



The Effect of Capital Adequacy Ratio, Debt Ratio, Credit Risk, Liquidity Risk, and Management Efficiency on Profitability: A Study of the Financial Institutions Sector, Banking Sub-Sector, Listed on the IDX for the 2020–2024 Period

Intan Novita Sari*, Supriyono, Hutomo Rusdianto

Universitas Muria Kudus

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*Correspondence: Intan Novita Sari

E-mail: 202011329@std.umk.ac.id

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Abstract: This study investigates the impact of capital adequacy ratio, debt ratio, credit risk, liquidity risk, and management efficiency on the profitability of banking institutions listed on the Indonesia Stock Exchange (IDX) during 2020–2024. Employing a quantitative approach, the research utilizes secondary data from annual financial reports of 47 banks, selected through purposive sampling. Data analysis was conducted using classical assumption tests and multiple linear regression. The results reveal that capital adequacy ratio and debt ratio do not significantly affect profitability, while credit risk and management efficiency have a significant negative effect. Liquidity risk shows a negative but insignificant impact. The findings indicate that effective credit risk management and operational efficiency are crucial for enhancing bank profitability. In conclusion, the simultaneous influence of all five variables explains a substantial portion of profitability variation, highlighting the importance of internal financial management in the banking sector.

Keywords: Capital Adequacy Ratio, Credit Risk, Debt Ratio, Liquidity Risk, Profitability

Introduction

Research Phenomenon

Banking profitability is a key indicator for assessing financial performance and the resilience of the financial sector, particularly in developing countries like Indonesia (Kasmir, 2016) (Hasanudin et al, 2023). During the 2020–2024 period, the profitability of banks listed on the Indonesia Stock Exchange (IDX) experienced significant fluctuations, primarily due to the Covid-19 pandemic, which reduced credit demand, increased the risk of non-performing loans, and suppressed liquidity (Saif-Alyousfi, 2022) (Jigeer & Koroleva, 2023). This phenomenon underscores the importance of analyzing internal factors such as the capital adequacy ratio, debt ratio, credit risk, liquidity risk, and management efficiency in determining bank profitability (Akther et al, 2023) (Rachman et al, 2023).

Research Problems

The decline in banking profitability during the pandemic has raised concerns for investors and bank management regarding business sustainability and competitiveness in the financial industry (Muhammed et al, 2024) (Anggraini et al, 2022). Investors tend to consider declining investment returns, which can impact investment interest in the banking sector (Jigeer & Koroleva, 2023) (Saif-Alyousfi, 2022). Furthermore, banks face challenges in maintaining financial performance, improving operational efficiency, and maintaining capital stability amid external and internal pressures (Akther et al, 2023) (Farooq et al, 2021).

Previous studies have shown mixed results regarding the impact of the capital adequacy ratio, debt ratio, credit risk, liquidity risk, and management efficiency on bank profitability (Rachman et al, 2023) (Doğan & Yildiz, 2023). Some studies found that the capital adequacy ratio and management efficiency had a positive effect on profitability, while others showed a negative or insignificant effect (Arif & Masdupi, 2020) (Juraev, 2023). These differing findings necessitate further research with more recent data and broader coverage, particularly in the 2020–2024 period in the Indonesian banking sector (Akther et al, 2023) (Hasanudin et al, 2023).

Purpose, Urgency, and Novelty of the Research

This study aims to analyze the effect of the capital adequacy ratio, debt ratio, credit risk, liquidity risk, and management efficiency, both partially and simultaneously, on profitability in the financial institutions sector, banking sub-sector, listed on the Indonesia Stock Exchange (IDX) for the period 2020–2024 (Akther et al, 2023) (Rachman et al, 2023). The urgency of this research lies in the need for a comprehensive understanding of the factors that influence bank profitability amidst the ever-changing economic and regulatory dynamics (Saif-Alyousfi, 2022) (Farooq et al, 2021). The novelty of this study is the use of the latest data for the period 2020–2024 and the simultaneous analysis of five main variables, thus enriching the literature and providing practical recommendations for bank management and investors in strategic decision-making (Jigeer & Koroleva, 2023) (Muhammed et al, 2024).

