

Impact of CAR and ROE on ROA in Indonesian Banking (2021–2024)

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ABSTRACT

The purpose of this research is to evaluate how the Capital Adequacy Ratio (CAR) and the Return on Equity (ROE) affect the Return on Assets (ROA) for all Indonesian Stock Exchange-listed banks (IDX)^1 from 2021 to 2024. A quantitative research method with secondary data using annual financial reports was utilized for this study. There were three types of data analysis completed in this study: descriptive statistics, classical assumption tests, and panel regression analyses. The results of this study showed no relationship between CAR and ROA. However, a significant relationship was found between ROE and ROA. Additionally, the results indicate that CAR and ROA have a significant effect on ROE. Therefore, it appears that the efficiency with which banks utilize their equity is more important than how much capital banks need; therefore, profitability for banks will be primarily determined by how well banks manage to efficiently use equity and improve return on investment from equity investees.

Keywords: *Capital Adequacy Ratio; Return on Equity; Return on Assets; Banking Sector.*

Corresponding author: kariimamonica29@gmail.com

How to cite this article: Kariima Monica. The Impact of Capital Adequacy Ratio and Return on Equity on Return on Assets on the Indonesia Stock Exchange in Banking Sector for the 2021-2024 Period: English. Neraca Keuangan: Jurnal Ilmiah Akuntansi Dan Keuangan.

History of Article: Received: 25 April 2026. Revision: 14 May 2026. Published: 19 May 2026.
DOI Prefix 10.32832/neraca.v21i1.23434

INTRODUCTION

The banking sector, as a financial intermediary between the surplus and deficit sectors, is an important component of the national economy. Banks contribute to economic growth, investment, and overall financial stability by facilitating the flow of funds from savers to borrowers. In addition to this intermediary function, banks contribute to the effective delivery of monetary policy and the development of the financial system. Hence, the maintenance of sound financial performance in the banking sector is important to sustain economic growth.

Financial performance is a key indicator for evaluating the stability, efficiency, and sustainability of the sector. A sound banking system should be not only a profit-making machine but also a machine for risk management and resource allocation. These numbers, like the Capital Adequacy Ratio and the Return on Equity and the Return, on Assets help us understand how well a bank is performing. These ratios give a comprehensive view of many aspects of financial performance including risk management, profitability, and asset utilization.

When we look at the ways to measure how well a bank is doing Return on Assets is one of the most widely used measures of bank profitability. This is because Return, on Assets shows how well a bank uses its assets to make money. Return on Assets is an important indicator because it helps us understand how efficiently a bank is using its assets to generate revenues. A higher ROA signifies higher management efficiency in converting assets into profits, which is crucial for maintaining the competitiveness of the banking industry. Compared to other profitability ratios, ROA is considered a more comprehensive indicator because it takes into account all assets held by the bank. Therefore, understanding the determinants of ROA is vital for evaluating the overall long-term performance sustainability of a bank.

The Capital Adequacy Ratio is one of the things that can affect the Return on Assets. The Capital Adequacy Ratio is a way to figure out if a bank has money to cover potential losses and stay financially stable. The Capital Adequacy Ratio is important because it helps us understand if a bank can handle times. Banks need to have enough capital to absorb financial shocks and reduce the risk of going bankrupt. When we talk about banks there is an amount of Capital Adequacy Ratio that they need to have. This is so that the banking system is safe and sound. Having more Capital Adequacy Ratio than needed is not always a good thing. If banks have much Capital Adequacy Ratio and they do not use it well it can be a waste. Banks should use their Capital Adequacy Ratio, for things that're useful and help

the bank grow. This creates a potential trade-off between financial stability and profitability.

The bank ability to make money is also determined by something called Return on Equity. Return on Equity is a measure of how a bank can use the money that shareholders have invested to make a profit. This means that Return on Equity is really important because it shows how good a bank is, at using shareholder money to generate profits. ROE reflects management efficiency in generating returns through the efficient utilization of invested capital. When a bank has a Return On Equity it means the bank is making money more effectively from the money that is invested in it. This can help the bank use its assets better and make money overall. Return On Equity is very important, for people who invest in banks because it helps them see how well the bank is doing financially. It is a thing for investors to look at when they are evaluating the financial performance of a bank and its Return On Equity.

