

Does capital adequacy ratio matter during the Covid-19 outbreak? Evidence on state-owned banks in Indonesia

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Abstract

The Covid-19 outbreak has led to significant transformations in the financial performance of Indonesia's banking sector. Weak economic indicators have resulted in reduced bank capital due to inadequate working capital loans. This study aims to investigate alterations in the capital adequacy ratio (CAR) of Indonesia's state-owned banks during the Covid-19 pandemic. The dataset is derived from the quarterly financial reports of state-owned banks spanning the period 2020-2021. Our findings establish a relationship between bank lending, non-performing loans (NPLs), and CAR. Under the prevailing circumstances, a considerable decline in credit and a noteworthy upsurge in NPLs emerged starting from the third quarter of 2020, with a slight increase persisting into the third quarter of 2021. In contrast, the capital adequacy ratio exhibits a tendency towards stability, attributed to governmental reinforcement of bank capital. We also prove that bank lending has a positive impact on CAR, whereas NPLs have a negative impact on CAR. The research underscores the state-owned banks' ability to consistently and securely maintain the CAR, further emphasizing that this prudent safeguarding mechanism ensures a continuous capital enhancement in conjunction with lending growth, all the while upholding the regulatory norms of the banking industry

Keywords: Capital adequacy ratio; Covid-19; Lending; Non-performing loans

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1. Introduction

The banking situation in Indonesia has changed significantly over time. These changes are not only due to internal developments within the banking sector but are also influenced by external factors, such as the current Covid-19 pandemic. The impact of the pandemic has led to a significant increase in non-performing loans (NPLs). The NPL figures saw a drastic shift as the Covid-19 outbreak spread across all regions of Indonesia, affecting the economy. This

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ratio measures a bank's ability to minimize problematic loans (Astreanto & Riyadi, 2017; Taruna, 2021).

With the rising NPL ratio, banks are required to set aside substantial reserves to cover bad debts, leading to limited credit availability. Failure to collect these debts can result in losses. The high NPL ratio affects the Capital Adequacy Ratio (CAR), a measure of how much a bank's assets containing risk can be funded by its own capital. Banks are mandated to maintain a CAR of around 8%, ensuring all commercial banks adhere to this requirement. This CAR requirement is in place to ensure banks possess sufficient capital to mitigate potential risks stemming from asset expansion, particularly assets that yield returns while carrying risks (Tionarto et al., 2022; Tumipa et al., 2022). In the face of rising global economic pressures, banks are required to keep their capital levels adequate. Adequate capital allows banks to have financial reserves to cover losses arising from bad loans or borrower defaults. In essence, CAR assists banks in managing the risk of losses associated with their credit portfolios. CAR plays a vital role in maintaining the financial stability of banks. If a bank suffers substantial losses and its capital decreases, a low CAR can lead to financial instability and even bankruptcy risks (Özgür, 2021). A robust CAR equips banks with better resilience against unexpected economic shocks or operational risks. Having sufficient capital enables banks to grow more securely. Banks with adequate CAR are better positioned to extend new credit to customers without risking their own stability. This implies that banks can support sustainable economic growth and business activities (Thoa & Anh, 2017).

The banking sector's ability to credit distribution can influence CAR. The higher the bank lending, the potential for reduced capital creation and increased levels of risky assets held by the bank (Rianto & Salim, 2020). However, bank lending facilitates investment, distribution, and consumption of goods and services, given that these activities are intrinsically tied to the use of money. Smooth investment, distribution, and consumption activities are crucial for the economic of community development (Sukirno, 2020).

The impact of loans on CAR is due to the close relationship between loans and credit risk, which refers to the risk of borrowers not being able to repay their loans. If banks extend credit to borrowers facing financial difficulties or high default risks, a portion of those loans might turn into non-performing loans. Non-performing loans lead to financial losses for the bank as the loaned funds won't be repaid. These losses ultimately reduce the bank's capital (Rianto & Salim, 2020; Sukirno, 2020). Since CAR is calculated as a percentage of core capital to weighted risk, a decrease in capital due to bad loans will lower CAR. Thus, the higher the non-performing loan rate in the bank's loan portfolio, the lower the CAR.

