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The Effect of Net Interest Margin (NIM) and Capital Adequacy Ratio (CAR) On Return on Assets (ROA)

Nadia Nurafida[1]. Achmad Agus Yasin Fadli[2]

Universitas Pamulang, nadianurafida@gmail.com ; dosen00949@unpam.ac.id

Abstract. This study aims to determine the effect of Net Interest Margin (NIM) and Capital Adequacy Ratio (CAR) on Return on Assets (ROA) at PT Bank Mandiri Tbk. The writing in this research uses a quantitative descriptive method. The type of data used is secondary data. The sample used in this study is the balance sheet and income statement of PT Bank Mandiri for the period 2013-2022. The results of the analysis show that 1) Partially, the independent variables do not have an influence on the dependent variable. 2) Simultaneously, no influence is found between the independent and dependent variables. Based on the determination calculation, an R Square value of 0.260 or 26% is obtained. This indicates that the percentage contribution of the independent variables, Net Interest Margin (NIM) and Capital Adequacy Ratio (CAR), to the dependent variable, Return on Assets (ROA), is 26%. The remaining 74% is influenced by other variables not included in this study.

Keywords: Net Interest Margin (NIM) ; Capital Adequacy Ratio (CAR) ; Return on Assets (ROA)

A. INTRODUCTION

In the increasingly competitive business landscape in both the industrial and service sectors, Indonesian companies have experienced significant qualitative and quantitative growth in line with these developments. Some companies have transformed into publicly traded companies, with their shares now held by the general public, not just limited shareholders. As a developing country, Indonesia has made progress in all sectors of the global economy, leading to rapid corporate growth as economic activities expand.

One of the industrial sectors in Indonesia contributing to economic growth and development is the banking sector. Today, the word "bank" is no longer foreign to us. It's not just urban residents but also those in rural areas who understand how banks operate. Banks are financial institutions that provide various products and services such as loans, savings, and secure storage for valuable items.

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The primary activity of a bank is closely related to money. One of its main activities is mobilizing funds from the general public, known as "funding." Mobilizing funds means that banks collect funds by purchasing them from the general public. Additionally, banks also channel funds to the public through loans and provide various other services.

PT Bank Mandiri, Tbk is a banking company that collects funds from the public in the form of savings, deposits, current accounts, and investments, and then channels these funds to the public in the form of credit. Bank Mandiri recognizes the importance of maintaining and improving its financial performance to sustain its business through increased profitability.

Evaluating a company's financial performance at the end of a period is an important step in assessing its progress. This evaluation requires specific standards as a basis for comparison. In this study, the author uses the calculation of ratios that can describe aspects related to a company's financial performance, including Net Interest Margin (NIM), Capital Adequacy Ratio (CAR), and Return on Assets (ROA).

Generally, companies consider profitability more important than the profit they earn. Large profits do not always indicate a company's success or operational efficiency. Efficiency can actually be determined by comparing profits to the capital that generated those profits, or in other words, calculating the level of profitability. Higher profitability levels indicate a healthy financial condition of the company.

Table 1: NIM, CAR, and ROA Ratios for PT Bank Mandiri Tbk for the Years 2013-2022

Year	NIM	CAR	ROA
2013	7,27%	14,93%	2,57%
2014	7,74%	16,60%	2,42%
2015	8,04%	18,60%	2,32%
2016	8,13%	21,36%	1,42%
2017	7,33%	21,64%	2,05%
2018	6,71%	20,96%	2,32%
2019	6,95%	21,39%	2,16%
2020	6,64%	19,90%	1,17%
2021	7,03%	19,60%	1,87%
2022	7,41%	19,46%	2,40%

Source: Financial Report of PT Bank Mandiri Tbk

According to Kristian (2016), Net Interest Margin (NIM) is a ratio used to measure a bank's ability to manage its productive assets to generate net interest income. The overall costs that a bank must pay will affect the percentage of interest rates applied to loans provided to customers to achieve the bank's net income. An increase in NIM indicates the bank's effectiveness in managing its productive assets. Based on the presented data, the NIM value fluctuated during this period, with a significant increase from 2020 to 2022.

