|---|---|
| 1. | Implementation of Green Banking (X1) | Green Banking or environmentally friendly banking is an effort to promote environmentally friendly operations and reduce the carbon footprint of banking activities. | GCR | GB = Total Implementation of GB at the Bank / Green Coin Rating Indicator X 100% | Ratio |
| 2. | Operating Cost Efficiency (X2) | is a ratio that describes the efficiency of banks in carrying out their activities. | BOPO | BOPO = Operating Expenses / Operating Income X 100% | Ratio |
| 3. | Financial Performance (Y) | ROE is a ratio that measures to get net profit with capital from shareholders. | ROE | ROE = Net Income / Shareholders' Equity X 100% | Ratio |

## RESULTS AND DISCUSSION

## RESULTS

### Data Description

The results of this analysis will provide a detailed explanation of each variable (green banking, operational cost efficiency and financial performance).

**Table 1 Descriptive Statistical Analysis**

| | X1 | X2 | Y |
|---|---|---|---|
| Mean | 77.70833 | 91.99900 | 10.64633 |
| Median | 78.12500 | 74.36500 | 9.045000 |
| Maximum | 93.75000 | 347.8800 | 68.56000 |
| Minimum | 62.50000 | 31.48000 | 0.010000 |
| Std. Dev. | 7.281911 | 70.87184 | 14.05557 |

| | | | |
|---|---|---|---|
| Observations | 30 | 30 | 30 |

Source: E-Views10, processed by the author in 2025

Based on the results of the descriptive statistical analysis above, it can be seen that the sample in this study is 30, this shows that the amount of data analyzed is 30 data. The interpretation results of the descriptive statistical analysis above are as follows:

1. Analysis of the financial performance variable (ROE) in banking has a mean or average of 10.64633, minimum 0.010000, maximum 68.56000 and standard deviation 14.05557. This means that the average amount of financial performance as measured by ROE from each bank in OJK during the 2019-2023 research period reported in the annual financial report or annual report is 10.64633. the smallest ROE value is 0.010000 at PT. Bank Bukopin Syariah in 2020. While the largest ROE value is 68.56000 at PT. Bank Bukopin Syariah in 2023.
2. Analysis of the green banking implementation variable has a mean or average of 77.70833, minimum 62.50000, maximum 93.75000 and standard deviation 7.281911. This shows the average value of the green coin rating indicator from the results of the disclosure of green banking in banks registered with the OJK during the 2019-2023 period reported in the sustainable financial report or sustainability report of each bank, namely 77.70833. the smallest green banking application value is 62.50000 at PT. Bank Panin Dubai Syariah in 2019. Meanwhile, the largest value of green banking implementation is 93.75000 at PT. Bank Bukopin Syariah in 2021.
3. Analysis of the variable operating cost efficiency (BOPO) of banks has a mean or average of 91.99900, minimum 31.48000, maximum 347.8800 and standard deviation 70.87184. This means that the average amount of BOPO value in banks registered with OJK in the 2019-2023 period reported in the annual financial report or annual report is 91.99900. the lowest BOPO value (efficient) is 31.48000 at PT. Bank Panin Dubai Syariah in 2020. The highest BOPO value (less efficient) is 347.8800 at PT. Bank Bukopin Syariah in 2023.

## DISCUSSION

### Chow Test

**Table 2 Chow Test**

| Effects Test | Prob. |
|---|---|
| Cross-section F | 0.0004 |
| Cross-section Chi-square | 0.0000 |

*Source: E-views10, processed by the author in 2025*

From the table above, the cross section F probability value is 0.0004 <0.05, so the selected model is the fixed effect model (FEM). Furthermore, it is necessary to conduct a Hausman test to choose between the fixed effect model (FEM) or the random effect model (REM).

**Hausman Test**

**Table 3 Hausman Test**

| Test Summary | Prob. |
|---|---|
| Cross-section random | 0.1154 |

*Source: E-views10, processed by the author in 2025*

From the table above, the cross section random probability value is 0.1154> 0.05, so the selected model is the random effect model (REM). So there is no need to do the langrange multiplier test because the CEM and FEM have been eliminated, so the selected model is the random effect model (REM).

