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The Impact of Non-Performing Loan, Loan to Deposit Ratio, Operating Expenses to Operating Income, and Net Interest Margin on Banking Stock Prices

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Abstract

The purpose of this study is to examine the impact of non-performing loans, loan-to-deposit ratio, operating cost-to-operating income, and net interest margin on the share prices of traditional financial institutions listed on the Indonesia Stock Exchange during the period 2020–2024. A quantitative methodology was used, drawing on secondary data from the market capitalization-based financial statements of the top ten banks. The sample was selected through purposive sampling, and the data were analyzed using multiple linear regression. The results show that, simultaneously, non-performing loans, loan-to-deposit ratio, operating cost-to-operating income, and net interest margin have a statistically significant influence on banking stock prices. However, when assessed individually, only the BOPO variable exhibits a significant and negative effect. This indicates that higher operational inefficiency tends to reduce investor interest and negatively impact stock valuation in the banking sector. In contrast, the NPL, LDR, and NIM variables, although aligned with theoretical expectations, did not demonstrate statistically significant effects within the model. The coefficient of determination (R^2) is 0.240, meaning that approximately 24% of the variation in stock prices can be explained by the four independent variables, while the remaining 76% may be attributed to other external or internal factors not captured in the model. These findings underscore the critical role of operational efficiency as reflected by the BOPO ratio, particularly during periods of economic uncertainty such as the post-pandemic era. The study offers useful insights for investors, banking management, and policymakers in making strategic financial decisions based on fundamental performance indicators.

Keywords: Stock Price, NPL, LDR, BOPO, NIM, Banking Sector

Introduction

The banking industry plays a crucial role in a country's economy by serving as a financial intermediary that channels funds from surplus units to deficit units. Its performance not only contributes to the overall stability of the financial system but also serves as a key indicator for investors in making informed investment decisions, especially through the movements of bank stock prices in the capital market (Fama, 1970). For this reason, it is essential for academics, practitioners, and regulators to understand the fundamental factors that influence the stock prices of banks.

Among the most frequently examined financial performance indicators that relate to stock prices are non-performing loans, loan-to-deposit ratio, operating cost-to-operating income, and net interest margin. NPL represents the level of credit risk and the effectiveness of a bank's credit management. A high NPL indicates a higher proportion of problematic loans, which negatively influences investor perceptions regarding the quality of the bank's assets (Prastowo & Sardjito, 2017). LDR measures the extent to which a bank can convert third-party funds into productive credit, directly affecting profitability and liquidity risk (Siamat, 2005). BOPO is an indicator of operational efficiency; a high BOPO suggests greater operational costs that can potentially suppress net income (Kasmir, 2014). Meanwhile, NIM demonstrates the bank's ability to generate net interest income from its intermediation activities. A high NIM typically signals strong profitability performance and

Tends to be viewed favorably by investors (Suryani & Rakhman, 2015). Understanding these indicators is key to interpreting stock price movements in the banking sector.

This study is particularly relevant given that the period from 2020 to 2024 was marked by significant challenges due to the COVID-19 pandemic, which had a considerable impact on the stability of the financial industry, including the banking sector. The sharp economic fluctuations during this time also impact the financial performance of banks and the movement of stock prices on the IDX. Prior research by Susanti and Firmansyah (2021) discovered that financial metrics such as NPL and NIM significantly affect bank stock prices. However, their results varied and

were not entirely consistent within the post-pandemic context. For instance, they reported that NPL and BOPO have a negative effect on stock prices, whereas LDR and NIM showed a positive influence. These inconsistencies underscore the importance of updating empirical studies to reflect the specific conditions of the 2020–2024 period, which includes the pandemic and its economic aftermath.

Therefore, this study aims to examine both the simultaneous and individual effects of NPL, LDR, BOPO, and NIM on the stock prices of conventional banks listed on the IDX during that period. By focusing on recent data and key financial ratios representing credit risk, operational efficiency, and profitability, this study aims to add to the body of knowledge in academia and provide valuable insights for investors, bank managers, and policymakers in making informed, data-driven financial decisions.