Non-performing loans (NPLs) are loans that face difficulties in repayment due to deliberate reasons or external factors beyond the debtor's control (Yuliani et al., 2015). Effective credit management by banks, particularly when extending credit to the public and ensuring loan repayments follow agreed terms, is essential to avoid problematic loans. Interest income received from loan interest decreases as the non-performing loan (NPL) rate increases, as a result of the higher number of problematic loans, leading to a reduction in CAR since profits, a component that contributes to capital structure, decrease. Research by (Buyuksalvarci & Abdioglu, 2011) on Turkish banks shows an increase in credit loss provisions leading to a CAR decrease. An increase in credit loss provisions indicates the potential for NPLs.

This study aims to identify bank lending, NPLs, and CAR during the COVID-19 pandemic. The emergence of the COVID-19 pandemic has prompted policies from the

Bank of Indonesia to anticipate the occurrence of the non-performing loan cycle. Credit distribution slowdown occurred particularly in sectors highly impacted by COVID-19, such as transportation, tourism, hospitality, and micro, small, and medium enterprises (MSMEs). In-depth research aims to analyze the impact of bank lending and NPLs on CAR resilience in facing economic changes due to the COVID-19 pandemic.

2. Hypotheses Development

Bank lending and capital adequacy ratio during Covid-19 pandemic

During the Covid-19 pandemic, banks in Indonesia experienced an increase in credit risk and economic uncertainty due to lockdown conditions and restrictions on economic activities. On the other hand, banks also needed to continue lending to support businesses in need of funds and maintain their financial health. The premise is that financial crises alter the negative supply and demand effects of loans. Banks maintain lending to bolster their liquidity (Çolak & Öztekin, 2021). The decision to maintain bank lending led to an increase in the Capital Adequacy Ratio (CAR) due to the interest margin on loans, which can contribute to capital (Bartik et al., 2020; Humphries et al., 2020). Research conducted by Auer et al. (2022) and Benes & Kumhof (2015) found that when banks increase the amount of outstanding credit, CAR increases because banks manage their credit efficiently, maintain sufficient liquidity levels (Bhoka et al., 2021), and generate reasonable profits. Based on theoretical and empirical studies, the first hypothesis is as follows:

H₁: bank lending has a positive effect on the capital adequacy ratio.

Non-performing loans and capital adequacy ratio during Covid-19 pandemic

During the Covid-19 pandemic, NPLs refer to loans that borrowers fail to repay according to the agreed-upon schedule. This situation can arise due to the intensified economic impact of the pandemic, leading to financial difficulties for many individuals, businesses, and the broader economy. Many people lost their jobs or experienced significant income reductions, making it challenging for them to meet their financial obligations, including loan payments. Credit is closely tied to credit risk or the risk of borrower default. When banks extend credit to borrowers facing financial difficulties or having a high default risk, there is a potential for some of these credits to turn into problematic loans (Nugroho et al., 2021). Several studies indicate that during the COVID-19 pandemic, loan quality declined, NPLs increased, bank capital deteriorated, and the operations of major banks were affected (Barua & Barua, 2020; Korzeb & Niedziółka, 2020). Research conducted by Park & Shin (2021) found that when banks increase the amount of outstanding credit, the Capital Adequacy Ratio (CAR) decreases because the bank assumes a larger credit risk. Based on theoretical and empirical studies, the second hypothesis is as follows:

H₂: non-performing loans have a negative effect on the capital adequacy ratio.

