

Comparative Analysis of the Influence of Credit Risk, Operational Efficiency, and Capital Adequacy on Financial Sustainability in Conventional Banks and Sharia Banks in Indonesia and Malaysia

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Abstract

Banking plays a strategic role in maintaining financial system stability, making financial sustainability an important aspect that needs to be analyzed in both conventional and sharia banks. This study aims to analyze the influence of credit risk, operational efficiency, and capital adequacy on financial sustainability, which is proxied by Return on Assets (ROA), and to compare it between banks in Indonesia and Malaysia as well as between conventional banks and sharia banks during the period 2021-2024. This study uses a quantitative approach with a comparative study design and utilizes secondary data. The research data sources are official publications from the Financial Services Authority, Bank Negara Malaysia, and the annual reports of each bank. The analysis method used is panel data regression with a multiple linear regression approach and dummy variables to test differences between countries and types of banks. Data processing was performed using Stata/MP 17 software. The results show that partially, credit risk proxied by NPL/NPF and capital adequacy proxied by CAR do not have a significant influence on financial sustainability proxied by Return on Assets (ROA), while operational efficiency proxied by BOPO has a negative and significant influence on ROA. Simultaneously, the variables NPL/NPF, BOPO, and CAR have a significant influence on ROA, with an R^2 value of 85.63% of ROA variation explained by these three variables, and an Adjusted R^2 of 84.39%, indicating that the model has strong and stable explanatory power. Meanwhile, comparative analysis shows that the financial sustainability of banks in Indonesia is empirically better than that of banks in Malaysia, as evidenced by the t-count of the country dummy variable of 7.63, which is greater than the t-table of 1.999, and a p-value of 0.000, which is less than 5%, so that the difference is statistically significant. Conversely, there is no significant difference between conventional banks and sharia banks, as indicated by the t-value of the bank type dummy variable of -1.30, which is smaller than the t-table value of 1.999, and a p-value of 0.198, which is greater than 5% for the 2021-2024 period.

Keywords: Financial Sustainability, Credit Risk, Operational Efficiency, Capital Adequacy, Indonesia, Malaysia

1. Introduction

One industry that is very important to a country's economy is banking. (Ariningsih et al., 2023, p. 487) From an operational perspective, sharia banks and conventional banks are two categories of banking companies. (Amima & Muharrami, 2025, p. 55) The existence of banks as financial intermediaries is one of the most important tools for the smooth running of economic activities. (Amanda et al., 2024, p. 43) Meanwhile, one of the government's initiatives to encourage economic growth is to expand and improve banking performance. (Aliefah, 2021, p. 46) This shows how important the banking sector is for the stability and economic growth of a country, and to ensure that banking institutions can operate optimally, it is important to maintain their performance and health. (Sulistiyana et al., 2025, p. 284)

Maintaining customer trust is of utmost importance, requiring good governance and prioritizing financial health. By prioritizing the promotion and maintenance of monetary and financial stability, a resilient economy can be built and maintained. Meanwhile, in Malaysia, Bank Negara Malaysia oversees the healthy functioning of the financial system, while in Indonesia, Bank Indonesia acts as the central bank responsible for ensuring financial stability and supporting the country's economy. (Saddam et al., 2024, p. 17)

Law No. 7 of 1992 and Law No. 10 of 1998 define banks as commercial organizations that aim to improve living standards by collecting deposits from the general public and channeling them as loans. Sharia banks, on the other hand, are financial organizations that follow sharia law to balance and harmonize various economic sectors. (Azzahra et al., 2023, p. 261) The public's desire for a different banking system is reflected in the proliferation of sharia banks in Indonesia. (Munifatussa'idah, 2020, p. 256)

Both Malaysia and Indonesia use a dual banking system in which sharia banks and conventional banks coexist. The traditional banking system gave rise to sharia banks in Malaysia and Indonesia. However, Bank Islam Malaysia Berhad (BIMB) was the first sharia bank established in Malaysia in 1983. When Tabung Haji Malaysia was established in 1963, the idea of sharia finance had already begun to take shape. (Hilman, 2020, p. 2) Because Indonesia and Malaysia both have Muslim-majority populations and are global centers for sharia finance, sharia banks have been able to grow rapidly in both countries. (Raunaqa et al., 2022, p. 129)

Banks must be financially sustainable in order to predict their operational potential. Maintaining continuity and expansion is essential for banks to operate efficiently. A sustainable finance roadmap has been released by the Financial Services Authority to assist financial institutions in sustainable financing. The goal of sustainable finance is to encourage the growth and development of financial services organizations while making them more resilient and competitive. (Pungus et al., 2024, p. 296) Financial sustainability itself is the ability to fulfill the obligation to provide public services, both in terms of quality and quantity, to the community in order to maintain or improve the welfare of the community for the present and the future. (Saferi & Sari, 2024, p. 1183)

Meanwhile, credit risk, often referred to as financial risk, is one of the risks faced by sharia banks. (Ikramina & Sukmaningrum, 2021, p. 35) Bank financial performance is a study that highlights the operational results achieved by banks by focusing on successfully and efficiently managed resources, the results of which can be used by relevant stakeholders. (A'laa & Sahliyah, 2025, p. 65) Optimizing a company's financial performance largely depends on its operational efficiency. Businesses can reduce production costs, shorten cycle times, and improve the quality of their goods or services by increasing operational efficiency, all of which increase profit margins. In addition, high efficiency increases competitiveness by enabling businesses to quickly adapt to changes in consumer demand and market conditions. (Romaui, 2025, p. 336) Furthermore, in terms of capital adequacy, it also serves as a measure of investor and consumer confidence in banks. (Nurhildi & Yuwono, 2025, p. 303)

Previous research was conducted by Fathihani in 2025 entitled "Capital Adequacy, Credit Risk, and Efficiency in Islamic Bank Profitability." His findings show that "CAR and FDR have a significant positive influence on ROA, indicating that strong capital adequacy and efficient liquidity management increase profitability. Conversely, NPF and BOPO have a negative influence on ROA, indicating that high credit risk and operational inefficiency reduce bank performance." (Fathihani et al., 2025, p. 120) Meanwhile, another study was conducted by Rizky Witanty & Agus Sukoco in 2025 entitled "The Effect of Capital Adequacy Ratio (CAR), Operating Income Operating Costs (BOPO), and Non-Performing Financing (NPF) on Return On Asset (ROA) at Indonesia-Malaysia Sharia Commercial Banks in 2019-2023." The results of the study show that "CAR and NPF have a positive effect on ROA, while BOPO has a negative effect. The coefficient of determination shows that the regression model is able to explain most of the variation in ROA." (Witanty & Sukoco, 2025, p. 28)

Previous research was also conducted by Sutrisno in 2016 entitled "Risiko, Efisiensi dan Kinerja pada Bank Konvensional di Indonesia." The results of his research showed that "CAR has a negative influence, NPL has no influence, while LDR and NIM have a positive and significant influence on banking performance. Meanwhile, BOPO has a negative and significant influence on banking performance." (Sutrisno, 2016, p. 111) Meanwhile, another study was conducted by Lukman Al Hakim et al. in 2024 entitled "Systematic Literature Review: Pengaruh CAR, LDR, NPL, dan BOPO terhadap ROA Bank yang Terdaftar pada Bursa Efek Indonesia Tahun 2014 - 2024." The results of the study show that "NPL and BOPO have a significant negative influence on ROA. Conversely, CAR and LDR do not show a consistent significant influence on ROA." (Hakim et al., 2024, p. 1357)