Literature Review

Stock Price

Stock price is a key indicator used to evaluate a company's market value, including in the banking sector. Tandelilin (2010) explains that stock prices are influenced not only by a company's internal fundamentals but also by external factors such as monetary policy, interest rates, and macroeconomic conditions. In banking, stock price movements are closely linked to financial performance indicators that demonstrate a bank's effectiveness in managing risk and generating profitability.

Non Performing Loan

A non-performing loan is a ratio that measures the extent of troubled loans or default by debtors. This ratio reflects the quality of assets and the credit risk management conducted by banks. A high NPL lowers bank profits and can reduce investor confidence, which may negatively impact stock prices. Several studies have found that non-performing loans have a negative impact on bank stock prices (Ariyanti & Rahmawati, 2017; Prastowo & Sardjito, 2017). This suggests that the greater the danger of loan failure, the more likely investors are to withdraw their funds from banking stocks.

Loan to Deposit Ratio

Loan-to-deposit ratio measures a bank's ability to channel third-party funds into loans. A higher LDR ratio indicates greater credit distribution, which can impact interest income growth. However, an excessively high LDR also suggests potential liquidity risk. The study by Lestari & Setiawan (2019) showed that LDR has an impact on stock prices that is favorable, as long as the value remains within an optimal threshold.

Operating Expenses to Operating Income

BOPO describes a bank's operational efficiency. The lower the BOPO ratio, greater operational efficiency of the bank. This level of efficiency plays an important role in generating profit and raising the business's perceived value among investors. Research by Wibowo & Syaiful (2020) showed that BOPO have a negative impact over stock prices, meaning that higher the operational costs, the lower investor interest in the bank's shares.

Net Interest Margin

A net interest margin is bank profitable indicator that shows its ability to generate net income from intermediation activities. A high NIM indicates efficiency in generating net interest income and is generally associated with strong financial performance. The study by Rakhman & Suryani (2015) concluded that stock prices are significantly and favourably impacted by NIM. because investors tend to interpret intermediation performance as a signal of long-term profitability.

Research Model

This study involves four independent variables Non-performing Loan (NPL), Loan-to-deposit Ratio (LDR), Operating Expenses to Operating Income (BOPO) and Net Interest Margin (NIM) and one dependent variable, which is stock price.

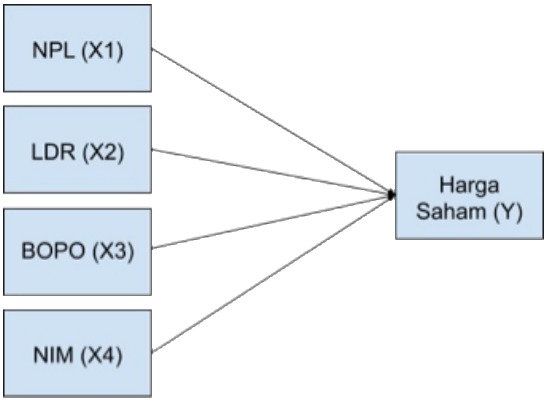

Figure 1: Conceptual framework

Source: Data processed by researchers, 2025

Research Methods

Materials

The yearly financial reports of conventional banks that were listed on the IDX between 2020 and 2024 provided secondary data used in this study. The collected data consists of financial ratios like non-performing loan, loan-to-deposit ratio, BOPO, and net interest margin, as well as each bank's year-end closing stock prices. The main sources of data are the authorized IDX site, bank publications, and financial data platforms such as RTI Business. Sample picking was carried out using purposive sampling, a method based on specific criteria. The criteria for selecting samples in this study are as follows: 1. Conventional (non-sharia) banks are listed on IDX. 2. Banks that published comprehensive and audited financial statements during the 2020–2024 period. 3. Banks are not delisted or involved in mergers during the observation period. 4. Banks that ranked among the top 10 in market capitalization within the banking sector.

Methods

This research employs a quantitative approach to investigate how variables relate to one another. Quantitative research is a scientific approach that uses numerical data—such as figures, charts, and tables—and applies statistical/quantitative analysis to test predefined hypotheses (Syahroni, 2022). The study seeks to determine whether NPL, LDR, BOPO,

and NIM affect stock prices. The population studied consists of conventional banks listed on IDX over a 5-year period (2020–2024). The sample, representing part of the population, consists of 10 companies that met the established criteria and were selected using purposive sampling. According to Lenaini (2021), purposive sampling is a non-random technique in which researchers select samples based on specific characteristics relevant to the research objectives, aiming to address the research problem effectively. Over a five-year period, a whole 50 data point observations were used in this study.

