

Bank Profitability and Its Macroeconomic Determinants: Evidence from Indonesian Listed Banks

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ABSTRACT

This study aims to examine the effects of the BI Rate, Non-Performing Loans (NPL), and inflation on the profitability of banks listed on the Indonesia Stock Exchange (IDX) during the period 2019–2022. A quantitative research approach was employed to analyze the relationships among the variables. The population of this study consists of 20 banks listed on the IDX within the observation period. Using purposive sampling, 12 banks were selected as the research sample. Secondary data were obtained from published financial statements and macroeconomic indicators, and the data were analyzed using multiple regression analysis. The results of the partial t-test indicate that the BI Rate does not have a significant effect on bank profitability, while Non-Performing Loans (NPL) have a negative and significant effect on profitability. Inflation was also found to have no significant effect on bank profitability. However, the simultaneous F-test results show that the BI Rate, NPL, and inflation jointly have a positive and significant effect on bank profitability. These findings suggest that although individual macroeconomic variables may not significantly influence profitability, credit risk, as reflected by NPL, plays a crucial role in determining bank performance. The study contributes to the existing literature by providing empirical evidence on the impact of macroeconomic factors and credit risk on banking profitability in emerging markets, particularly Indonesia. The results are expected to provide useful insights for bank management, investors, and policymakers in formulating strategies to enhance banking performance and financial stability



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INTRODUCTION

In the era of globalization, rapid advancements in innovation and knowledge have significantly influenced economic activities across countries, particularly within the financial sector. The development of financial institutions, especially banks, plays a vital role in support-

ing economic growth through financial intermediation. A stable and efficient banking system is essential for maintaining economic resilience, as financial institutions are highly sensitive to macroeconomic fluctuations (Dewi & Saraswati, 2024). Economic instability can weaken banking performance and, in extreme

cases, lead to systemic financial crises. According to (Ceysa et al., 2024) banks are institutions that collect funds from the public in the form of deposits and channel them into credit and other financial services to improve societal welfare.

The banking sector occupies a strategic position in national economic development, making bank profitability a crucial indicator of financial soundness and sustainability. Profitability reflects a bank's ability to generate earnings, distribute dividends, and enhance firm value (Arlita et al., 2023). Consequently, understanding the determinants of bank profitability has become an important concern for policymakers, investors, and bank management. A study by (Dayanti & Indrarini, 2019) suggest that both internal factors, such as credit risk, and external macroeconomic factors, including interest rates and inflation, significantly influence bank performance.

Monetary policy variables, particularly interest rates, play a critical role in shaping banking activities. In Indonesia, the BI Rate serves as the benchmark interest rate set by Bank Indonesia and influences lending rates, investment decisions, and inflation expectations. While (Himma & Atmanti, 2025) report a positive relationship between interest rates and profitability, a study by (Dwinanda & Tohirin, 2021) find insignificant or even negative effects, particularly during periods of economic uncertainty. These inconsistencies highlight the need for further empirical investigation, especially in emerging markets such as Indonesia.

Credit risk, commonly measured by the Non-Performing Loan (NPL) ratio, is another key determinant of bank profitability. High NPL levels indicate poor asset quality and increase the likelihood of financial losses, as banks must allocate higher provisions for bad loans. Prior empirical evidence consistently shows that NPLs negatively affect bank profitability (Yulyanti et al., 2023). However, the magnitude and significance of this relationship may vary across countries and time periods, particularly during economic shocks such as the COVID-19 pandemic.

Inflation, as a macroeconomic indicator, also affects banking performance by influencing operating costs, interest margins, and real returns. While (Mariska S et al., 2025) suggest that anticipated inflation may positively affect bank profitability by allowing banks to adjust interest rates accordingly, (Rizza & Indarti, 2024) find that inflation negatively impacts

profitability when cost increases exceed revenue growth. The inconclusive findings in prior research indicate a research gap that warrants further examination.

Despite the growing body of literature on bank profitability, limited studies simultaneously examine the effects of the BI Rate, NPL, and inflation on the profitability of Indonesian banks using recent data. Most previous studies either focus on a single macroeconomic variable or analyze longer periods without capturing recent economic dynamics. This study addresses this gap by investigating the combined and individual effects of monetary policy, credit risk, and inflation on bank profitability during the 2019–2022 period, which includes significant economic disruptions. The novelty of this research lies in its comprehensive approach and its focus on listed Indonesian banks during a relatively underexplored and volatile period.