**Classical Assumption Test**

**1. Multicollinearity Test**

**Table 4 Multicollinearity Test**

| | X1 | X2 |
|---|---|---|
| X1 | 1.000000 | 0.324954 |
| X2 | 0.324954 | 1.000000 |

*Source: E-Views10, processed by the author in 2025*

Based on the multicollinearity test results in the table above, it can be said that the correlation value between the independent variables is 0.324954 <0.80 so it can be concluded that the data is free from multicollinearity problems.

**2. Panel Data Regression Analysis**

Based on the model selection test conducted, the random effect model (REM) is the model used in estimating panel data in this study.

**Table 5 Random Effect Model Regression Test Results**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 3.229156 | 18.95513 | 0.170358 | 0.8660 |
| X1 | -0.136498 | 0.246623 | -0.553468 | 0.5845 |
| X2 | 0.195917 | 0.027625 | 7.092062 | 0.0000 |
| Adjusted R-squared | 0.614417 | | | |
| F-statistic | 24.10538 | | | |

*Source: E-Views10, processed by the author in 2025*

Based on the results of the panel data regression analysis in the table above, the panel data regression equation is as follows:

Yit = α + β1X1it + β2X2it + €it
Y = 3.229156 - 0.136498*X1it + 0.195917*X2it

Notes:
Y = Dependent variable
A = Intercept/Constant
β1, β2 = Parameter
X1, X2 = Independent variable (independent)
€ = error component at time t for cross section unit i
i = Order of observed companies (cross section)
t = Time period (time series)

The explanation of the panel data regression equation above is as follows:

a. The constant value of 3.229156 means that if the independent variable increases by one unit on average, the dependent variable will increase by 3.229156.
b. The beta coefficient value of the green banking variable (X1) is negative -0.136498, meaning that if the value of green banking implementation decreases, then financial performance (ROE) will decrease by -0.136498 and vice versa.
c. The beta coefficient value of the operational cost efficiency variable (X2) is positive 0.195917, meaning that if the operational cost efficiency decreases, the ROE variable (Y) will increase by 0.195917, and vice versa, if the operational cost efficiency variable (X2) increases, the ROE variable (Y) will decrease by 0.195917.

**Hypothesis Test**

**1. T Test (Partial)**

**Table 6 T Test**

| Variable | Coefficient | t-Statistic | Prob. |
|---|---|---|---|
| C | 3.229156 | 0.170358 | 0.8660 |
| X1 | -0.136498 | -0.553468 | 0.5845 |
| X2 | 0.195917 | 7.092062 | 0.0000 |

*Source: E-Views10, processed by the author in 2025*

**The Effect of Green Banking Implementation on Financial Performance (ROE) at Islamic Commercial Banks in Indonesia for the 2019-2023 Period**

Based on the partial test or t test, the calculated t value is -0.553468 < t table, namely 2.04841 and a significant value of 0.5845> 0.05, then H0 is accepted and H1 is rejected, meaning that the application of green banking has no significant effect on financial performance as measured by ROE at Islamic commercial banks.

Green banking can have a negative and insignificant effect on return on equity (ROE) for several reasons. First, the application of green banking is still relatively new, especially in Islamic banking. Regulations governing green banking are also newly implemented, regulated in the Financial Services Authority (OJK) regulation number 51 / POJK.03 / 2017, so that banks are still in the adaptation and initial investment stages which may not provide direct benefits. Second, the implementation of green banking in several Islamic banks has not been optimal. For example, Bank Panin Dubai Syariah recorded the lowest increase in the application of green banking from 62.5% in 2019 to 75% in 2023, but the results were still not optimal. This is because green banking practices have not been implemented thoroughly in all operational and financing sections. In addition, Panin Dubai Syariah Bank still provides financing to sectors that risk damaging the environment, such as mining. Additional costs for environmental management and sustainability reporting are also an obstacle for banks in fully implementing green banking. Third, the implementation of green banking often requires considerable initial costs, such as the development of environmentally friendly products, green technology, and human resource training. These costs can reduce profitability in the short term so that it has a negative impact on Return On Equity (ROE), while the benefits are only seen in the long term. (Wairisal, 2024)

This is in line with stakeholder theory that companies must pay attention to the interests of various stakeholders, including customers, society, and the environment, so that the implementation of green banking is a form of corporate social responsibility to meet the expectations of these stakeholders. The results of this study are supported by (Nurmalia, 2021) which states that green banking has no effect on profit growth because BUS has not implemented green banking optimally, operational activities are still not fully able to eliminate the use of paper, electricity and water 100% which results in not optimizing the emphasis on operational costs so that it has no effect on financial performance. Furthermore, research by (Mustika et al., 2023) states that implementing green banking requires additional costs, such as compliance costs and the cost of creating sustainability reports that have a negative impact on bank profitability. This condition is also supported by research (Romli & Reza Zaputra, 2022) and (Paradila & Regina Jansen Arsjah, 2024) where their research shows the results that green banking has a negative effect on the performance and value of banking companies listed on the IDX.