Methodology

Types and Methods of Research

This study uses a quantitative approach with survey methods and statistical analysis, aiming to examine the effect of the capital adequacy ratio, debt ratio, credit risk, liquidity risk, and management efficiency on the profitability of banks listed on the Indonesia Stock Exchange (IDX) for the 2020–2024 period. The quantitative method was chosen because it provides an objective and measurable picture of the relationship between variables through numerical data and multiple linear regression analysis (Sugiyono, 2022) (Cresswell, 2021) (Azizah, 2025).

Data Analysis Instruments and Techniques

The main instrument in this study was secondary data in the form of annual financial reports of banks published on the Indonesia Stock Exchange (IDX). The data was processed using statistical software, such as SPSS, to conduct classical assumption tests (normality,

multicollinearity, heteroscedasticity, and autocorrelation) and multiple linear regression analysis. Data analysis techniques included the t-test for partial hypothesis testing and the F-test for simultaneous testing, as well as the determination test (R^2) to measure the contribution of independent variables to profitability (Sudaryono, 2022) (Emzir, 2021) (Rahayu, 2025).

Population and Sample

The study population comprised all banking companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period, totaling 47 banks. The sample was drawn using a purposive sampling technique with the following criteria: (a) banks listed on the IDX in 2020–2024, (b) published consecutive annual financial reports during the period, and (c) did not experience consecutive losses. This technique ensures the selected sample is relevant and meets the requirements for statistical analysis (Sugiyono, 2022) (Azizah, 2025) (Rahayu, 2025).

Research Procedures

The research procedure began with secondary data collection from the official websites of the Indonesia Stock Exchange (IDX) and the Financial Services Authority (OJK), followed by data processing using documentation methods. After data collection, classical assumption tests were conducted to ensure the validity of the regression model, followed by multiple linear regression analysis to examine the effect of each variable on profitability. The analysis results were systematically interpreted to address the research problem formulation and objectives (Sugiyono, 2022) (Cresswell, 2021) (Rahayu, 2025).

Results and Discussion

Normality Test

		Unstandardized Residual	
N		90	
Normal Parameters ^{a,b}	Mean	,0000000	
	Std. Deviation	,25406083	
Most Extreme Differences	Absolute	,077	
	Positive	,059	
	Negative	-,077	
Test Statistic		,077	
Asymp. Sig. (2-tailed) ^c		,200 ^d	
Monte Carlo Sig. (2-tailed) ^e	Sig.	,197	
	99% Confidence Interval	Lower Bound	,187
		Upper Bound	,207

a. Test distribution is Normal.

Figure 1. Test Results

The results of the study show that the significance value (Sig.) reached 0.200. This value is much higher than the commonly used significance limit, which is 0.05. Thus, it can be concluded that the residual data in the multiple regression model are normally distributed.

Multicollinearity Test

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	Rasio Kecukupan Modal	,207	4,827
	Rasio Hutang	,193	5,181
	Risiko Kredit	,737	1,357
	Risiko Likuiditas	,566	1,767
	Efisiensi Manajemen	,777	1,286

a. Dependent Variable: Profitabilitas

Figure 2. Test Results

Based on the analysis results, all variables showed a tolerance value above 0.10 and a VIF value below 10. A tolerance value greater than 0.10 indicates that the variable does not have a high correlation with other variables. Thus, it can be concluded that there is no indication of multicollinearity in the regression model used in this study.

Heteroscedasticity Test

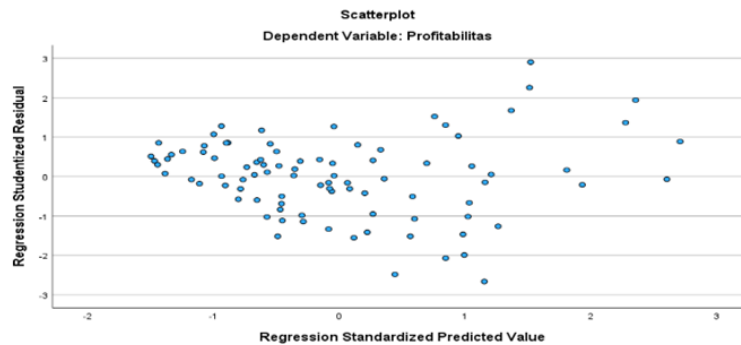


Figure 3. Test Results

Based on the findings from the scatter plot in this study, it appears that the residual points are randomly distributed above and below the zero line, and do not exhibit any specific pattern such as a straight line, curve, or other shape. This random distribution indicates that the residual variance is constant for each predicted value; thus, no signs of heteroscedasticity were found.

