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# The Effect of Capital Adequacy, Credit Risk, and Liquidity on Commercial Banks Profitability in Indonesia Stock Exchange

Anastasia Anggraini<sup>1, \*</sup>, Dewa Gede Dharma Suputra<sup>1</sup>

<sup>1</sup>Faculty of Economics and Business, Udayana University (UNUD), Bali, Indonesia

The purpose of this study was to analyse the effect of capital adequacy, credit risk, and liquidity on company profitability. The research population is all banking companies listed on the Indonesia Stock Exchange (BEI). The sampling technique used purposive sampling method, namely the method of determining the sample with certain considerations. The sample criteria are the banking sector that is listed continuously on the Indonesian Stock Exchange as many as 38 banking companies listed on the IDX continuously during the 2015 - 2019 period. The results show that capital adequacy and liquidity have a positive effect on profitability and credit risk have a negative effect on profitability. This study illustrates that capital adequacy, liquidity, and credit risks can predict the level of profitability that can be used by investors and stakeholders in taking decisions.

**Keywords:** Capital adequacy, Credit risk, liquidity, and Profitability

## 1. INTRODUCTION

Financial institutions are companies engaged in the financial sector with activities only to raise funds and channel funds or both collect and channel funds [1]. The banking sector is an important part of the performance infrastructure for strong macroeconomic and monetary policies at the national level [2]. Profitability is the company's ability to make a profit during a certain period [3]. Return on Asset (ROA) is usually used as a proxy in measuring the profitability of a bank. Return on Asset is used because it is an important profitability ratio for the bank and is used to measure the effectiveness of the bank in generating profits by utilizing total assets owned [4].

Until now, the development of the national banking industry has experienced increasingly positive developments. Based on Indonesian Banking Statistics data until March 2019, the growth of national banking has increased quite significantly. In addition, the financial sector is currently still dominated by banks that control 77.15% of the asset market share with a total of 115 commercial banks and 1,593 rural banks. Bank capital has a function as the main source of financing for operational activities. Generally, each bank is required to maintain sufficient capital funds to deal with the possibility of -

\*Email Address: [akwila\\_lights@yahoo.co.id](mailto:akwila_lights@yahoo.co.id)

unwanted things occurring in the future 950 [5]. Capital Adequacy Ratio (CAR) is a proxy for measuring the fulfilment of a bank's capital obligations. One of the main activities of the bank in order to increase profitability is the provision of credit. Lending activities are prone to risks which can be one of the main causes for banks to face problems and lead to bankruptcy. Problems common happening is their inability to direct to pay its obligations, either number of short and long term to the lender. Bad credit or problematic credit can also occur because the bank is too expansive, so that the bank continues to pursue the target of lending without paying attention to the level of prudence .

Before the giving of credit, the bank must collect sufficient information about potential customers to be able to minimize credit risk. This information is usually collected during credit documentation [6]. Non Performing Loans (NPL) can be used to measure a bank's ability to minimize non-performing loans it faces [7]. Apart from capital adequacy and credit risk, liquidity management is a complex issue in bank operations. This is because most of the funds managed by banks come from the public, which are short-term and can be withdrawn at any time [7]. Loan to Deposit Ratio (LDR) is a liquidity ratio commonly used in banking [8] .

A number of studies on research variables regarding the effect of credit risk on profitability show that credit risk has a negative effect on profitability [9]. Research conducted by [10] found that credit risk has a significant negative effect on profitability. In contrast to research [11], it is found that credit risk has a positive and insignificant effect on profitability. Likewise, research [12] shows that credit risk has a positive effect on profitability.

Research [13, 14] states that capital adequacy has no effect on profitability. But, contrary to research conducted by [15] showed that the capital adequacy positive effect on profitability. Research conducted [16, 17, 18] found that liquidity has a positive and significant effect on profitability. This study is supported by research [19] that ldr has a positive and significant effect on profitability. This study aims to analyze the effect of capital adequacy, credit risk, and liquidity on profitability.