Previous research was conducted by Norfa A. Yusuf et al. in 2024, entitled "Analisis Perbandingan Kinerja Keuangan Bank Konvensional dan Bank Syariah." The results of the study showed that "there are significant differences that can be identified between the financial performance of conventional banks and sharia banks in the CAR and NPL variables, while in the ROA and LDR variables there are no differences." (Yusuf et al., 2024, p. 1088) Meanwhile, previous research was also conducted by Dwi Kharisma Wati & Civi Erikawati in 2024 with the title "Perbandingan Kinerja Keuangan antara Bank Konvensional dengan Syariah yang Terdaftar di Bursa Efek Indonesia pada Tahun 2020-2023." The results of the study stated that

“conventional and sharia banks do not have significant differences in financial performance, according to the Return On Asset (ROA) and Capital Adequacy Ratio (CAR) indicators.” (Wati & Erikawati, 2024, p. 179)

Meanwhile, previous research was conducted by Pipin Lestari in 2020 with the title “Analisis Komparatif Kinerja Keuangan Perbankan Syariah di Indonesia dan Malaysia dengan Pendekatan Metode CAMEL Periode 2014-2018.” The results of the study show that “there are no significant differences in the health of sharia banking in Indonesia and Malaysia as seen from the average ranking of the six ratios over five consecutive years using the CAMEL method. However, the results of data analysis using the Independent t-test for three variables, namely (NPF, NPM, BOPO), showed significant differences, while the variables (CAR, ROA, and FDR) showed no significant differences between Indonesian and Malaysian banks.” (Lestari, 2020, p. 175)

Based on the above explanation, this study departs from current issues such as increasing credit risk, operational efficiency pressures, and capital adequacy requirements that have the potential to disrupt the sustainability of banking performance post-pandemic and amid global economic uncertainty. From the perspective of Sustainability Theory and Signaling Theory, empirical results remain inconsistent in explaining the financial sustainability of banks. Various previous studies have also shown diverse findings regarding the influence of credit risk, operational efficiency, and capital adequacy on banking performance and sustainability, both in conventional and sharia banks, leaving an empirical gap that requires more comprehensive testing. Therefore, this study uses credit risk proxied by NPL/NPF, operational efficiency proxied by BOPO, and capital adequacy proxied by CAR as the main determinants of financial sustainability proxied consistently by Return on Assets (ROA), and applies comparative analysis based on panel data regression and dummy variables to capture differences in characteristics between countries and types of banks. The selection of conventional banks and sharia banks in Indonesia and Malaysia is based on the position of both countries as regional centers of sharia finance with dual banking systems, regulatory differences, and varying levels of industry maturity. It is therefore relevant to examine the dynamics of financial sustainability in banking in the face of current global economic challenges, which is the main distinguishing feature of this study compared to previous studies.

Based on the above description, the researcher raises a topic entitled **“Comparative Analysis of the Influence of Credit Risk, Operational Efficiency, and Capital Adequacy on Financial Sustainability in Conventional Banks and Sharia Banks in Indonesia and Malaysia”** with the following research questions: 1) Does credit risk partially influence financial sustainability in conventional and sharia banks in Indonesia and Malaysia during the period 2021-2024? 2) Does operational efficiency partially influence financial sustainability in conventional and sharia banks in Indonesia and Malaysia during the period 2021-2024? 3) Does capital adequacy partially influence financial sustainability in conventional and sharia banks in Indonesia and Malaysia during the 2021-2024 period? 4) Do credit risk, operational efficiency, and capital adequacy simultaneously influence financial sustainability in conventional and sharia banks in Indonesia and Malaysia during the period 2021-2024? 5) Are there differences

in the influence of credit risk, operational efficiency, and capital adequacy on financial sustainability between banks in Indonesia and banks in Malaysia during the period 2021-2024? 6) Are there differences in the influence of credit risk, operational efficiency, and capital adequacy on financial sustainability between conventional banks and sharia banks in Indonesia and banks in Malaysia during the period 2021-2024?

Meanwhile, the objectives of this study include: 1) To analyze the partial influence of credit risk on financial sustainability in conventional and sharia banks in Indonesia and Malaysia during the period 2021-2024; 2) To analyze the partial influence of operational efficiency on financial sustainability in conventional and sharia banks in Indonesia and Malaysia during the period 2021-2024; 3) To analyze the partial influence of capital adequacy on financial sustainability in conventional and sharia banks in Indonesia and Malaysia during the period 2021-2024; 4) To analyze the simultaneous influence of credit risk, operational efficiency, and capital adequacy on financial sustainability in conventional and sharia banks in Indonesia and Malaysia during the period 2021-2024; 5) To analyze the differences in the impact of credit risk, operational efficiency, and capital adequacy on financial sustainability between banks in Indonesia and banks in Malaysia during the period 2021-2024; 6) To analyze the differences in the influence of credit risk, operational efficiency, and capital adequacy on financial sustainability between conventional banks and sharia banks during the period 2021-2024.

2. Literature Review

2.1. Sustainability Theory

According to Du Plessis in 2002, sustainability in its broadest sense can be defined as conditions that enable human survival, and to achieve these conditions, the following are required both intra- and extra-generationally: justice, the fulfillment of society's needs in a manner that is appropriate, a balance between those needs and the carrying capacity of the earth, and prosperity. (Joseph et al., 2022, p. 3)

According to Hutton & Cox, the Theory of Sustainability conveys harmony in the interconnected economic, social, and environmental aspects, and challenges in the social and environmental fields are closely related to the rate of bank growth and innovation. (Fortuna et al., 2024, pp. 259-260) Sustainability means encouraging something to maintain a lasting form of life. (Rahmawati et al., 2023, p. 27)

2.2. Signal Theory

According to Spence in Sartono in 2010, in banking, signaling theory explains how businesses provide useful information signals to interested parties, including customers, regarding financial reports. Signaling theory describes signals from senders who have information in the form of descriptions of company conditions that are useful and needed by recipients. (Febbytia et al., 2022, pp. 3-4)

Signal theory or communication theory is an important concept in various disciplines, especially management, economics, and accounting. Therefore, a good understanding of signal

theory can help companies design effective financial reporting strategies. (Kurnia et al., 2024, pp. 196-197)

A significant problem for both conventional and sharia banks is non-performing loans. Non-performing loans are more common in sharia banks than in conventional banks. (Kadir et al., 2021, p. 208) On the other hand, the Capital Adequacy Ratio compares the amount of capital required by banks. (Nadlira et al., 2022, p. 22) Meanwhile, Return on Assets (ROA), which is often used as a measure of financial health, is an important indicator for assessing a bank's ability to maximize its assets to generate profits. (Kartika et al., 2025, pp. 291-292) On the other hand, the operational efficiency ratio evaluates how well a bank performs its operational tasks and is also referred to as the Operational Expense to Operating Income Ratio (BOPO). (Situmorang et al., 2024, p. 70)

2.3. Financial Sustainability

An organization's ability to pay all of its expenses from operating income without requiring external funding or subsidies is known as financial sustainability. (Suwarsono & Idris, 2024, p. 9) The concept of sustainability refers to a sustainable program, meaning that the program can continue to function as a financial institution that contributes to development progress and has the capacity to carry out activities or services to achieve its objectives and functions as a sound financial institution. If the percentage is higher than 100%, financial sustainability can be considered good. This means that the bank's total income must be greater than its total expenses within a certain period of time. (Munandar & Aravik, 2022, p. 52)