Earlier studies have tried to analyze the connection between CAR, ROE, and ROA, and their findings have been inconclusive. There is evidence indicating that CAR significantly affects ROA due to the reason that the high CAR helps in ensuring the stability and profitability of banks. However, other researchers argue that there is no significance correlation between CAR and ROA. This suggests that capital adequacy by itself may not directly affect profitability. Similarly, research results regarding the relationship between ROE and ROA have also been inconsistent; some studies found a significant impact, while others did not. These conflicting findings indicate that contextual variables including economic circumstances, the regulatory environment, and industry features could affect the connections among these variables.

These inconsistencies expose research gaps, especially in the framework of underdeveloped nations such as Indonesia. In recent years, there have been significant changes in the banking industry in Indonesia, particularly following the COVID-19 pandemic. This virus has affected the economic performance of credit circulation and asset quality. Consequently, banks are facing a situation where they must adapt to new challenges, such as increased credit risk, changes in customer behavior, and regulatory adjustments.

The period from 2021 to 2024 marks a critical phase of economic recovery in which the banking sector gradually adapts to and stabilizes the post-pandemic conditions. Banks are anticipated to balance profitability with financial stability in a volatile macroeconomic climate at this period. Therefore, analyzing the determinants of bank profitability during this period is crucial, as it provides significant insights into how banks respond to changing economic conditions.

Post-pandemic recovery phase is the main topic of this study, which also uses panel data analysis on Indonesian Stock Exchange (IDX)-listed banks, setting it apart from earlier studies. This study offers recent empirical data highlighting the current state of the economy by examining how Return on Assets (ROA) is affected at the same time and in part by Capital Adequacy (CAR) and Return on Equity (ROE) during this particular time. Moreover, this study advances the continuing discussion about the relative importance of capital adequacy and profitability in influencing financial performance.

In light of this information, the purpose of this research is to find out how ROA of banks that are listed in the Indonesia Stock Exchange (IDX) from 2021 to 2024 will be affected by CAR and ROE.

Theoretical and practical features of this study are likely to be added upon. Theoretically, it enhances the financial literature by offering empirical data on the links between profitability, asset efficiency in the banking sector, and capital adequacy. Practically, it is expected to provide useful insights for bank management to optimize financial performance, for investors to make more informed investment decisions, and for policymakers to design regulations that balance financial stability and profitability.

THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

The theoretical basis for this research is derived from signaling theory. The signaling theory, as discussed by Spence (1973), defines the manner through which firms provide information on their financial status to interested parties. With regard to corporate finance, the concept is better described by Ross (1977), who states that financial decisions and measures act as signaling means towards interested parties.

Ratios such as Capital Adequacy Ratio (CAR), Return on Equity (ROE), and Return on Assets (ROA) are important indicators that will help the stakeholders in understanding the performance and risks associated with banks.

The Impact of the Capital Adequacy Ratio (CAR) on ROA

The ability of a bank to cope with potential losses and ensure financial stability is demonstrated by the Capital Adequacy Ratio (CAR). A high CAR indicates that there is sufficient capital in the bank to mitigate any risk incurred by the activities of the bank (Suwandi, 2017). According to Bernardin (2016), CAR is a measurement tool that represents the ratio of risk-weighted assets.

From the viewpoint of signaling theory, a high CAR gives a positive indication of a bank's solvency and resilience, therefore boosting stakeholder confidence and enhancing operational performance. Adequate capital enables banks to absorb risks and operate more safely, which can lead to improved profitability, including ROA.

However, excessive capital can prevent funds from being optimally utilized for productive activities, leading to inefficiencies in resource allocation and potentially lowering profitability. Empirical research results regarding this issue show mixed trends. CAR has a positive effect on ROA (Rahmani and Suwandi, 2017), while there is an insignificant relationship between the two factors according to Widyastuti and Aini (2021). Therefore, the first hypothesis is:

H1: The Capital Adequacy Ratio has a significant effect on Return on Assets.

