18. Determinant of Capital

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Determinants of Capital Buffer: Study on Conventional Commercial Banks in Indonesia

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ABSTRACT

This study aims to examine the factors that determine the capital buffer in conventional commercial banks operating in Indonesia. This study uses non-performing loans, bank size, return on equity, loans to total assets as independent variables, and capital buffer as the dependent variable. The population in this study was 38 conventional commercial banks that are still actively operating in Indonesia. The sampling method used the purposive sampling method according to the needs of the analysis and obtained 90 samples of observation data. The results showed that non-performing loans and loans to total assets had a negative effect on a capital buffer, while bank size had a positive effect. However, the return on equity has no effect on the capital buffer.

Keywords: bank size, capital buffer, loan to total assets, non-performing loans, return on equity.

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I. Introduction

The banking industry is an intermediary institution that has a strategic role and function in the economy of a country. The function of the bank as a financial intermediary is to connect parties who have excess funds (surplus) with parties who need funds (deficit). The function of banking as an intermediary institution can run well, so it takes a bank that has good financial performance. Bank is a business that has a high level of risk, especially during a crisis period. If the risk owned by the bank is realized, the bank will experience a loss. To avoid these losses, banks need to have a capital buffer as safety when facing losses.

Capital buffer is the difference between the minimum capital adequacy ratio (CAR) and the bank's capital adequacy ratio (above 8% of RWA according to Bank Indonesia regulations), for banks, the capital buffer is used to reduce losses that may occur in the future when the economy is slowing down. The reason for the need to provide a capital buffer is because banks have an assessment of the amount of risk that is different from government regulations. In addition, the minimum capital required by the government does not guarantee that it will be able to cover losses felt by banks. Therefore, banks need capital buffer supplies that function as reserves against the budget for banks experiencing unexpected capital shocks and difficulties in obtaining new capital (Shim, 2013). Banks affected by capital shocks are unable to meet the minimum capital requirements that have been determined by the government, which can lead to supervisory interventions that can be detrimental and trigger the bank to go bankrupt.

Capital buffer has countercyclical and procyclical characteristics in terms of bank size. Smaller bank sizes have backward-looking characteristics, while larger bank sizes have forward-looking characteristics (Jokipii & Milne, 2008). Banks that behave backward-looking are likely to continue to increase the amount of credit when credit demand is high. This causes delays in anticipating credit risk and the obligation to increase capital buffers during a recession so that capital buffers are procyclical. On the other hand, banks with forward-looking characteristics tend to increase their capital buffer while increasing the amount of credit when credit demand is high so that banks can predict future shocks (Borio *et al*., 2001). This means that the capital buffer has countercyclical characteristics.

In producing a healthy banking system, Basel III is used as an international standard of capital through increasing quality and quantity, so that banks increase their expertise to minimize risks caused by crisis conditions or excessive bank credit growth, healthy banks are able to develop and compete both nationally and internationally. (www.ojk.go.id). Basel III was proposed by the Basel Committee on Banking Supervision (BCBS) founded in 1975, suggesting an approach that is more sensitive to unexpected changes in the market (Girlts & Ilja, 2014). However, the Financial Services

Authority (OJK) announced that the implementation of Basel III Reforms would be postponed to January 1, 2023, because this postponement is one of the 3 (three) follow-up policies related to controlling the effects of Covid-19 on the banking industry issued by the OJK (www.cnbindonesia.com).

The implementation of Basel III is a continuation of the implementation of Basel II, this Basel III regulation focuses on strengthening the banking capital structure, which has so far been determined by Bank Indonesia in the national banking industry. In Basel III, it is explained that banks need to strengthen their capital, in order to have proper liquidity when capital is eroded for some reason. The role of Basel III is to strengthen the micro and macro position, on the micro side, it is carried out by increasing the quality and quantity of banking capital, and the availability of capital buffers owned by banks (Ichtiani *et al*, 2017). As well as the need to provide sufficient capital buffer for bank capital by requiring the establishment of a conservation buffer of 2.5% of all risk-weighted assets (RWA) owned by banks, to minimize losses in times of crisis.

Several previous studies related to the factors that affect the capital buffer have been carried out with different results. Therefore, this study tries to complement the results of previous studies by using non-performing loans (NPL), bank size, return on equity (ROE), and loans to total assets ratio as variables that determine capital buffer. Non-performing loans (NPL) is a measuring tool that can be used to measure the level of credit risk. Bank size (Size) is a measure that describes the ownership of a bank's assets as well as a variable that affects the capital buffer. Return on equity is the ratio used to measure the profitability of a bank, and this variable is also a variable that affects the capital buffer. Another variable loans to total assets (LOTA) which is a ratio to measure the level of liquidity to determine the bank's ability to fulfill credit requests with bank assets as collateral.