Autocorrelation Test

Runs Test		Runs Test	
		Profitabilitas	
Test Value ^a	1,13	Test Value ^a	1,13
Cases < Test Value	45	Cases < Test Value	45
Cases >= Test Value	45	Cases >= Test Value	45
Total Cases	90	Total Cases	90
Number of Runs	20	Number of Runs	20
Z	-5,512	Z	-5,512
Asymp. Sig. (2-tailed)	<,001	Asymp. Sig. (2-tailed)	<,001

a. Median

Figure 4. Autocorrelation Test Results Before and After Data Transformation

Based on the results of the run test before data transformation, a significance value of 0.001 was obtained. This value is smaller than the predetermined significance level of 0.05. Therefore, it can be concluded that there is autocorrelation in the residual data. The data was then transformed and retested, the asymp. Sig (2-tailed) value after data

transformation showed that the value was much greater than 0.05, namely 0.595. Therefore, it can be concluded that there is no autocorrelation in the residual data.

t-test

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	9.404	1.022		9.197	<.001
Rasio Kecukupan Modal	-.003	.005	-.036	-.616	.539
Rasio Hutang	-.746	.969	-.047	-.769	.444
Rasio Kredit	-.059	.025	-.075	-2.406	.018
Rasio Likuiditas	-.003	.002	-.069	-1.909	.060
Efisiensi Manajemen	-.084	.003	-.847	-31.174	<.001

a. Dependent Variable: Profitabilitas

Figure 5. Test Results

1. Based on the calculations, it is known that the capital adequacy ratio variable (X1) has a t-value of -0.616. This t-value is -0.616, which is greater than 0.05. From these results, it can be concluded that partially, the capital adequacy ratio has no effect and is not significant on profitability.
2. The calculation results show that the debt ratio variable (X2) recorded a t-value of -0.769, which is greater than 0.05. Therefore, the debt ratio also has no significant effect on profitability.
3. Unlike the previous two variables, the credit ratio variable (X3) has a t-value of -2.406, which is greater than the 1.663 table value, with a significance value of 0.018, which is less than 0.05. These results indicate that the ratio has a negative and significant effect on profitability.
4. Meanwhile, the liquidity ratio variable (X4) shows a t-value of -1.909, which is greater than 1.663, with a significance level of 0.060, which is above 0.05. Statistically, the liquidity ratio has a negative and insignificant effect on profitability.
5. The management efficiency variable (X5), measured by the BOPO ratio, recorded a t-value of -31.174, which is greater than 1.663, with a significance value of 0.001, which is much smaller than 0.05. This indicates that management efficiency has a negative and significant effect on profitability.

F test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	89,555	5	17,911	262,013	,000 ^a
	Residual	5,742	84	,068		
	Total	95,298	89			

a. Predictors: (Constant), Efisiensi Manajemen, Rasio Kecukupan Modal, Rasio Likuiditas, Rasio Kredit, Rasio Hutang

b. Dependent Variable: Profitabilitas

Figure 6. Test Results

Based on the F test results obtained through SPSS output, it is known that the calculated F value of 262.013 is greater than the F table of 2.479 with a significance level of 0.000. Thus, it can be concluded that simultaneously all independent variables used in this model have an influence and are significant on the dependent variable, namely profitability.

R2 Test

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,969 ^a	,940	,936	,26151

a. Predictors: (Constant), Efisiensi Manajemen, Rasio Kecukupan Modal, Risiko Likuiditas, Risiko Kredit, Rasio Hutang

b. Dependent Variable: Profitabilitas

Figure 7. Test Results

Based on the regression analysis displayed in the SPSS output, the Adjusted R Square value was 0.936. This indicates that 93.6% of the variation in the profitability variable can be explained by the five independent variables present simultaneously in this regression model. Meanwhile, the remaining 6.4% is explained by other variables outside the model or by other factors not examined in this study, such as external economic factors, industry competition, regulations, and other managerial factors.