Based on the above discussion, the objective of this study is to analyze the partial and simultaneous effects of the BI Rate, Non-Performing Loans (NPL), and inflation on the profitability of banks listed on the Indonesia Stock Exchange during the 2019–2022 period.

HYPOTHESIS DEVELOPMENT

The Effect of the BI Rate on Bank Profitability (ROA)

According to (Amollo & Ndede, 2023), the BI Rate, or benchmark interest rate, represents the price of borrowing funds. Interest rates are expressed as a percentage of the principal over a specified period and reflect the cost of financial resources that borrowers must pay to lenders. As a key instrument of monetary policy, changes in the BI Rate directly influence banking activities, particularly lending and deposit mobilization.

Empirical evidence regarding the relationship between interest rates and bank profitability remains mixed. (Dithania & Suci, 2022) find that the BI Rate has a positive and significant effect on the profitability of commercial banks listed on the Indonesia Stock Exchange. A higher BI Rate may encourage individuals to increase their savings in banks, thereby expanding banks' deposit bases and enhancing interest income. This condition can positively contribute to bank profitability. However, an increase in the BI Rate may also raise borrowing costs for businesses, potentially reducing investment and credit demand, which could

adversely affect bank performance.

Despite these opposing effects, this study assumes that the positive impact of increased interest income and deposit growth outweighs the potential decline in credit demand. Therefore, the following hypothesis is proposed:

H1: The BI Rate has a positive and significant effect on the profitability (ROA) of banks listed on the Indonesia Stock Exchange.

The Effect of Non-Performing Loans (NPL) on Bank Profitability (ROA)

Non-Performing Loans (NPL) represent a key indicator of credit risk and reflect a bank's ability to manage problematic loans arising from borrowers' inability to repay part or all of their obligations. According to (Hor & Lim, 2025), the NPL ratio is used to assess the effectiveness of bank management in controlling credit quality and minimizing loan default risks. A high level of NPLs indicates poor asset quality and poses significant challenges to the stability and performance of financial institutions.

NPLs have adverse implications not only for the overall economy but also for individual financial institutions. An increase in NPLs reduces banks' interest income, increases provisioning costs, and weakens their capacity to extend new credit. Consequently, rising NPL levels tend to erode bank profitability and limit financial intermediation activities. Prior empirical studies consistently document a negative relationship between credit risk and bank profitability. (Kalkan, 2025) finds that Non-Performing Loans have a significant negative effect on bank profitability, suggesting that ineffective credit risk management undermines financial performance. Based on the theoretical framework and empirical evidence, this study proposes the following hypothesis:

H2: Non-Performing Loans (NPL) have a negative and significant effect on the profitability (ROA) of banks listed on the Indonesia Stock Exchange.

The Effect of Inflation on Bank Profitability (ROA)

Inflation is defined as a sustained and generalized increase in the prices of goods and services over a certain period of time. A rise in the prices of only one or two goods does not constitute inflation unless it spreads to other goods and services, leading to an overall increase in the price level. The opposite condition of inflation is known as deflation. According to

(Batsinda & Shukla, 2019), inflation plays an important role in shaping economic conditions and may influence corporate and banking performance through its impact on costs, revenues, and real returns.

From a banking perspective, inflation can affect profitability in different ways. When inflation is anticipated, banks may adjust interest rates on loans and deposits accordingly, potentially widening interest margins and increasing profitability. Conversely, unanticipated inflation may increase operational costs and credit risk, thereby reducing bank performance. Empirical findings regarding the impact of inflation on profitability remain mixed across sectors and countries. (Zuchrinata & Yunita, 2019) find that inflation has a positive and significant effect on the profitability of coal mining sub-sector companies listed on the Indonesia Stock Exchange during the 2013–2017 period, suggesting that firms can benefit from price increases under certain conditions. Drawing on this empirical evidence and theoretical considerations, this study proposes the following hypothesis:

H3: Inflation has a positive and significant effect on the profitability (ROA) of banks listed on the Indonesia Stock Exchange.