The Impact of Return on Equity (ROE) on Return on Assets (ROA)

ROE (return on equity), otherwise known as profitability, is the measure of the company's performance in producing profits for equity investment of its shareholders (Zulfikar, 2016). Musyarrofah (2018) argues that an increase in ROE signifies improved financial performance and enhanced management efficiency.

As per signaling theory, higher ROE serves as a favorable signaling attribute reflecting the profitability and efficiency of a company thereby positively impacting investor confidence. From a financial perspective, ROE reflects the efficiency of equity utilization, which is closely related to overall profitability. As ROA indicates the efficiency of asset utilization, an increased ROE should positively affect ROA.

However, existing empirical studies have shown inconsistent results. From the report of Ikhwal (2016) and Zulkarnaen (2018) shows that ROE influence to ROA, Nadia (2022) report that it has no relationship significance. Thus from this, the second hypothesis is stated as below:

H2: Return on Equity (ROE) has a significant effect on Return on Assets (ROA).

The Simultaneous Impact of the Capital Adequacy Ratio (CAR) and Return on Equity (ROE) on Return on Assets (ROA)

The two financial ratios used are capital adequacy ratio (CAR) and return on equity (ROE). CAR shows the bank's ability to manage risks while ROE shows the bank's ability to generate profits. If the two financial ratios are considered together, they will communicate more information regarding the firm's overall position in terms of signaling theory. When the capital adequacy and ROE of the banks are high, then stakeholders will be more confident about the bank and the performance will improve.

Moreover, it is expected that the availability of capital and the efficient use of equity would jointly impact ROA. From this point of view, risk management and profitability efficiency contribute towards improving financial performance. Based on the above arguments, the following hypothesis can be formulated:

H3: The Capital Adequacy Ratio and Return on Equity (ROE) simultaneously impact Return on Assets (ROA).

RESEARCH METHOD

For the present study, the methodology used was quantitative research methods using secondary data sourced from banking firms listed in the Indonesia Stock Exchange (IDX) for the period of 2021-2024. Quantitative approach was utilized in measuring the relationship between variables and proving hypothesis through data analysis objectively.

The number of firms included in this study was 46 banking firms listed in the IDX. Purposeful sampling was the technique used in selecting samples. The purpose of this method was to make sure the data would be complete and suitable with the scope in this study, the criteria of the samples selection were: 1) Banking company that listed in IDX during the observation periods from 2021-2024; 2) Banking companies that provided fully information concerning its annual financial reports in the observation period; 3) Banking companies that provided full data concerning variables of research; and

4) Banking companies that were not delisted during the observation period. From these 46 banks, the samples of research was obtained as 16 banks. There were 64 firm year data was available in 4 years observation period, so that the study can construct a balanced panel data.

In this research, the data was collected through the annually published financial reports on the official IDX site, individual company Web sites, additional data was gained from IDX statistic data, Yahoo Finance in order to strengthen data, at the same time, relevant research and articles and literature from literature book as supporting development of theory framework and hypotheses have been reviewed.

In this current research study, one dependent variable and two independent variables have been set. In this regard, one dependent variable is Return on Asset that indicates the measurement of income against total assets. The other dependent variable is capital adequacy ratio that indicates the measurement of profit of a company against its total assets. Another dependent variable is Return on Equity that indicates the measurement of income against the total equity of a company. The formula for Return on Assets is net income divided by total assets. The formula for capital adequacy ratio is capital divided by risk-weighted assets. The formula for Return on Equity is net income divided by total equity.

In order to proceed in this study, analytical methods like descriptive statistics, test for classical assumptions and panel data regression analysis were performed. Descriptive statistics have been employed to paint an accurate picture of the data in the form of average value, minimum value, maximum value, and standard deviation for each variable. Tests for classic assumptions such as tests for normality, multicollinearity, heteroscedasticity, and serial correlation have been undertaken to verify whether the regression model satisfies the assumptions of classicity, yielding unbiased estimates.