In this study, financial sustainability is measured using the Return on Assets (ROA) indicator. ROA was chosen as an indicator because it reflects a bank's ability to utilize all of its assets to generate consistent profits. ROA is also the most commonly used financial performance indicator to assess the effectiveness of asset management, while also illustrating the extent to which a bank is able to maintain its profitability on a sustainable basis. ROA is also used to assess how profitable a business is in carrying out all of its operations. This ratio shows the proportion of net profit to capital invested in assets. (Kumaidi, 2025, p. 2236) A lower ROA indicates a weakening of the bank's capacity to manage assets to increase revenue and cut costs. (Nungcahyani & Wahyudi, 2024, p. 879) This ratio can be formulated as follows:

$$ROA = \frac{\text{Net Profit}}{\text{Total Assets}} \times 100\%$$

2.4. Credit Risk

According to Ferry and Sugiarto, "Credit risk is defined as the risk of loss associated with the borrower (counterparty) being unable or unwilling to fulfill their obligation to repay the borrowed funds in full at maturity or thereafter." According to Kasmir: "Credit risk results from uncollectible credit due to a grace period (term) for repayment." (Yanti, 2020, p. 95) Maintaining asset quality is a challenge for sharia banking. The non-performing loan (NPL) ratio for conventional banks and the non-performing financing (NPF) ratio for sharia banks

have increased in line with the slowdown in loan growth for all banks in Indonesia, both conventional and sharia. (Afivi & Fitri, 2025, p. 8689)

Supriatini & Sulindawati in 2021 defined NPL as the ratio of total loans granted by banks to the amount of loans issued at the collection rate, or non-performing loans. The non-performing loan rate, or NPL, is a metric that can be used to evaluate how well a bank is performing. (Desy et al., 2025, p. 1169) According to Mutiah, in 2020, bad debt was defined as the disbursement of cash by financial institutions, including sharia banks, in situations where client payments contained problems including bad debts, late installment payments, and debtors who failed to fulfill their obligations. Both parties are harmed by this situation. (Fadhilah & Purbayati, 2025, p. 193) Meanwhile, Bank Indonesia classifies non-performing loans into several groups, such as loss loans, doubtful loans, and substandard loans. Banks must aggressively control bad debt to keep it below the mandatory maximum limit of 5%. (Ariyani et al., 2025, p. 1547)

In this study, credit risk is measured using the NPL indicator for conventional banks and the NPF indicator for sharia banks. Both indicators are used as variables to measure the credit risk level of each type of bank, using the following formula:

NPL Formula :

$$NPL = \frac{\text{Non – Performing Loans}}{\text{Total Credit}} \times 100\%$$

NPF Formula :

$$NPF = \frac{\text{Non – Performing Financing}}{\text{Total Financing}} \times 100\%$$

2.5. Operational Efficiency

A business's ability to produce the most output with the least amount of resources while maintaining the quality of its goods or services is known as operational efficiency. Meanwhile, in Lean Thinking, Womack and Jones stated in 1996 that operational efficiency is also related to eliminating waste at every stage of the manufacturing or service process. (Ariyandi & Purwanti, 2025, p. 329)

The BOPO variable (Operating Expenses to Operating Income) is used in this study to measure operational efficiency. The ability of bank management to manage operating expenses in relation to income is measured through the BOPO ratio itself. Bank operations are more efficient when the BOPO ratio is lower, and vice versa. (Onoyi & Windayati, 2021, p. 20) BOPO is used to measure the ability and effectiveness of banks in conducting their daily business. (Subaktiar et al., 2024, p. 274) Conversely, Riyadi in Fadhilah & Suprayogi in 2019 stated that a lower BOPO ratio indicates better bank management performance because it makes better use of existing resources. (S et al., 2024, p. 123) BOPO is calculated using the following formula:

$$BOPO = \frac{\text{Operating Costs}}{\text{Operating Revenue}} \times 100\%$$

2.6. Capital Adequacy

According to Mawardi in 2021, capital adequacy is one of the main indicators in assessing the financial stability of an institution and its ability to manage risk. A level of capital adequacy that complies with minimum banking requirements has an impact on financial performance. Sufficient capital that remains within regulatory limits can drive an increase in interest income and profits, which ultimately strengthens the bank's financial performance. (Oktiandra & Pambudi, 2025, p. 96)

Because the Capital Adequacy Ratio (CAR) is a global standard for evaluating a bank's risk-absorbing capital, this ratio is used in this study to determine capital adequacy. In 2013, Mia Lasmi defined the Capital Adequacy Ratio (CAR) as a bank's ability to use its current capital to offset potential losses in credit or securities trading. (Arseto et al., 2022, p. 911) Based on Bank Indonesia Regulation No. 15/12/PBI/2013, the CAR value is evaluated and set at a minimum of 8%. (Nuramal et al., 2024, pp. 498-499) The Capital Adequacy Ratio (CAR) is calculated using the following formula:

$$CAR = \frac{\text{Total Capital Bank}}{\text{Risk - Weighted Assets (RWA)}} \times 100\%$$

3. Research Method

Quantitative methods were used in this study by utilizing secondary data. Secondary sources include books, scientific papers or journals, and other sources related to the research subject. Quantitative research is a methodical study of events through the collection of data that can be assessed using statistical, mathematical, or computer methods. Meanwhile, secondary data is information that has been collected by other researchers and is available to researchers for specific study purposes. (Hambali et al., 2024, p. 47) The data sources used in this study were official publications from the Financial Services Authority, official publications from Bank Negara Malaysia, and the annual reports of each bank. In addition, this study also uses a comparative study method. According to Sugiyono in 2017, comparative research is part of research that aims to compare the occurrence of one or more variables in two samples or at different times. (Rosalia et al., 2025, p. 264)

The researchers in this study used Stata/MP 17 software to process the data. The research period used was four years, from 2021 to 2024. The technique used was "panel data regression analysis with multiple linear regression, because this study also used dummy variables." The population in this study was "all conventional banks and sharia banks in Indonesia and Malaysia." Meanwhile, "the hypothesis criteria in this study are H₀: Independent variables do not influence dependent variables, and H₁: Independent variables influence dependent variables." Meanwhile, the sample in this study "was determined using purposive sampling, which is a sampling method based on certain considerations tailored to the research objectives." This technique was chosen because not all conventional banks and sharia banks in Indonesia

and Malaysia had complete data during the observation period, so only banks that met certain criteria could be used as research samples.

The criteria used in determining the sample include the following:

1. The bank is a conventional commercial bank and/or sharia commercial bank that operates commercially;
2. The bank originates from Indonesia and/or Malaysia as the focus of comparison in cross-country comparative research;
3. The bank has complete financial reports and bank publications available for the 2021-2024 research period;
4. The bank provides complete, consistent, and accessible data for all research variables, namely financial sustainability, credit risk, operational efficiency, and capital adequacy, each of which is proxied by Return on Assets (ROA), Non-Performing Loans/Non-Performing Financing (NPL/NPF), Operating Expenses to Operating Income (BOPO), and Capital Adequacy Ratio (CAR);
5. The bank operates actively and continuously during the research period and does not experience mergers, acquisitions, or significant structural changes that could influence the consistency and comparability of the research data.

