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The Influence of Bank-Specific Variables and Macroeconomics on Rural Banks with High-Level Non-Performing Loans

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ABSTRACT

Rural banks' roles as financing services have become a great contributor to Indonesia's MSME business. This study aims to examine the firm performance of rural banks in the Province of West Nusa Tenggara, Indonesia. The bank-specific variable and macroeconomics are used to test the effect on the rural banks with a high NPL level in Indonesia's province. This study employs the panel data regression with semi-annual reports of 17 rural banks from 2017-2021. The effect of NPL, CAR, bank size, LDR, GDP growth rate, inflation rate, interest rate, and exchange rate on ROA and ROE were analyzed. NPL was found positively affect ROA but doesn't affect ROE. While both CAR and bank size positively affect ROA but don't affect ROE. Moreover, the LDR doesn't affect both ROA and ROE.

Keywords: bank-specific variables, macroeconomics, firm performance

1. Introduction

The banking industry plays a key factor as the backbone of a country's economic growth. Effective management of the banking system could affect a country's economic growth (Taliwuna et al., 2019). Some of the main roles of the banking industry were to convert public saving's into productive investments and improve the standard of living in a country (Gazi et al., 2021). An indicator that is widely used to measure credit risk is non-performing loans (NPL). Which have been believed as one of the cause global financial crisis in 2008 that happened in the United States of America and caused spillover to various countries of the world. The NPL rise was caused by bad management of credit quality (Mrindoko et al., 2020).

According to Peraturan Bank Indonesia Nomor 15/2/PBI/2013, banks that have an NPL ratio exceeding 5% are considered to be in trouble and possibly facing difficulties in running their business activities. However, the NPL level of Indonesian rural banks averages 6.77% in 2021. Three provinces with the worst NPL level are the Province of West Papua, Nanggroe Aceh Darussalam, and West Nusa Tenggara with NPL levels of 44.19%, 19.3%, and 12.67% respectively. These levels of NPL have been consistently far above the industry average by more than 2 times (ojk.go.id, 2022). The high level of NPL could reduce the earnings of banks. However, a bank's performance may be affected by many factors. According to Siddique et al. (2022), rising of NPL is caused by a lack of assessment of customers, market issues, and insufficient knowledge of customers regarding loans. A successful bank's performance was affected by great credit risk management, so banks need to plan and formulate a strategy to minimize credit risk to maximize their profitability (Yeasin, 2022).

Bank's performance refers to the ability to generate sustainable profits by managing its funds to achieve its goals in the future. The Implementation of good bank governance can be done by positioning their financial, credit, and investment to align the bank's goals, such as risk control, profit, and growth (Haryanto & Stevania, 2022; Taha & Top, 2022). In terms of profitability, a bank's performance can be measured by return on assets (ROA) and return on equity (ROE). ROA is known as an indicator that can show how profitable a company can get from its assets (Almansour et al., 2021). This indicator is also able to measure the efficiency of the bank's

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management to generate profit and evaluate the competition and operating performance of the banks (Farah & Khemissi, 2021). While, the ROE ratio is used to measure the firm profitability by revealing the profits of banks from shareholders' capital (Gabeshi, 2021). This ratio also shows how far a bank manages to mobilize its equity (Gurung & Gurung, 2022).

Macroeconomic indicators such as the inflation rate can describe the stability of a country's economic situation. It is known that the biggest destabilization of the economy was caused by a spiking inflation rate in a short period. This situation can obstruct economic growth by complicating the business process and high production costs which cause unbalanced supply and high demand in the country. GDP growth can describe the country's economic growth, it is used to show the ability of the economy to meet the demand of economic actors and become the standard of living (Hesniati et al., 2022; Warkawani et al., 2020). The Province of West Nusa Tenggara recorded a GDP growth of 3.15% in 2021 and the inflation rate rise to a 2.12% level at the end of 2021 (bps.go.id, 2022). Most credit from the rural bank is used to finance work capital, investment, and consumption. The majority of the loans were dominated by the consumption and work capital section with 46.19% and 46.00% respectively. While the remainder was channeled to the investment section. The average interest rate of rural banks in Indonesia for capital work, investment, and consumption are 23.22%, 21.29%, and 20.98% respectively (ojk.go.id, 2022). The effect of macroeconomic factors extends to a broader population and reflects the functioning of the nation's economy. Macroeconomic factors are part of the larger economic environment, which means organizations have limited control over them. This condition increases the need for managerial efficiency to overcome challenges and take advantage of opportunities presented by macroeconomic indicators (Gautam & Gautam, 2021).