To test the influence of CAR and ROE on ROA, the panel data regression analysis approach was adopted for the present study. This analysis includes cross-sectional and time series data. The regression equation model adopted for the present study is as follows:

$$ROA = \alpha + \beta_1CAR + \beta_2ROE + \varepsilon$$

With ROA being the dependent variable, CAR & ROE is the independent variable, is the intercept, 1 & 2 are the regression coefficients, and ε is the error term. The analysis method using parametric statistical analysis by means of t-test (testing individual variables effect) and F-test (testing all together effect), whereas in this study the significance level is 5% (0.05) and IBM SPSS Statistics version 27 were used.

RESULTS AND DISCUSSION

RESULTS

Descriptive Statistics

The description of statistics entails presenting the minimum value, maximum value, mean, and standard deviation (Ghozali, 2016). These parameters make the general depiction of the data set. This provides a summary of data distribution and the general status of variables to enable researchers carry out more test.

Table 1. Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
ROA	32	196.00	5712.1562	-26.0000	511.32636
CAR	32	-9544.00	-51.6250	5712.1563	6512.88082
ROE	32	-1475.00	-26.0000	-51.6250	2568.84794

Table 1, descriptive statistics, has three variables with 32 observations each. Variable, Return on Asset (ROA), has Minimum =196.0000, Maximum=5,712.1562 and Mean =-26.0000. This suggests that the sample banks tend to exhibit negative profitability on average in terms of asset utilization. The standard deviation value of 511.32636 suggests that the level of variance in the data is at a medium. Capital Adequacy Ratio (CAR) presents a minimum figure of -9, 544.00, a maximum figure of -

51.6250, and an average of 5, 712.1563. The considerable standard deviation of 6, 512.88082 indicates that there is a lot of fluctuation amongst the firms that were analyzed as well as the differences in their capital adequacy levels could be quite substantial.

In the case of Return on Equity (ROE), its lowest value was -1475.00, while its highest value was -26.0000, and the median value was -51.6250. Therefore, it is evident that majority of the firms under consideration were experiencing declining ROE values. In terms of standard deviation, the value was quite high at 2,568.84794, indicating a lot of volatility in equity returns. From this study, it is clear that there exist substantial variations in performance among the sample banks.

Classical Assumption Tests

Normality Test

Purpose of Normality Test is checking the residuals or errors' normal distribution is considered one of the aims that normality test seeks to achieve (Ghozali, 2016). The use of Q-Q plot is among the tools used in normality tests. In case where the values of the residuals in a Q-Q plot fall on a diagonal line, the normality assumption is expected to be fulfilled.

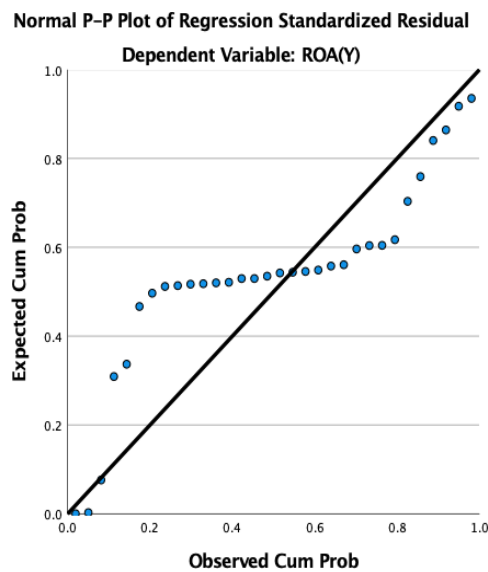


Figure 1. Normality Test (Q-Q Plot)

As seen from Figure 1, the data points are evenly spread along the diagonal line without any significant deviations. Such a distribution indicates that the residuals follow a normal distribution. Consequently, the regression equation satisfies the normality assumption.