3. Methods, Data, and Analysis

This research is a descriptive study as it explains the developments in credit distribution, Non-Performing Loans (NPLs), and Capital Adequacy Ratio (CAR) during the Covid-19 pandemic period in Indonesian state-owned banks (SOBs) from 2020 to 2021. The research employs a quantitative research approach, as it requires financial reports to understand the impact of credit distribution and NPLs on CAR during the Covid-19 pandemic. Based on the research objectives, this study is an associative causal research aiming to analyze the influence of credit distribution and NPLs on CAR. Associative causal research seeks to understand the relationship between two or more variables. This type of

research aims to build theories to explain, predict, and control phenomena. The research subjects are BRI, BNI, BTN, and Bank Mandiri.

Secondary data sources are used in this study, obtained from financial reports of Bank Rakyat Indonesia, Bank Negara Indonesia, Bank Tabungan Negara, and Bank Mandiri, available on the website www.idx.co.id. The data collection technique is documentation, collecting quarterly financial data from Quarter 1 to Quarter 4 during the Covid-19 pandemic period in the two-year period of 2020-2021.

The dependent variable in this study is the Capital Adequacy Ratio (CAR), which represents the adequacy of capital to absorb potential losses faced by the company. The CAR formula is as follows:

$$CAR = (Tier\ 1\ Capital + Tier\ 2\ Capital) / (Risk\ -weighted\ Assets) \times 100\%$$

There are two independent variables in this study: (1) Banking lending, which is the ability to extend loans with a promise of repayment according to the agreed-upon schedule. Banking lending is measured by the total outstanding credit. (2) Non-Performing Loans (NPLs), which refers to loans where the debtor fails to make scheduled payments for a specified period. The NPLs formula is as follows:

$$NPLs = (Total\ Non\ -performing\ Loans) / (Total\ Loans) \times 100\%$$

The research analysis technique uses multiple regression analysis, which involves more than one independent variable. Multiple regression analysis is conducted to determine the direction and extent of the influence of independent variables on the dependent variable. The steps involved in multiple regression analysis are: (1) determining the model summary; (2) conducting the simultaneous test; (3) creating output for coefficients and significance; (4) performing classical assumption tests, including linearity, normality, heteroskedasticity, autocorrelation, and multicollinearity. The regression model equation is as follows:

$$CAR = \alpha + \beta_1.LEND + \beta_2.NPLs$$

Where: CAR = Capital Adequacy Ratio; LEND = Banking lending; NPLs = Non-Performing Loans; α = Constant; β = Regression coefficient

Hypothesis testing is carried out using the t-test and F-test. The t-test is used to determine the partial influence of banking lending and NPLs on CAR. If the significance level $\alpha < 0.05$, then banking lending and NPLs significantly affect CAR. If the significance level $\alpha > 5\%$, then banking lending and NPLs do not affect CAR. The F-test is used to determine if there is a significant difference between the means of different groups being compared. The primary purpose of the F-test is to determine if the variation between groups is greater than the variation within groups. The F-test is a type of statistical test used in analysis of variance (ANOVA). Using the F-test, it can be determined if banking lending and NPLs have a simultaneous influence on CAR.

4. Results

The development of the number of bank lending during the Covid-19 pandemic at SOBs

Income is an important factor in a bank because it is a measure of progress or decline of a bank. The greater the income, the bank is considered to have a better level of

soundness, and vice versa. However, this amount of income often fluctuates due to macroeconomic changes. Likewise, the income earned by BUMNs is shown in Figure 1.

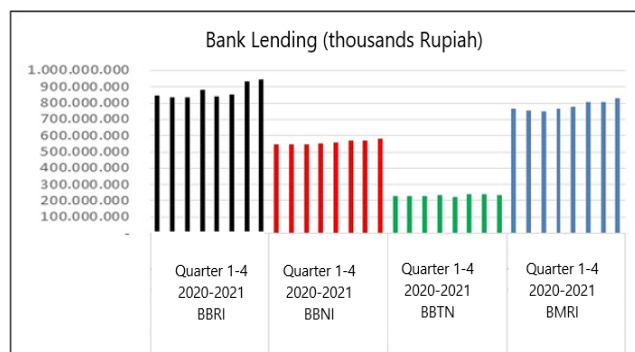


Figure 1. Development of bank lending at state-owned banks during the Covid-19 pandemic for the 2020-2021 period