Additionally, the Capital Adequacy Ratio (CAR) is a ratio that calculates the amount of capital held by the bank in relation to Risk-Weighted Assets (RWA). The higher the CAR, the better the bank's ability to bear the risk of each loan or risky productive asset. A low CAR can cause some banks to cease operations. In the presented data, the CAR value for

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PT Bank Mandiri Tbk appears secure because the minimum CAR set by Bank Indonesia is 8%. This minimum CAR limit aims to protect customers from potential losses incurred by the bank and maintain overall financial system stability.

Profitability is a bank's ability to generate profits efficiently and effectively through sales and investments. High profitability indicates that the bank operates effectively and efficiently and can expand its business. This is crucial for a bank to maintain stability, attract investors' interest, and build public trust in depositing funds in the bank. One profitability measure used is Return on Assets (ROA), which depicts the results obtained from the amount of assets used in the company as an indicator of management activity.

B. LITERATURE REVIEW

Management

According to Firmansyah (2018:4), "management is the art and science of planning, organizing, arranging, directing, and controlling human resources to achieve predetermined goals."

Financial Management

According to Wijaya (2017:2), "financial management relates to the management of finances such as budgeting, financial planning, cash, credit, investment analysis, and fund acquisition."

Financial Reports

According to Munawir (2014:2), "financial reports are the results of accounting processes that can be used as a tool for communication between financial data or activities of a company with stakeholders interested in the data or activities of the company."

Net Interest Margin (NIM)

According to Janrosl & Yuliani (2017), Net Interest Margin is the ratio of net interest income to productive assets.

Capital Adequacy Ratio (CAR)

According to Wardiah (2013:295), "Capital Adequacy Ratio is the ratio of a bank's capital adequacy or the bank's ability in the capital it has to cover potential losses in lending or trading in securities."

Return on Assets (ROA)

Return On Assets (ROA) according to Kasmir (2016:201) is a "ratio that shows the return on the amount of assets used in the company."

Previous Research

This research is motivated by a research gap in previous studies. Based on research conducted by Eng (2013), Dewi (2017), Rembet and Baramuli (2020), Pardede and Pangestuti (2016), Ali (2017), Nugroho et al. (2019), Dini and Manda (2020), Rohmiati and Subroto (2019), Saputra et al. (2018), Anggraini and Suryaningtias (2017), they concluded that Net Interest Margin (NIM) has an influence on Return on Assets (ROA). However, Nufus and Munandar (2021) found that Net Interest Margin (NIM) does not have an influence on Return on Assets (ROA).

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Furthermore, research on the impact of Capital Adequacy Ratio (CAR) by several previous studies, namely the research by Dewi (2017), Warsa and Mustanda (2016), Rembet and Baramuli (2020), Pardede and Pangestuti (2016), Nugroho et al. (2019), and Fadli and Samudra (2023) found that it has an impact on Return on Assets (ROA). However, in the research by Eng (2013), Dini and Manda (2020), Saputra et al. (2018), Anggraini and Suryaningtias (2017), and Nufus and Munandar (2021), there was no influence found between the Capital Adequacy Ratio (CAR) variable and Return on Assets (ROA).

The research results by Anggraini and Suryaningtias (2017) indicate an influence of Net Interest Margin (NIM) and Capital Adequacy Ratio (CAR) on Return on Assets (ROA) simultaneously. However, according to Nufus and Munandar (2021), there is no simultaneous influence.