Multicollinearity Test

The multicollinearity test is a technique used to detect extremely strong correlation among the independent variables in a regression model. Multicollinearity is an undesirable characteristic of a regression model. According to Ghozali (2016), the presence of multicollinearity in a model can be detected through tolerance and variance inflation factor (VIF). If the tolerance is greater than 0.10 and the VIF is less than 10, then the model does not have any problem with multicollinearity.

Table 2. Multicollinearity Test

Model	Unstandardized B	Coefficients Std. Error	Std. Coefficients Beta	t	Sig.	Collinearity Tolerance	Statistics VIF
(Constant)	-7.177	72.735		-0.099	0.922		
CAR (X1)	0.002	0.008	-0.023	-0.216	0.830	1.000	1.000
ROE (X2)	0.162	0.021	0.814	7.540	0.000	1.000	1.000

As seen from table 2, there is no problem of multicollinearity in this regression model because all the independent variables have a tolerance value of 0.10 or above and a VIF value below 10. In addition, the independent variables do not have any correlation among themselves in case their VIF value is 1.000 or higher. Therefore, in conclusion, the regression model fulfills the requirement of multicollinearity assumption.

Heteroscedasticity Test

The heteroscedasticity test aims to understand whether residual reactions are distributed across the board. Since a good test implies assuming homoscedasticity, it implies handling residuals (Ghozali, 2016). One common method for detecting heteroscedasticity is to use a scatter plot of standardized residuals and predicted values.

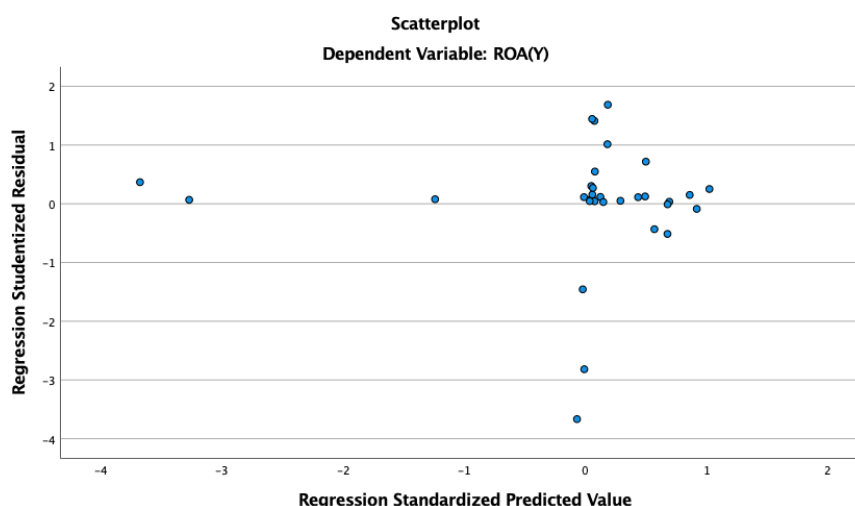


Figure 2. Heteroscedasticity Test (Scatterplot)

As seen from Figure 2, there is no problem of multicollinearity in this regression model since the values of tolerances of all independent variables are greater than or equal to 0.10 while the value of VIF is less than 10. Furthermore, the VIF of 1.000 or more shows that there is no relationship between the independent variables. Hence, to sum up, this regression model satisfies the assumption of multicollinearity.

Autocorrelation Test

Autocorrelation test is used to determine whether there is a relationship between the residual of the given regression analysis. According to Gujarati (2003), it is possible to diagnose autocorrelation using the Durbin Watson (DW) test. Usually, when the value of DW falls within 1.5 and 2.5, there is absolutely no need to worry about any issue of autocorrelation.

Table 3. Autocorrelation Test

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	Durbin-Watson
1	0.814	0.662	0.639	307.156.450	1.120

The durbin-watson value of 1.120 is shown in table 3. This value is just a little lower than the widely accepted range of 1.5 to 2.5, suggesting a positive autocorrelation. Nevertheless, since the difference is not great, the model is deemed fit for further analysis.