This study employs several analytical tools, such as descriptive statistics, normality, multicollinearity, heteroskedasticity, and multiple regression analysis to assess the causal relationship (dependent variable). Independent variables are non-performing loan, loan-to-deposit ratio, BOPO, and NIM, and the dependent variable is stock price. The analysis was conducted using SPSS software version 27.

Operational Definitions and Variable Measurement

The choice of research title determines the selection of both independent and dependent elements. The definitions and formulas of each variable are explained below:

Table 1: Operational variables

Variable	Definition
Stock Price (Y):	The market value of a stock traded on the stock exchange. Formula: $\text{Stock Price} = \frac{Pt - Pt-1}{Pt-1} \times 100$
non-performing loan (X1)	A ratio used to measure credit risk. The lower NPL, the better the credit quality distributed by the bank. According to Bank Indonesia, the ideal gross NPL should be below 5%. Formula: $\text{NPL} = \frac{\text{Non-Performing Loan}}{\text{Total Loan}} \times 100$
loan-to-deposit ratio (X2):	A ratio implemented to indicate a bank's liquidity by comparing all loans granted with total third-party funds collected. Formula: $\text{LDR} = \frac{\text{Total Loan}}{\text{Third-Party Funds}} \times 100$
BOPO (X3):	A ratio implemented to assess a bank's operational efficiency, indicating the extent of operating costs incurred to generate operating income. Formula:

	$BOPO = \frac{\text{Operating Cost}}{\text{Operating Expenses}} \times 100$
net interest margin (X4)	A ratio that indicates the gap between interest earnings and interest expenses relative to average earning assets. Formula: $NIM = \frac{\text{net interest income}}{\text{average earning assets}} \times 100$

Results and Discussion

Results

Descriptive Analysis Results

Each variable used in this study was analyzed using descriptive statistics. Descriptive analysis serves as an initial step before conducting further analysis, as it helps researchers understand and identify the characteristics of the data (Sulung & Muspawi, 2024). This analysis presents minimum, maximum, average, and standard deviation values for each variable, as shown below:

Table 2 descriptive statistical test

Variable	N	Minimum	Maximum	Mean	Std. Deviasi
NPL	50	.00	1.42	.6282	.32920
LDR	50	60.04	145.86	82.9172	.1498311
BOPO	50	41.67	261.10	76.8758	29.94908
NIM	50	3.82	10.45	5.2272	1.31346
Harga Saham	50	670.00	16000.00	3856.4000	2841.22316

A descriptive statistics analysis was carried out to provide a general overview of the characteristics of the data used in this study. The outputs show that the non-performing loan variable have a mean value of 0.6282, with a lowest value of 0.00 and a highest value of 1.42. This suggests that, in general, conventional banks have an average NPL ratio of 0.6282%, with a data dispersion (standard deviation) of 0.3292. The minimum value of 0.00 suggests that there were banks with no non-performing loans in certain years, while the maximum value of 1.42% remains within the safe threshold set by Bank Indonesia (a maximum of 5%). These findings imply that the majority of the sampled banks are in a healthy condition in terms of credit risk management.

The average LDR of 82.92% indicates that, in general, banks have disbursed approximately 82% of external funds in the form of loans. The minimum value of 60.04% reflects a conservative lending approach, while

the maximum value of 145.86% suggests a condition of over-lending, which may pose liquidity risks. The relatively wide range (standard deviation = 14.98%) indicates differences in credit disbursement strategies among the banks in the sample.

The average BOPO (operating expenses to operating income) value of 76.88% indicates that most banks are still operating within a relatively efficient range, as BOPO is generally considered efficient when it is below 80%. However, the high standard deviation (±29.95) and a maximum value reaching 261.10% reflect extreme inefficiency in some banks, even surpassing their total operating income. This suggests the presence of outliers or banks with exceptionally poor operational performance.