Theoretical Framework

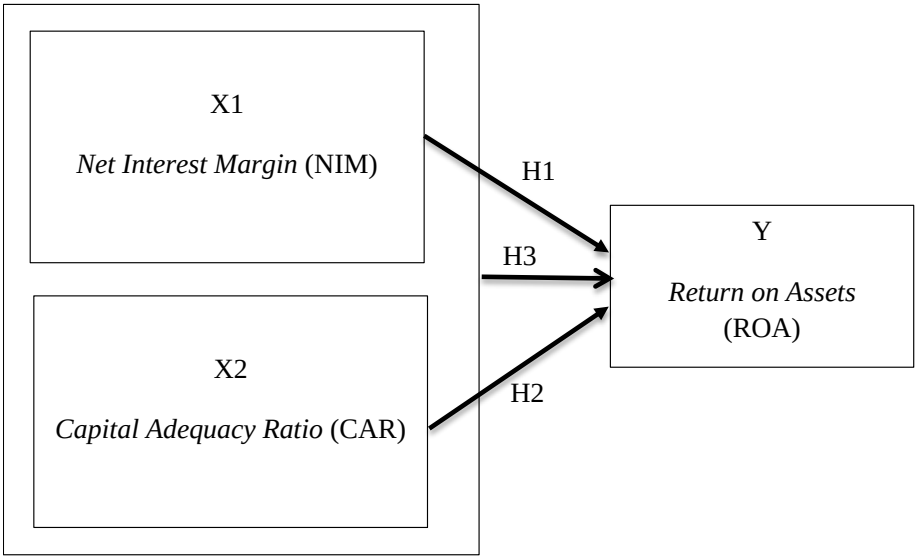

Figure 1 Theoretical Framework

Hypotheses

Based on the theoretical framework and research model, the hypotheses can be formulated as follows:

H_{a1}: It is suspected that Net Interest Margin (NIM) has an influence on Return on Assets (ROA) at PT Bank Mandiri Tbk for the period 2013-2022.

H_{a2}: It is suspected that Capital Adequacy Ratio (CAR) has an influence on Return on Assets (ROA) at PT Bank Mandiri Tbk for the period 2013-2022.

H_{a3}: It is suspected that Net Interest Margin (NIM) and Capital Adequacy Ratio (CAR) have an influence on Return on Assets (ROA) at PT Bank Mandiri Tbk for the period 2013-2022.

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C. RESEARCH METHODOLOGY

Research Type

This research is an associative study with a causal relationship using financial data from PT Bank Mandiri Tbk for the period 2013-2022. The nature employed in this thesis is quantitative descriptive research, where research data consists of numbers and analysis using research statistics. Data collection involved searching for facts from financial reports consisting of balance sheets and income statements.

Population and Sample

According to Sujarweni (2014:65), "population refers to the total number of objects or subjects with specific characteristics and qualities that are the focus of the research, and conclusions are then drawn from it." The population used in this thesis is the complete set of financial reports from PT Bank Mandiri Tbk for the period 2013-2022.

According to Sugiyono (2015:120), "a sample is a portion of the total and the characteristics possessed by the population." The sample used in this research consists of financial reports in the form of balance sheets and income statements from PT Bank Mandiri Tbk for the period 2013-2022.

Data Collection Techniques

Data sources in the research, according to Sujarweni (2014:73), include:

a. Primary Data
   Primary data is data obtained from respondents through questionnaires, focus groups, panels, or data resulting from interviews conducted by the researcher with experts.
b. Secondary Data
   Secondary data is data obtained from records, company financial publications, government reports, articles, theory books, magazines, and other sources. Therefore, the data used in this research is secondary data taken from the financial reports of PT Bank Mandiri Tbk.

Data Analysis Technique

In processing the obtained secondary data, the researcher used statistical software applications, including Microsoft 2019, which involves creating tables and graphs for descriptive analysis, and SPSS 25 for data processing used to assist the researcher in analyzing data for conducting multiple linear regression significance testing.

