

## ***The Effect of NPL, BOPO, NIM on ROA of State-Owned Banks Listed on The Indonesia Stock Exchange***

### **Pengaruh NPL, BOPO, NIM Terhadap ROA pada Bank BUMN yang terdaftar pada Bursa Efek Indonesia**

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#### **ABSTRACT**

*This study aims to find out about the effect of NPL, BOPO, NIM against ROA of BUMN banks listed on the Indonesian stock exchange, using Verification descriptive research method with a quantitative approach. The dependent variable used in this study is Return On Assets (Y). The independent variables used in this study are NPL (X1), BOPO (X2), and NIM (X3). The population in this study are state-owned banks listed on the Indonesia Stock Exchange, totaling 4 banks. In this study, sample deception was carried out by means of non-probability sampling with saturated sampling, where samples of all members of the population were used as samples. Based on the research, several conclusions can be drawn, namely: Net Interest Margin (NIM) on Return on Assets (ROA), but there is no effect of Operating Expenses and operating income (BOPO) on Return on Assets (ROA), while simultaneously there is an influence of NPL, NIM and BOPO on Return on Assets (ROA).*

**Keywords:** NPL, BOPO, NIM, ROA

#### **ABSTRAK**

Penelitian ini bertujuan untuk mengetahui pengaruh NPL, BOPO, NIM terhadap ROA bank BUMN yang terdaftar di bursa efek Indonesia, dengan menggunakan metode penelitian deskriptif verifikatif dengan pendekatan kuantitatif. Variabel dependen yang digunakan dalam penelitian ini adalah Return On Asset (Y). Variabel independen yang digunakan dalam penelitian ini adalah NPL (X1), BOPO (X2), dan NIM (X3). Populasi dalam penelitian ini adalah bank-bank BUMN yang terdaftar di Bursa Efek Indonesia yang berjumlah 4 bank. Dalam penelitian ini, penarikan sampel dilakukan dengan cara non-probability sampling dengan sampling jenuh, dimana sampel semua anggota populasi digunakan sebagai sampel. Berdasarkan penelitian yang dilakukan, maka dapat ditarik beberapa kesimpulan yaitu: Net Interest Margin (NIM) terhadap Return on Assets (ROA), namun tidak terdapat pengaruh Biaya Operasional dan Pendapatan Operasional (BOPO) terhadap Return on Assets (ROA), sedangkan secara simultan terdapat pengaruh NPL, NIM dan BOPO terhadap Return on Assets (ROA).

**Kata Kunci** NPL, BOPO, NIM, ROA

### **1. Introduction**

According to Banking Law Number 10 of 1998, banking entities in Indonesia are categorized into commercial banks and rural banks (BPR). Commercial banks are empowered to handle payment transactions and conduct various banking activities, often with specialized services. One prominent example of a commercial bank in Indonesia is the State-Owned Commercial Bank, also known as BUMN Commercial Bank. As per Kasmir (2013), State-Owned Banks are financial institutions whose establishment deeds and capital are owned by the Indonesian government. Notable examples of State-Owned Banks include PT Bank Rakyat Indonesia (Persero) Tbk, PT Bank Negara Indonesia (Persero) Tbk, PT Bank Mandiri (Persero) Tbk, and PT Bank Tabungan Negara (Persero) Tbk ([www.idx.co.id](http://www.idx.co.id)).

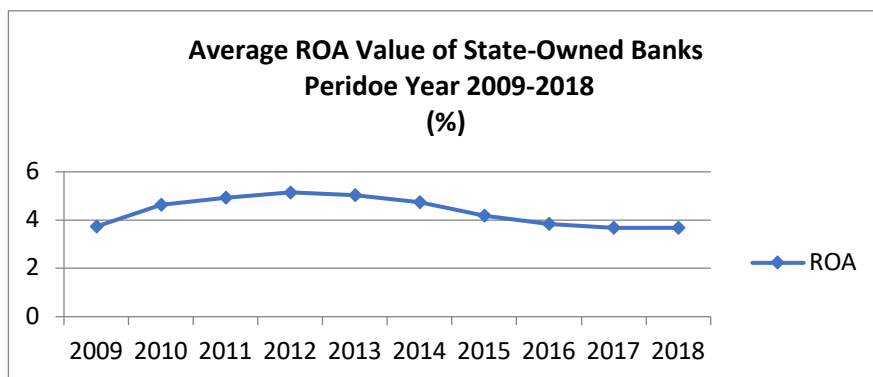
In their operations as trusted financial intermediaries, banks strive to attract new customers, increase deposit funds, and generate profits through credit provision (Simorangkir, 2004). Putrianingsih & Yulianto (2016) emphasize that credit constitutes a primary revenue source for Indonesian banks. Moreover, according to Lukman (2003), Return on Assets (ROA) serves as a key metric for assessing bank performance, indicating the company's earnings capacity from its operational assets. ROA is favored for its ability to gauge asset management efficiency and enable performance comparisons across different periods (Pandia 2012; Cuaca et al., 2020).

