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# ANALYSIS OF RETURN ON ASSET FOR BUKU IV: JAKARTA INTERBANK SPOT DOLLAR RATE, CAPITAL ADEQUACY RATIO AND LOAN-TO-DEPOSIT RATIO[3]

*The research aim is to study factors that can affect the Return on Assets for BUKU IV Banks in Indonesia. The paper uses monthly data from annual reports. The independent variables are Jakarta Interbank Spot Dollar Rate, Capital Adequacy Ratio, and Loan to Deposit Ratio. Data analysis is done by using multiple linear regression. There is partial effect between the Capital Adequacy Ratio towards Return on Asset, significantly. Furthermore, all of the independent variables have a simultaneous effect on the Return on Asset, significantly. Regarding the research limitations, future research can use the research object not limited to banking companies in order to generate a better research model. Future research may use longer periods for better prediction ability.*
*Keywords: Capital Adequacy Ratio; Jakarta Interbank Spot Dollar Rate; Loan to Deposit Ratio; Return on Asset*
*JEL: G10; G11; G14; G18*

## Introduction

A good financial system is very helpful to support the growth of the economy in a country. Managing the financial system is dealing with banking companies is a key success to achieve sustainable economic growth. Profitable banks will ensure the financial system's stability. As a financial intermediary, banking companies have an important task in channelling funds and increasing economic activity as a financial resource. These are the reasons why banking company is one of the institutions that are able to support the economy in Indonesia. The continuity of banks and the ability to compete with each other is related to profitability. Most banking companies generate profit because it's the major objective in business organizations (Adeusi, Kolapo & Aluko, 2014).

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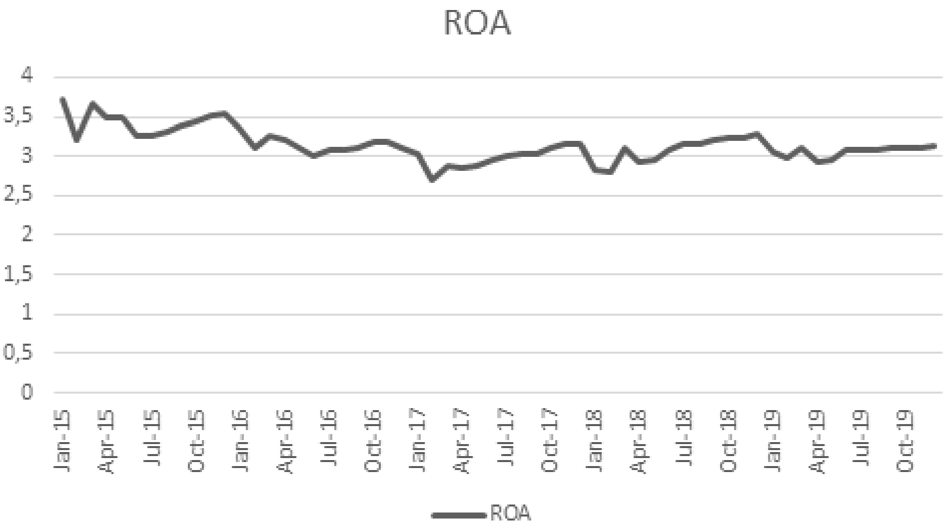
***Figure 1. Return on Asset (ROA) based on Bank BUKU IV in Indonesia from January 2015 to December 2019 (in %)***




In most cases, the banking industry defines the development aspect of an economy. In dealing with the competition, banks are surviving by enhancing their performance, especially for profitability. There is some early literature dealing with factors that have an effect towards bank profitability (Short, 1979; Bourke, 1989). The bank's profitability depends on some internal and external factors. The effect between the growth of the economy and banking profitability is fundamental to be considered in every decision-making in the company (Rajan & Zingales, 1998; Levine, 1998).

Developing countries are depicted through low gross domestic product, growth rate, technology and skills, proper market, capital formation, and weak economy and regulation (Goldberg, 2014). The value of this paper is to explore bank profitability determinants for developing countries, especially in Indonesia. There are several studies that have examined bank performance, especially in terms of profitability. Profitability determinants for banking companies are classified into internal factors and external factors.