Several studies have shown a strong relationship between macroeconomic factors, NPL, CAR, bank size, LDR, and bank performance. Therefore, this research will examine the effect of NPL, CAR, bank size, and LDR on bank performance with the macroeconomic factors as control variables.

1.1 Relationship between Non-Performing Loans (NPL) and Bank Performance

Banks' failure may be caused by the rising of non-performing loans. Bad credit can increase the number of defaulted loans and decrease bank profitability. When borrowers were unable to fulfill their commitment, banks will be more stringent on distributing credit. So, in the short term, it can reduce bank profits due to the decrease in interest income and the increase in provision costs (Abdelaziz et al., 2022; Katusiime, 2021). NPL may affect bank profitability both in the short term and the long term. It causes liquidity problems for banks, resulting in a lower lending capacity (Siddique et al., 2020).

The NPL ratio has a significant negative effect on both the ROA and ROE of banks. This result is found when financial institutions face high-risk loans and many loans are not repaid. As a result, these loans become a loss and decrease the bank's income (Jadah et al. 2020). Failing to obtain good quality loans and creditworthy customers may increase the risk of default or NPL, which will affect the performance, growth, and sustainability of the banks (Munangi & Sibindi, 2020). Several studies have found a significant negative influence of NPL on a bank's performance, including Wagdi and Salman (2022); Lawrence et al. (2020); Kumar and Bird (2022); and Çollaku and Aliu (2021).

H_1: Non-performing loans influence significant negative on return on assets

H_2: Non-performing loans influence significant negative on return on equity

1.2 Relationship between Capital Adequacy Ratio (CAR) and Bank Performance

Capital plays an important role in every business to operate effectively including the banking sector. The CAR ratio is used to determine the availability of adequate resources to cover risks on its financial balance sheet to reduce the probability of the bank bankrupt. Having capital that can absorb losses can improve investor confidence in the business, as a strong capital base reduces the likelihood of bankruptcy rate for the bank (Solanki & Aggarwal, 2022; Siddique et al., 2020).

When a bank has enough capital to meet the risk-weighted assets, the financial performance automatically improves (Siddique et al., 2020). Because higher equity can support the bank when there are losses from risky investments. Higher capital also protects against poor financial conditions (Hossain & Ahamed, 2021). A larger CAR can improve the stakeholder's confidence in the bank and make the bank more competitive. In addition, banks with higher CAR and cash reserves indicate the bank is safer and tends to fulfill their financial obligations, and is more profitable and financially stable (Munangi & Sibindi, 2020; Oudat & Ali, 2020). Some studies have found CAR significantly positively influences bank performance including Kumar and Bird (2022); Farah and Khemissi (2021); Siddique et al. (2022).

H_3: Capital adequacy ratio influence significant positive on return on assets

H_4: Capital adequacy ratio influence significant positive on return on equity

1.3 Relationship between Bank Size and Bank Performance

Larger banks provide a positive effect on bank performance because of the benefit of economies of scale, resulting in higher ROA and ROE (Sultan et al., 2020; Jadah et al., 2020). Banks with a larger size can achieve better profits because of a better opportunity to reach the market than smaller banks (Taha & Top, 2022). Larger banks have a strong capital and asset base, which enables them to provide more loans and invest in various securities. A larger market share can increase efficiency, enables them to obtain funds

at a lower cost, and provides them with strong market power (Hossain & Ahamed, 2021).