Meanwhile, the average NIM of 5.23% indicates that the banks in the sample generally have a high capacity for net interest income generation. The minimum value of 3.82% is still considered healthy, while the maximum value of 10.45% shows that some banks are highly efficient in their intermediation activities. The data dispersion (standard deviation of 1.31) is relatively low, suggesting that NIM values across the banks are fairly homogeneous.

For the stock price variable, which serves as the dependent variable, the average is recorded at IDR 3,856.4 per share, with a lowest of IDR 670 and a highest of IDR 16,000. The standard deviation of 2,841.22 indicates a high level of fluctuation among bank stock prices, which may be attributed to differences in market capitalization, investor sentiment, and the financial performance of each bank.

Normality Test Results

Finding out if the processed data is regularly distributed is done using the normality test. If the assumption of normality is not met, the results of statistical analysis may become invalid or misleading (Isnaini et al., 2025). One method to test the normality of residuals is the one-sample Kolmogorov–Smirnov test. The Kolmogorov–Smirnov method was used to perform the residual normalcy test in this study, yielding a significance value of 0.056. Since this value is higher than 0.05, the residuals are considered to be normally distributed, indicating that the normality assumption in multiple regression is satisfied.

Table 3: Tests of Normality

	Unstandardized Residual
N	50
Kolmogorov-Smirnov Z	.056

Source: Processed Data

Multicollinearity Test

Multicollinearity analysis is applied to determine whether there is correlation between independent variables in the regression model the tested regression model shows a high or perfect correlation among the independent variables, it indicates the presence of multicollinearity (Sholihah et al., 2023). The test results show that all independent variables—NPL, LDR, BOPO, and NIM—have tolerance values above 0.10 and VIF values below 10. Specifically, the highest VIF value is 2.239 for the LDR variable, which is still within the acceptable range. Therefore, it can be concluded that this regression model is free from multicollinearity.

Table 4: Uji Multikolinearitas

Variable	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
NPL	.677	1.476
LDR	.447	2.239
BOPO	.746	1.341
NIM	.700	1.430
Dependent Variable: Harga Saham		

Source: Processed Data

Heteroscedasticity Test

To ascertain whether there is any disparity in the variance of residuals between observations inside the regression model, the heteroscedasticity test is performed. When each observation in the regression model has a different residual variance, this is known as heteroscedasticity (Mardiatmoko, 2020). The Glejser technique was used to conduct the heteroscedasticity test in this investigation. by regressing the absolute residual values against the independent variables. The test results show significance values of 0.206 for NPL, 0.659 for LDR, 0.718 for BOPO, and 0.129 for NIM. Since all significance values are greater than the 0.05 threshold, it can be determined that there is no indication of

heteroscedasticity in the regression model. Therefore, the model satisfies the classical assumption of homoscedasticity.

Table 5: Uji Heteroskedasticity

	Variable	Sig.
Glejser	NPL	.206
	LDR	.659
	BOPO	.718
	NIM	.129

Source: processed data

The regression model shows strong statistical significance, primarily based on the results of the multiple linear regression analysis shown in Table 6. With a significance level of 0.013 and a computed F-value of 3.561, the variables NPL, LDR, BOPO, and NIM all work together to positively affect banking companies' stock prices between 2020 and 2024. This finding supports the core assumption of Efficient Market Hypothesis, which posits that stock prices reflect all relevant information, including key financial ratios that represent the fundamental performance of banking institutions.

Additionally, the coefficient of determination (R-squared) is 0.240, which indicates that the independent variables in this model account for about 24% of the variation in stock prices, with the remaining 76% being influenced by factors not included in the model. Even after controlling for the number of variables, the model's stability is indicated by the adjusted R-squared value of 0.173. In the context of capital market research, this value is considered quite reasonable, given that stock prices are heavily impacted by various external issues, like macroeconomic conditions, monetary policy, and market sentiment.