Koroleva, et.al. (2021) studied the bank profitability determinants by using regression models of commercial banks in China from 2007 until 2019. Their study provides recent changes in the Chinese banks related to the profitability of state-owned commercial banks. Internal determinants have a significant positive effect towards banks' profitability. Banks that have larger size, better credit quality and higher liquidity have higher profitability than others. Meanwhile, Gross Domestic Product has a negative effect on bank profitability. The lower the Gross Domestic Product, the higher commercial banks' profitability in China.

Internal factors of profitability from banking companies are described as factors that are affected by internal decisions, hence external factors are dealing with factors which are not affected by internal decisions. For internal factors, there is much literature examining the effect between capitalization and profitability of banking companies in every country. However, until now there are still differences from academic to research results on the effect of capitalization to profitability. Many academics have obtained research results that have negative and positive impacts between equity to profitability.

As two reasons from the results of the positive effect of capitalization on profitability, Berger (1995) proposed the signalling and bankruptcy cost hypothesis. Higher bank equity describes positive signals to market about the future profitability. In contrast, the bankruptcy costs hypothesis confirms that banks with good capitalization are less dependent on debt. Furthermore, well-capitalized banks also have lower financing costs. This will lead to lower bankruptcy costs and increased profitability.

Goddard et al. (2004a) utilized Capital Asset Ratio as a measurement of capitalization from 665 banks in Europe. By using regression analysis, they found a significant effect between the Capital Asset Ratio on bank profitability positively. Pasiouras and Kosmidou (2007) also discovered that the equity-to-assets ratio has a positive effect on profitability from 284 banks in Europe by using applied static regression. Furthermore, Athanasoglou et al. (2008) found a larger capitalization from Greek banks. Larger capital allows banks to face unexpected losses and be able to pursue business opportunities wider.

According to Regulation from Bank Indonesia no. 14/26/PBI/2012, bank grouping is based on activities of Commercial Bank Group, it's BUKU. BUKU I is defined as banks with total capital less than IDR 1 trillion. BUKU II is defined as banks with total capital between IDR 1 trillion and IDR 5 trillion. BUKU III is defined as banks with total capital between IDR 5 trillion and IDR 30 trillion. BUKU IV is defined as banks with a total core capital of more than IDR 30 trillion.

This research is aimed to examine bank profitability determinants for BUKU 4 in Indonesia. There is so much literature that already examined these bank categories (Setiawan and Hermanto, 2017).

## Literature Review

### *Signaling theory*

The role of signalling theory is to mitigate information asymmetries (Spence, 2002). The signalling theory comes from information asymmetries between management and shareholders of the firm. It is associated with a signal derived from the policy of management. The policy is intended to give a signal to outsiders such as investors about the prospects of the company and provide usefulness as a consideration in making investment decisions. Accurate information is fundamental for the investment decisions of individuals, businesses and governments (Connelly et al., 2011).

Signalling theory originally suggested by Spence (1973). This theory helps in explaining the two parties' behaviour when they have different information. This theory has spread widely in accounting and financing studies which suggest management may inform investors about the firm through financial information. The signaler, signal, and receiver are key factors of this theory. The signalers are insiders who get any information from an individual (Spence, 1973), organization (Ross, 1977), or product (Kirmani & Rao, 2000), which are not recognized by outsiders.

Financial economists like Ross (1973) and Bhattacharya (1979) have developed several findings to describe these relationships. Firm debt (Ross, 1973) and dividends (Bhattacharya, 1979) exhibit signals for the quality of the company. For the long term, only high-quality firms have the capability to make interest and dividend payments. Otherwise, low-quality firms can't have that kind of capability. Hence, such signals affect outsiders like investors' perceptions of the quality of the company. Because of this interest, much literature in the field of economics grew by applying the signalling theory (Riley, 2001).