When the size of a bank increase, its operational efficiency level also increases. Commercial banks expand their business to aid the growth of the bank. Banks often benefit from combined energy and economies of scale. As a result, the increased size of a bank can be attributed as a strength for the bank (Hieu & Minh, 2022; Gurung & Gurung, 2022). Several studies also found a significant positive influence of bank size on bank performance including Chi-ahti et al. (2021); Krishna et al. (2021); and Hieu and Minh (2022).

H_5: Capital adequacy ratio influence significant positive on return on assets

H_6: Capital adequacy ratio influence significant positive on return on equity

1.4 Relationship between Loan-to-deposit and Bank Performance

Loan-to-deposit ratio measures the utilization of deposits to generate interest income through loans, which is an important source of profit for commercial banks (Gurung & Gurung, 2022). Banks use their assets to generate income and the investment on their customers will increase along with deposits. This also indicates that banks are investing their assets in the market, both in the form of loans and other investments (Yeasin, 2022). Bank's income is gained from the gap between the loan interest and the deposit interest. Therefore, when the disbursement of credit funds increases, the bank will have a higher level of interest return (Nugraha et al., 2021).

Higher LDR ratio results in a higher profit for banks because the earnings from lending credit provide a higher profit than other investments. On the other hand, a decrease in the bank deposit results in a loss of low-cost funds which can be utilized when liquidity is needed. Without low-cost funds, banks have to borrow credit from the central bank or other commercial banks, incurring a higher cost of funds to counter liquidity crises (Paul et al., 2021). Several studies also found a significant positive effect of loan-to-deposit ratio on bank performance including Gazi et al. (2021); Malik (2020); and Lawati (2021). But, some studies found an insignificant effect of loan-to-deposit ratio on bank performance, including Amjath and Begum (2022); Farah and Khemissi (2021); and Wagdi and Salman (2022).

H_7: Loan-to-deposit ratio influence significant positive on return on assets

H_8: Loan-to-deposit ratio influence significant positive on return on equity

According to research done by others, this study extends the essential characteristics of financial ratios by adding macroeconomic variables such as GDP growth, inflation rate, exchange rate, and interest rate. In addition, this study employs the most recent data from the rural bank in the Province of West Nusa Tenggara, Indonesia, as the research sample. Semi-annual financial reports are used to ensure a detailed change in the financial situation. This study aims to examine how changes in financial and macroeconomic indicators have affected the firm's performance of rural banks in the Province of West Nusa Tenggara, Indonesia.

2. Research Methods

This study used semi-annually financial reports of 17 rural banks from 29 rural banks operating in the Province of West Nusa Tenggara. The purposive sampling method was used to sample the data required for research by the consideration of certain steps (Maulana et al., 2021). The criteria of the sample used in this study are: (1) rural banks in the Province of West Nusa Tenggara which has financial report data published on the ojk.go.id website. (2) rural banks which have published reports for the 2nd and 4th quarters for the 2017-2021 period. (3) rural banks which present the required data. The sample that meets the criteria is listed in Table 1 below.

Table 1. Criteria for Research Sample

Information	Amount
Rural banks in the Province of West Nusa Tenggara with financial report data published on the *ojk.go.id* website	29
Rural banks which have published reports for the 2nd and 4th quarters of the 2017-2021 period	17
The number of samples for 2017-2021 in the semi-annual research period	170

Source: Data processed (2023)

Secondary data is used to collect financial reports and macroeconomic data from ojk.go.id, bi.go.id, and ntb.bps.go.id. This study collected financial reports and macroeconomic data in the period between 2017-2021. So, the panel data method is used which combines time series data and cross-section. Therefore, the data analysis method used in this study is multiple linear regression by E-views 12 program to test the direct effect. The equation models applied in this study are shown below:

$$Y = \alpha + \beta 1NPL + \beta 2CAR + \beta 3BS + 4LDR + \beta 5GDP + \beta 6INF + \beta 7INT + \beta 8EXCH$$