Based on Figure 1, it can be seen that the development of credit distribution is quite stable. In 2020 Bank BRI's lending decreased in the second quarter to 11,178,204 and in the first quarter of 2021 to 38,820,564. At Bank BNI, a decrease occurred in the second quarter of 2020 of 1,793,215. While at Bank BTN it decreased in 2020 in the second quarter of 1,375,735, in the first quarter of 2021 it was 11,086,469 and in the fourth quarter it was 8,808,282 and at Bank Mandiri lending decreased in 2020 the second quarter of 13,261,645, and the third quarter of 3,690,451.

Development of non-performing loans during the Covid-19 pandemic at state-owned banks (Bank BUMN)

Non-Performing Loans (NPLs) is a ratio to measure the amount of non-performing loans in a bank due to non-current payments made by the customer and causing the bank's performance to decline and become inefficient. The development of NPLs during 2020-2021 is shown in Figure 2.

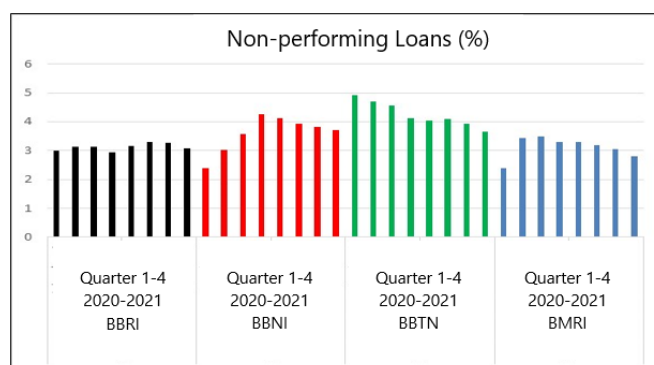


Figure 2. Development of NPLs at state-owned banks during the Covid-19 pandemic for the 2020-2021 period

Based on Figure 2, the NPL development at BRI Bank experienced a decrease in the third quarter of 2020 by 0.01%, in the fourth quarter by 0.18% and in 2021 the third quarter by 0.02% and the fourth quarter by 0.2%. At Bank BNI, the decline in 2021 in the first quarter was 0.13%, the second quarter was 0.18%, the third quarter was 0.11, and the fourth quarter was 0.11%. Meanwhile, Bank BTN experienced a decline in the second quarter of 2020 by 0.2%, the third quarter 0.15%, the fourth quarter 0.43%, in 2021 the third quarter

0.16, the fourth quarter 0.3%. And at Bank Mandiri the decline in 2020 quarter 4 was 0.21%, in 2021 the second quarter was 0.11%, the third quarter was 0.13%, and the fourth quarter was 0.25%.

Development of capital adequacy ratio during the Covid-19 pandemic at state-owned banks (SOBs)

The Capital Adequacy Ratio (CAR) is a ratio that shows how much the total bank assets that contain risks are also financed from their own capital, in addition to obtaining funds from parties outside the bank. The higher the CAR, the more capital the bank has in overcoming the decline in assets. The development of CAR in state-owned banks during the Covid-19 pandemic is presented in Figure 3.

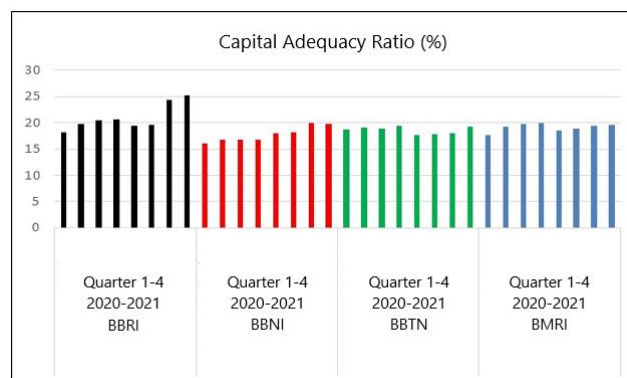


Figure 3. Development of CAR in state-owned banks during the Covid-19 pandemic for the 2020-2021 period