The Effect of the BI Rate, Non-Performing Loans (NPL), and Inflation on Bank Profitability (ROA)

The BI Rate, Non-Performing Loans (NPL), and inflation are key macroeconomic and financial factors that influence bank profitability. Changes in the BI Rate directly affect banks' lending and deposit rates. When the BI Rate increases, lending rates offered by banks tend to rise, allowing banks to charge higher interest on loans and potentially increase interest income (Li & Liu, 2019). Higher interest income may contribute positively to bank profitability. However, an increase in the BI Rate may also raise banks' funding costs, as banks may need to pay higher interest to depositors and creditors, which could reduce profitability if not managed effectively.

Non-Performing Loans represent credit risk arising from borrowers' inability to fulfill their repayment obligations. Elevated NPL levels reduce interest income and require banks to allocate higher loan loss provisions, thereby weakening profitability. Inflation further influences bank performance by affecting economic growth, operating costs, and borrowers' repayment capacity. A study by (Ameur, 2024)

shows that high inflation may slow economic activity and reduce debtors' ability to repay loans, which can lead to higher NPL ratios and lower bank profitability.

The interaction of these variables highlights the importance of simultaneously examining monetary policy, credit risk, and macroeconomic conditions when assessing bank profitability. Understanding their combined effect provides a more comprehensive view of the factors shaping banking performance. Based on this framework, the following hypothesis is proposed:

H4: The BI Rate, Non-Performing Loans (NPL), and inflation simultaneously have a positive and significant effect on the profitability (ROA) of banks listed on the Indonesia Stock Exchange.

METHODOLOGY

Contains the type of research, time and place of research, targets/objectives, research subjects, procedures, instruments and data analysis

This study adopts a causal research design using a quantitative approach to examine the relationships between macroeconomic variables and bank profitability. Multiple linear regression analysis is employed to analyze the effect of the BI Rate, Non-Performing Loans (NPL), and inflation on bank profitability, measured by Return on Assets (ROA). The analysis aims to provide empirical evidence regarding both the partial and simultaneous effects of the independent variables on the dependent variable. The subject of this research consists of banking institutions listed on the Indonesia Stock Exchange (IDX).

The object of the study is the banks' financial statements, specifically the balance sheets and income statements, covering the period from 2019 to 2022. These financial reports serve as the primary source of secondary data used to measure bank profitability and other relevant financial indicators. The population of this study includes banks listed on the Indonesia Stock Exchange during the 2019–2022 period. A purposive sampling method is employed, meaning that sample selection is based on predefined criteria relevant to the objectives of the study. As a result, not all banks in the population meet the required criteria for inclusion. Based on this method, a total of 12 banks are selected as the research sample.

Prior to hypothesis testing, descriptive statistical analysis is conducted to summarize

the characteristics of the data, including the mean, minimum, maximum, and standard deviation. This analysis provides an overview of the distribution and variability of each research variable and facilitates an initial understanding of the data patterns.

To ensure the validity and reliability of the regression model, classical assumption tests are performed. The normality test is used to examine whether the residuals are normally distributed, which is a prerequisite for unbiased statistical inference. After the classical assumptions are satisfied, multiple linear regression analysis is conducted to estimate the relationship between the independent variables and bank profitability. The t-test is used to examine the partial effect of each independent variable on ROA, while the F-test is applied to evaluate the simultaneous effect of all independent variables on the dependent variable. The coefficient of determination (R^2) is used to measure the explanatory power of the regression model. This comprehensive analytical approach ensures that the empirical results are statistically robust and reliable for drawing valid conclusions regarding the determinants of bank profitability in Indonesia.

RESULT

Descriptive Statistics

Descriptive statistical analysis was conducted to determine the minimum, maximum, mean, and standard deviation of the research variables. The results of the descriptive statistical analysis in this study are presented as follows.

Descriptive statistics on [Table 1](#) were computed for BI Rate, NPL, Inflation, and Profitability to summarize the data characteristics. BI Rate ranged from 352.00 to 513.00 (mean = 414.75; SD = 60.29), indicating moderate variation. NPL varied widely from 32.00 to 1,702.00 (mean = 517.43; SD = 404.84), reflecting significant differences in non-performing loans. Inflation ranged from 156.00 to 400.00 (mean = 265.75; SD = 94.89), showing moderate volatility. Profitability ranged up to 5,164.00 (mean = 3,956.06; SD = 448.02), highlighting considerable variation among banks. These results provide a foundation for further analysis of the relationships between the variables.