This study investigates the influence of bank-specific factors and macroeconomics on rural banks' performance. Bank's performance is measured by the return on assets (ROA) and the return on equity (ROE) ratio. ROA ratio is used to describe the effectiveness rate of banks in generating a profit from their asset. This ratio was calculated by dividing the net profit by the total asset. While the ROE ratio is used to indicate the effectiveness rate of the bank's management in converting the shareholder's capital into net profit (Sahraoui & Merhoun, 2022). This ratio is measured by dividing the net profit by total equity. Several indicators of bank-specific factors and macroeconomics are measured:

Table 2. Measurement of the Variables

Variable Type	Variable Name	Measurement	Formula	Source
Dependent	Firm Performance	Return on Asset	$\frac{\text{Net Profit}}{\text{Total Asset}}$	(Sahraoui & Merhoun, 2022)
		Return on Equity	$\frac{Net\ Profit}{Total\ Equity}$	
Independent	Bank Specific Variables	Non-Performing Loans	$(\text{Non} - \text{Performing Loan} + \text{Doubted Loan} + \text{Bad debt}) / \text{Total Loans}$	(Kumar & Bird, 2022)
		Capital Adequacy Ratio	$\frac{Tier\ 1\ Capital + Tier\ 2\ Capital}{Risk - Weighted\ Assets}$	
		Bank Size	$ln(Total\ Asset)$	
		Loan-to-deposit (LDR)	$\frac{Total\ Loan}{Total\ Deposit}$	
Control	Macroeconomics	GDP Growth	$\frac{\text{Current Period GDP} - \text{Previous Period GDP}}{\text{Previous Period GDP}}$	
		Inflation Rate	$\frac{\text{Current Period CPI} - \text{Previous Period CPI}}{\text{Previous Period CPI}}$	
		Interest Rate	Interest rate determined by Indonesia's central bank in the period.	
		Exchange Rate	The exchange rate is determined by Indonesia's rupiah against the United States dollar in the period.	

Source: Data processed (2023)

To determine a reliable panel regression model, this research needs to employ several tests including the Chow test, Hausman test, and Lagrange Multiplier test. The Chow test of this test is to determine whether the common effect model or the fixed effect model is more appropriate according to the research data. Hausman test is used to determine the regression testing model by comparing the fixed model effect with the random effect model according to the situation. Lastly, the Lagrange Multiplier model is used to determine the regression model to estimate the panel data by comparing the common effect model with the random effect model. After the best regression model is obtained, a hypothesis test will be used to show the influence of the variables.

3. Results and Discussions

The descriptive statistic is a test to present the maximum, minimum, mean, and standard deviation values of each variable used in the research. The descriptive statistics are shown in Table 3 below.

Table 3. Displays Descriptive Statistics

Variable	Descriptive Statistic			
	Minimum	Maximum	Mean	Std. Deviation
NPL	0.0253	0.5232	0.1518	0.0893
CAR	-0.0102	1.9258	0.4834	0.3333
Bank-Size	7501095	244670220	44956467.8	54291502.97
LDR	0.4461	1.0731	0.7468	0.1193
GDP	-0.0449	0.0338	0.0049	0.0220
INF	0.0014	0.0219	0.0126	0.0055
INT	0.0350	0.0600	0.0462	0.0089
EXCH	13298.2500	14496.9500	14071.3205	348.5679
ROA	-0.17376	0.0949	0.0137	0.0333
ROE	-11.0521	6.6252	0.0377	1.0084