Based on the five selection criteria, this study identified 16 conventional commercial banks and/or sharia commercial banks as samples. The list of banks is as follows:

Table 1. List of research samples

No.	Bank	No.	Bank
1.	PT Bank Mandiri (Persero) Tbk.	9.	PT Bank BTPN Syariah Tbk.
2.	PT Bank Rakyat Indonesia (Persero) Tbk.	10.	PT Bank Mega Syariah
3.	PT Bank Negara Indonesia (Persero) Tbk.	11.	Malayan Banking Berhad
4.	PT Bank Central Asia Tbk.	12.	CIMB Group Holdings Berhad
5.	PT Bank CIMB Niaga Tbk.	13.	Public Bank Berhad
6.	PT Bank Danamon Indonesia Tbk.	14.	Maybank Islamic Berhad
7.	PT Bank Syariah Indonesia Tbk.	15.	CIMB Islamic Bank Berhad
8.	PT Bank Muamalat Indonesia Tbk.	16.	Bank Islam Malaysia Berhad

4. Findings and Discussion

4.1. Descriptive Statistical Analysis

Before conducting further analysis, the data was first cleaned using descriptive statistics. (Martias, 2021, p. 40)

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. dev.	Min	Max
Y (ROA)	64	1.986719	.7995655	.8	4

X1 (NPL/NPF)	64	1.985937	.9509589	.65	4.5
X2 (BOPO)	64	64.85313	11.62044	41	92
X3 (CAR)	64	22.36484	2.761709	18	30.5

Source: Stata/MP 17 data processing results

The table above shows that the mean is higher than the standard deviation, indicating that the data tends to be stable and does not show significant differences between observations. This condition indicates that the data is in a reasonable pattern and can be considered good and ready for further analysis.

4.2. Testing Classical Assumptions in Panel Data

4.2.1. Normality Test

The Skewness-Kurtosis test is a data normality test used as a comparison because, when applied to data with a mean value less than the standard deviation, this test still has the ability to provide an assessment of normality. (Sintia et al., 2022, p. 327)

Table 3. Skewness Kurtosis Test

Skewness and kurtosis tests for normality

Variable	Obs	Pr(skewness)	Pr(kurtosis)	Adj chi2(2)	Prob>chi2
Y (ROA)	64	0.2034	0.8489	7.62	0.0822
X1 (NPL/NPF)	64	0.1093	0.2221	4.20	0.1227
X2 (BOPO)	64	0.8040	0.5779	0.38	0.8285
X3 (CAR)	64	0.1025	0.2235	3.05	0.0603

Source: Stata/MP 17 data processing results

Based on the results of the Skewness Kurtosis test above, it can be seen that Prob>chi2 for each variable exceeds alpha 5%. Therefore, it can be concluded that all variables are normally distributed.

4.2.2. Multicollinearity Test

Table 4. Multicollinearity Test

Variable	VIF	1/VIF
X2 (BOPO)	4.94	0.198287
X1 (NPL/NPF)	4.81	0.207967
X3 (CAR)	1.21	0.823378
Mean VIF	3.65	

Source: Stata/MP 17 data processing results

Based on the results of the Variance Inflation Factor (VIF) test, the average VIF is 3.65. Therefore, at a level of 10% and even at a level of 5% (alpha), there is no multicollinearity problem in this research regression model.

4.2.3. Heteroscedasticity Test

Table 5. Heteroscedasticity Test

=====	
* OLS Glejser Lagrange Multiplier Heteroscedasticity Test	
=====	
Ho: No Heteroscedasticity - Ha: Heteroscedasticity	
Glejser LM Test	= 0.49504
Degrees of Freedom	= 3.0
P-Value > Chi2(3)	= 0.91998

Source: Stata/MP 17 data processing results

The test results show that Glejser LM is 0.49504 with df of 3.0 and p-value of 0.91998. Since the p-value is well above 0.05, there is no heteroscedasticity. This means that the residual variance is homogeneous (homoscedasticity) and the regression model is considered stable and suitable for use.

4.3. Multiple Linear Regression Analysis

Table 6. Multiple Linear Regression Analysis

Source	SS	df	MS	Number of obs = 64		
				F(5, 58)	=	69.13
Model	34.4893073	5	6.89786146	Prob > F	=	0.0000
Residual	5.78690432	58	.099774212	R-squared	=	0.8563
				Adj R-squared	=	0.8439
Total	40.2762116	63	.639304946	Root MSE	=	.31587
Y (ROA)	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
X1 (NPL/NPF)	-.1406057	.1138322	-1.24	0.222	-.3684657	.0872542
X2 (BOPO)	-.0567572	.0087809	-6.46	0.000	-.0743342	-.0391803
X3 (CAR)	.0238666	.0280654	0.85	0.399	-.0323124	.0800455
Indonesia	1.532713	.2009471	7.63	0.000	1.130474	1.934952
Malaysia	0	(omitted)				
Conventional Bank	-.1285857	.098655	-1.30	0.198	-.3260651	.0688938
Sharia Bank	0	(omitted)				
_cons	4.527449	.9604331	4.71	0.000	2.604933	6.449965

Source: Stata/MP 17 data processing results

Regression analysis results:

- The regression model is significant and feasible to use, because the F test shows a Prob. value of 0.000, meaning that the variables collectively affect ROA.
- BOPO is the only variable that has a significant influence, with a negative relationship, meaning that the higher the BOPO, the lower the ROA.
- NPL/NPF and CAR do not significantly affect ROA, although their directions are negative (NPL) and positive (CAR), respectively.
- Country has a significant influence, with banks in Indonesia having higher ROA than those in Malaysia.
- Bank type (conventional vs sharia) is not significant, so that the two do not show a statistically significant difference in ROA.

4.4. F Test and R-Squared

The F test is used to simultaneously show how independent factors influence dependent variables. The R-Squared test, on the other hand, aims to determine the extent to which variations in independent variables explain variations in dependent variables.

4.4.1. Determination Coefficient Test and F Test

Table 7. Results of the Coefficient of Determination Test and F Test

R-squared	Adj R-squared	f-count	f-table	Hypothesis	Results
0.8563	0.8439	69.13	2.36	H ₀ is rejected	Simultaneously Influence

Based on the regression results from this research model, it can be concluded that:

- An R-squared value of 0.8563 indicates that the variables of credit risk, operational efficiency, capital adequacy, country, and bank type can explain 85.63% of the variation in Financial Sustainability (ROA).
- The adjusted R-squared value is 0.8439, which means that after adjusting for the number of variables and samples, the model is still able to explain 84.39% of the variation in ROA. This shows that the model used is very strong and stable.
- The calculated F value of 69.13 is greater than the F table value of 2.36, indicating that the regression model used is simultaneously significant.
- Because F count > F table, H₀ is rejected, which means that all independent variables together have a significant influence on Financial Sustainability (ROA).

The results above indicate that the regression model used can be considered feasible, valid, and capable of explaining most of the ROA variation in conventional and sharia banks in Indonesia and Malaysia.

4.5. T Test

Table 8. T Test Results

Variable	t-count	t-table	p-value	Hypothesis	Results
X1 (NPL/NPF)	-1.24	1.999	0.222	H ₀ is accepted	Not Significantly Influence
X2 (BOPO)	-6.46	1.999	0.000	H ₀ is rejected	Significantly Influence
X3 (CAR)	0.85	1.999	0.399	H ₀ is accepted	Not Significantly Influence
D1 - Country Dummy (Indonesia = 1, Malaysia = 0)	7.63	1.999	0.000	H ₀ is rejected	Significantly Influence
D2 - Bank Type Dummy (Conventional = 1, Sharia = 0)	-1.30	1.999	0.198	H ₀ is accepted	Not Significantly Influence

The following is an interpretation of the table above:

1. NPL/NPF has a “calculated t-value of $-1.24 < t\text{-table } 1.999$ and a p-value of $0.222 > 0.05$, so H₀ is accepted, which means that NPL/NPF does not have a significant influence on ROA.”
2. BOPO has a “calculated t-value of $-6.46 > t\text{-table } 1.999$ and a p-value of $0.000 < 0.05$, so H₀ is rejected, which means that BOPO has a significant negative influence on ROA, indicating that the higher the BOPO, the more the ROA variable tends to decrease.”
3. CAR has a “calculated t-value of $0.85 < t\text{-table of } 1.999$ and a p-value of $0.399 > 0.05$, so H₀ is accepted, which means that CAR has no significant influence on ROA.”
4. The Country Dummy variable (Indonesia vs Malaysia) has a “calculated t-value of $7.63 > t\text{-table } 1.999$ and a p-value of $0.000 < 0.05$, so H₀ is rejected, meaning that the Country Dummy variable (Indonesia vs Malaysia) has a significant positive influence, indicating that ROA for banks in Indonesia is higher than in Malaysia.”
5. The Bank Type Dummy Variable (Conventional vs Sharia) has a t-value of $-1.30 < t\text{-table } 1.999$ and a p-value of $0.198 > 0.05$, so H₀ is accepted, which means that the Bank Type Dummy Variable (Conventional vs Sharia) does not have a significant influence on ROA.