## 2. METHODOLOGY

Capital adequacy is one of the important factors which shows the ability of bank management to supervise and control risks that occur which can affect the amount of bank capital. Capital adequacy is reflected in the Capital Adequacy Ratio (CAR). CAR reflects own capital to generate profits. The greater the CAR, the greater the opportunity to generate profits because with large capital, management is more flexible in placing its funds into profitable investment activities. If the CAR value is high, it means that the bank is able to finance the bank's operations, and this favorable situation can contribute significantly to the bank's profitability [20]. This concept is supported by the results of research [21, 22] that CAR has a positive effect on profitability. The results of this study are supported by research [23, 24] that CAR has a positive relationship with profitability. Meanwhile, research conducted [25] found that capital adequacy did not affect profitability because banking companies generally did not want to set a CAR that was too high because high capital could reduce the income earned. In addition, a high CAR can reduce a bank's ability to expand its business because the larger capital reserves are used to cover the risk of loss.

Credit risk is reflected in the Non-Performing loan (NPL). NPL is a measure of the business risk ratio that shows the amount of non-performing credit risk that exists in a banking company. According to [26] NPL reflects credit risk, where the smaller the NPL, the smaller the credit risk borne by the bank. If the NPL is higher, the higher the loan arrears will have the potential to reduce interest income. The research carried out [27, 28] found that the NPL significant negative effect on profitability. This research is supported by [25] that the higher non-performing loans cause a decrease in the level of bank income. Liquidity can be measured using the Loan to Deposit Ratio (LDR). LDR is the ability of a bank to meet depositors' withdrawal on funds that have been used by the bank to provide credit to other parties.

The high LDR of a bank indicates that the bank is considered capable and effective in managing the funds entrusted by customers. Based on this, the bank gets a higher income on interest. With income that continues to increase, banks can generate large profits, thereby increasing the ratio of Return on Assets (ROA). A number of studies [16, 17, 18] found that liquidity has a positive and significant effect on profitability. The same thing was done by [19] finding that LDR has a positive and significant effect on profitability.

*H<sub>1</sub>: Capital adequacy has a positive effect on profitability.*

*H<sub>2</sub>: Credit risk has a negative effect on profitability.*

*H<sub>3</sub>: Liquidity has a positive effect on profitability.*

In this research was conducted on the IDX (Indonesia Stock Exchange) with a population the population in this study were all banking companies listed on the Indonesia Stock Exchange (BEI), amounting to 45 banks. The sampling technique was carried out using purposive sampling method, namely the method of determining the sample with certain considerations. The results of the calculation obtained a sample size of 38 banking companies that were registered continuously during the 2015 - 2019 period on the Indonesia Stock Exchange (IDX). The type of data based on the source used in this study is secondary data collected by conducting non-participant observation. This research was designed with an associative quantitative approach. The object of this research is the profitability of banking companies listed on the Indonesia Stock Exchange (BEI) in 2015-2019.

Before the data was collected as a whole, a purposive sampling method was carried out where the sampling was based on the consideration of the research subject, the sample was selected based on the suitability of the characteristics with the specified sample criteria in order to obtain a representative sample. Furthermore, the collected data were analyzed using descriptive statistical analysis of linear, classic assumption test, the coefficient of determination ( $r^2$ ), f test (test the feasibility of the model), and the statistical test t. Table I shows the sample selection criteria on process and result of survey on Indonesia Stock Exchange (IDX).

Table. I Process and Results of Sample Selection Based on Criteria

No.	Criteria	Number of Companies
1	Banking companies listed on the Indonesia Stock Exchange (IDX)	45
2	Commercial bank companies that were not listed continuously on the Indonesia Stock Exchange during 2015-2019	7
<b>Total Sample Companies</b>		<b>38</b>

3. RESULTS AND DISCUSSION

In this study, the model produced by multiple linear regression analysis was tested using the classical assumption test technique, the coefficient of determination ( $r^2$ ), f-test (model feasibility test), t statistical test. In this study, the classical assumption test was used to determine the accuracy of the model used including normality test, autocorrelation test, heteroscedasticity test, and multicollinearity test (see Table II).

Table II. Kolmogorov-Smirnov Normality Test Results

		Unstandardized Residual
N		190
Normal Parameters <sup>a, b</sup>	Mean	,0000000
	Std. Deviation	,89739202
Most Extreme Differences	Absolute	,042
	Positive	,042
	Negative	-,042
Statistical Test		,042
Asymp. Sig. (2-tailed)		,200 <sup>c, d</sup>

Asymp Value. Sig (2-tailed) in table 4.3 shows that it is greater than the level of significance of 0.05 used, it can be concluded that the residuals of data are said to be normally distributed. Furthermore, autocorrelation test aims to test whether in the linear regression model there is a correlation between confounding error in period t and confounding error in period t-1. A good regression model is regression that is free of autocorrelation [29]. If there is a correlation, it is estimated that there is an autocorrelation problem. This test was carried out with the Durbin-Watson Test (see Table III).