Source: processed data, 2023

According to Table 3, NPL displays an average value of 0.1518, this value shows a high rate of non-performing loans in the rural banks. A higher NPL value indicates that rural banks have a higher credit risk. Furthermore, the value of standard deviation shows 0.0893 or lower than the mean value which can be stated there is less diversity in the distribution of NPL variable data. The CAR variable has an average of 0.4834, which indicates the average rural banks in the Province of West Nusa Tenggara have met the minimum requirement determined by Bank Indonesia at 7.99%. Moreover, the standard deviation shows there is less diversity in the distribution of CAR. The bank size variable shows an average value of 44956467.80 which represents the average total asset of rural banks in the Province of West Nusa Tenggara. Moreover, the standard deviation shows there is

a diversity in bank size variables. The loan-to-deposit (LDR) has a mean of 0.7468 and a standard deviation of 0.1193. The mean value indicates average rural banks in the Province of West Nusa Tenggara distribute their credit at a 74.68% rate from the deposit their obtained. While the standard deviation exhibits a lower value than the average value so it can be stated there is less diversity in the LDR variable.

The GDP growth variable has an average of 0.0049 and a standard deviation of 0.0220. A higher GDP growth value exhibits better economic growth and the average value shows that there is a positive growth in every period. Moreover, the standard deviation value shows a higher value than the average value, this value indicates that GDP growth variable data is more diverse from the average value. The inflation rate variable has an average value of 0.0126, which indicates the average inflation in the Province of West Nusa Tenggara is 1.26% in every semi-annual period. While the standard deviation shows there is less diversity in the inflation rate variable. Moreover, the interest rate variable shows an average value of 0.0462, which indicates the average interest rate used was 4.62% during the period. The standard deviation shows the interest rate variable has less diversity from the average value. The exchange rate variable has an average value shows 14071.3205 which means the average exchange rate for every dollar was Rp14.071,3205 during the period. The standard deviation shows the exchange rate variable has less diversity than the average value.

In addition, the minimum value of ROA value shows -0.17376, and the maximum value of 0.049. The test result shows ROA variable has a mean value of 0.0137, which represent the average rural banks in the Province of West Nusa Tenggara generating a 1.37% profit from the total asset they own or manage. The standard deviation value shows 0.0333 or higher than the average value, which can be stated that the sample data used are volatile and have more diversity. the ROE variable shows a minimum value of -11.0521 and a maximum value of 6.6252. According to the test, the average value shows 0.0377 which indicates the average rural bank in the Province of West Nusa Tenggara generates 3.77% profit from the shareholder's capital. Moreover, the descriptive statistical test results show a standard deviation of 1.0084 which represents there is a diversity in the ROE variable.

To find the best regression models, this research needs several tests to choose the models between common effect model (CEM), fixed effect model (FEM), and random effect model (REM). The tests consist of the Chow test, Hausman test, and Lagrange Multiplier test.

Table 4. *Chow* test of Bank Specific Variable and Macroeconomics on ROA

Effect Test	Statistic	d.f.	Prob.
Cross-section F	2.863233	(16.144)	0.0004
Cross Section Chi-Square	46.681069	16	0.0001

Source: processed data, 2023

Table 4 represents the probability score of Cross-section F and Cross Section Chi-Square, which if the score is lower than α (α = 0.05) the best model for this research is the fixed effect model (FEM). However, if the results show a higher score than α (α = 0.05), the model that should be used in this research is the common effect model (CEM). The test scores a 0.0004 and 0.0001, which means it was lower than 5%. According to the circumstances, the best model to present the effect is the fixed effect model (FEM), which will be followed by the Hausman test.

Table 5. *Chow* Test of Bank Specific Variable and Macroeconomics on ROE

Effect Test	Statistic	d.f.	Prob.
Cross-section F	0.878950	(16.144)	0.5943
Cross Section Chi-Square	15.747701	16	0.4707

Source: processed data, 2023

Table 5 represents the Chow test result for the effect on ROE. The score shows a probability of Cross-section F and Cross Section Chi-Square above α (α = 0.05). According to the circumstances, the best model to present the effect is the common effect model (CEM). Hence, the Lagrange Multiplier will be employed.

After the Chow test is employed, the Hausman test is the next step to be taken. This test is used to decide which of the FEM and REM models is more suitable according to the research data conditions. The results were determined by the probability score, if the score was below α (α = 0.05) it means FEM was more suitable for the research. Otherwise, If the score was above α (α = 0.05), it means the relevant model that should be used was REM or CEM and the Lagrange Multiplier test is needed to show the best model.