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D. RESULTS AND DISCUSSION

Descriptive Statistics

Table 2 Descriptive Data Analysis

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Net Interest Margin	10	6.64	8.13	7.3250	.51821
Capital Adequacy Ratio	10	14.93	21.64	19.4440	2.21078
Return on Assets	10	1.17	2.57	2.0700	.45794
Valid N (listwise)	10				

Source: Data from SPSS version 25

Based on the results of descriptive statistics calculations shown in Table 2, it can be observed that the dependent variable (Y), which is Return on Assets (ROA), has a minimum value of 1.17% and a maximum value of 2.57%. The mean value is 2.0700, and the standard deviation is 0.45794.

Classical Assumption Tests

The purpose of testing classical assumptions is to ensure that the regression equation obtained is accurate in estimation, unbiased, and consistent. The classical assumption tests in this research include tests for Normality, Multicollinearity, and Autocorrelation.

a. Normality Test

The Normality Test is conducted to determine whether the residual values are normally distributed. The results of the normality test for the residual values of the NIM and CAR variables with respect to ROA are as follows:

Table 3 Kolmogorov Test

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		10
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.39389713
Most Extreme Differences	Absolute	.234
	Positive	.139
	Negative	-.234
Test Statistic		.234
Asymp. Sig. (2-tailed)		.130[c]

a. Test distribution is Normal.

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b. Calculated from data.
c. Lilliefors Significance Correction.

Source: Data from SPSS version 25

Based on the table above, the significance value (2-tailed) is 0.130, indicating that the residual data is normally distributed with a Kolmogorov-Smirnov significance value of 0.130 > 0.05. Therefore, it can be concluded that the residual data for the independent variables NIM and CAR with respect to ROA in this study follows a normal distribution.

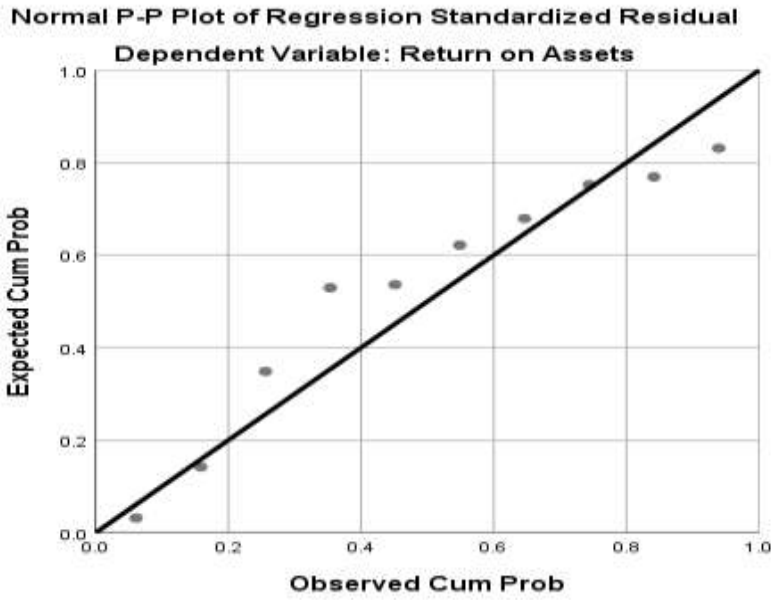

Figure 2 Normal P-Plot

Source: Data from SPSS version 25

From the above picture, it can be concluded that the residual values are normally distributed. In the picture, the points are scattered around the diagonal line and follow the diagonal line's direction. Therefore, it can be inferred that the residual values of the data have a normal distribution, or the data meet the classical assumption of normality.

b. Multicollinearity Test

Table 4 Multicollinearity Test

Coefficients[a]

Model	Unstandardized Coefficients	Standardized Coefficients	Collinearity Statistics	
	Std. Error	Beta	Tolerance	VIF
1 (Constant)	2.741			
Net Interest Margin	.293	.038	.962	1.039

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Capital Adequacy Ratio	.069	-.501	.962	1.039

a. Dependent Variable: Return on Assets

Source: Data processed by SPSS version 25

From the coefficient table obtained, it can be seen that the tolerance values for NIM and CAR are 0.962, and the VIF values for NIM and CAR are 1.039. This means that the VIF values are less than 10. Thus, it can be concluded that there is no multicollinearity issue in the tested data.