II. Literature Review

A. *The Pecking Order Theory*

Pecking order theory was first put forward by Donaldson in 1961 and then developed by Stewart C. Myers and Nicolas Majluf in 1984. According to Myers (1984) Pecking order theory is where companies will use internal sources of funds first in financing their investments, if they are not sufficient the company will use external funds in the form of debt or equity issuance as a last resort. This theory is based on asymmetric information so that external funding costs become more expensive, and managers will use the funding source that has the lowest cost, namely internal funding sources. Pecking order theory is a theory that proposes funding decisions follow a hierarchy in which sources of funding originating from within the company (internal financing) are prioritized over funding sources originating from outside the company – external financing.

With asymmetric information, management has more information than shareholders. Asymmetric information can influence managers in determining funding source decisions, between using internal or external sources of funding and between adding new debt or issuing new equity. Basically, managers prefer internal funds to external funds because internal funding sources allow companies to no longer need to open themselves to the spotlight of outside capital. External funds are needed when internal funds are insufficient and the preferred source of funds is debt, not shares. In addition, the influence of asymmetric information results in a gap or discrepancy between bank management and bank owners which may cause bank management to deviate, so that stock prices cannot reflect complete information about the company's status.

Pecking order theory is used in this study because it adheres to funding decisions with a logical order of preference starting from the smallest risk, namely retained earnings, debt, and equity issuance, and can explain the factors that affect the capital buffer. With this, banking companies that have high Return on Equity (ROE) indicate high profits, these profits become retained earnings which are used to increase the buffer for banks.

B. *Moral Hazard Theory*

A moral hazard is an activity carried out by managers that are not fully known by shareholders or lenders, which causes managers to take actions beyond the knowledge of investors who violate contracts and are actually not ethically or ethically feasible. According to Luiz *et al.* (2001) moral hazard occurs due to deposit insurance or deposit insurance, which can increase banks to provide credit inadvertently because government deposits or deposit guarantee institutions and credit guarantees cause banks to be very aggressive in extending high-risk credit. Banks that have small capital tend to be more willing to take risks by agreeing to loans with small collateral values or new customer loans.

Moral hazard is used to explain that banks can aggressively place a credit in high-risk projects or businesses using funds from public or public deposits. This high-risk credit has potential if successful. However, if it fails, a lot of it will be borne by the depositor or the owner of the funds. Therefore, in these decisions, banks rely more on public sources of funds than on their own capital. The larger the placement of high-risk credit, the smaller the funds provided by the bank because the bank relies on external funds. Thus, the higher the Loans to Total Assets (LOTA), the lower the capital buffer.

C. *Portfolio Theory*

Modern portfolio theory was first put forward by Harry Markowitz in 1952 with a concept known as investment diversification or making investments that are not centered on one asset. Portfolio theory relates risk to return in a competitive economy. This portfolio states that diversification can reduce risk in banking so as to optimize returns. The purpose of diversification is to minimize the level of risk that is not systematic or cannot be eliminated (Latulanit *et al*., 2018). Portfolio theory is defined as a series of investment opportunities that aim to choose an effective combination of investments owned, to obtain high returns with a certain risk or a certain return with the lowest risk.

The concept of portfolio risk states that with the addition of assets to the portfolio continuously, it will get the benefits of risk reduction to get bigger until it reaches a certain point where the benefits of the reduction are reduced. Large size companies tend to have better performance or provide greater returns than small companies. The bigger the bank, the more flexible it is in managing its portfolio. Thus, banks can

regulate risk-weighted assets (RWA). A decrease in RWA will increase the capital adequacy ratio (CAR), while an increase in CAR indicates an increase in the capital buffer. Thus, it can be said that the larger the bank, the higher the capital buffer.

D. Hypothesis Development

a) Effect of non-performing loans on capital buffer

Moral hazard theory assumes that banks can aggressively place credit in high-risk projects or businesses using public or public deposits, this high-risk credit has the potential for high returns if successful. However, if it fails, a lot of it will be borne by the depositor or the owner of the funds. The ratio of non-performing loans shows that bank management has the ability to manage non-performing loans or bad loans that are influenced by gap factors or external factors beyond the control of the debtor. With a higher increase in the value of non-performing loans, it indicates a higher risk of potential return, but the value of non-performing loans should not exceed the Bank Indonesia regulation, which is 5%, if it exceeds it means the bank is not healthy. Thus, the higher the non-performing loan, the bank provides a lower capital buffer.