Flamini et al. (2009) elaborate that ROA reflects an organization's effectiveness in leveraging its asset base to generate earnings, historically serving as a primary benchmark for inter-bank comparisons and performance monitoring over time. Hence, ROA not only provides insights into asset management efficiency but also facilitates performance assessments across banks (Alfanti et al., 2024).

Financial performance serves as a barometer of a company's overall financial health, with superior performance indicating stronger company standing (Inoguchi 2012; Siagian et al., 2024). Bank performance, in particular, can be evaluated through various indicators, including financial statements that offer insights into financial condition and management accountability to stakeholders (Anton et al., 2021). Profitability serves as a key measure for banking performance, with Return on Asset (ROA) commonly used to assess profitability. BI Circular Letter No. 13/30/DPNP dated December 16, 2011, stipulates that ROA is calculated as the ratio of after-tax profit to total assets, with higher ROA values indicating better financial performance due to higher return rates.

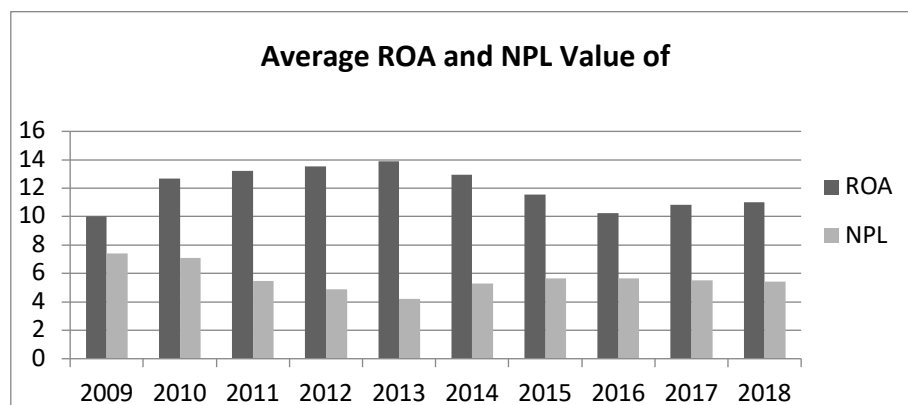
The 2008 global economic crisis, originating from the US, had widespread ramifications, affecting various countries worldwide, including Indonesia. This crisis extended to real and non-financial sectors, with significant impacts on economic growth and exchange rates. Despite these challenges, the Indonesian banking sector displayed resilience, with private commercial banks maintaining a robust Capital Adequacy Ratio (CAR) of 16.8% in 2008. Notably, national bank credit growth surged amidst the crisis, reaching 30.7% by December 2008 (Source: www.bappenas.go.id, accessed on March 2, 2020).

Amidst intense competition within the domestic banking sector, the global financial crisis prompted state-owned banks to exercise caution in managing liquidity and credit disbursement to mitigate potential Non-Performing Loans (NPLs) (Source: <https://economy.okezone.com>, accessed on March 2, 2020). Notably, the average ROA values for BUMN banks between 2009-2018 exhibited an upward trend, surpassing the Bank Indonesia standard of 1.5%.