Table 6. *Hausman* Test of Bank Specific Variable and Macroeconomics on ROA

Test Summary	Chi-Sq Statistic	Chi-Sq d.f.	Prob.
Cross-section random	0.000000	8	1.0000

Source: processed data, 2023

According to Table 6, the Hausman test shows a probability score of 1.000. This score indicates that REM is more suitable to use than FEM. Hence, the test will be continued with the Lagrange Multiplier test to identify the most effective model between CEM and REM.

Table 7. *Lagrange Multiplier* Test of Bank Specific Variable and Macroeconomics on ROA

	Test Hypothesis		
	Cross-section	***Time***	***Both***
Breusch-Pagan	6.377434	1.972398	8.349832
	(0.0116)	(0.1602)	(0.0039)

Source: processed data, 2023

The Lagrange Multiplier test result is determined by the probability score, if the score is below α (α = 0.05), thus the model that should be used was REM. However, if the score is above α (α = 0.05), CEM was the best model to be used. Table 7 represents the Lagrange Multiplier test results with a probability score of 0.0116, which means the score was below α (α = 0.05) and the best model to be used in analyzing the effect of bank-specific variables and macroeconomics on ROA is REM.

Table 8. *Lagrange Multiplier* Test of Bank Specific Variable and Macroeconomics on ROE

	Test Hypothesis		
	Cross-section	**Time**	**Both**
Breusch-Pagan	0.219587	4.796557	5.016144
	(0.6394)	(0.0285)	(0.0251)

Source: processed data, 2023

According to Table 8, the Lagrange Multiplier test results show a probability score of 0.6394, which is higher than α (α = 0.05). From the examination, the best model for analyzing the effect of bank-specific variables and macroeconomics on ROE is CEM.

After choosing the best model for the research, a hypothesis test is next to be done. The next test is the t-test or hypothesis test, this test is used to show the effect of the independent variable on the dependent variable severally.

Table 9. *t* Test Result on ROA – Random Effect Model

Variable	**Coefficient**	**Prob.**	**Conclusion**	**Hypothesis**
Constant	-0.013920	0.9065	-	-
NPL	-0.177863	0.0000	Significant	Accepted
CAR	0.024618	0.0303	Significant	Accepted
Bank Size	0.011128	0.0212	Significant	Accepted
LDR	0.020662	0.3346	Insignificant	Rejected
GDP Growth	0.010684	0.9127	Insignificant	-
Inflation Rate	-0.949069	0.0450	Significant	-
Interest Rate	0.644743	0.0177	Significant	-
Exchange Rate	-0.0000129	0.0524	Insignificant	-

Source: processed data, 2023

According to the regression test result, Table 10 shows NPL has a probability of 0.0000 with a coefficient of -0.177863. The results indicate there is a significant negative effect from NPL on ROA. Moreover, CAR has a significant positive effect on ROA because it has a probability of 0.0303 with a coefficient of 0.024618. Bank size also has a significant positive impact on ROA, with a probability of 0.0212 and a coefficient of 0.011128. However, the LDR doesn't affect significantly ROA, because it has a probability of 0.3346, which is higher than 0.05, and a coefficient of 0.020662.

Among the macroeconomic variables, there are only 2 variables that have a significant effect on ROA, namely inflation rate and interest rate. The inflation rate has a probability of 0.0450 with a coefficient of -0.949069, which means it has a significant negative effect on ROA. While interest rate has a significant positive effect on ROA with a probability of 0.0177 and a coefficient of 0.644743. However, GDP growth and the exchange rate doesn't show any significant effect on ROA with a probability of 0.9127 and 0.0524 respectively, and a coefficient of 0.010684 and -0.0000129 respectively.