Discussion

The Effect of Capital Adequacy Ratio, Debt Ratio, Credit Risk, Liquidity Risk, and Management Efficiency on Profitability

Capital Adequacy Ratio (CAR) and Profitability

The results of the study indicate that the capital adequacy ratio (CAR) did not significantly impact bank profitability on the IDX in the 2020–2024 period. This finding is supported by several studies that found that CAR, although important for maintaining stability and customer trust, does not always have a direct impact on bank profits, especially if the capital held is already well above the minimum threshold set by regulators. Research by Rahayu (2024) and Kessek et al. (2023) also concluded that CAR tends to be insignificant in influencing Return on Assets (ROA) in publicly listed banks in Indonesia. However, several other studies, such as Rachman et al. (2023) and Munggar (2024), found a positive effect of CAR on profitability, especially in banks with lower credit risk. These differences in results indicate that the influence of CAR is highly contextual, depending on the risk profile and capital management strategy of each bank.

Debt Ratio (DER) and Profitability

The debt-to-equity ratio (DER) was also found to have no significant effect on profitability. Debt funding structure does not directly determine bank profits, as long as debt levels remain within reasonable limits and can be managed well. Research by Zendrato et al. (2023) and Adria & Susanto (2020) shows mixed results, but the majority of contemporary studies confirm that DER is not the primary determinant of profitability in the Indonesian banking sector. This underscores the importance of risk management and operational efficiency over relying solely on leverage.

Credit Risk and Profitability

Credit risk, as measured by Non-Performing Loans (NPLs), has been shown to have a significant negative impact on profitability. High NPLs reduce revenue and increase the provision for losses, thus reducing bank profits. This finding is consistent with research by Sulastrini et al. (2023), Saif-Alyousfi (2022), and Munggar (2024), which emphasizes that effective credit risk management is crucial for maintaining bank financial performance. Other studies also show that credit risk can moderate the effect of CAR on ROA, so banks with high credit risk tend to be less able to utilize capital to increase profitability.

Liquidity and Profitability Risk

Liquidity risk was found to have a negative but insignificant effect on profitability. While theoretically, increased liquidity risk can reduce profitability, in practice, this impact is not always statistically evident, especially if the bank is able to maintain liquidity at a safe level. Research by Putri & Wahyudi (2023) and Haffizah (2025) shows that liquidity risk can have a positive or negative effect depending on fund management strategies and market conditions. However, in general, liquidity has not been proven to be a major determinant of bank profitability during the study period.

Management Efficiency and Profitability

Management efficiency, as measured by the BOPO ratio, has a significant negative impact on profitability. The higher the BOPO ratio, the worse the bank's operational efficiency, resulting in lower profits. Research by Hananto & Amijaya (2021) and Kessek et al. (2023) supports this finding, emphasizing that operational efficiency is a crucial factor in improving bank profitability. Management that can reduce operational costs and maximize revenue will more easily achieve optimal profit levels.

Conclusion

The conclusion of this study indicates that the capital adequacy ratio and the debt ratio do not significantly influence the profitability of banks listed on the Indonesia Stock Exchange for the 2020–2024 period. Conversely, credit risk and management efficiency are shown to have a negative and significant effect, indicating that increasing non-performing loans and low operational efficiency can substantially reduce bank profits. Liquidity risk is also found to have a negative but insignificant effect, indicating that good liquidity management remains important even though it is not the primary determinant of profitability. Simultaneously, the five independent variables in the regression model contribute significantly to the variation in profitability, with an Adjusted R Square value reaching 93.6%. This finding supports the literature that banking profitability in Indonesia is more influenced by credit risk management and operational efficiency than capital structure or leverage.

This study is limited by the use of secondary data and the limited timeframe of 2020–2024. Therefore, the results may not fully represent the dynamics of the banking industry in the long term, beyond the pandemic. Furthermore, external factors such as regulatory changes, macroeconomic conditions, and industry competition have not been analyzed in depth. For future research, it is recommended to expand the observation period, add

external variables, and use a mixed-methods approach for more comprehensive results. The practical implications of this study are the need for banks to strengthen credit risk management and improve operational efficiency as key strategies for maintaining and increasing profitability. Regulators and investors should pay more attention to these aspects in their decision-making and supervision of the banking sector.

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