Kirmani and Rao (2000) examined a study that used signalling theory that distinguish between high and low-quality firms. Even though firms know exactly the valuable information about quality, outsiders like investors and customers do not know about that valuable information, hence information asymmetry exists. Therefore, the firm has an opportunity to give positive/negative signals about the quality to outsiders. They'll obtain different payoffs when high-quality firms want to give a signal or not.

### *Bank Profitability*

Return on assets is a common ratio to measure performance in terms of profitability and evaluate the banks' ability to generate returns from their sources of funds. Return on asset is described as the efficiency of using total assets in a company. Return on asset is described as the profit earned per dollar of assets (Al-Harbi, 2019). In the literature, this ratio is more often used as the ratio to evaluate bank performance in terms of profitability.

## Bank Profitability Determinants

Internal factors can be described as factors that are affected by internal decisions. Management objectives in banking companies are different from one to another which will lead to differences in performance, especially in profitability. External factors are related to those factors which are affected by events outside the bank, not from internal of the company.

There is much literature that already examined bank profitability based on BUKU. Setiawan and Hermanto (2017); Ardiansyaha (2018); Imani and Pracoyo (2018); Utomo and Anggono (2020); Rahmi (2021) and Yesyurun (2021). Setiawan and Hermanto (2017) examined the effect of internal factors on the profitability of BUKU III and BUKU IV banks in Indonesia from 2006 until 2015. They found that all internal factors have a significant effect on profitability simultaneously.

Ardiansyaha (2018) studied the profitability and stock return determinants for BUKU II from January 2014 until December 2018. They found that total assets, non-performing loans, capital adequacy ratio, net interest margin, and the number of employees have significant effects towards profitability. Good corporate governance and the number of electronic banking variations that are owned have significant effects on stock returns.

Imani and Pracoyo (2018) analyzed the influence of internal factors on bank profitability for BUKU III from 2011-2015. They found that capital and liquidity risk had insignificant effects on bank profitability. Meanwhile, credit risk has a significant effect on bank profitability.

Utomo and Anggono (2020) examined the effect of bank-specific variables on the profitability of bank BUKU IV period 2008 until 2019. Liquid Assets to Total Assets has significant effect to profitability, Non-performing Loans to Total Loans has a significant effect to profitability, Operating Cost to Operating Income has a significant effect to profitability, Third-party funds to Total Assets has a significant effect to profitability, and Core Capital Tier 1 to Total Assets has significant effect to profitability. In getting more profit, banks should maintain low operating expenses and get a source of funds with low cost.

Rahmi (2021) examined the financial performance of banking companies during COVID-19 of banks in Indonesia based on BUKU. This paper is a quantitative and qualitative research. The result of this paper indicates an effect for most asset and liability variables, significantly.

Furthermore, Yesyurun (2021) examined the effect of financial profitability, risk, collectability and liquidity on dividend policy during the BUKU IV period from 2010 until 2019. The research found a positive effect of the profitability and risk factors on dividend policy but not significant results.

***Table 1. Bank Profitability Determinants***

| Explanatory Variables | Positive Effect with | Negative Effect with | No Effect with |
|---|---|---|---|
| Internal Determinants | | | |
| Capital Adequacy Ratio (CAR) | Capraru (2014); Anwar and Murwaningsari (2017); Wahyudi, et. al. (2019); Swandewi and Purnawati (2021) | Saona (2016) | Yuhasril (2019); Sari and Septiano (2020); Jati (2021) |
| Loan to Deposit Ratio (LDR) | Hapsari (2018); Supriyono and Herdhayinta (2019) | Gerinata (2020); Sunaryo (2020); Hertina, Rahmat and Furqon (2022) | Sari and Murni (2016); Yuhasril (2019); Sari and Septiano (2020); Rajindra, et. al. (2021) |
| External Determinant | | | |
| Exchange Rate-Jakarta Interbank Spot Dollar Rate (JIBOR) | Wulansari (2018) | Akims, Omagwa and Mungai (2020); Ratih and Candradewi (2020); Sausan, Korawijayanti and Ciptaningtias (2020); Wijaya and Sedana (2020) | Kriswanto (2019) |

Internal Determinants

Internal factors can be divided into financial and non-financial factors, which fall under the bank management control (Haron, 2004). Curak, Poposki and Pepur (2012) did research on internal factors of banks' performance by using a dynamic panel analysis of 16 banks period 2005 until 2010. According to the results, the most important variable is operating expense management.