T-test

The t-test is run to see how each independent variable affects the dependent variable separately. According to Ghozali (2016), the t-test is performed to establish the significance of the influence of each independent variable on the dependent variable independently.

Table 4. T-Test

Model	Unstandardized B	Coefficients Std. Error	Std. Coefficients Beta	t	Sig.	Collinearity Tolerance	Statistics VIF
(Constant)	-7.177	72.735		-0.099	0.922		
CAR (X1)	0.002	0.008	-0.023	-0.216	0.830	1.000	1.000
ROE (X2)	0.162	0.021	0.814	7.540	0.000	1.000	1.000

As seen from table 4, the t-value for CAR variable is -0.216 with a significance level of 0.830 (>0.05). Therefore, CAR does not significantly influence ROA. On the other hand, ROE's t-value is 7.540 with its significance level being 0.000 (<0.05), therefore, ROE positively and significantly affects ROA. Hypothesis H2 is, therefore, accepted. This means that ROE alone significantly affects ROA while CAR has no effect.

F-test

The F-test is the technique that can be used in order to check the overall effect of the independent variables on the dependent variable. As quoted from Ghozali (2016), the purpose of such a test is to ascertain whether the independent variables influence the dependent variable significantly altogether.

Table 5. F-Test Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5369086.63	2	2684543.31	28.455	0.000
	Residual	2736007.37	29	94345.082		
	Total	8105094.00	31			

As seen from Table 5 above, the F-test outcome at the level of significance of 0.000 (<0.05) is 28.455, meaning that there exists a statistically significant relationship between CAR and ROE in influencing the Return on Assets (ROA). Moreover, because the F-value is greater than the F value from the table ($F > 3.32$), it means that the considered regression is statistically significant. This implies that Hypothesis H3 is confirmed. In brief, the results show that the independent variables collectively influence the dependent variable.

DISCUSSION

This study finds that Return on Equity (ROE) has a statistically significant positive impact on Return on Assets (ROA), while the Capital Adequacy Ratio (CAR) does not. There is, however, a statistically positive relation between both variables to ROA. Thus, profitability in banking is much more determined by how efficiently banks use their equity than how much capital they have.

Theoretically, the findings of this study align with signaling theory, which posits that financial performance measures signal the state of the firm to stakeholders. This is because ROE is high, meaning that the management is efficient in using shareholders' money, thereby sending a favorable signal about the bank's profitability and operating performance. Furthermore, these findings align with existing research that has revealed a significant relationship between ROE and ROA, suggesting that effective equity management contributes to increased asset productivity.

However, the insignificant effect of CAR on ROA shows that although capital adequacy plays a critical role in achieving financial stability, it does not necessarily translate to higher profitability. This finding is consistent with earlier studies indicating that having extra capital leads to inefficiency because money is not efficiently used for profitable purposes. In addition, these findings imply that banks focus

more on minimizing risks than maximizing profits, particularly when recovering from the pandemic.

From a practical perspective, the findings of this study offer several important implications. First, bank management should focus on optimizing equity capital utilization to increase profitability. Allocating equity capital efficiently to productive assets is crucial for maximizing profits. Second, while maintaining adequate capital is crucial, banks must manage it effectively to prevent inefficiencies.

From an investor's perspective, ROE is more likely to serve as a better predictor of bank performance compared to the CAR because the former clearly measures profitability. On the other hand, there is need for regulators to ensure that any policy aimed at ensuring adequate capital is not one-sided but incorporates efficiency and productivity.

CONCLUSION

In this regard, the current study examines the effects of CAR and ROE on ROA of the banking industry companies listed at the Indonesia Stock Exchange during the period 2021-2024. As a result of the study, the hypothesis is proved, showing that CAR and ROE have a positive impact on ROA. Moreover, CAR has no significant impact on ROA, whereas ROE affects ROA significantly positively.

Thus, bank managers should focus on efficient equity capital usage in order to improve profitability while ensuring that their companies maintain an adequate level of capital.

The study faces several limitations because of a rather short period of observations and two independent variables. Thus, future studies need to include a longer period of observation and more variables.

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