These results are also in accordance with the findings (Handajani et al., 2021) which state that sustainability practices in the banking business do not have a significant effect on bank performance because sustainable banking practices function more as an effort to gain legitimacy from regulators and meet

stakeholder expectations, not as a core business strategy that directly increases profitability or operational efficiency. However, the results of research by (Salsabilla Mutia Fortuna, Ridwansyah, 2024) show that green banking is able to have a positive influence on financial performance, the effect is not strong enough or statistically significant in the context of Islamic banking during this research period. The implementation of green banking may require more time or a more intensive approach to show a significant impact on the financial performance of Islamic banking.

**The Effect of Operating Cost Efficiency on Financial Performance (ROE) at Islamic Commercial Banks in Indonesia for the 2019-2023 Period**

The t test results on the operational cost efficiency variable (X2) obtained a t value of 7.092062> 2.04841 and a probability value of 0.0000 <0.05 so partially the operational cost efficiency variable has a significant positive effect on financial performance (ROE), so H0 is rejected and H2 is accepted. When the company succeeds in reducing operating costs, the company becomes more efficient, which then increases operating profit because the costs incurred to generate revenue are less. This increase in operating profit then has a positive impact on net income, so that the company is more effective in generating profits from its equity (Widyastuti et al., 2024). The results of this study are in line with legitimacy theory which states that efficient operational cost management contributes to increasing company profitability. In other words, companies that succeed in reducing BOPO effectively show good financial performance and gain legitimacy from the public and stakeholders as a responsible and sustainable company. (Nurkhalifa et al., 2021)

Efficiency can be interpreted as a way to achieve a goal by optimally utilizing the resources owned. In the context of this study, it was found that the higher the BOPO value had a positive effect on the bank's financial performance. This shows that an increase in operating costs reflected in higher BOPO can be accompanied by an increase in service quality, product expansion, or investment in technology that supports bank growth. In other words, even though operating costs increase, it can lead to an increase in bank revenue and profitability. Therefore, under certain conditions, a higher BOPO ratio does not necessarily reflect inefficiency, but can be an indicator that the bank is making strategic investments to improve its financial performance. (Ferly et al., 2023)

The results of this study are supported by (Rustandi, 2024) which states that operational cost efficiency has a positive and significant effect on financial performance as measured by Return On Equity (ROE). When net income increases, assuming shareholders' equity remains constant, ROE will increase. In line with research by (Judijanto, 2024) the results state that operational efficiency has a positive and very significant effect on the sustainability of the company's financial performance. This means that companies that are able to

manage work processes more efficiently, reduce costs, and increase productivity will find it easier to maintain profits in a sustainable manner. In contrast to research (Mustika et al., 2023) the results of his research show that BOPO has a negative and significant effect on the financial performance of Islamic commercial banks, which means that the more the BOPO ratio decreases, the financial performance will increase

**2. F Test (Simultaneous)**

**Table 1 Simultaneous (F Test)**

| | |
|---|---|
| F-statistic | 24.10538 |
| Prob(F-statistic) | 0.000001 |

*Source: E-Views10, processed by the author in 2025*

Based on the results of the F test above, it can be seen that the F value of 24.10538> F table is 3.35 and the probability value is 0.000001 <0.05, thus H0 is rejected and H3 is accepted, meaning that the green banking variable and operational cost efficiency together have a significant effect on financial performance at Islamic commercial banks in Indonesia.

Banks that implement green banking pay attention to sustainability aspects in their business with two main approaches, namely green financing and green operations. Green financing means that banks provide financing only for projects that are environmentally friendly and do not support activities that damage nature, such as green investments, green securities, green credits and green insurance (Nurkhalifa et al., 2021) Meanwhile, green operations are the bank's efforts to use resources and energy efficiently in its operations such as reducing the use of paper, saving electricity and water and applying the principles of reducing, reusing and recycling to minimize negative impacts on the environment. (Lilik Handajani, Ahmad Rifai, 2019)

The implementation of green banking and operational cost efficiency affects financial performance (ROE) because banks that implement green banking can take advantage of technological advances in their activities so that they become more efficient, such as reducing the use of electrical energy and implementing a paperless system. So that the operational expenses that must be incurred by the bank will decrease and improve financial performance.(Hastuti & Kusumadewi, 2023) When banks implement green banking through sustainability reports and succeed in reducing operational costs, banks can significantly increase their profitability levels.