Table 6 summarizes the result

Model	**unstandardized coefficients**		**t**	**Sig.**	**Ket.**
	B	**Std. Error**			
(Constant)	-338.668	3124.006	-.108	.914	
NPL	-458.028	1362.415	-.336	.738	Decline
LDR	53.475	36.862	1.451	.154	Decline
BOPO	-33.382	14.274	-2.339	.024	Accepted
NIM	500.286	336.012	1.489	.143	Decline
R		.490[a]	**F count**		3.561
R-squared		.240	**F sig**		.013[b]
Adj R Square		.173			

Source: Processed Data

Discussion

The regression coefficient value for the non-performing loan variable is -458.028, and its significance (Sig.) score is 0.738 (> 0.05). This suggests that, statistically speaking, non-performing loans (NPLs) have no discernible impact on banks' financial performance. The negative coefficient suggests a negative relationship, meaning that for every one-unit increase in NPL, financial performance tends to decrease by 458.028 units. However, since the significance value is far above 0.05, this effect is not statistically strong enough to be considered significant. The standardized beta value of -0.053 also indicates that the influence of NPL is relatively weak in comparison to other parameters. Although a high NPL indeed reflects an elevation in NPL, within the context of this model, its effect is not substantial enough to significantly impact financial performance. This could be due to effective credit risk management or adequate loan loss provisions.

LDR indicates a regression coefficient score of 53.475 with a confidence level of 0.154 (> 0.05), indicating that the loan-to-deposit ratio didn't have a statistically significance impact on the financial performance of banks. The positive coefficient suggests how an improvement in LDR tends to be matched by an improvement in financial performance; however, this effect is not statistically significant. The standardized beta score of 0.282 suggests how LDR has a stronger positive influence compared to NPL, but it is still not statistically significant. LDR reflects the proportion of third-party funds disbursed as loans. Although this ratio ideally indicates a bank's productivity in managing its funds, in this model, its effect is not substantial enough to significantly impact financial performance.

BOPO has a regression coefficient value of -33.382 with a statistical value of 0.024 (< 0.05), which suggests that BOPO has a negative and massive impact on the financial performance of banks. The negative coefficient shows that an increase in BOPO reduces the performance of the financial system. The standardized beta value of -0.352 is the largest in absolute terms among the variables, indicating that BOPO is the most dominant factor in the model. A high BOPO reflects low operational efficiency, as the operating expenses exceed the revenue generated.

Therefore, operational efficiency is proven to be a critical factor that has an important impact on the financial results of banks.

NIM has a regression coefficient score of 500.286 with a statistical value of 0.143 (> 0.05). This means that although NIM has a positive effect, it has no discernible effect on financial success in this model. The standardized beta value of 0.231 indicates that its contribution to the dependent variable is fairly substantial, but not statistically strong enough. A high NIM typically reflects high profitability from intermediation activities; however, in this model, an increase in NIM has not demonstrated a significant impact on financial performance. This could be due to fluctuations in interest margins or high operating expenses.

Conclusion

This study observes goals to analyze the implication of NPL, LDR, BOPO, and NIM on the stock prices of bankcorporations indexed on the IDX at some point in the 2020–2024 period. Based totally on the consequences of the multiple linear regression analysis, several key findings were received: Simultaneously all four impartial variables (NPL, LDR, BOPO, and NIM) have an important impact on share prices, as indicated by way of an F-value of 3.561 and an importance stage of 0.013 (< 0.05). This supports the efficient market speculation by means of Fama (1970), which states that stock prices replicate all applicable statistics, consisting of an organization's monetary ratios.

Partially, only the BOPO variable was found to have a significant negative effect on stock prices, with a regression coefficient of -33.382 and a significance level of 0.024. This indicates that the higher the level of operational inefficiency in a bank, the lower the investor interest in its stock, consistent with the findings of Wibowo & Syaiful (2020). The variables NPL, LDR, and NIM showed directional effects that align with theoretical expectations (NPL negative, LDR and NIM positive), but these effects were not statistically significant. Nevertheless, these results are consistent with previous studies, which suggest that the impact of financial ratios on banking stock prices may vary depending on the time period and economic conditions (Susanti & Firmansyah, 2021; Ariyanti & Rahmawati, 2017). The coefficient of determination (R^2) of 0.240

indicates that only 24% of the variation in the factors can be used to explain stock prices. In this model, while the remaining 76% is impacted by additional elements, including macroeconomic circumstances, interest rates, monetary policy, and market sentiment.

Overall, this study highlights the importance of BOPO as a key indicator considered by investors in evaluating bank stocks, especially during periods of economic uncertainty such as the post-pandemic years. These findings are expected to serve as a strategic reference for bank management to improve efficiency and for investors to make fundamentally based investment decisions.

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