Table 11. *t* Test Result on ROE – Common Effect Model

Variable	**Coefficient**	**Prob.**	**Conclusion**	**Hypothesis**
Constant	-2.927761	0.4789	-	-
NPL	-0.770313	0.3922	Insignificant	Rejected
CAR	0.282204	0.3891	Insignificant	Rejected
Bank Size	0.153881	0.2131	Insignificant	Rejected
LDR	0.248147	0.7220	Insignificant	Rejected
GDP Growth	0.312867	0.9344	Insignificant	-
Inflation Rate	-5.349892	0.7702	Insignificant	-
Interest Rate	5.483910	0.5934	Insignificant	-
Exchange Rate	-0.000000838	0.9737	Insignificant	-

Source: processed data, 2023

Table 11 shows all independent variables have an insignificant effect on ROE because all of the variables have a probability score higher than 0,05. Results show all independent variables have a high probability score, it is shown there is a high volatility on the ROE data or there is an inconsistency effect of the independent variables on ROE. This result may be caused by the unusual condition of the research object.

According to the table above, the first hypothesis of this study is accepted but the second hypothesis is rejected. The results show NPL has a significant negative effect on ROA because rural banks gain their profit from the interest of credit distributed. If a non-performing loan has occurred, it may decrease the profit or even cause a loss for rural banks. Some researchers also found similar results including Wagdi and Salman (2022); Lawrence et al. (2020); Kumar and Bird (2022); and Çollaku and Aliu (2021). However, NPL shows an insignificant effect on the ROE of rural banks, it may happen because the ROE variable was a ratio to measure the profit gained only from the capital of the bank. Hence, the rural banks in the Province of West Nusa Tenggara have a volatility of capital (ROE std. deviation > ROE mean), which may cause an insignificant effect from NPL on the ROE of the rural banks. Hence, hypothesis two is rejected. this result was also founded by several studies including Mrindoko et al. (2020); Amjath and Begum (2022); and Wagdi and Salman (2022).

The third hypothesis has a significant positive on the ROA of rural banks, it may be caused by the contribution of society's trust in a high CAR. Higher CAR of banks is believed to have lower risk and have the ability to receive a significant loss. Most banks use their capital as a loss absorber when there is operational loss, so rural banks with a higher CAR can do riskier investments with a higher profit. According to the data, the average CAR of rural banks in the Province of West Nusa Tenggara is 48,34%, which means almost half of the assets owned are their capital. Several studies also found similar results including Kumar and Bird (2022); Munangi and Sibindi (2020); Farah and Khemissi (2021); Hossain and Ahamed (2021); and Siddique et al. (2020). Moreover, the fourth hypothesis is rejected, CAR has an insignificant effect on the ROE of rural banks may happen because a higher profit is needed for a higher equity to show a higher ROE. When the CAR of rural banks in a high level, banks need to gain more profit to increase ROE. However, when the CAR of rural banks is at a low level, banks aren't allowed to take riskier investments which results in a stagnant ROE level. Several studies also found similar results such as Wagdi and Salman (2022); Munangi and Sibindi (2020); and Lawrence et al. (2020).

The fifth hypothesis stated bank size has a significant positive effect on ROA and it is founded in this study. Bank size is measured by the amount of total assets the banks have; a bigger bank size enables the bank to gain more profit by credit distribution from customer savings (deposit). Most of the time, deposits become cheap funds for banks because of low-interest costs, therefore the bigger bank size shows more deposits from customers. Hieu and Minh (2022); Chiahti et al. (2021); and Krishna et al. (2021) also found similar results as bank size effect significantly positive on ROA. However, the sixth hypothesis is rejected, this study found bank size effect insignificant on the ROE of rural banks. It may happen because ROE is measured by the rate of return received by their shareholders, yet all rural banks have different composition of their capital structure. Rural banks with a smaller composition of capital (equity) may achieve a higher ROE level than rural banks with higher composition of capital with the same amount of profit. Several studies also found an insignificant effect of bank size on the ROE of banks, including Farah and Khemissi (2021); Munangi and Sibindi (2020); and Sahraoui and Merhoun (2022).