Classical Assumption

A normality test on [Table 2](#) was conducted on the unstandardized residuals ($N = 44$) to

assess whether they followed a normal distribution. The residuals had a mean of 0.000 and a standard deviation of 2.489. The Kolmogorov–Smirnov test, with Lilliefors significance correction, indicated no significant deviation from normality ($D = 0.078$, $p = 0.200$), suggesting that the residuals are approximately normally distributed. This result supports the assumption of normality for further regression analysis.

A regression model can be considered reliable if its residuals are normally distributed. Based on the results of the normality test, the unstandardized residuals yielded an Asymp. Sig. (2-tailed) value of 0.200, which is greater than the 0.05 significance level. Therefore, the residuals can be considered normally distributed according to the Kolmogorov–Smirnov test. This indicates that the assumption of normality has been satisfied for the regression analysis.

Multiple Linear Regression Test

The ANOVA results (Table 3) indicate that

Table 1. Result of Descriptive Statistic Analysis

	N	Min	Max	Mean	Std. Dev
BI RATE	4	352,00	513,00	414,75	60,2944
	8			00	9
NPL	4	32,00	1702,00	517,43	404,843
	8			75	17
INFLATION	4	156,00	400,00	265,75	94,8935
	8			00	6
PROFITABIL	4	-	5164,00	-	3956,06
ITY	8	18201,00		448,0208	467
Valid N (listwise)	4				

Source: processed data (2025)

the regression model significantly predicts profitability. The regression sum of squares was 333,658 with a mean square of 111,219, yielding an F-value of 12.17 and a significance level of 0.000 ($p < 0.05$). This shows that the independent variables—BI Rate, NPL, and Inflation—collectively have a significant effect on profitability, confirming the overall model fit.

DISCUSSION

This study investigates the extent to which macroeconomic factors and bank-specific risk jointly influence the profitability of Indonesian listed banks during the 2019–2022 period. The ANOVA results confirm that BI Rate, Non-Performing Loans (NPL), and inflation simultaneously exert a statistically significant effect on bank profitability, indicating that profitability dynamics in Indonesia are shaped by both monetary policy conditions and internal risk exposure. This finding reinforces the argument by (Hasanov et al., 2018) that bank performance cannot be examined in isolation from the broader macroeconomic environment, particu-

Table 2. Result of Classical Assumption Test

Unstandardized Residual		
N		44
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	2,48904862
Most Extreme Differences	Absolute	.078
	Positive	.069
	Negative	-.078
Test Statistic		.078
Asymp. Sig. (2-tailed)		.200c,d
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		
d. This is a lower bound of the true significance.		

Source: processed data (2025)

larly in emerging markets characterized by structural vulnerabilities and policy sensitivity.

From a monetary economics perspective, the significance of the BI Rate supports the interest rate transmission mechanism theory, which explains how central bank policy rates influence bank lending behavior and net interest margins. However, the effect of interest rates on profitability is not necessarily linear. While higher policy rates may improve interest income, they can simultaneously increase credit risk and funding costs. Previous studies in developing economies by (Abuka et al., 2019) suggest that excessive tightening of monetary policy may erode bank profitability by suppressing credit growth. Therefore, the significance of the BI Rate in this study should be interpreted within the context of Indonesia's gradual and accommodative monetary stance during the post-pandemic recovery.

The role of NPL as part of the jointly significant model highlights the structural importance of asset quality in determining bank profitability. Higher NPL ratios reflect inefficiencies in credit screening and monitoring, which directly reduce profitability through increased loan loss provisions and reduced interest income. This is in line with a study by (Maaji et al., 2023) that there is a strong nega-

tive relationship between NPL and profitability, particularly during periods of economic stress. Despite regulatory reforms and prudential supervision, credit risk remains a persistent challenge for Indonesian banks, especially in times of economic disruption such as the COVID-19 period.