The Influence of Credit Risk on Financial Sustainability in Conventional and Sharia Banks in Indonesia and Malaysia during the Period 2021-2024

The results show that “credit risk measured using the NPL/NPF ratio does not have a significant influence on financial sustainability (ROA). This is evidenced by a t-value of -1.24, which is smaller than the t-table value of 1.999, and a p-value of 0.222, which is above the 5% significance level. The regression coefficient of -0.1406 indicates that the direction of the influence is negative, but the magnitude of the influence is not statistically strong enough to affect changes in ROA. It can be concluded that variations in credit risk at conventional and sharia banks in Indonesia and Malaysia during the 2021-2024 period do not have a significant

impact on the level of financial sustainability.” This finding is in line with the Theory of Sustainability and Signaling Theory, which explains that credit risk (NPL/NPF) that can still be controlled through banking risk management does not yet constitute a strong negative signal for stakeholders and therefore does not have a significant influence on the financial sustainability (ROA) of banks.

These results are reinforced by previous research conducted by Adi Santoso in 2016 entitled “Peningkatan Profitabilitas pada Industri Perbankan Go-Publik di Indonesia.” His research shows that “the NPL variable does not have a significant influence on return on assets.” (Santoso, 2016, p. 1) Previous research was also conducted by Retno Puji Astuti in 2022 entitled “Pengaruh CAR, FDR, NPF, dan BOPO terhadap Profitabilitas Perbankan Syariah.” The results of her research show that “NPF does not have a significant influence on profitability (ROA).” (R. P. Astuti, 2022, p. 3213)

The Influence of Operational Efficiency on Financial Sustainability in Conventional and Sharia Banks in Indonesia and Malaysia during the Period 2021-2024

The results show that “operational efficiency measured using the BOPO ratio has a significant partial influence on financial sustainability (ROA). This is evidenced by a t-value of -6.46, which is much greater in absolute terms than the t-table value of 1.999, and a p-value of 0.000, which is well below the 5% significance level. The regression coefficient of -0.0568 shows that the influence of BOPO on ROA is negative, so that the higher the BOPO value, which reflects an increase in operational costs, the lower the level of financial sustainability of the bank.” These results are in line with the Theory of Sustainability and Signaling Theory, which emphasize that operational efficiency is a key factor in financial sustainability, where an increase in BOPO reflects inefficiency that sends a negative signal to stakeholders and significantly reduces the bank’s ability to maintain financial sustainability (ROA).

These findings indicate that during the period 2021-2024, operational efficiency is a strong factor in determining financial sustainability performance in both conventional and sharia banks in Indonesia and Malaysia. These results are reinforced by previous research conducted by Yuha Nadhirah Qintharah and Ety Murwaningsari in 2024, entitled “Kecukupan Modal Memoderasi Efisiensi Operasional dan Diversifikasi Pendapatan terhadap Keberlanjutan Finansial.” Their research results state that “operational efficiency (BOPO) has a significant negative influence on financial sustainability.” (Qintharah & Murwaningsari, 2024, p. 11) Another study was conducted by Nur Azizah Syamsuddin & Rifqi Nur Wahyudi in 2025 entitled “Pengaruh Risiko Kredit dan Efisiensi Operasional terhadap Kinerja Keuangan pada Perusahaan Perbankan Konvensional yang Terdaftar di Bursa Efek Indonesia.” The results of the analysis show that “partially, operational efficiency (BOPO) has a negative and significant influence on financial performance (ROA).” (Syamsuddin & Wahyudi, 2025, p. 2)

The Influence of Capital Adequacy on Financial Sustainability in Conventional and Sharia Banks in Indonesia and Malaysia during the Period 2021-2024

The results show that “capital adequacy measured using the Capital Adequacy Ratio (CAR) does not have a significant partial influence on financial sustainability (ROA). This is

evidenced by a t-value of 0.85, which is smaller than the t-table value of 1.999, and a p-value of 0.399, which is well above the significance threshold of 5%. The regression coefficient of 0.0239 indicates a positive relationship, but it is not statistically strong enough to indicate a real influence. Thus, in the 2021-2024 period, the level of capital adequacy has not been able to contribute significantly to improving financial sustainability in conventional and sharia banks in Indonesia and Malaysia.”

This finding is in line with the Theory of Sustainability and Signaling Theory, which explains that capital adequacy (CAR) functions more as a risk buffer to maintain bank stability than as a direct driver of profitability. Therefore, as long as CAR is above the minimum regulatory requirement, its variation is not a strong enough signal to significantly affect financial sustainability (ROA). These results are reinforced by previous research conducted by Ike Dwi Astuti & Nur Kabib in 2021 entitled “Faktor-faktor yang Mempengaruhi Profitabilitas Bank Syariah Indonesia dan Malaysia.” The results of their research show that “CAR has no significant influence on ROA.” (I. D. Astuti & Kabib, 2021, p. 1053)

The Simultaneous Influence of Credit Risk, Operational Efficiency, and Capital Adequacy on Financial Sustainability in Conventional and Sharia Banks in Indonesia and Malaysia during the Period 2021-2024

The results of the study indicate that “Credit Risk, Operational Efficiency, and Capital Adequacy simultaneously have a significant influence on Financial Sustainability in Conventional Banks and Sharia Banks in Indonesia and Malaysia during the period 2021-2024. This is evidenced by the F-value of 69.13, which is much greater than the F-table value of 2.36, so that H_0 is rejected and the model is statistically significant. Empirically, the ability of independent variables to explain variations in Financial Sustainability is reflected in the R-squared (R^2) value of 0.8563, which means that 85.63% of changes in Financial Sustainability can be explained by Credit Risk, Operational Efficiency, and Capital Adequacy. Meanwhile, the Adjusted R-squared (Adjusted R^2) value of 0.8439 indicates that after considering the number of variables in the model, 84.39% of the variation in Financial Sustainability can still be strongly explained, so the model is considered stable and there is no overfitting.”

This finding is in line with the Theory of Sustainability and Signaling Theory, which asserts that a bank’s financial sustainability is determined by the simultaneous interaction between credit risk management, operational efficiency, and capital adequacy, where the combination of these three factors collectively forms a strong financial performance signal that significantly influences financial sustainability (ROA). These results are reinforced by previous research conducted by Siti Kartika Rahmatillah in 2025 entitled “The Effect of Credit Risk and Operational Efficiency on the Profitability of Islamic Banks: A Comparative Study of Indonesia and Malaysia 2017-2024.” The results of the study show that “NPF and BOPO simultaneously have a significant influence on ROA with a coefficient of determination of 72.56%. Partially, NPF has no significant influence, while BOPO has a significant negative influence.” (Rahmatillah et al., 2025, p. 190) However, the research conducted by Siti Kartika Rahmatillah did not include the Capital Adequacy Ratio (CAR) variable.