c. Heteroskedasticity Test

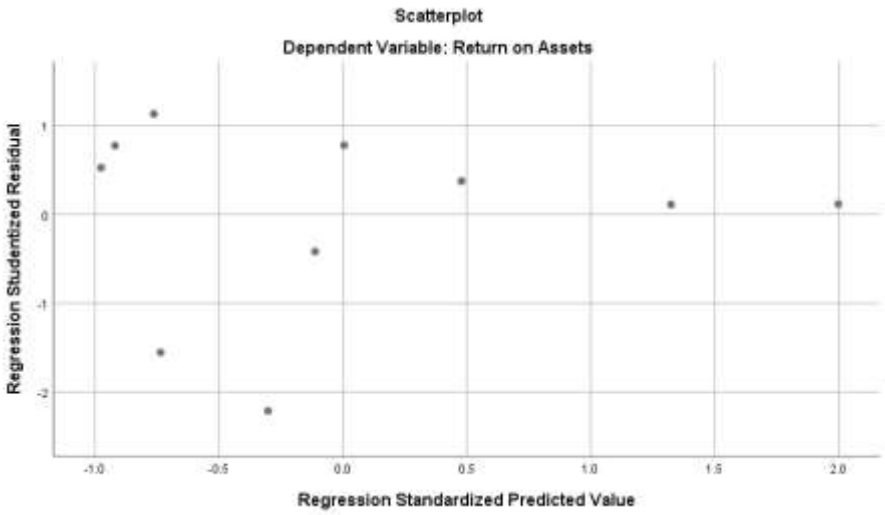

Figure 3 Heteroskedasticity Test

Source: Data processed by SPSS version 25

Based on the chart above, it can be observed that the data points are evenly distributed above and below the zero line, not clustered in one place, and do not form a specific pattern. Therefore, it can be concluded that there is no heteroskedasticity problem in this regression analysis.

Autocorrelation Test

Table 5 Autocorrelation Test

Model Summary[b]

l	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
	.510[a]	.260	.049	.44664	2.072

a. Predictors: (Constant), Capital Adequacy Ratio, Net Interest Margin

b. Dependent Variable: Return on Assets

Source: Data processed by SPSS version 25

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Based on the table above, the Durbin-Watson value is 2.072. Since the Durbin-Watson value falls between dU < d < 4-dU, the test result is not rejected. Therefore, it can be concluded that there is no autocorrelation issue in this research.

Multiple Linear Regression Analysis

Table 6 Multiple Linear Regression Analysis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	Collinearity Statistics	
		B	Std. Error	Beta	Tolerance	VIF
1	(Constant)	3.842	2.741			
	Net Interest Margin	.034	.293	.038	.962	1.039
	Capital Adequacy Ratio	-.104	.069	-.501	.962	1.039

a. Dependent Variable: Return on Assets

Source: Data processed by SPSS version 25

$$Y = 3.842 + 0.034X1 - 0.104X2$$

The regression equation can be explained as follows:

1. The constant value of 3.842 indicates that when Net Interest Margin and Capital Adequacy Ratio are both equal to 0, the Return on Assets value is 3.842.
2. The regression coefficient for the Net Interest Margin variable is 0.034, which means that for every 1% increase in Net Interest Margin, Return on Assets increases by 0.034, assuming other variables remain constant.
3. The regression coefficient for the Capital Adequacy Ratio variable is -0.104, indicating that for every 1% increase in Capital Adequacy Ratio, Return on Assets decreases by -0.104, assuming other variables remain constant.

Correlation Coeffiecient Test (R)

Table 7 Correlation Coefficient Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.510[a]	.260	.049	.44664	2.072

a. Predictors: (Constant), Capital Adequacy Ratio, Net Interest Margin

b. Dependent Variable: Return on Assets

Source: Data processed by SPSS version 25

In the table above, the correlation coefficient test results show an R value of 0,510. This indicates that the correlation between Return on Assets (ROA) (dependent variable)

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and Net Interest Margin (NIM) and Capital Adequacy Ratio (CAR) (Independent variables) has a moderate level of relationship at 51%.