Based on this study, the first internal determinant in this study is the Capital Adequacy Ratio, one of the most current issues in banking companies which evaluate efficiency, stability and capital strength. The higher the ratio, the lower the external funding and the higher the profitability. Sufficient capital will offer protection against bankruptcy that emerges from banking business risk (Adeyinka & Olalekan, 2013). Equity to total assets is expected to have a positive effect on banks' performance because banks with good capital will lead to a lower chance of bankruptcy (Berger, 1995).

Capital Adequacy Ratio can be used to measure adequate capital. In the empirical literature, many studies have focused more on how capital adequacy improves the banks' profit (Athanasoglou, Brissimis and Delis, 2008; Chaudhry, Chatrath and Kamath, 1995; Demirguc-Kunt and Huizinga, 1999; Murthy and Rama, 2008). A lot of research shows that capital adequacy of banking companies has an effect on banking performance, significantly. The variable that has an important role in maintaining bank profitability in Vietnam is measured by Return on Assets (Batten and Vo, 2019a, Do and Vu, 2019).

Capraru and Ihnatov (2014) studied the profitability determinants of 143 commercial banks from 2004 to 2011. Management efficiency and capital adequacy growth have significant effects towards bank profitability. The higher capital adequacy, the higher profitability.

Nguyen (2020) investigated the factors that could affect the profitability of 22 Vietnamese banks from 2010-2018. Bank capital adequacy, NIM, and non-interest income have a positive effect on bank performance as measured by profitability. Conversely, non-performing loans and state ownership have a negative effect on profitability. Furthermore, Vong and Chan (2009) examined determinants of banking profitability period 1993-2007 in Macau. Capital Adequacy Ratio also has an effect on profitability.

Haris, et. al. (2020) examined the effect of internal determinants on profitability by using the Generalized Method of Moments for Pakistani banks from 2007 until 2018. They found that the strong capital of financial institutions is important in maintaining solvency. Banks must maintain optimum capital to ensure smooth earnings. Banks operating in Pakistan are obliged to have the required amount of capital. Kodana (2020) examined the determinants of Return on Assets for banks BUKU 4 from 2015 until 2019 by using panel data and panel regression. They found that CAR and OEOI ratios have a negative effect on profitability and NIM has a positive effect on ROA significantly. In generating profit, banks in BUKU IV need to maintain NIM, CAR and OEOI.

The next internal determinant is the Loan to Deposit Ratio (LDR). The greater the number of loans, the higher the bank income. Based on that, it’s expected to have a positive effect of LDR to profitability. Sufian (2012) and Menicucci and Paolucci (2016) found that loans contribute to the profitability of banking companies. However, the increase in loans could escalate the costs of funds leading to a negative effect between profitability and loans.

Supriyono and Herdhayinta (2019) examined the factors that could affect the profitability of 27 BPD banks in Indonesia period 2011-2015. The profitability of BPD Bank was determined by the internal and external factors, they're the total assets, LDR, OE/OI, NIM, BI Rate and Inflation. All of those factors have a positive effect on profitability except for core capital, CAR, OE/OI and inflation, which have a negative effect on profitability. Furthermore, Setiawan and Hermanto (2017) analyzed the effect of Non-Performing Loans (NPL), Loan Deposit Ratio (LDR), Capital Adequacy Ratio (CAR), Net Interest Margin (NIM), and Operating Expense to Operating Income Ratio (OEOI) toward profitability for BUKU 4 and BUKU 3 banks in Indonesia from 2006-2015. All of the independent variables have an effect on profitability, significantly.

Al-Harbi (2019) investigated 686 conventional banks over the period 1989-2008. He found that banking sector development and loans will increase profitability in the long run. In addition, equity, foreign ownership, off-balance sheet activities, real gross domestic product growth, real interest rate and concentration foster bank profitability.