Significant Differences in the Influence of Credit Risk, Operational Efficiency, and Capital Adequacy on Financial Sustainability between Banks in Indonesia and Banks in Malaysia during the Period 2021-2024

The results of the study indicate that “there are significant partial differences in the influence of Credit Risk, Operational Efficiency, and Capital Adequacy on Financial Sustainability between banks in Indonesia and banks in Malaysia for the period 2021-2024. Empirical evidence is shown by the country dummy t-value of 7.63, which is much greater than the t-table value of 1.999, and a p-value of $0.000 < 0.05$, so it can be concluded that the influence of these three variables on Financial Sustainability (ROA) differs significantly between the two countries. Empirically, banks in Indonesia have consistently higher Financial Sustainability (ROA) than banks in Malaysia, as evidenced by the country dummy coefficient of 1.532713, which indicates a strong positive direction of influence. This finding indicates that the sensitivity of Financial Sustainability (ROA) to changes in Credit Risk, Operational Efficiency, and Capital Adequacy is much greater and more profitable for banks in Indonesia.”

These findings are consistent with the Theory of Sustainability and Signaling Theory, which explain that differences in institutional environments, banking regulations, industrial efficiency levels, and macroeconomic stability between countries cause differences in the sensitivity of financial performance to credit risk, operational efficiency, and capital adequacy, so that the influence of these three variables on the financial sustainability (ROA) of banks in Indonesia and Malaysia differs significantly. These results are reinforced by previous research conducted by Amandha Pangestika Dewi in 2018 entitled “Studi Perbandingan CAR, BOPO, NPF dan Profitabilitas ROE Bank Syariah di Indonesia dan Malaysia.” Her research findings state that “there are differences in CAR, BOPO, NPF, and ROE between sharia banks in Indonesia and sharia banks in Malaysia.” (Dewi, 2018, p. 1) Another previous study was conducted by Ayukha Asna Levia & Sri Sulasmiyati in 2017 entitled “Analisis Komparasi Kinerja Perbankan Terbesar di Indonesia dan Malaysia (Studi pada Bank Umum di Indonesia dan Malaysia Tahun 2011 - 2015).” The results of the study stated that “there is a significant difference in the profitability indicator of the ROA ratio of banks in Indonesia and Malaysia. The average ROA in Indonesia is 4.02% higher than the average ROA in Malaysia, which is 1.36%.” (Levia & Sulasmiyati, 2017, p. 47)

Significant Differences in the Influence of Credit Risk, Operational Efficiency, and Capital Adequacy on Financial Sustainability between Conventional Banks and Sharia Banks in Indonesia and Malaysia during the Period 2021-2024

The results of the study indicate that “there is no significant difference in the partial influence of Credit Risk, Operational Efficiency, and Capital Adequacy on Financial Sustainability between Conventional Banks and Sharia Banks in the 2021-2024 period. Empirical evidence is shown by the t-value of the bank type dummy of -1.30, which is smaller than the t-table of 1.999, and a p-value of $0.198 > 0.05$, so that the influence of these three variables on Financial Sustainability (ROA) is declared to be statistically insignificant between the two types of banks.”

This finding is in line with the Theory of Sustainability and Signaling Theory, which explains that similarities in regulatory frameworks, prudential principles, and banking supervision standards cause credit risk, operational efficiency, and capital adequacy to have a relatively similar influence on financial sustainability (ROA) in conventional banks and sharia banks, thus not causing significant differences between the two. These results are reinforced by previous research conducted by Akhmad Akbar Susamto in 2020 entitled “Comparing Credit Risk in Islamic and Conventional Banking Using Bank-Level Panel Data.” Based on his analysis, he states that “there is no difference between the level of credit risk in sharia banking and the level of credit risk in conventional banking.” (Susamto et al., 2020, pp. 235-236)

Conclusion

Based on the results of the study, it can be concluded that credit risk, proxied by NPL/NPF, and capital adequacy, proxied by CAR, do not have a significant partial influence on financial sustainability, proxied by ROA, while operational efficiency, proxied by BOPO, has a negative and significant partial influence on financial sustainability. Meanwhile, simultaneously, credit risk, operational efficiency, and capital adequacy have a significant influence on the financial sustainability of banks. In addition, the results of the comparative analysis show that there are differences in financial sustainability between banks in Indonesia and Malaysia, but there are no significant differences between conventional banks and sharia banks.

Theoretically, the findings of this study are in line with the Theory of Sustainability, which asserts that the financial sustainability of banks is determined by their ability to maintain operational efficiency and manage various risk factors in an integrated manner over the long term. In addition, the results of this study also support Signaling Theory, in which financial performance indicators such as BOPO, NPL/NPF, and CAR serve as signals for stakeholders, but only operational efficiency has been proven to be the dominant signal that directly affects the financial sustainability of banks.

Further research is expected to develop studies on banking financial sustainability by extending the observation period, adding other relevant variables, and using alternative indicators to produce more comprehensive findings. The development of this research is important to enrich the empirical literature in the banking sector and provide input for regulators and bank management in their efforts to maintain the stability and sustainability of banking performance in the future.

References

- A'laa, S., & Sahliyah, F. (2025). Pengaruh Ukuran Aset, Equity to Total Assets, dan Capital Adequacy Ratio terhadap Kinerja Keuangan Bank Umum Syariah. *NISBAH: Jurnal Perbankan Syariah*. 11(1): 62-72.
- Afivi, M., & Fitri, A. O. (2025). Analisis Faktor-faktor yang Mempengaruhi Non-Performing Financing (NPF) pada Perbankan Syariah. *JIIIC: Jurnal Intelek Insan Cendikia*. 2(5): 8697-8707.

- Aliefah, A. N. (2021). Pengaruh Inflasi, Tingkat Suku Bunga, Nilai Tukar, PDB, bagi hasil terhadap Deposito Mudharabah Bank Syariah Bukopin. *LABATILA: Jurnal Ilmu Ekonomi Islam*. 05(01): 45-70.
- Amanda, F. A., Yafiz, M., & Anggraini, T. (2024). Pengaruh Tingkat Bagi Hasil, Financing to Deposit Ratio (FDR) dan Inflasi terhadap Deposito Mudharabah Perbankan Syariah. *Jurnal Tabarru': Islamic Banking and Finance*. 7(1): 42-53.
- Amima, A. fildza, & Muharrami, R. S. (2025). The Effect of Capital Ratios, Credit Risk, and Inflation on Liquidity in Indonesian Islamic Commercial Banks. *Journal of Applied Economics in Developing Countries*. 10(1): 55-64.
- Ariningsih, N. D., Pamungkas, Z. B., & Lestari, T. I. (2023). Perlindungan Hukum terhadap Konsumen Pengguna Jasa Perbankan. *Prosiding Seminar Nasional Hukum, Bisnis, Sains dan Teknologi*. 487-496.
- Ariyandi, I. R., & Purwanti. (2025). Strategi Efektif untuk Meningkatkan Efisiensi Operasional Perusahaan. *Journal of Business Economics and Management*. 01(03): 328-334.
- Ariyani, D., Rahmayanti, D., Widyastuti, E., Arinta, Y. N., Saifudin, Nugraini, C. T. L., & Kamalia, N. (2025). How is the Role of BPRS Intermediation in Indonesia? Analysis of Internal and External Factors Towards Financing. *Proceedings of the International Conference of Islamic Economics and Business (ICONIES)*. 11(1): 1543-1556.
- Arseto, D. D., Arfah, Y., & Siregar, S. (2022). The Effect of Capital Adequacy Ratio (CAR) and Liquidity on Profitability of Islamic Commercial Banks in Indonesia for the 2016-2020 Period. *Jurnal Ilmiah Ekonomi Islam*. 8(01): 909-915.
- Astuti, I. D., & Kabib, N. (2021). Faktor-faktor yang Mempengaruhi Profitabilitas Bank Syariah Indonesia dan Malaysia. *Jurnal Ilmiah Ekonomi Islam*. 7(02): 1053-1067.
- Astuti, R. P. (2022). Pengaruh CAR, FDR, NPF, dan BOPO terhadap Profitabilitas Perbankan Syariah. *Jurnal Ilmiah Ekonomi Islam*. 8(03): 3213-3223.
- Azzahra, T. F., Sholahuddin, M., & Soepatini. (2023). Comparative Analysis of Islamic Banks' Performance in Indonesia and Malaysia with RGEC and the Islamicity Performance Index (2018-2021). *Kontigensi: Jurnal Ilmiah Manajemen*. 11(1): 261-272.
- Desy, F. S., Nurulrahmatiah, N., & Muniarty, P. (2025). Pengaruh Non Performing Loan (NPL), Capital Adequacy Ratio (CAR) dan Net Interest Margin (NIM) terhadap Harga Saham pada Bank BUMN. *Ekopedia: Jurnal Ilmiah Ekonomi*. 1(3): 1165-1180.
- Dewi, A. P. (2018). *Studi Perbandingan CAR, BOPO, NPF dan Profitabilitas ROE Bank Syariah di Indonesia dan Malaysia*.
- Fadhilah, F. I., & Purbayati, R. (2025). The Influence of Internal and External Factors on the Level of Non-Performing Financing in Sharia Banks in Indonesia for the Period 2014-2023. *Indonesian Journal of Economics and Management*. 5(2): 190-203.