**Figure 1. Graph of Average ROA Value of BUMN Banks for the Period 2009-2018**  
 Source: Indonesian Banking Statistics (2023)

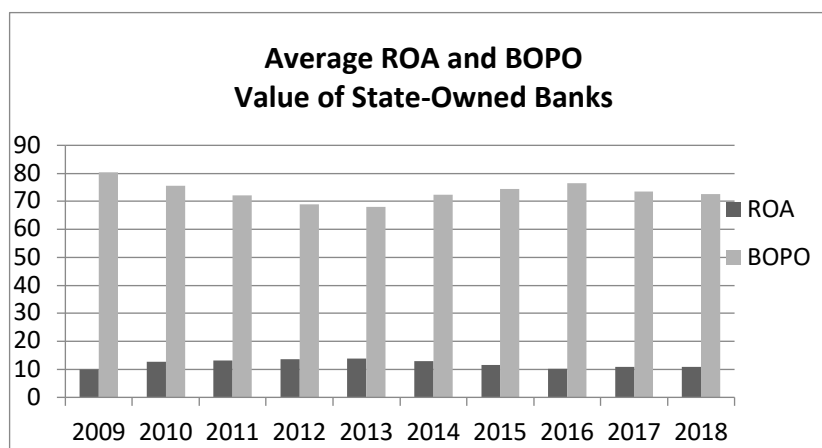
Based on Figure 1.1 the ROA value of BUMN Banks fluctuates and tends to increase from 2009-2018. In 2009 the ROA value was at 3.73%, while in 2010 the ROA value increased to 4.64%. In 2011 ROA again experienced an increase again, namely 4.93%. In 2012 ROA experienced an increase, namely to 5.15%. Starting from 2013 it decreased to 5.03%. In 2014 BUMN banks experienced a decline again to 4.73%. 2015 experienced a decline again of 4.19%. In 2016 BUMN banks decreased by 3.84%. In 2017 it decreased again by 3.69%. In 2018 the BUMN bank's ROA value decreased again to 3.68%.



**Figure 2. Average ROA and NPL Value of BUMN Banks for the period 2009-2018**

Source: Indonesian Banking Statistics (2023)

This *Non Performing Loan* (NPL) ratio is related to credit where this ratio is most often faced by banks, because of the distribution of funds to the community in the form of loans. The NPL is the ratio of non-performing loans to total loans. NPL is said to be good if it is less than 5, the smaller the NPL, the better the ROA value will be.



**Figure 3. Average ROA and BOPO values of BUMN Banks for the 2009-2018 Period**

Source: Indonesian Banking Statistics (2023)

The BOPO ratio is utilized to assess banks' efficiency and proficiency in executing their operational activities (Mandagie, 2021). It can be calculated by comparing total operating expenses with total operating income. Any increase in operating costs will lead to a reduction in pre-tax profits, subsequently diminishing the bank's profitability (ROA) (Hasibuan et al., 2021).

The Net Interest Margin (NIM) ratio gauges bank management's effectiveness in leveraging its productive assets to generate net interest income (Yuhartil, 2019; Parhusip & Cakranegara 2021).

NIM is computed by dividing the bank's interest income minus interest expenses by the average earning assets. A higher NIM indicates superior performance in generating interest income.

Research conducted by Rifansa and Pulungan (2022) reveals that NIM and CAR have a significant impact on ROA, while LDR positively influences ROA. Additionally, findings from Pinasti and Mustikawati's study (2016) indicate that BOPO negatively affects profitability, whereas NIM positively impacts profitability.

## **2. Methods**

The research methodology employed in this study is a descriptive verification method with a quantitative approach. The dependent variable under investigation is financial performance, assessed through Return On Assets (ROA) (Y). The independent variables analyzed include Non-Performing Loans (NPL) (X1), Bank Operating Profitability (BOPO) (X2), and Net Interest Margin (NIM) (X3).

The population for this study comprises BUMN Banks listed on the Indonesia Stock Exchange, totaling 4 Banks. Sample selection was conducted using nonprobability sampling with saturated sampling, encompassing all members of the population.

Secondary data in the form of annual reports sourced from the official websites of each bank and the Indonesian Statistics Agency (BPS) were utilized as samples. The data consist of quantitative time series data encompassing NPL, BOPO, NIM, and ROA data collected from the period 2009-2018. Data collection methods employed in this study include literature review and documentation.

Furthermore, data analysis will be conducted using multiple linear regression analysis in SPSS to examine the relationships between the dependent variable (ROA) and independent variables (NPL, BOPO, and NIM).