Table III. Durbin-Watson Autocorrelation Test Results Model Summary <sup>b</sup>

Model	R	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,774 <sup>a</sup>	,599	,90460	1,797

a. Predictors: (Constant), X3, X1, X2

b. Dependent Variable: Y

The Durbin-Watson test listed in table 4 has a value of 1.797 (d = 1.797). The "d" value will be juxtaposed with the "du" and "dl" values where the "du" and "dl" values with a sample size of 190 and the number of independent variables 3 are obtained the dl table and du table values are dl = 1.7306 and du = 1,7947. When juxtaposed, there is no correlation where  $du < d < 4-du$  ( $1.7947 < 1.797 < 2.2053$ ). Heteroscedasticity test is proposed if the regression model is different in variance from the residuals of one observation to another. If the residual variance from one observation to another is constant, it is called homoscedasticity and if it is different, it is called heteroscedasticity [2, 9]. A good regression model is homoscedasticity or heteroscedasticity does not occur.

The results of the heteroscedasticity test of this study can be seen in Table IV.

Table IV. Glejser Heteroscedasticity Test Results Coefficients <sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
(Constant)	,783	,281		2,787	,006	
1	X1	-,033	,042	-,070	-,787	,432
	X2	,025	,043	,054	,571	,569
	X3	-,008	,043	-,016	-,191	,849

<sup>a</sup> Dependent Variable: abs\_res

The Heteroscedasticity test in the table shows that the significance value of the Capital Adequacy variable is 0.432, the Credit Risk variable is 0.569 and Liquidity is 0.849. Thus, the significant value > 0.05 means that heteroscedasticity does not occur. Multicollinearity test is proposed to test the correlation between independent variables in regression. A good regression model should not have a correlation between the independent variables. To detect multicollinearity, the Tolerance and Variance Influence values can be seen from the results of multiple regression calculations. If the Tolerance value > 0.10 and if the VIF value < 10 it means that there is no multicollinearity (see Table V).

Table V. Multicollinearity Test Results Coefficients <sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics		
	B	Std. Error	Beta			Tolerance	VIF	
(Constant)	11,574	,485		23,84	,000			
1	X1	,446	,073	,347	6,087	,000	,664	1,507
	X2	-,404	,075	-,326	-5,414	,007	,595	1,682
	X3	,392	,074	,284	5,297	,015	,750	1,334

<sup>a</sup> Dependent Variable: Y

The multicollinearity test on the table shows the significance value of the Capital Adequacy variable, the value of VIF = 1.507 and tolerance = 0.664, the Credit Risk variable, namely the VIF value = 1.682 and tolerance = 0.595 and Liquidity with a VIF value = 1.334 and tolerance = 0.750. Thus, the Tolerance value of each variable is 0.10 and if the VIF value of each variable is < 10, it means that there is no multicollinearity. Multiple regression is a linear relationship between two or more independent variables and the dependent variable with the aim of estimating and / or predicting the population average or the average value of the dependent variable based on the known value of the independent variable. The multiple linear regression is expressed on equation one, as follows:

$$Y = 11,574 + 0,446 X_1 - 0,404 X_2 + 0,392 X_3 \quad (1)$$

The coefficient of determination is the amount of the independent variable's contribution to the dependent variable. Here, the assessment results show an efficient determination was calculated in the Table VI.



Table VI. The Summary Result of Determination Coefficient Test Model <sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,774 <sup>a</sup>	,599	,593	,90460	1,797

a. Predictors: (Constant), X3, X1, X2

b. Dependent Variable: Y

Based on table 6 output above, note the value of the coefficient of determination or R square is equal to 0.599. This value can be interpreted that 59.9% capital adequacy, credit risk, and liquidity simultaneously (together) affect profitability while 40.1% are influenced by other variables. The F statistical test is used to see the feasibility of the research model. The F test basically aims to see whether all the independent or independent variables referred to in the model have a simultaneous influence on the dependent or dependent variable. The results of the F test can be seen from the results of the processed SPSS regression by comparing the level of significance of F count with F table. In determining the F table value, the significance level used is 5% or 0.05. The test criteria used are if F count > F table, then Ho is rejected and Ha is accepted, and if F counts < F table, then Ho is accepted and Ha is rejected (see Table VII).