Based on Figure 3, CAR at Bank BRI has decreased in the first quarter of 2021 by 1.21%. Bank BNI experienced a decrease in the fourth quarter of 2021 by 0.16%. CAR at Bank BTN decreased in 2020 in the third quarter of 0.15%, in 2021 in the first quarter of 1.69%. And Bank Mandiri experienced a decrease in the first quarter of 2021 of 1.39%.

Descriptive Statistics

Variable descriptive statistics in this study for bank lending, NPL, and CAR are shown in the statistical test results in Table 1.

Table 1.
Descriptive statistical test results

Variables	N	Minimum	Maximum	Mean	Std. Deviation
LEND	32	223,965.647	943,702,693	611,150,201	6.3294E+16
NPLs	32	2.38	4.91	3.5253	0.383
CAR	32	16.07	25.28	19.1138	3.535
Valid N (listwise)	32				

Based on Table 1, it can be seen that 32 data have been observed, which come from 4 state-owned banks listed on the Indonesia Stock Exchange (IDX) for the 2020-2021 period. From table 1 it can also be seen that the minimum bank lending value (LEND) is 223,965,647, the maximum value is 943,702,693, and the average/mean value is 611,150,201. The amount of banking lending at state-owned banks is at a fairly wide interval and the variation in the number of bank loans is quite large. For NPLs the minimum value is 2.38%,

the maximum value is 4.91%, and the average/mean value is 3.52%. This shows that the amount of NPLs in state-owned banks is at a controlled level with fairly homogeneous variations. Meanwhile, the minimum CAR value is 16.07%, the maximum value is 25.28%, and the average/mean value is 19.11%. CAR shows a controlled level with fairly homogeneous variations. A good CAR level is above 12%, while in state-owned banks the average is more than required.

Results of Classical Assumptions Test

Classical assumption tests are preliminary steps conducted before proceeding with further analysis of the collected data. These tests aim to ensure that the regression model meets the criteria of being BLUE (Best Linear Unbiased Estimator). Classical assumption tests are carried out by examining data for normality, multicollinearity, and autocorrelation. Based on the results of the normality test using the Kolmogorov-Smirnov method, a significance value of 0.124 is obtained. Since this value is greater than the significance level $\alpha=0.05$, it can be concluded that the data is normally distributed. Multicollinearity testing results in tolerance values for the variable "bank lending" (LEND) and the variable "NPLs" of 0.435 and VIF values of 2.297. This indicates that the regression model passes and does not exhibit multicollinearity, as the tolerance value of $0.435 > 0.100$ and the VIF value of $2.297 < 10.00$. Heteroskedasticity testing reveals that the data is free from heteroskedasticity. This aligns with the decision-making basis that if the significance value is above $\alpha=0.05$, then it can be considered free from heteroskedasticity. In this study, the significance value for the "LEND" variable is 0.234, while for the "NPLs" variable it is 0.447.

Regarding autocorrelation testing, the Durbin-Watson statistic is found to be 1.738. To determine whether the Durbin-Watson value falls between 2 and $(4-du)$, it's necessary to know the du value itself from the Durbin-Watson distribution table. The du value itself is 1.65. Therefore, $4-du = 4 - 1.65 = 2.35$. It can be said that this data passes the Autocorrelation test because the value $1.574 < 1.738 < 2.35$.

Results of Multiple Regression Test

The t test is used in order to be able to test the significance of the relationship between the independent and dependent variables partially. This study examines whether bank lending (LEND), and NPLs, have an effect on CAR. If the sig. < 0.05 , it means that the independent variables LEND and NPLs partially affect the CAR variable. Table 2 shows the results of the t test with multiple regression analysis.