Research results Abbas *et al*. (2021) it was found that non-performing loans (NPL) had a significant positive effect on the capital buffer. Meanwhile Liu (2016) and Anisa & Sutrisno's (2020) found that non-performing loans (NPL) had a negative effect on the capital buffer. Based on the description above and previous research, the research hypothesis can be formulated as follows:

H_1: Non-performing loans (NPL) has a negative effect on the capital buffer.

b) Effect of bank size on capital buffer

Portfolio theory assumes a series of investment opportunities that aim to choose an effective combination of their investments, to get a high return with a certain risk or a certain return with the lowest risk. Bank size is the size of the bank seen from the total assets owned by the bank. Large banks have a lower probability of experiencing negative shocks to their capital because large banks diversify their investments or invest not in one field to get high returns. Thus, banks can regulate Risk Weighted Assets, a decrease in the RWA will increase the capital adequacy ratio, and an increase in CAR indicates an increase in the capital buffer. Therefore, it can be said that the larger the bank, the higher the capital buffer.

The results of research by Liu (2016) and Fauziah *et al*. (2020) show that Bank Size has a significant positive effect on the capital buffer at a significance level of less than 10% and 1%. Meanwhile, Atici & Gursoy (2013) and Abbas *et al*. (2021) in their research found that bank size has a negative effect on a capital buffer. Based on the description above and previous research, the following hypotheses can be formulated:

H_2: Bank Size has a positive effect on the capital buffer.

c) Effect of return on equity (ROE) on capital buffer

Pecking Order Theory assumes that funding decisions follow a hierarchy in which sources of funding originating from within the company are prioritized over sources of funding originating from outside the company. ROE growth can increase the amount of available capital buffer because the resulting profit tends to be used as retained earnings. In addition, a higher ROE value indicates the amount of funds obtained is relatively large, so to use them you have to go through various long processes. Thus, if increasing capital through the capital market by issuing new shares is quite expensive, retained earnings are often used to increase the capital buffer.

The results of research by Atici and Guner (2013) and Belém & Gartner (2016). shows that return on equity has a significant positive effect on the capital buffer. While the results of research from Liu, J. (2016) found that return on equity had a negative negative effect, but Anggraini & Baskara (2020) did not find this influence. Based on the description above, the hypothesis is formulated as follows:

H_3: Return on Equity (ROE) has a positive effect on the capital buffer.

d) The effect of loans to total assets on the capital buffer

Pecking order theory assumes that the company will use internal sources of funds first in financing investment, if it is deemed insufficient, the company will use external funds in the form of debt or the issuance of new equity. Loans to Total Assets is the ratio used to compare how much credit is given by the bank to the total assets owned by the bank. The high number of loans granted will reduce the capacity of banks to provide capital buffers and choose to increase their total assets in anticipation of these risks.

In research results from Abbas *et al*. (2021), it was found that loans to total assets had a significant negative effect on the capital buffer. However, the results of research from Belém & Gartner (2016) found that loans to total assets had a positive effect on the capital buffer. Based on the description and previous research, the following hypothesis is formed:

H_4: Loans to Total Assets (LOTA) has a negative effect on the capital buffer.

III. METHODOLOGY

This research is to investigate the factors that affect the capital buffer in conventional commercial banks listed on the Indonesia Stock Exchange (IDX) for the 2015-2019 period. The variables used as well as operational definitions and variable measurements are shown in Table 1 below.

To find out the factors that affect the capital buffer, the data were analyzed using regression analysis with the following formulation.

$$CB = a + b_1NPL + b_2Size + b_3ROE, + b^4\ LOTA + e$$

where:
CB = Capital Buffer.
NPL = Non-Performance Loan.
ROE = Return on Equity.
LOTA = Loan to Total Asset.
e = Error.

TABLE I: OPERATIONAL DEFINITIONS AND MEASUREMENT OF VARIABLES

Variable	Definition	Calculation
Capital Buffer	The difference between the CAR owned by the bank and the Minimum CAR set by the regulator	CB = CAR – Minimum Reserver Reqiurement (8%)
Non-Performing Loans (NPL)	Ratio to measure the ability of bank management in overcoming non-performing loans provided by banks.	The amount of nonperforming loans in a bank's loan portfolio divided total amount of outstanding loans the bank holds
Bank Size (Size)	The scale carried out by the bank which is seen from the total assets or assets of the bank, the bank's assets increase shows that the investment made is getting bigger.	Bank Size = ln (total assets bank)
Return on Equity (ROE)	The ratio used to measure the ability of a bank, which will be used to pay dividends or be used as retained earnings in the future.	$ROE = \frac{Earning\ After\ Taxes}{Equity}\ x\ 100\%$
Loans to Total Asset (LOTA)	Is a ratio used to compare how much credit is given by the bank to the total assets owned by the bank	$LOTA = \frac{Credit\ Out\ Standing}{Total\ Assets}\ x\ 100\%$

IV. RESULTS AND DISCUSSION

A. Descriptive Statistics

Table II below is the distribution of variables used from the results of descriptive statistical tests which show the minimum, maximum, mean, and standard deviation values.