### 3. Results and Discussion

#### Classical Assumption Test

##### a. Normality Test

**Table 1. Normality Test Result**

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		40
Normal Parameters <sup>a</sup>	Mean	.0000000
	Std. Deviation	.19547202
Most Extreme Differences	Absolute	.097
	Positive	.097
	Negative	-.064
Kolmogorov-Smirnov Z		.614
Asymp. Sig. (2-tailed)		.845

a. Test distribution is Normal.

Based on the table above, it shows that the normality test results have a significant value of 0.845 greater than 0.05 so it can be concluded that the data tested is normally distributed.

##### b. Multicollinearity Test

**Table 2. Multicollinearity Test Result**

Model	Coefficients <sup>a</sup>					Collinearity Statistics	
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Tolerance	VIF
	B	Std. Error	Beta				
1 (Constant)	7.847	.611		12.836	.000		
NPL	.113	.064	.091	1.779	.084	.349	2.862
NIM	.329	.034	.465	9.598	.000	.389	2.572
BOPO	-.097	.007	-.716	-14.076	.000	.353	2.831

Dependent Variable: ROA

Based on the table above, it shows that the tolerance value for variables X1, X2, and X3 is greater than 0.10. while the VIF value for variables X1, X2, and X3 < 10.00, then referring to the basis for decision making in the multicollinearity test, it can be concluded that there are no multicollinearity symptoms in the regression model.

**c. Autocorrelation Test**

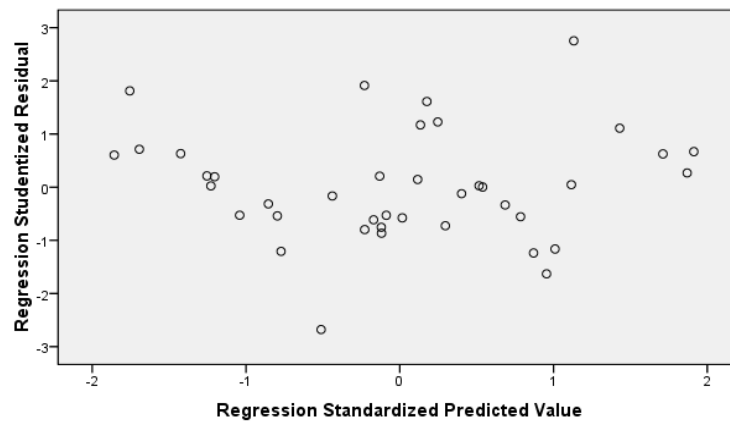
**Table 3. Autocorrelation Test Result**

Model Summary <sup>b</sup>						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	
1	.983 <sup>a</sup>	.967	.964	.20345	1.548	

a. Predictors: (Constant), BOPO, NIM, NPL  
 b. Dependent Variable: ROA

Based on the table above, it shows that the DW = 1.548 value, this value will be compared with the table value using a significance value of 5%. The number of samples (n) = 40 and the number of independent variables is 3, then the value of dL = 1.338 and dU = 1.658 will be obtained. therefore, the value of dU = 1.658 > DW 1.548 < (4-dU) 2.342 so that autocorrelation occurs or the correlation test is not fulfilled.

**d. Heteroscedasticity Test**



**Figure 1. Multicollinearity Test Result**

Based on the table above, it shows that it is known that the spread points above and below or around the number 0, the points do not collect only above or below, the distribution of data points does not form a wavy pattern widening then narrowing and widening again, and the distribution of data points is not patterned so it can be concluded that there is no heteroscedasticity problem until a good and ideal regression model can be fulfilled.

**Hypothesis Test**

**a. Multiple Linear Analysis (Correlation)**

**Table 4. Correlation between X1, X2, and X3 to Y**

		Correlations			
		NPL	NIM	BOPO	ROA
NPL	Pearson Correlation	1	.401*	.488**	-.071
	Sig. (2-tailed)		.010	.001	.661
	N	40	40	40	40
NIM	Pearson Correlation	.401*	1	-.390*	.781**
	Sig. (2-tailed)	.010		.013	.000
	N	40	40	40	40
BOPO	Pearson Correlation	.488**	-.390*	1	-.853**
	Sig. (2-tailed)	.001	.013		.000
	N	40	40	40	40
ROA	Pearson Correlation	-.071	.781**	-.853**	1
	Sig. (2-tailed)	.661	.000	.000	
	N	40	40	40	40

\*. Correlation is significant at the 0.05 level (2-tailed).  
 \*\*. Correlation is significant at the 0.01 level (2-tailed).