The seventh and eighth hypotheses in this study stated loan-to-deposit influence significantly positively on ROA and ROE. However, this study found LDR has an insignificant effect on the ROA and ROE of rural banks in the Province of West Nusa Tenggara. It may be caused by credit distribution from the rural banks that haven't reached the government recommendation, which is at 74,68% and the ratio considered healthy is between 78%-92%. Hence, it almost reaches the recommendation from the government, and the rate of non-performing loans in the province is still high. That's why the LDR ratio has an insignificant effect on ROA and ROE. This result was also found by several studies such as Amjath and Begum (2022); Farah and Khemissi (2021); Jacob et al. (2022); Lawrence et al. (2020); and Wagdi and Salman (2022).

GDP growth has an insignificant effect on both ROA and ROE, it may happen because when there is a growth in the economy and the power of society savings is increased, the rural banks need to distribute the credit by their risk management. If the credit distribution isn't well managed, hence customer savings will be a financial cost for rural banks. As a result, GDP growth effect insignificantly on ROA and ROE of rural banks because bank performance is determined by bank management as well. Some studies also found similar results including Chiahti et al. (2021); Farah and Khemissi (2021); Gautam and Gautam (2021); and Krishna et al. (2021).

Inflation rates show a significant negative on ROA, it may happen because a high inflation rate creates a situation for society to become more thrifty than usual. When society refuses to expend its money, it causes the economic turnover decreases and it will be difficult for banks to extend their credit which results in a decrease of ROA. Several studies have found that the inflation rate effect is significantly negative on ROA, including Chiahti et al. (2021); Taha and Top (2022); and Hossain and Ahamed (2021). However, the result shows the inflation rate affects insignificantly on the ROE of rural banks, it may be caused by the variety of rural banks' capital composition. When there is a change in the profit, the ROE ratio will become

fluctuate and vary. These results were also found by Abdullahi and Yusuf (2022); Imane (2020); and Mrindoko et al. (2020).

Interest rates have a significant positive effect on ROA, these results indicate every increase in interest rates, the profitability of rural banks will increase. It may happen because when the interest rate is increased the difference between the credit interest and deposit interest is bigger. Hence, the rural banks will have a higher profit margin. Several studies also found interest rate effect significant positive on ROA, including Taha and Top (2022); Gabeshi (2021); and Farooq et al. (2021). However, the interest rate effect is insignificant on ROE, it may be caused by the variety of ROE. Several studies also found similar results, including Abdullahi and Yusuf (2022); Donkor et al. (2020); and Mrindoko et al. (2020).

The exchange rate shows an insignificant effect on both ROA and ROE, these results may happen because most transactions done by rural banks were domestics transaction and most credit distribution is addressed to SMEs in the Province of West Nusa Tenggara. Hence, a change in the exchange rate has an insignificant effect on rural banks' performance. Several researchers also found similar results, including Akims et al. (2020); Farooq et al. (2021); Egolum et al. (2020); Imane (2020); and Neupane (2020).

4. Conclusion

This study has been done to measure bank-specific variables and macroeconomic effects on the firm performance of rural banks in the Province of West Nusa Tenggara. The results of this study show there are 3 hypotheses accepted and 5 hypotheses rejected. The result shows NPL and inflation rate have a significant negative effect on ROA. While CAR, bank size, and interest rate have a significant positive effect on ROA. However, this study found LDR, GDP growth, and exchange rate have insignificant effects on ROA. This study also found all independent variables and control variables have insignificant effects on the ROE of rural banks. To have a good performance, rural banks need to control their credit risk and have enough capital to run their operation.

The outcome of this study could be beneficial for rural banks that have difficulty increasing their profit. This study is constrained by the object because it focused on the rural bank in the Province of West Nusa Tenggara. Future research may include other macroeconomic variables that were not used in this study such as oil price, income per capita, and unemployment rate with a longer period for more accurate results.

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