- Fathihani, Saputri, I. P., & Randyantini, V. (2025). Capital Adequacy, Credit Risk, and Efficiency in Islamic Bank Profitability. *Involvement International Journal of Business*. 2(2): 120-130.
- Febbytia, A., Nurbaity, & Putri, A. R. (2022). Equivalent Rate for Islamic Banks According to Signal Theory Perspective. *Islamic Accounting Journal*. 2(2): 1-14.
- Fortuna, S. M., Eliza, A., & Nurmalia, G. (2024). Determinan Financial Sustainability Ratio Bank Umum Syariah di Indonesia. *AT-TAWASSUTH: Jurnal Ekonomi Islam*. 9(2): 255-274.
- Hakim, L. Al, Daylami, I., & Albart, N. (2024). Systematic Literature Review: Pengaruh CAR, LDR, NPL, dan BOPO terhadap ROA Bank yang Terdaftar pada Bursa Efek Indonesia Tahun 2014 - 2024. *Jurnal Pendidikan Indonesia*. 5(11): 1357-1364.
- Hambali, F., Gitama, G. N. D. P., & Pranata, S. (2024). Pengaruh Insentif dalam Meningkatkan Kinerja Karyawan pada Ninja Express Cirebon. *Jurnal Witana (JW)*. 02(01): 45-49.
- Hilman, I. (2020). Komparasi Performa Keuangan Bank Syariah Indonesia dan Bank Syariah Malaysia. *Jurnal Manajemen dan Bisnis Sriwijaya*. 18(1): 1-14.
- Ikramina, C., & Sukmaningrum, P. S. (2021). Macroeconomic Factors on Non-Performing Financing in Indonesian Islamic Bank: Error Correction Model Approach. *JEBIS: Jurnal Ekonomi dan Bisnis Islam*. 7(1): 34-50.
- Joseph, S. K., Ralwala, A. O., Towey, I. N. W., & Mutisya, E. (2022). Sustainability Theory: Synopsis, Concepts, Interpretations and Discourses. *Journal of the Kenya National Commission for UNESCO*. 2(1): 1-13.
- Kadir, R. D., Ratnasari, S. L., & Abduh, M. (2021). What Drives Non Performing Financing? Evidence from Islamic Rural Banks in Indonesia During Covid-19. *IKONOMIKA: Jurnal Ekonomi dan Bisnis Islam*. 6(2): 207-218.
- Kartika, B., Winarsih, S., & Ardana, Y. (2025). Kinerja Bank Syariah Indonesia: Analisis Pengaruh NPF, BOPO, dan CAR Tahun 2015-2024. *Journal of Artificial Intelligence and Digital Business (RIGGS)*. 4(2): 291-299.
- Kumaidi. (2025). Examining ROA, ROE, and FDR Contributions to CAR BSI During Post Pandemic (2021-2023). *El-Mal: Jurnal Kajian Ekonomi & Bisnis Islam*. 6(3): 2235-2246.
- Kurnia, R., Nugroho, L., & Janee-Ali, A. (2024). Signaling Theory VIS a VIS Bankruptcy Prediction Model in Islamic Bank Industry in Indonesia. *Aibi Research, Management and Engineering Journal*. 12(1): 195-203.
- Lestari, P. (2020). Analisis Komparatif Kinerja Keuangan Perbankan Syariah di Indonesia dan Malaysia dengan Pendekatan Metode CAMEL Periode 2014-2018. *Jurnal Masharif Al-Syariah: Jurnal Ekonomi dan Perbankan Syariah*. 5(2): 175-193.

-
- Levia, A. A., & Sulasmiyati, S. (2017). Analisis Komparasi Kinerja Perbankan Terbesar di Indonesia dan Malaysia (Studi pada Bank Umum di Indonesia dan Malaysia Tahun 2011 - 2015). *Jurnal Administrasi Bisnis (JAB)*. 51(2): 40-49.
- Martias, L. D. (2021). Statistika Deskriptif sebagai Kumpulan Informasi. *Fihris: Jurnal Ilmu Perpustakaan dan Informasi*. 16(1): 40-59.
- Munandar, A., & Aravik, H. (2022). Pengaruh Camel terhadap Financial Sustainability Ratio pada Bank Umum Syariah Periode Juni 2014 - Februari 2022. *Ekonomica Sharia: Jurnal Pemikiran dan Pengembangan Ekonomi Syariah*. 8(1): 49-58.
- Munifatussa'idah, A. (2020). Determinants Non-Performing Financing (NPF) in Indonesia Islamic Banks. *EQUILIBRIUM: Jurnal Ekonomi Syariah*. 8(2): 255-274.
- Nadlira, H. A., Banani, A., & Laksana, R. D. (2022). Analisis Pengaruh Intellectual Capital dan Rasio Keuangan terhadap Kinerja Keuangan Bank Umum Syariah di Indonesia (Studi Empiris pada Bank Umum Syariah yang terdaftar di Otoritas Jasa Keuangan Periode 2014-2019). *Indonesian Journal of Islamic Business and Economics*. 04(01): 16-39.
- Nungcahyani, S., & Wahyudi, A. (2024). Pengaruh Pembiayaan terhadap Profitabilitas (ROA) pada Bank Umum Syariah di Indonesia (2017-2022). *Jurnal Ilmiah Ekonomi Islam*. 10(01): 876-886.
- Nuramal, Amin, A., & Mispa, S. (2024). The Role of Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR) and Company Size on Profitability. *Al-Buhuts*. 20(1): 495-505.
- Nurhilmi, C., & Yuwono, M. (2025). Pengaruh Manajemen Aset, Leverage, Kecukupan Modal, dan Profitabilitas terhadap Risiko Likuiditas pada Bank Perkreditan Rakyat di Jawa Barat. *JPIM: Jurnal Penelitian Ilmiah Multidisipliner*. Vol. 01, No.04: 295-306.
- Oktiandra, S. N., & Pambudi, R. (2025). Pengaruh Kecukupan Modal, Tingkat Efisiensi Operasional, dan Risiko Kredit terhadap Kinerja Keuangan Perbankan Indonesia. *BALANCE: Jurnal Akuntansi, Auditing dan Keuangan*. 22(1): 89-109.
- Onoyi, N. J., & Windayati, D. T. (2021). Pengaruh Ukuran Perusahaan, Good Corporate Governance dan Efisiensi Operasi terhadap Kinerja Keuangan (Studi Kasus pada Bank BUMN yang Terdaftar di Bursa Efek Indonesia Tahun 2016-2020). *Zona Keuangan: Program Studi Akuntansi (S1) Universitas Batam*. 11(1): 15-28.
- Pungus, C. N., Maramis, J. B., & Karuntu, M. M. (2024). Pengaruh Return on Asset, Non-Performing Loan, Loan to Deposit Ratio terhadap Financial Sustainability dengan Nilai Perusahaan sebagai Variabel Intervening pada Perusahaan Perbankan yang Go Public. *Jurnal EMBA*. 12(01): 295-306.
- Qintharah, Y. N., & Murwaningsari, E. (2024). Kecukupan Modal Memoderasi Efisiensi Operasional dan Diversifikasi Pendapatan terhadap Keberlanjutan Finansial. *Akuntabilitas: Jurnal Ilmu Akuntansi*. 17(1): 11-20.