## CONCLUSIONS

Research that has been conducted at Islamic Commercial Banks for the 2019-2023 period, found the results of green banking partially has a negative effect on

financial performance (ROE) with a probability value of 0.5845 so that the hypothesis is rejected. Meanwhile, operational cost efficiency (BOPO) partially has a positive and significant effect on financial performance (ROE) with a probability value of 0.0000 so that the hypothesis is accepted. Simultaneously green banking and operational cost efficiency have a significant effect on financial performance at Islamic commercial banks in Indonesia.

Based on the results of the study, it is expected that Islamic banks will focus more efforts on increasing operational cost efficiency as a strategic step to improve financial performance. In addition, although the effect of green banking has not been significant, the application of sustainability principles still needs to be encouraged and developed gradually in order to make a long-term positive contribution to the bank's performance and reputation. Furthermore, Islamic banks need to improve the understanding and ability of human resources related to green banking so that its implementation can run more effectively. Thus, Islamic banks can optimize both aspects to achieve efficient and sustainable financial performance.

This research is limited only to the implementation of green banking using green coin rating indicators and operational cost efficiency using BOPO indicators. The financial performance assessment is only limited to the ROE (return on equity) ratio because it is to determine the effect of green banking and operational cost efficiency on the bank's ability to generate profits in managing shareholders' capital. The object of this research is limited to Islamic Commercial Banks in Indonesia that have met the research criteria.

## REFERENCES


Ajizi, M. N. (2024). *Analysis of the Effectiveness of the Green Banking Implementation Model on Financing Distribution in Islamic Banks*. 1-128.

Ardhana, R. L., Suhendro, S., & Kuriniati, S. (2024). Analysis of Factors Affecting Financial Performance. *Journal of Economic, Business and Accounting (COSTING)*, *7* (3), 4639-4647. https://doi.org/10.31539/costing.v7i3.9051

Arhinful, R., & Radmehr, M. (2023). The effect of financial leverage on financial performance: evidence from non-financial institutions listed on the Tokyo stock market. *Journal of Capital Markets Studies*, *7*(1), 53-71. https://doi.org/10.1108/JCMS-10-2022-0038

Donath, L., Mircea, G., Neamțu, M., & Sîrghi, N. (2023). A mathematical approach to network contagion regarding greening banks' policies. *Economic Research Ekonomska Istrazivanja*, *36*(1). https://doi.org/10.1080/1331677X.2023.2180057

Ge'e, F., Waruwu, K., Damanik, H., & Sitompul, J. (2023). The Effect of Operating Costs on Net Income at National Private Banks Listed on the Indonesia Stock Exchange. *Jurnal Neraca Agung*, *13*(1), 68.