Kusumawardhani and Yuninda (2021) examined stock price determinants in the banking sector. This study studied internal factors on stock prices in Indonesia from 2010-2018. The research is descriptive quantitative research. They used purposive sampling in order to set the samples. Asset Growth has an effect on the price of stock, significantly. Capital (CAR) has a negative effect on stock price, significantly. Asset Growth has an effect on the price of stock, significantly. LDR and DER have a negative effect on stock price, significantly.

External Determinant

External variables are beyond the management's control but reflect factors from the economy, financial structure and legal environment (from external). Jakarta Interbank Spot Dollar Rate (JIBOR) is an external determinant in this study. In Shenzen, Khan (2019) examined the factors that could affect the returns of stocks period January 2008 until December 2018. The exchange rate has a significant effect on return. Inflation and interest rates have a significant effect on stock of return. The central bank needs to make a policy to stabilize the exchange rate. Rates of foreign exchange have become the major financial and economic variables that affect the value of stock and cash flow.

Lu, Lu and Lv (2021) examined the effect between the exchange rate and the performance of banking companies. This study was conducted using two samples, the first was banks in the United Kingdom and the second was the whole country's bank performance. During the period of Brexit, they found a correlation between the performance of banking companies and the exchange rate.

Taiwo and Adesola (2013) studied the determinants of performance for banking companies in Nigeria. They found that the exchange rate has a significant effect on banking performance. The fluctuations in the exchange rate have an effect on loan management, which generates an increase in non-performing loans. Additionally, changes in exchange rates have a significant effect on profitability.

Babazadeh, & Farrokhnejad (2012) studied the effect between foreign exchange rates and profitability. The exchange rate increases in the short term, meanwhile profit is higher than equilibrium in the long term. The exchange rate has a significant effect on foreign exchange profits in banking companies.

Bello (2013) investigated the effect of the exchange rate on the U.S. stock market from 2000 until 2012. The most volatile currency is the Chinese Yuan and the euro is the least volatile. Euro appreciated the most during the research period. On average, the Japanese yen has a negative effect on the U.S. stock market. Meanwhile, the euro and the pound have a positive effect on U.S. stocks. U.S. stocks have a positive effect on the yuan even if it's not significant. As the exporters, the foreign exchange market can provide a competitive advantage in the export market.

Supriyono (2019) studied bank profitability in Indonesia from 2011 until 2015. He found a positive effect between the BI Rate and the profitability of the BPD Bank. Besides that, bank profitability is significantly affected by total assets, LDR, OE/OI, and NIM and externally by inflation.

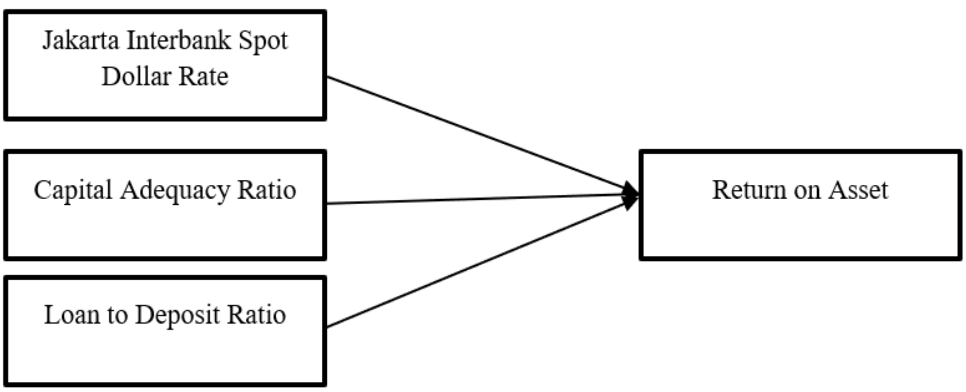
Based on the findings from previous studies and following the research objectives, this study tries to test the following hypothesis:

*$H_1$: Jakarta Interbank Spot Dollar Rate has a significant effect on Return on Asset for Banks BUKU IV in Indonesia period 2015-2019*

*$H_2$: Capital Adequacy Ratio has a significant effect on Return on Asset for Banks BUKU IV in Indonesia period 2015-2019*

*$H_3$: Loan to Deposit Ratio has a significant effect on Return on Asset for Banks BUKU IV in Indonesia period 2015-2019*

***Figure 1. Theoretical Framework***



## Research Method

The type of this research is quantitative research. This study uses annual reports from BUKU IV Banks. This study does not focus on bank entry or exit bank in BUKU 4 category, because the focus is on financial report data in BUKU 4 category. The analysis depends on secondary data. Monthly data was obtained from January 2015 to December 2019 because the available data that was successfully collected was in that period. The following statistical tools are applied in this research to test and analyse the effect between independent to dependent variables.

- Descriptive Statistics
- Multiple Correlation and
- Multiple Regression Analysis

Eventually, this paper will test the hypothesis by using this model:

$$\mathrm{ROA}_t = \alpha_t + \beta_1 \mathrm{JISDOR}_t + \beta_2 \mathrm{CAR}_t + \beta_3 \mathrm{LDR}_t + \varepsilon_t$$

where:

$\alpha_{it}$ = intercept period t

$\varepsilon_{it}$ = error period t

$\mathrm{ROA}_{it}$= Return on Asset period t

$\mathrm{JISDOR}_{it}$= Jakarta Interbank Spot Dollar Rate period t

$\mathrm{CAR}_{it}$= Capital Adequacy Ratio period t

$\mathrm{LDR}_{it}$ = Loan to Deposit Ratio period t

## Results

Descriptive Statistics

Descriptive statistics of the sample are presented in Table 2. The analysis of descriptive statistics can be used to describe the general overview of the data from banking companies BUKU 4 period of 2015-2019. The analysis includes mean and standard deviation using SPSS which can be seen in Table 2.

The average value of Return on Assets that were sampled in this study was 3.14. The standard deviation showed a number of 0.20214 which is smaller than the mean. The average value of the Jakarta Interbank Spot Dollar Rate that was sampled in this research was 13,694.5667. The standard deviation showed a number of 554.35650 which is larger than the mean. The average value of the Capital Adequacy Ratio that was sampled in this research was 20.8768. The standard deviation showed a number of 1.00627 which is smaller than the mean. The average value of the Loan to Deposit Ratio that was sampled in this research was 87.3507. The standard deviation showed a number of 2.8549 which is smaller than the mean.

***Table 2. Descriptive Statistics***

| | Mean | Std. Deviation | N |
|---|---|---|---|
| ROA | 3.1427 | .20214 | 60 |
| JISDOR | 13694.5667 | 554.35650 | 60 |
| CAR | 20.8768 | 1.00627 | 60 |
| LDR | 87.3507 | 2.85492 | 60 |

Multiple Correlation

Correlation analysis can be used to measure the linear relationship strength between 2 variables. Table 3 exhibits a correlation among independent variables of Return on Assets of BUKU IV banks.

***Table 3. Correlations between JISDOR, CAR and LDR to ROA***

| | | ROA | JISDOR | CAR | LDR |
|---|---|---|---|---|---|
| ROA | Pearson Correlation | 1 | -.096 | -.647** | -.474** |
| | Sig. (2-tailed) | | .467 | .000 | .000 |
| | N | 60 | 60 | 60 | 60 |
| JISDOR | Pearson Correlation | -.096 | 1 | .244 | .668** |
| | Sig. (2-tailed) | .467 | | .060 | .000 |
| | N | 60 | 60 | 60 | 60 |
| CAR | Pearson Correlation | -.647** | .244 | 1 | .656** |
| | Sig. (2-tailed) | .000 | .060 | | .000 |
| | N | 60 | 60 | 60 | 60 |
| LDR | Pearson Correlation | -.474** | .668** | .656** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | |
| | N | 60 | 60 | 60 | 60 |

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

If the significance value is less than 0.05 then there is a correlation between the variables, if the significance level is bigger than 0.05 then there is no effect between the variables. Based on the results, JISDOR has no significant correlation (0.467 > 0.05). CAR has a significant correlation (0.000 < 0.05). LDR has a significant correlation (0.000 < 0.05).