Hypothesis Testing

1. Partial Hypothesis Testing (t-test)

Table 8 t-test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.842	2.741		1.402	.204
	Net Interest Margin	.034	.293	.038	.115	.912
	Capital Adequacy Ratio	-.104	.069	-.501	-1.513	.174

a. Dependent Variable: Return on Assets

Source: Data processed by SPSS version 25

Explanation:

1) Effect of Net Interest Margin on Return on Assets

Based on the table above, it is observed that the calculated t-value is smaller than the tabulated t-value, or 0.115 < 2.36462, and the significance value is larger than 0.05. Therefore, it can be interpreted that H01 is accepted, and Ha1 is rejected. Hence, it can be concluded that Net Interest Margin (NIM) does not have a significant effect on Return on Assets (ROA) at PT Bank Mandiri Tbk for the period 2013-2022.

2) Effect of Capital Adequacy Ratio on Return on Assets

Based on the table above, it is observed that the calculated t-value is smaller than the tabulated t-value, or (-1.513) < 2.36462, and the significance value is larger than 0.05. Therefore, it can be interpreted that H02 is accepted, and Ha2 is rejected. Hence, it can be concluded that Capital Adequacy Ratio (CAR) does not have a significant effect on Return on Assets (ROA) at PT Bank Mandiri Tbk for the period 2013-2022.

2. Simultaneous Hypothesis Testing (F-test)

Table 9 F-test (ANOVA)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.491	2	.246	1.231	.348[b]
	Residual	1.396	7	.199		
	Total	1.887	9			

a. Dependent Variable: Return on Assets

b. Predictors: (Constant), Capital Adequacy Ratio, Net Interest Margin

Source: Data processed by SPSS version 25

Based on the output table above, the ANOVA F-test result shows an F-value of 1.231 < the tabulated F-value of 4.74, with a significance level of 0.348 > 0.05. Therefore,

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it can be interpreted that H03 is accepted, and Ha3 is rejected. It can be concluded that Net Interest Margin and Capital Adequacy Ratio do not have a simultaneous effect on Return on Assets at PT Bank Mandiri Tbk.

Coefficient of Determination (R2) Test

Table 10 Coefficient of Determination Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.510[a]	.260	.049	.44664	2.072

a. Predictors: (Constant), Capital Adequacy Ratio, Net Interest Margin

b. Dependent Variable: Return on Assets

Source: Data processed by SPSS version 25

The coefficient of determination can be observed from the R square value. Based on the table above, an R2 value of 0.260 or 26% is obtained. This indicates that the Net Interest Margin and Capital Adequacy Ratio variables have a low influence on Return on Assets, accounting for 26%, while the remaining 74% is influenced by other variables not examined in this research.

Discussion of the Research

Based on the data analysis results, the following conclusions and discussions can be made:

1. Partial Effects of Net Interest Margin and Capital Adequacy Ratio on Return on Assets:
   a. Effect of Net Interest Margin on Return on Assets

      Based on the t-test results, it is found that the calculated t-value is smaller than the tabulated t-value, or 0.115 < 2.36462, and the significance value is larger than 0.05. Therefore, H01 is accepted, and Ha1 is rejected. It can be concluded that Net Interest Margin (NIM) does not have a significant effect on Return on Assets (ROA) at PT Bank Mandiri Tbk.

   b. Effect of Capital Adequacy Ratio on Return on Assets

      Based on the t-test results, it is found that the calculated t-value is smaller than the tabulated t-value, or (-1.513) < 2.36462, and the significance value is larger than 0.05. Therefore, H02 is accepted, and Ha2 is rejected. It can be concluded that Capital Adequacy Ratio (CAR) does not have a significant effect on Return on Assets (ROA) at PT Bank Mandiri Tbk.
2. Simultaneous Effects of Net Interest Margin and Capital Adequacy Ratio on Return on Assets:

   Simultaneously, Net Interest Margin (NIM) and Capital Adequacy Ratio (CAR) do not have a significant effect on Return on Assets (ROA). Based on the F-test (ANOVA), the F-value is 1.231 < the tabulated F-value of 4.74, with a significance level of 0.348 >

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0.05. Therefore, H03 is accepted, and Ha3 is rejected. It can be concluded that Net Interest Margin and Capital Adequacy Ratio do not have a simultaneous effect on Return on Assets at PT Bank Mandiri Tbk.

E. CONCLUSIONS AND SUGGESTIONS

Conclusion

The author discussed the main points and issues based on PT Bank Mandiri Tbk for a period of 10 years from 2013 to 2022. Here are some conclusions that can be drawn based on the research data analysis:

1. The Net Interest Margin (NIM) at PT Bank Mandiri Tbk from 2013 to 2022 fluctuates every year. NIM has a minimum value of 6.64, a maximum value of 8.13, a mean value of 7.3250, and a standard deviation of 0.51821. Based on the analysis for the Net Interest Margin variable, the calculated t-value is 0.115 with a significance value of 0.912. Since the t-value < the tabulated t-value (0.115 < 2.36462) and the significance value (0.912 > 0.05), H01 is accepted, and Ha1 is rejected with the conclusion that the Net Interest Margin variable does not affect Return on Assets.
2. The Capital Adequacy Ratio (CAR) at PT Bank Mandiri Tbk from 2013 to 2022 also fluctuates every year. CAR has a minimum value of 14.93, a maximum value of 21.64, a mean value of 19.4440, and a standard deviation of 2.21078. Based on the analysis for the Capital Adequacy Ratio variable, the calculated t-value is (1.513) with a significance value of 0.174. Since the t-value < the tabulated t-value ((1.513) < 2.36462) and the significance value (0.174 > 0.05), H02 is accepted, and Ha2 is rejected with the conclusion that the Capital Adequacy Ratio variable does not affect Return on Assets.
3. The results of the simultaneous test (F-test) show an F-value of 1.231 with a significance of 0.348. The F-table value at a 5% confidence level with df1 = 2 and df2 = 7 is 4.74. Since the F-value < F-table (1.231 < 4.74) and the significance value (0.348 > 0.05), it can be concluded that both Net Interest Margin and Capital Adequacy Ratio do not simultaneously affect Return on Assets.

Research Limitations

Based on the research conducted by the researcher and the results of this study, the following limitations can be identified:

1. Sample limitations: The study only used data from one company in the banking industry, PT Bank Mandiri Tbk.
2. Variable limitations: The study only used two independent variables, Net Interest Margin (NIM) and Capital Adequacy Ratio (CAR), which may not represent all the factors affecting Return on Assets (ROA) as the dependent variable.
3. Data limitations: The study relied solely on financial reports to determine the values of Net Interest Margin (NIM) and Capital Adequacy Ratio (CAR).

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Recommendations

Based on the research discussion and conclusions above, the author would like to provide some recommendations related to this research, which may serve as input for relevant parties:

1. For companies, the Net Interest Margin (NIM) and Capital Adequacy Ratio (CAR) ratios can be used to measure the level of Return on Assets (ROA). A lower Net Interest Margin (NIM) value leads to a lower Return on Assets (ROA), while a higher Capital Adequacy Ratio (CAR) value leads to a higher Return on Assets. Therefore, companies need to carefully consider their performance.
2. For future research, decision-makers should not rely solely on data related to Net Interest Margin (NIM) and Capital Adequacy Ratio (CAR). They should also include other variables that can influence Return on Assets (ROA), both fundamental and economic condition factors. Additionally, researchers in the future can extend the research period to obtain better and more accurate research results.
3. For readers, this research can serve as a reference for conducting further research and can also provide additional insights and a general overview when choosing research topics.

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