-
- Rahmatillah, S. K., Nanda, T. S. F., & Ayumiati. (2025). The Effect of Credit Risk and Operational Efficiency on the Profitability of Islamic Banks: A Comparative Study of Indonesia and Malaysia 2017-2024. *Journal of Sharia Economics*. 6(2): 190-211.
- Rahmawati, A. L., Arifin, L. S., & Dwisusanto, Y. B. (2023). Pendekatan Mimesis untuk Keberlanjutan Arsitektur Vernakular. *Archimane*. 1(1): 23-36.
- Raunaqa, Y., Deva, D. A. R., & Hana, K. F. (2022). Komparasi Kinerja Keuangan Bank Syariah Indonesia dan Bank Syariah Malaysia pada Masa Pandemi Covid-19. *Shafin: Sharia Finance and Accounting Journal*. 2(2): 128-143.
- Romauli, L. K. (2025). Pengaruh Arus Kas Operasional, Pertumbuhan Pendapatan, dan Efisiensi Operasional terhadap Kinerja Keuangan. *Jurnal Ilmu Akuntansi Value Relevance*. 3(1): 335-348.
- Rosalia, Putri, P. R., Fitriah, L. N., & Koto, I. (2025). Analisis Komparatif Implementasi Pendidikan Multikultural dalam Sistem Pendidikan Indonesia dan Kanada. *EDUCATIONAL : Jurnal Inovasi Pendidikan & Pengajaran*. 5(2): 261-272.
- S, A. D. K., Rusiadi, R., Efendi, B., & Nasution, L. N. (2024). Analisis Pengaruh Rasio-Rasio Keuangan terhadap Rasio Beban Operasional-Pendapatan Operasional (BOPO) pada Bank Umum Syariah di Indonesia. *Jurnal Ekonomi dan Pembangunan Indonesia*. 2(4): 118-136.
- Saddam, S. Z., Jaafar, M. N., Muhamat, A. A., Nizam, N. S. M., & Halim, N. A. (2024). Determinants of Islamic Banks' Stability in Malaysia and Indonesia. *The Indonesian Capital Market Review*. 16(1): 17-29.
- Saferi, D. M., & Sari, V. F. (2024). Pengaruh Budget Transparency dan Fiscal Autonomy terhadap Financial Sustainability: Studi Empiris pada Kabupaten dan Kota di Indonesia. *Jurnal Eksplorasi Akuntansi (JEA)*. 6(3): 1182-1196.
- Santoso, A. (2016). Peningkatan Profitabilitas pada Industri Perbankan Go-Publik di Indonesia. *Esensi: Jurnal Bisnis dan Manajemen*. 6(1): 1-16.
- Sintia, I., Pasarella, M. D., & Nohe, D. A. (2022). Perbandingan Tingkat Konsistensi Uji Distribusi Normalitas pada Kasus Tingkat Pengangguran di Jawa. *Prosiding Seminar Nasional Matematika, Statistika, dan Aplikasinya*. 2(2): 322-333.
- Situmorang, D. R., Sagala, F., Silitonga, I. M., Panjaitan, R. Y., & Sagala, L. (2024). Analysis of the Influence of Loan to Deposit Ratio, Capital Adequacy Ratio, Non-Performing Loan, Operational Efficiency Ratio, and Total Asset Turnover on Return on Asset of Commercial Bank Listed on the Indonesian Stock Exchange Period 2019 - 2023. *Jurnal Ilmiah AccUsi*. 6(1): 66-76.
- Subaktiar, S., Abdullah, U., & Radiah, R. (2024). Pengaruh Capital Adequacy Ratio (CAR), Non Performing Loan (NPL), Biaya Operasional terhadap Pendapatan Operasional (BOPO) terhadap Likuiditas yang Diukur dengan Loan to Deposit Ratio pada PT.

-
- Bank Mandiri (Persero) Tbk. *Jurnal Ekonomi dan Pembangunan Indonesia*. 2(1): 264-279.
- Sulistiyana, E., Gunarianto, & Survial. (2025). Profitabilitas dan Risiko Bank: Perspektif Mediasi Capital Adequacy Ratio pada Industri Perbankan Indonesia. *Jurnal PETA*. 10(2): 283-296.
- Susanto, A. A., Octavio, D. Q., & Wardani, D. T. K. (2020). Comparing Credit Risk in Islamic and Conventional Banking Using Bank-Level Panel Data. *Economica: Jurnal Ekonomi Islam*. 11(2): 235-262.
- Sutrisno. (2016). Risiko, Efisiensi dan Kinerja pada Bank Konvensional di Indonesia. *Jurnal Ilmiah Akuntansi dan Bisnis*. 11(2): 111-116.
- Suwarsono, B., & Idris, A. (2024). Review Literatur Financial Sustainability pada Lembaga Keuangan Mikro Lintas Negara. *Jurnal Cendekia Keuangan*. 3(1): 8-19.
- Syamsuddin, N. A., & Wahyudi, R. N. (2025). Pengaruh Risiko Kredit dan Efisiensi Operasional terhadap Kinerja Keuangan pada Perusahaan Perbankan Konvensional yang Terdaftar di Bursa Efek Indonesia. *Axegnal: Tax and Economic Insights Journal*. 1(3): 1-14.
- Wati, D. K., & Erikawati, C. (2024). Perbandingan Kinerja Keuangan antara Bank Konvensional dengan Syariah yang Terdaftar di Bursa Efek Indonesia pada Tahun 2020-2023. *Pajak dan Manajemen Keuangan*. 1(4): 179-190.
- Witanty, R., & Sukoco, A. (2025). The Effect of Capital Adequacy Ratio (CAR), Operating Income Operating Costs (BOPO), and Non-Performing Financing (NPF) on Return on Asset (ROA) at Indonesia-Malaysia Sharia Commercial Banks in 2019-2023. *International Journal of Management Finance*. 2(4): 28-39.
- Yanti, T. A. (2020). Analisis Pengaruh Risiko Kredit terhadap Profitabilitas Bank Syariah Sumatera Utara. *Ekonomi, Keuangan, Investasi dan Syariah (EKUITAS)*. 1(2): 93-99.
- Yusuf, N. A., Soleman, R., & Fala, D. Y. A. S. (2024). Analisis Perbandingan Kinerja Keuangan Bank Konvensional dan Bank Syariah. *Ekonomika45: Jurnal Ilmiah Manajemen, Ekonomi Bisnis, Kewirausahaan*. 11(2): 1088-1098.

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