Based on the table above, the 2 tailed sig significance value between NPL (X1) and ROA (Y) is  $0.661 > 0.05$ , which means that there is no significant correlation between variable X1 and variable Y. Furthermore, the relationship between NIM (X2) and BOPO (X3) with ROA (Y) has a sig. 2 tailed of  $0.000 < 0.05$  which means there is a significant correlation between NIM (X2) and BOPO (X3) to ROA (Y).

**b. Determination Coefficient Test**

**Table 5. Result for R Square**

Model Summary <sup>b</sup>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.983 <sup>a</sup>	.967	.964	.20345	1.548

a. Predictors: (Constant), BOPO, NIM, NPL

b. Dependent Variable: ROA

Based on the table above, it shows that the coefficient of determination ( $R^2$ ) is 0.987 or 98.7%. The ROA (Y) variable can be explained by the NPL (X1), NIM (X2) and BOPO (X3) variables or it can be interpreted that the NPL (X1), NIM (X2) and BOPO (X3) variables have contributed to ROA (Y) by 98.7% and the remaining 1.3% is the contribution of other variables not examined in this study.

**c. Partial Test (t Test)**

The effect of NPL (X1), NIM (X2), and BOPO (X3) partially on ROA (Y) can be known through statistical testing using the following hypothesis:

**Table 6. T-Test Result**

		Coefficients <sup>a</sup>				Collinearity Statistics	
		Unstandardized Coefficients		Standardized Coefficients			
Model		B	Std. Error	Beta	t	Sig.	VIF
1	(Constant)	7.847	.611		12.836	.000	
	NPL	.113	.064	.091	1.779	.084	2.862
	NIM	.329	.034	.465	9.598	.000	2.572
	BOPO	-.097	.007	-.716	-14.076	.000	2.831

a. Dependent Variable: ROA

H0:  $\beta_1 = \beta_2 = \beta_3 = 0$  There is no partial influence between NPL (X1), NIM (X2), and BOPO (X3) on ROA (Y).

H1:  $\beta_1 \neq 0$ ,  $\beta_2 \neq 0$ ,  $\beta_3 \neq 0$  There is a partial influence between NPL (X1), NIM (X2), and BOPO (X3) on ROA (Y).

The criterion H0 is rejected if  $Sig < \alpha$  or  $|t_{count}| > t_{table}$ . For the correlation of NPL (X1), NIM (X2), and BOPO (X3) partially to ROA (Y) with a significant level ( $\alpha$ ) 5% degree of freedom ( $df = (n-k) = 40 - 4 = 36$ ) obtained  $t_{table} = 1.680$ . The effect of NPL (X1), NIM (X2), and BOPO (X3) partially on ROA (Y) can be shown in the table as follows:

Based on the table above, it can be concluded that the t value of the independent variables is 1,779 (X1), 9,598 (X2), and -14,076 (X3), then for the NPL variable (X1) and NIM (X2)  $t_{count} > t_{table}$  (1,779 and 9,598 > 1,680) while the BOPO variable (X3)  $t_{count} < t_{table}$  (-14,076 < 1,680), if according to the hypothesis which states that H0 is rejected then H1 is accepted, then:

- NPL variable (X1) has a positive and significant effect (0.000) partially on ROA (Y)
- NIM variable (X2) has a positive and significant effect (0.000) partially on ROA (Y)
- BOPO variable (X3) has no positive and significant effect (0.000) partially on ROA (Y).

**d. Simultaneous Test (F Test)**

$df$  (numerator) = 4 - 1 = 3

$df$  (denominator) = 40 - 4 = 36

The calculated f value is obtained using the help of SPSS, then it will be compared with the f table at the  $\alpha = 5\%$  level, the  $f_{table}$  is 2.87.