Table 2.
 Hasil Uji t

Model	Beta Coefficients	Std. Error	t	Sig.
(Constant)	9.689	3.327	2.912	0.007
LEND	0.857	0.000	3.737	0.001
NPLs	-0.515	0.696	2.245	0.033

Dependent variable: CAR

Based on Table 2, it can be concluded that the LEND variable partially affects CAR because the significant value is $0.001 < 0.05$. The NPLs variable partially influences CAR with a significant value of $0.033 < 0.05$. Based on the beta coefficient, it can be seen that LEND and NPLs have a positive effect on CAR. In general, the results of multiple regression analysis form the following regression equation:

$$CAR = 9.689 + 0.857LEND - 0.515NPLs + \varepsilon$$

In accordance with Table 2, the results of the partial t test show that the results of testing the hypotheses H_1 and H_2 are accepted because the significance values of each variable are 0.001 and 0.033 below the value of $\alpha = 0.05$. However, based on the value of the beta coefficient, the H_2 hypothesis is rejected, because NPLs have a positive effect on CAR.

The objective of the F test is to be able to observe whether or not there is a simultaneous influence exerted by the LEND and NPLs variables on CAR. The basis for decision making in the simultaneous test is the significance value of $F < 0.05$, meaning that the LEND and NPLs variables simultaneously influence the CAR variable. The results of the F test are shown in Table 3.

Table 3.

F test results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	36.857	2	18.428	7.349	0.003 ^b
Residual	72.724	29	2.508		
Total	109.580	31			

a. Dependent Variable: CAR

b. Predictors: (Constant), Bank lending, NPLs

Based on Table 3, the results of the LEND and NPLs variables simultaneously influence the CAR variable as evidenced by the F significance value of $0.003 < 0.05$. This means that the LEND and NPLs variables are able to jointly predict changes in CAR levels in state-owned banks in Indonesia.

5. Discussion

The effect of bank lending on the capital adequacy ratio (CAR) during the Covid-19 pandemic

The research results demonstrate that bank lending has a positive and significant impact on CAR. This implies that an increase in bank lending is accompanied by a growth in CAR. Bank lending is one of the many activities that can influence a bank's financial position and capital. When a bank provides loans to borrowers, it creates new assets in the form of receivables. The interest income and other fees derived from these loans can enhance the bank's revenue. However, this influence on CAR is not direct. CAR is a ratio that measures a bank's capital adequacy in facing specific risks. It is calculated by dividing the bank's core capital by the specific risks it faces, such as credit risk, market risk, and operational risk. According to Çolak & Öztekin (2021), there are two reasons why bank lending has a positive impact on CAR. Firstly, there is asset growth. When a bank extends loans and generates new assets in the form of receivables, the total assets of the bank tend to increase. Healthy asset growth can help the bank generate more income while also presenting greater risks. If this growth is managed well and credit risks are monitored, it can contribute to bank stability and, in the long term, enhance CAR. Secondly, interest income plays a role. The interest income obtained from loans can increase the bank's profits. Strong profits can provide a positive contribution to the bank's capital, which in turn can enhance CAR.

This study finds that the state-owned banking industry in Indonesia consistently maintains CAR at a safe and strong level during the Covid-19 pandemic. This safeguarding of a secure level involves consistently increasing capital alongside the growth of credit

distribution while adhering to banking industry regulatory requirements, such as maintaining a strong bank CAR of at least 12%. The positive and significant influence between bank lending and CAR during the pandemic indicates that the Indonesian banking industry generated substantial profits. The government, as the primary owner, and bank management actively increased the bank's capital. These findings support research conducted by [Auer et al. \(2022\)](#), [Siagian \(2020\)](#), and [Tionarto et al. \(2022\)](#).