https://doi.org/10.46930/neraca.v13i1.2867
Goh, T. S. (2024). The Effect of CSR, Managerial Ownership, Green Banking, and Financial Ratios on Performance in the Banking Sector. *Owner: Accounting Research and Journal*, *8*, 4745-4756.
Hanif, Wahyu Ningsih, N., & Iqbal, F. (2020). Green Banking on the Profitability of Islamic Commercial Banks in Indonesia. *Scientific Journal of Finance and Banking*, *3*(2), 86-99.
Hasibuan, E., Theresya, H., Gaol, L. F. L., & Sitepu, W. R. B. (2021). The Effect of Third Party Funds, Operating Expenses on Operating Income, and Loan to Deposit Ratio on Profitability in Banking Companies Listed on the Indonesia Stock Exchange for the 2016-2018 Period. *Economics, Finance, Investment and Sharia (EKUITAS)*, *2*(2), 194-199. https://doi.org/10.47065/ekuitas.v2i2.671
Hastuti, T., & Kusumadewi, R. K. A. (2023). The Effect of Green Banking on Firm Value: The Mediating Role of Bank Efficiency. *Indonesian Accounting and Business Review*, *7*(2), 380-393. https://doi.org/10.18196/rabin.v7i2.18312
Hayati, N., & Yulianto, E. S. (2020). The Role of Sustainable Finance in the Banking Industry in Supporting Sustainable Development Goals. *Journal of Business and Economic Accounting*, *6*(1), 1633-1652. https://doi.org/10.33197/jabe.vol6.iss1.2020.473
Hutagalung, I. P., & Darnius, O. (2022). Panel Data Regression Analysis with Common Effect Model (CEM), Fixed Effect Model (FEM) and Random Effect Model (REM) Approaches (Case Study: HDI North Sumatra Period 2014 - 2020). *FARABI: Journal of Mathematics and Mathematics Education*, *5*(2), 217-226. https://doi.org/10.47662/farabi.v5i2.422
Juwita, C. P., & Diana, N. (2020). The Effect Of DER And ROE On Stock Price JII Compnies. *Management Analysis Journal*, *9*(4), 434-441.
Kadarudin, Husni Thamrin, & Arpina. (2021). The Role and Rights of the Community in Environmental Protection and Management According to Law No. 32 of 2009 concerning Environmental Protection and Management. *Collegium Studiosum Journal*, *4*(2), 55-63. https://doi.org/10.56301/csj.v4i2.479
Finance, O. J. (2017). *Implementation of Sustainable Finance for Financial Services Institutions, Issuers, and Public Companies*. 1-15.
Finance, O. J. (2019). *Roadmap for Sustainable Finance in Indonesia*. 1-23.
Khan, I. U., Hameed, Z., Khan, S. U., & Khan, M. A. (2024). Green banking practices, bank reputation, and environmental awareness: evidence from Islamic banks in a developing economy. *Environment, Development and Sustainability*, *26*(6), 16073-16093. https://doi.org/10.1007/s10668-023-03288-9

Mahardika, P. A. D., & Fitanto, B. (2023). The Effect of Green Banking on Banking Financial Performance in Indonesia (Period 2018-2022). *Contemporary Studies in Economic, Finance and Banking*, *2*(4), 659-672. https://doi.org/10.21776/csefb.2023.02.4.9

Maulida, K., Ekawati, E., Hasyimi, D. M., & Hazas Syarif, A. (2021). The Effect of Inventory Financing and Receivable Financing in Working Capital Financing on the Financial Performance of Islamic Commercial Banks in Indonesia with Non Performing Financing as a Moderating Variable in 2015-2019. *Al-Mashrof: Islamic Banking and Finance*, *2*(2), 130. https://doi.org/10.24042/al-mashrof.v2i2.10978

Mustika, S. N., Kristianingsih, K., Tripuspitorini, F. A., & Djuwarsa, T. (2023). Analysis of the Effect of Green Banking Implementation and Operating Cost Efficiency on the Profitability of Islamic Commercial Banks in Indonesia. *Journal of Applied Islamic Economics and Finance*, *3*(2), 436-443. https://doi.org/10.35313/jaief.v3i2.3861

Mustofa, U. A., Edy, R. N. A. P., Kurniawan, M., & Kholid, M. F. N. (2020). Green Accounting on CSR on Buses in Indonesia with Financial Performance as an Intervening Variable. *Scientific Journal of Islamic Economics*, *6*(3), 508. https://doi.org/10.29040/jiei.v6i3.1372

Mutawali, Saniah, N., & Ridha, A. (2022). The Effect of Capital Adequacy Ratio (CAR) and BOPO on Financial Performance at Bank Mandiri, Bank BNI, and Bank BTN for the 2011-2020 Period. *Journal of PERKUSI: Marketing, Finance, and Human Resources*, *2*(3), 327-332.

Nasution, R. (2018). Synergy and Optimization of Green Banking Sharia Banking in Realizing Suistainable Finance. *ECONOMICS: Journal of Economics and Development Studies*, *18*(1), 33-52. www.menlh.go.id

Nurkhalifa, U., Machpudin, A., & Setiawati, R. (2021). The Effect of Capital Adequacy and Operational Efficiency on the Financial Performance of Conventional Commercial Banks on the Indonesia Stock Exchange for the 2016-2020 Period. *Journal of Management Dynamics*, *9*(2), 85-98.

Nurmalia, G. (2021). Green Banking and Capital Adequacy Ratio Affect Profit Growth of Islamic Commercial Banks in Indonesia. *Scientific Journal of Finance and Banking*, *4*(2), 173-187.