**Table 6. F-Test Result**

		ANOVA <sup>b</sup>				
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43.824	3	14.608	352.904	.000 <sup>a</sup>
	Residuals	1.490	36	.041		
	Total	45.314	39			

a. Predictors: (Constant), BOPO, NIM, NPL

b. Dependent Variable: ROA



Based on the table of F results, it shows the value of F count = 352.904 with a significance level of 0.000 while the value of F table = 2.87. The value of F count > F table (352.904 > 2.87) and the level of significance (0.000 < 0.050) with the hypothesis H0 rejected and H1 accepted, so it can be concluded that the independent variables namely NPL (x1), NIM (X2), and BOPO (X3) together have a positive and significant effect on ROA (Y).

The findings of this research shed light on the relationship between various financial indicators and Return on Assets (ROA), offering valuable insights into the factors influencing bank performance.

#### 1. Effect of Non-Performing Loan (NPL) on Return on Asset (ROA)

The results indicate a significant effect of Non-Performing Loan (NPL) on Return on Asset (ROA). This finding underscores the importance of managing and minimizing non-performing loans to enhance bank profitability. High levels of NPL can adversely impact asset quality and profitability, leading to lower ROA. Banks should implement effective risk management strategies and credit assessment mechanisms to mitigate the risk of non-performing loans and improve overall financial performance.

#### 2. Effect of Net Interest Margin (NIM) on Return on Asset (ROA)

The analysis reveals a significant effect of Net Interest Margin (NIM) on Return on Asset (ROA). This highlights the critical role of interest income in driving bank profitability. A higher NIM indicates efficient management of interest-bearing assets and liabilities, resulting in increased net interest income and improved ROA. Banks should focus on optimizing interest rate spreads and effectively managing interest rate risk to maximize NIM and enhance overall financial performance.

#### 3. No Effect of Operating Expenses and Operating Income (BOPO) on Return on Asset (ROA)

Contrary to expectations, the study finds no significant effect of Operating Expenses and Operating Income (BOPO) on Return on Asset (ROA). This unexpected result may indicate that operating expenses and income do not directly influence overall profitability as measured by ROA. However, it is essential to further explore the underlying factors contributing to this finding and consider other performance metrics to comprehensively assess the impact of operating expenses and income on bank profitability.

#### 4. Influence of NPL, NIM, and BOPO on Return on Asset (ROA)

The analysis reveals a combined influence of Non-Performing Loan (NPL), Net Interest Margin (NIM), and Operating Expenses and Operating Income (BOPO) on Return on Asset (ROA). This underscores the multifaceted nature of bank performance, with various financial indicators collectively shaping profitability. Banks must adopt a holistic approach to performance management, addressing factors such as asset quality, interest income generation, and operational efficiency to optimize ROA and sustain long-term profitability.

### 4. Conclusions

Following thorough research and discussions, several conclusions emerge: Firstly, it is evident that Non-Performing Loans (NPLs) significantly impact Return on Assets (ROA). This underscores the critical role asset quality, particularly in the form of defaulted loans, plays in a company's financial performance. Secondly, there is a notable influence of Net Interest Margin (NIM) on Return on Assets (ROA). This suggests that the profit margin derived from the interest rate

differential plays a crucial role in determining a company's efficiency in generating returns from its assets. However, in the same analysis, there appears to be no significant effect of Operating Expenses and Operating Income (BOPO) on Return on Assets (ROA). This indicates that while operational costs and revenue are vital in conducting business activities, they do not directly impact a company's efficiency in generating returns from its assets. Lastly, it can be concluded that the combination of NPLs, NIM, and BOPO has a significant influence on Return on Assets (ROA). This emphasizes that while these factors individually play important roles, their interaction also greatly affects a company's financial performance in generating returns from its assets.

Future research could delve deeper into several areas to enhance understanding and provide more comprehensive insights. Firstly, investigating the specific factors driving NPLs and how they can be managed effectively to mitigate their impact on ROA would be beneficial. Additionally, exploring alternative measures of asset quality beyond NPLs could offer a more nuanced understanding of their relationship with ROA. Moreover, examining the dynamics between NIM and ROA in different economic environments or industries could provide insights into the robustness of this relationship. Finally, exploring the underlying drivers of operational efficiency and their impact on ROA could offer valuable insights for companies seeking to optimize their financial performance.

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