Inflation's contribution to the model reflects the dual nature of inflation in banking performance. In line with the anticipated inflation hypothesis, moderate and predictable inflation may allow banks to adjust interest rates effectively, thereby preserving profitability. However, unanticipated inflation increases operational costs and weakens borrowers' real repayment capacity, potentially worsening asset quality. According to (Gazi et al., 2024) inflation tends to have an ambiguous effect on bank profitability, depending on institutional quality and market structure. The significance of inflation in this study suggests that Indonesian banks remain sensitive to price instability, which may limit their ability to fully hedge against macroeconomic shocks.

Critically, while the model demonstrates strong simultaneous effects, the reliance on aggregate profitability measures may mask heterogeneity across banks. Large banks with diversified income sources and stronger capital buffers may respond differently to macroeconomic changes compared to smaller or less capitalized banks. This limitation implies that the observed relationships may not be uniform across the banking sector. Future studies could adopt panel data techniques with bank-specific controls to better capture structural differences and dynamic adjustments in profitability.

Furthermore, the study period (2019–2022) encompasses extraordinary economic conditions, including the COVID-19 pandemic and subsequent recovery. These conditions may have amplified the relationships between macroeconomic variables and bank profitability, raising questions about the long-term generalizability of the findings. Nonetheless, the results provide important policy implications: maintaining monetary stability, controlling inflation, and strengthening credit risk management are essential for sustaining bank profitability. Policymakers and bank managers should therefore adopt a coordinated approach that balances macroeconomic objectives with microprudential resilience to ensure long-term financial stability.

Table 3. Result of Multiple Linear Regression Test

ANOVA ^a					
Model	Sum of Square	D F	Mean Square	F	Si g.
1 Regression	333658 127,53	3	111219 375,84	12, 17	.0 00
	4		5	6	B
Residual	401912 911,44	4 4	913438 4,351		
	5				
Total	735571 038,97	4 7			
	2				
a. Dependent Variable: PROFITABILITY					
b. Predictors: (Constant), INFLATION, NPL, BI RATE					

Source: processed data (2025)

CONCLUSION & SUGGESTION

The findings demonstrate that BI Rate, Non-Performing Loans (NPL), and inflation simultaneously have a significant effect on bank profitability, confirming that profitability dynamics in the Indonesian banking sector are shaped by both monetary policy conditions and internal risk management. These results underscore the importance of viewing bank profitability as a multifaceted outcome influenced by broader economic conditions rather than solely by internal managerial decisions.

Critically, the results suggest that while accommodative monetary policy can support bank profitability through interest margin adjustments, its effectiveness is constrained by rising credit risk and inflationary pressures. The persistent role of NPL highlights structural vulnerabilities in credit risk management, particularly during periods of economic uncertainty such as the COVID-19 pandemic. Inflation, although sometimes beneficial when anticipated, poses risks to profitability when volatility increases operational costs and weakens borrowers' repayment capacity. Collectively, these findings emphasize the need for a balanced policy framework that simultaneously promotes monetary stability and strengthens banking sector resilience.

From an academic perspective, this study contributes to the literature on bank profitability in emerging markets by providing empirical evidence from Indonesia during an extraordinary economic period. The results support monetary transmission theory and credit risk theory, while also highlighting the ambiguous role of inflation in banking performance. Future research is encouraged to extend this analysis by incorporating additional variables such as capital adequacy, bank size, liquidity, and income diversification, as well as employing dynamic panel models to capture long-term and bank-specific effects more accurately.

From a practical standpoint, the findings offer important implications for policymakers and bank managers. Bank Indonesia should carefully calibrate interest rate policies to balance financial stability and banking sector profitability, particularly during economic recovery phases. Bank management, on the other hand, should prioritize strengthening credit risk assessment and loan monitoring systems to mitigate the adverse effects of NPL on profitability. Additionally, banks are encouraged to diversify income sources beyond traditional lending activities to reduce sensitivity to macroeconomic

fluctuations.

Despite its contributions, this study has several limitations. First, the analysis focuses only on listed banks, which may limit the generalizability of the findings to smaller or non-listed banks. Second, the study period (2019–2022) coincides with extraordinary economic conditions, potentially amplifying the observed relationships. Third, the use of aggregate profitability measures may obscure heterogeneity across banks. Future studies should address these limitations by using broader samples, longer observation periods, and more granular profitability indicators to enhance the robustness and generalizability of the findings.

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