Paradila, C., & Regina Jansen Arsjah. (2024). Bank Performance Increases as an Impact of Capital Adequacy of Banking Companies in Indonesia. *Trisakti Economic Journal*, *4*(1), 885-894. https://doi.org/10.25105/jet.v4i1.19179

Park, H., & Kim, J. D. (2020). Transition towards green banking: the role of financial regulators and financial institutions. *Asian Journal of Sustainability and Social Responsibility*, *5*(1). https://doi.org/10.1186/s41180-020-00034-3

Pratiwi, A., Basyith, A., & Safitri, E. (2023). Disclosure of Green Banking,

Profitability and Company Size on Company Value in Banking in Indonesia. *International Journal of Finance Research*, *4*(2), 115-127. https://doi.org/10.47747/ijfr.v4i2.1211

Ria, D., Fasa, M. I., Suharto, S., & Fachri, A. (2023). Implementation of Green Banking in the Environment of Bank Muamalat Indonesia. *Jihbiz: Global Journal of Islamic Banking and Finance*, *5*(1), 1. https://doi.org/10.22373/jihbiz.v5i1.17195

Romli, R., & Reza Zaputra, A. R. (2022). The Effect of Green Banking Implementation, Corporate Social Responsibility on Firm Value in Banking Companies listed on the IDX. *Portfolio: Journal of Economics, Business, Management, and Accounting*, *18*(2), 36-59. https://doi.org/10.54783/portofolio.v18i2.214

Rustandi, U. (2024). *Increasing Profit Through Internal Company Factors*. *04*(03), 105-108.

Siahaan, C., Syahputra Silalahi, A., & Sariartha Sianipar, A. (2021). Analysis of Green Banking Sustainability and Financial Performance Implementation Towards Profitability of Banking Listed On The Indonesia Stock Exchange In 2012-2018. *Journal of Management Analitycal and Solution (JoMAS)*, *1*(1), 12.

Siregar, R., & Haryono, S. (2023). The Effect of Green Banking, Risk Management, Operational Efficiency and Sharia Governance on the Financial Performance of Islamic Commercial Banks. *Journal of Accounting and Management Research*, 73-88.

Sitompul, S., & Gunawan, G. (2022). The Relationship of Operating Expenses, Inventory Turnover and Revenue to Increasing or Decreasing Profitability at Pt. Global Agri Sejahtera. *METADATA Scientific Journal*, *4*(1), 301-315. https://doi.org/10.47652/metadata.v4i1.133

Tamin, M., Hilmi, H., Satria, D. I., & Usman, A. (2022). The Effect of Operating Expenses on Operating Income (BOPO) and Financing To Deposit Ratio (FDR) on Profitability at Islamic Commercial Banks in Indonesia 2016-2020. *Malikussaleh Accounting Journal (JAM)*, *1*(1), 123. https://doi.org/10.29103/jam.v1i1.7447

Wairisal, P. L. (2024). Implications of Return On Equity (Roe) in Building Sustainable Company Performance. *COSMOS: Journal of Education, Economics and Technology*, *1*(4), 238-249.

Yulistina, Y., Anwar, A., & Desmon, D. (2024). The Effect of Bopo and Fdr on the Financial Performance of Indonesian Sharia Banks Listed in the Financial Services Authority (OJK). *Journal of Management and Business*,*14* (2), 56. https://doi.org/10.36448/jmb.v14i2.3742

Yusri, A. Z. and D. (2020). Climate Change. *Journal of Education Science*, *7*(2), 809–820.

**BOOKS**

Agus Tri Basuki, I. Y. (2014). Electronic Data Processing (spss 15 and eviews 7). In *Hospitals* (Pert Edition, Vol. 44, Number 11). Danisa Media. https://doi.org/10.2307/3008753

Budiantoro, S. (2014). Guarding Green Banking Indonesia in the Framework of Sustainable Development. In *Perkumpulan Prakarsa.* www.responsibank.id

Nurdin, A. (2019). Bankers' Awareness of Environmental Sustainability. *Indonesian Banking Development Institute*, 1-3.

Siswanto, E. (2019). Basic Financial Management Textbook. In *State University of Malang* (Edition 1, Vol. 11, Number 1).

Windasari Rachmawati, A. K. (2024). *Green Bank* (first). University of Semarang Press (USM Press).