TABLE II: DESCRIPTIVE STATISTICS

	N	Minimum	Maximum	Mean	Std. Deviation
NPL	90	0,003	0,085	0,02733	0,015149
SIZE	90	16,127	24,022	19,38178	1,737202
ROE	90	0,001	0,225	0,09981	0,050421
LOTA	90	0,002	0,797	0,62783	0,097734
Capital Buffer	90	2,52	21,58	12,2266	3,60220
Valid N (listwise)	90				

Source: SPSS 25. output.

B. Classic Assumption Test

The classical assumption test which includes multicollinearity, heteroscedasticity, and autocorrelation tests is shown in Table III below.

TABLE III: CLASSIC ASSUMPTION TEST

Research variable	*Collinearity Statistics*		Sig
	Tolerance	VIF	Heteroscedasticity
NPL	0,784	1,275	0,399
SIZE	0,919	1,089	0,721
ROE	0,764	1,309	0,964
LOTA	0,897	1,115	0,457
Durbin Waston	1,818		

The results of the classical assumption test show that the classical assumption has been fulfilled because for the multicollinearity test results the VIF value is <10; for heteroscedasticity, all independent variables are not significant to the residual (>0.05) and for the autocorrelation test, the Durbin-Watson number of 1.818 is in the no-autocorrelation area.

C. Regression Test

Determination of the effect of non-performing loans, bank size, return on equity, and loans on total assets on the capital buffer is done using a multiple linear regression test, and the results of multiple linear regression are presented in Table IV below.

The results of the model feasibility test show that the model used in the study is declared to meet the requirements of the goodness of fit model with a calculated F value of 11.607 and a significance F = 0.000 and the results of the coefficient of determination test show an R-square value of 32.3%. Thus, the ability to explain the independent variable in the model to the capital buffer of 32.3% (0.323).

TABLE IV: REGRESSION TEST RESULTS

Dependent Variable	Unstandardized Coeficient	t-value	Sig-t	Conclusion
NPL	-60,975	-2,604	0,011	H_1 - Accepted
SIZE	0,926	4,909	0,000	H_2 - Accepted
ROE	-1,107	-0,155	0,877	H_3 - Rejected
LOTA	-13,167	-3,879	0,000	H_4 - Accepted
Model	F-value = 11,607 Sig-F = 0,000 *Adj R-Square* = 0,323			

Dependent Variable: Capital Buffer.
Source: processed secondary data.

The test results on hypothesis 1 (H_1) which states that NPL has a negative effect on the capital buffer, is accepted. The results of the t-test obtained a significance value of 0.011 > 0.05. In hypothesis 2 (H_2) which states that bank size has a positive effect on the capital buffer, it is also accepted. Based on the results of the t-test, the t significance value is 0.000 <0.05 and has a positive direction. The results of hypothesis 3 (H_3) which states that return on equity has a positive effect on the capital buffer are rejected because it has t-significance value of 0.877 > 0.05. The test results on hypothesis 4 (H_4) which states that LOTA has a negative effect are accepted, because it has a significant value of 0.000 <0.05 in a negative direction.

D. Discussion

a) The effect of non-performing loans (NPL) on the capital buffer

Based on the test results in Table IV shows that the Non-Permorming Loans (NPL) hypothesis has a negative effect and is accepted. This means that this research can empirically prove that non-performing loans have a negative effect on the capital buffer. This happens because bank management is able to overcome bad loans as indicated by the average non-performing loan under Bank Indonesia regulations, which is 5%. Bank management places funds in high-risk projects or businesses that have the potential for high returns. In these decisions, the provision of a capital buffer is low because bank management uses public funds rather than their own capital. This research is in line with the moral hazard theory which states that banks can aggressively place a credit in high-risk projects or businesses using public or public deposits, this high-risk credit has the potential for high returns

if successful. However, if it fails, a lot of it will be borne by the depositor or the owner of the funds.