Coefficient Determination

The purpose of this coefficient or $R^2$ in this study is to find out how well independent variables explain Return on Assets.

***Table 4. R Square***

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .668[a] | .447 | .417 | 15.43134 |

a. Predictors: (Constant), LDR, CAR, JISDOR

b. Dependent Variable: ROA

Based on the data presented in Table 4, the result of Adjusted $R^2$ was 0.447. JISDOR, CAR and LDR can explain 44.7% of Return on Assets. The remaining 55.3% was explained by other variables outside the research model.

Regression Analysis

Regression analysis of regression models is aimed at defining the effect of two or more variables. Besides showing the direction of these variables, it also shows the effect between independent and dependent variables. This study uses multiple linear regression and the results are shown on Table 5.

***Table 5. t-test***

| Model | | Unstandardized Coefficients B | Unstandardized Coefficients Std. Error | Standardized Coefficients Beta | t | Sig. |
|---|---|---|---|---|---|---|
| 1 | (Constant) | 5.958 | .629 | | 9.476 | .000 |
| | JISDOR | 7.970E-5 | .000 | .219 | 1.537 | .130 |
| | CAR | -.104 | .028 | -.516 | -3.677 | .001 |
| | LDR | -.020 | .013 | -.282 | -1.543 | .128 |

a. Dependent Variable: ROA

$$\mathbf{Y = 5.958 + 0.0000797JISDOR - 0.104CAR - 0.020LDR + e_t}$$

The constant (α) of 5.958 means that if all the independent variables are constant or equal to zero (0), then the value of Return on Assets is 5.958. JISDOR variable, a 0.0000797 coefficient is obtained with a positive sign means, that if the JISDOR variable increases by 1 unit, the Return on Asset will increase by 0.0000797 units by assuming that the other independent conditions were constant. CAR variable, a -0.104 coefficient is obtained with a negative sign means, that if CAR increases by 1 unit, the Return on Assets will decrease by

-0.104 units by assuming that the other independent conditions were constant. LDR variable, a -0.020 coefficient is obtained with a negative sign means, that if LDR increases by 1 unit, then Return on Asset will decrease by -0.020 units by assuming that other independent conditions were constant.

T-test

Hypothesis testing helps to find out the influence of JISDOR, CAR and LDR on the Return on Asset. Based on the table 4, the significance value of JISDOR is 0.130. The value is greater than $\alpha = 0.05$, it could be concluded that there is no effect between the JISDOR on ROA. The significance value of CAR is 0.001. The value is smaller than $\alpha = 0.05$, it could be concluded that there is a significant effect between the CAR on ROA. The significance value of LDR is 0.128. The value is greater than $\alpha = 0.05$, it could be concluded that there is no effect between the LDR on ROA.

F-Test

The F-test is conducted to test the simultaneous effect between all independent variables to dependent variables. This study used the level of significance is 5% as the tolerated value for the error.

***Table 6. F-test***

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 1.077 | 3 | .359 | 15.080 | .000[b] |
| | Residual | 1.334 | 56 | .024 | | |
| | Total | 2.411 | 59 | | | |

a. Dependent Variable: ROA

b. Predictors: (Constant), LDR, CAR, JISDOR

Based on Table 6, F test results describe that the significance value was 0,000. It can be seen that sig-value < 0.05. This showed that all of the independent variables have simultaneous effects on the Return on Assets.

**Conclusion**

Financial performance generated by banks plays a crucial role in maintaining financial system stability. Especially in developing countries, since banks serve as fundamental financial intermediaries, the performance of the sector directly affects economic development. The aim of this research is to investigate the ability of financial ratios, JISDOR, CAR and LDR in predicting Return on Assets by using multiple regression analysis. There is no partial effect between the JISDOR, LDR on ROA. Otherwise, there is a significant partial effect between the CAR on ROA. Furthermore, all of the independent variables have a simultaneous effect on the Return on Assets, significantly.