The effect of non-performing loans (NPLs) on capital adequacy ratio (CAR) during the Covid-19 pandemic

The research findings prove that NPLs have a positive and significant impact on CAR. NPLs refer to loans that are not repaid by borrowers according to the agreed payment schedule, typically due to financial or business issues. Assets that turn into NPLs pose a risk to a bank's capital. When borrowers fail to repay loans, the bank experiences financial losses as the funds that should have been received are not received. This means the bank's capital is reduced. Core capital is the most solid and stable component of a bank's capital structure. NPLs that result in losses lead to a decrease in the bank's core capital. Core capital is a critical element in calculating CAR, and a decrease in core capital will reduce CAR ([Büyüksalvarci, 2011](#)).

NPLs have a direct impact on CAR due to their association with potential losses that the bank must bear. When a bank experiences NPLs, it faces the risk of financial loss. The bank needs to use its capital to cover these losses (loss absorption). This reduces the amount of capital available to address other risks, thereby potentially reducing CAR. Moreover, to comply with regulatory requirements to maintain an adequate CAR level, banks may need to inject new capital to compensate for losses caused by NPLs (capital adequacy burden). This might require increased investment or raising new funds, which could reduce CAR if not balanced with corresponding asset growth.

However, the research results differ from previous findings. This difference is due to the conditions of the Covid-19 pandemic, which required Bank Indonesia to take strategic actions related to credit risk management. When reviewing the development descriptions of NPLs and CAR, it becomes evident that both tend to decrease. In this situation, NPLs in state-owned banks have decreased due to Bank Indonesia's policies such as temporary loan payment suspension (moratorium), credit restructuring programs, and economic stimulus measures. Additionally, government and central bank actions to address pandemic economic impacts could play a role in limiting the increase of NPLs.

The Covid-19 pandemic has increased the need for loan restructuring due to many debtors facing difficulties in repaying loans to banks or non-bank financial institutions due to the unhealthy economic conditions. Recognizing this, the Financial Services Authority (OJK) issued Regulation No. 11/POJK.03/2020 on National Economic Stimulus as a Countercyclical Policy in Response to the Spread of Coronavirus Disease 2019 (POJK No.11/POJK.03/2020), which regulates credit restructuring provisions as a response to the Covid-19 pandemic, aiming to maintain financial system stability and support economic growth.

The implementation of POJK No. 11/POJK.03/2020 had a positive impact. According to OJK data as of April 26, 2020, there were 561,950 debtors who successfully underwent credit restructuring by banks with a total restructuring value of Rp113.8 trillion. Meanwhile, 253,185 debtors successfully underwent restructuring by non-bank financial institutions with a total value of Rp13.2 trillion. This data indicates that credit restructuring provided stimulus to debtors during the COVID-19 pandemic, maintaining national economic stability. This demonstrates that the government's credit restructuring efforts were quite successful. Consequently, the positive and significant influence between NPLs

and CAR is the result of intensive capital growth, both from bank profits and capital injections from owners or investors, along with credit restructuring. The findings supporting the positive impact of NPLs on CAR are in line with the study conducted by Bukian & Sudiarta (2016). However, these findings contrast with the outcomes of Taruna (2021), Nugroho et al. (2021), and Park & Shin (2021).

6. Conclusion

The aims of this research are to determine whether there is an influence between bank lending and non-performing loans (NPLs) on the capital adequacy ratio (CAR) during the Covid-19 pandemic in state-owned banks from 2020 to 2021. The research findings indicate that bank lending has a positive and significant impact on CAR; the higher the bank lending, the greater the CAR. NPLs, on a partial basis, also have a positive and significant influence on CAR. Similarly, the research findings prove that bank lending and NPLs, when considered together, have a positive impact on CAR. This is due to the fact that during the Covid-19 pandemic, there was a decrease in both bank lending and NPLs, which resulted in a decrease in CAR for state-owned banks in Indonesia. This performance decline is attributed to Bank Indonesia's measures to alleviate global economic pressures through policies such as credit reduction (moratorium), credit relief (credit relaxation), and economic stimulus provided to debtors.

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