The results of this study are in line with research conducted by Liu (2016) and Anisa & Sutrisno (2020) which found a negative effect of non-performing loans (NPL) on capital buffers and are different from research conducted by Abbas *et al*. (2021) which stated non-performing loans have a positive effect on the capital buffer.

b) The effect of bank size on capital buffer

Based on the test results in Table IV shows that hypothesis 2 (H_2) is accepted. This means that this study is able to empirically prove the positive influence of bank size on the capital buffer. This happens because a bank with a large number of assets shows that the b tank has reached the maturity stage, is relatively stable and is able to generate large profits compared to a bank with small total assets. Large banks are considered to have more experience in dealing with bank risk and are more flexible in managing their portfolios, so that banks can increase their CAR which is a sign of an increase in a capital buffer. The results of this study are in accordance with the Markowitz model portfolio theory with the term investment diversification or making investments that are not centered on one asset.

The results of this study are in line with research conducted by Fauziah *et al*. (2020) which found a positive effect of bank size on the capital buffer. However, it is not in accordance with the research findings of Atici & Gursoy (2013) and Abbas *et al*. (2021) who found a negative effect of bank size on the capital buffer.

c) Effect of return on equity (ROE) on capital buffer

Based on the test results in Table IV shows that hypothesis 3 (H_3) is rejected. This means that this study cannot empirically prove the effect of bank size on the capital buffer. This is due to an increase in ROE followed by a decrease in the capital buffer. The large value of ROE does not guarantee an increase in the amount of retained earnings and becomes a capital buffer because ROE is an excess of the remuneration required by shareholders, which will be used to pay dividends. The results of this study are not in line with the Pecking Order Theory which states that funding decisions follow a hierarchy in which funding sources from within the company are prioritized over funding sources originating from outside the company.

The results of this study are in line with the research of Eliskovski (2014) and Anggraini & Baskara (2020) which did not find the effect of return on equity (ROE) on a capital buffer. In contrast to research conducted by Atici & Guner (2013) from Belém & Gartner (2016) which found a positive effect, the results of research from Liu (2016) found a negative effect on return on equity on a capital buffer.

d) Effect of loans to total assets (LOTA) on capital buffer

Based on the test results in Table IV, it is found that hypothesis 4 (H4) is accepted. This means that this study is able to empirically prove the negative effect of LOTA on the capital buffer. This is because banks are willing to take greater risks with their assets, so they decide to hold a smaller capital buffer. This is because the credit disbursed by the bank is funded by the assets owned. The results of this study are in line with the pecking order theory which states that the company will use internal sources of funds first in financing investment, if it is deemed insufficient, the company will use external funds in the form of debt or the issuance of new equity (Myers, 1984).

The results of this study are in line with research conducted by Abbas *et al*. (2021) who found a negative effect of loan to total assets (LOTA) on the capital buffer. However, this is different from the research conducted by Belém & Gartner (2016) which found a positive influence of loans to total assets on the capital buffer.

V. Conclusion

Based on the results of the research on the effect of non-performing loans (NPL), bank size, return on equity (ROE), and loans to total assets, (LOTA) on the capital buffer, it can be concluded that empirical facts show that there is a negative effect of non-performing loans. against capital buffers. This indicates that if non-performing loans decrease, the capital buffer will increase, meaning that a larger capital buffer is needed to maintain liquidity and customer confidence in the bank. In line with these findings, another finding is that the larger the size of the bank, the larger the capital buffer, and this is shown to have a positive effect.

Another finding is that return on equity has no effect on the capital buffer, while the loan to total assets has a negative effect. This finding shows that bank management places more emphasis on the policy of adding assets rather than increasing their own capital when there is an increase in credit. This policy can reduce the risk of lack of capital to facilitate bank business activities. The increase in the number of assets will increase public confidence in the bank, this trust is important to maintain the bank's performance.

Although this research has contributed to the capital buffer policy, this research also has limitations that need to be improved in future research. The limitations of this study are indicated by the low adjusted R-square value of 32.3%, which means that there are still external factors that need to be considered in determining the capital buffer policy. Therefore, in future research, other variables are needed as independent variables, especially macroeconomic variables, namely Growth of Gross Domestic Product (GDPG) and inflation.

The implication of this research is that bank management in setting capital buffer policies needs to pay attention to non-performing loans and the growth of bank assets. These two factors determine the capital buffer, bank management also needs to reformulate the policy of providing capital buffer so that banks can use capital as efficiently as possible because the capital buffer in banking exceeds the capital requirement.

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18. Determinant of Capital

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