Table VII. Simultaneous Test Results (F-Test) ANOVA <sup>a</sup>

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	227,796	3	75,932	92,792	,000 <sup>b</sup>
	Residual	152,204	186	,818		
	Total	380,000	189			

a. Dependent Variable: Y

b. Predictors: (Constant), X3, X1, X2

Based on the calculation result on Table VII, it is known that the F- value in the table is 92.792. The value of f table with a sample of 190 is 3.04. F table value = 3.04 < F value count = 92.792 so as the basis for decision making in the F test it can be concluded that capital adequacy, credit risk, and liquidity simultaneously (together) affect profitability. Hypothesis testing (t test), hypothesis testing is done to test each hypothesis or the effect partially (per independent variable) on the dependent variable [9]. This test can be done by observing the regression results processed using the SPSS program, namely by comparing the significance level of each independent variable  $\alpha = 0.05$ . If the significant level  $t < 0.05$ , the hypothesis proposed in this study is accepted [29]. Table VIII shows the results of the hypothesis test (t test) of this study.

Table VIII. Hypothesis Test Results (t test) Coefficients <sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
(Constant)	11,574	,485		23,840	,000	
1	X1	,446	,073	,347	6,087	,000
	X2	-,404	,075	-,326	-5,414	,007
	X3	,392	,074	,284	5,297	,015

Based on calculation output in Table VIII, it is known that the t test value in table 8 is equal to 0.000. The sig value is 0,000 < 0.05, so as the basis for decision making in the t test it can be concluded that capital adequacy, credit risk, and liquidity partially affect profitability.

Furthermore, CAR reflects own capital to generate profits. The greater the CAR, the greater the opportunity to generate profits because with large capital, management itself is very flexible in placing funds into profitable investment activities. If the CAR value is high, it means that the bank is able to finance the bank's operations, and this favorable situation can contribute significantly to the profitability of the bank concerned [20]. The test results state that capital adequacy has an effect on profitability, so it can be concluded that the first hypothesis is accepted. This theory is supported by research results from [21, 22] which found that CAR has a positive effect on profitability. The results of this study are supported by [23, 24] finding that the CAR variable has a positive relationship with profitability. Meanwhile, in a study conducted by [25] it was found that capital adequacy has no effect on profitability because generally banking companies do not want to set a CAR that is too high for their company because high capital will reduce the income earned. In addition, a high CAR can reduce a bank's ability to expand its business due to the large amount of capital reserves that are used to cover the risk of loss.

Credit risk is reflected in the Non-Performing loan (NPL). NPL is a measure of the business risk ratio that shows the amount of non-performing credit risk that exists in a banking company. According to [26] NPL reflects credit risk, where the smaller the NPL, the smaller the credit risk borne by the bank. If the higher the NPL, the higher the loan arrears, which has the potential to reduce interest income. The test results state that credit risk affects profitability, so it can be concluded that the second hypothesis is accepted. Based on this theory, the results of this study are supported by research conducted [27, 28] which found that NPL has a negative and significant effect on profitability. Another study by [25] indicated that higher non-performing loans lead to lower levels of bank income.

The high LDR in a bank indicates that the bank is considered capable and effective in managing the funds entrusted by the customer. Based on the foregoing, the bank gets interest income. The test results state that liquidity has an effect on profitability, so it can be concluded that the third hypothesis is accepted. With income that continues to increase, the bank will generate large profits so that it can increase the ratio of Return on Assets (ROA). This study is supported by research conducted [16, 17, 18] which found that liquidity has a positive and significant effect on profitability. This study is supported by research [19] which found that LDR has a positive and significant effect on profitability.

#### 4. CONCLUSION

The results of the analysis of the effect of capital adequacy, credit risk and liquidity on profitability in banking sector companies provide several conclusions. Adequacy capital positive influence and significant to the company's profitability in the banking sector, risk credit negatively affects the company's profitability in the banking sector, while liquidities positive effect on the company's profitability in the banking sector. The results of this study can be used as consideration for investors and related parties regarding the level of profitability as a tool in decision making. Adequacy capital, credit risk, and liquidity can be used as a tool in predicting how level profitability in the future. However, capital adequacy, liquidity, and credit risks necessary to consider other variables in predicting profitability for the value of determination (goodness of fit model) indicate there are other factors that can affect profitability.

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