## Discussion

### *Theoretical Implications*

This research has contributed to signalling theory research by establishing the need for understanding the role of JISDOR, CAR and LDR in influencing Return on Asset in banking companies in Indonesia for BUKU IV. The asymmetric information triggers signals to outsiders such as investors through management policies. It is expected that the signal will provide information for investors about how they view the company's prospects. By understanding this information, investors can make better investment decisions.

Based on Table 3, the significance value of JISDOR is 0.130. The value is greater than $\alpha = 0.05$, it could be concluded that there is no effect between the JISDOR on ROA. The significance value of LDR is 0.128. The value is greater than $\alpha = 0.05$, it could be concluded that there is no effect between the LDR on ROA. The significance value of CAR is 0.001. The value is smaller than $\alpha = 0.05$, it could be concluded that there is a significant effect between the CAR on ROA. Based on this result, CAR has a negative effect on ROA. However, a negative effect between profitability and the capital ratio can be expected given that well-capitalized banks are safer because they take less risk and generate lower returns. The study conducted by Saona (2016) found a negative effect between capital adequacy and profitability.

There are other findings that support the significant effect between CAR and ROA (Vong, and Chan, 2009; Azam and Siddiqui, 2012). They found the significant roles of the Capital Adequacy Ratio in determining Return on Asset. Vong, and Chan (2009) studied factors that affect the profitability of banking companies in Macau from 1993-2007. Internal determinant such as the Capital Adequacy Ratio has a positive effect on the profitability of banking companies.

Azam and Siddiqui (2012) compared the profitability of public, private, and foreign banks operating in Pakistan from 2004-2010. Profitability measurements were Return on Asset (ROA) and Return on Equity (ROE), while the factors that could affect the profitability were internal and external factors. They found that Operating Expense to Operating Income (OE/OI) and Gross Domestic Product (GDP) have an effect on ROA for public banks. CAR, Net Interest Margin (NIM), deposits, and Loan to Deposit Ratio (LDR) have an effect on ROA for private banks; and OE/OI and GDP have an effect on ROA for foreign banks. Meanwhile, OE/OI and GDP have an effect on ROE for public banks. Deposits have an effect on ROE for private banks and CAR, NIM, OE/OI and inflation have an effect on ROE for foreign banks.

*Practical Implications*

The results of this paper are useful to academics, managers, investors and other stakeholders. This study may help investors to achieve the maximum gain in stocks. By making an investment in the capital market, the capability to analyze the fundamental factors is crucial. Some of the investors choose the stocks that have higher Return on Asset. The variable that has a significant effect on profitability in this study is the Capital Adequacy Ratio. Investors need to consider that variable in order to get the optimal Return on Assets. This analysis is done to mitigate the losses or other unpredictable things in the future.

For management, the result of this study helps them to improve profitability. It would be good to evaluate the profitability of banking companies and find out the cause and effect of internal and external factors to create solutions to improve bank profitability. As seeing that Capital Adequacy Ratio has a significant effect on Return on Assets should have taken action to manage the profitability of banking companies in a way to maintain the stability of national economies.

For creditors, the result of this study helps them to observe how banks manage the profitability, especially for Return on Assets. Furthermore, they can propose new loans to banks based on good performance, especially for profitability ratio.

*Limitations and Recommendations for Future Research*

This paper has limitations which can be addressed through future empirical studies. This paper only examined the determinants of Return on Assets from January 2015 to December 2019 for BUKU IV. Regarding limitations, future research should study that not limited to Capital Adequacy Ratio, Jakarta Interbank Spot Dollar Rate and Loan to the loan-to-deposit ratio for banking companies in order to generate better results. Future research should focus on a paper that uses mixed methods, which will allow qualitative variables to determine bank profitability. Future research should consider the other variables related to the banking industry across many countries. A larger sample size as well as a longer time horizon should be considered for better prediction models.

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