THE EFFECT OF CREDIT RISK, LIQUIDITY RISK AND CAPITAL ADEQUACY ON BANK STABILITY

Andika Ardianto Saputra[1], Najmudin[2], Intan Shaferi[3]

[1]Students of the Faculty of Economics and Business, Jenderal Soedirman University, ardiantoandika@gmail.com

[2]Lecturer at the Faculty of Economics and Business, Jenderal Soedirman University, Najmudin_najmudin@yahoo.com

[3]Lecturer at the Faculty of Economics and Business, Jenderal Soedirman University, intanshaferi@gmail.com

ABSTRACT

Banking financial institutions have a role as an accelerator of economic growth. Therefore, banks must have a stable condition so that the 2008 crisis does not happen again. One of the indicators that determines banking stability is capital and risk. The bank has a dynamic structure so that in its activities it is inseparable from potential risks such as credit risk and liquidity risk. If this risk is not managed properly, it could potentially lead to bank instability. Capital adequacy also plays a role in absorbing the losses received so that the bank can be stable. This study has a purpose to investigate the effects of credit risk, liquidity risk and capital adequacy on stability bank. The sample used in the study was 10 banks registered on OJK for the period 2019-2020. The sampling technique used purposive sampling. Data were collected and analyzed using descriptive statistics and multiple linear regression using the SPSS 25. The results of this study prove that simultaneously credit risk, liquidity risk and capital adequacy have an influence on bank stability. While partially the variables that have a significant effect are capital adequacy which has a positive effect, credit risk and liquidity have a negative effect on bank stability in Indonesia.

Keywords: Credit Risk, Liquidity Risk, Capital Adequacy, Bank Stability

1. Introduction

Bank is a financial institution that is closely related to economic growth. The role of banks as intermediaries can be considered as an accelerator of economic growth. Therefore, stability in the banking sector fulfills the prerequisites for the stability and growth of an economy (Halling & Hayden, 2006). Banks with good capital adequacy play a role in absorbing bad credit and make banks stable (Afriyie & Akotey, 2012).

The dynamic and complex structure of a bank makes it vulnerable to financial risks. Basel II (2004) classifies risks into 3 types, namely credit risk, market risk and operational risk. Meanwhile, according to PBI No. 5/8 / PBI / 2003 risk consists of credit risk, market risk, liquidity risk, operational risk, legal risk, reputation risk, strategic risk and compliance risk.

These risks can have a negative impact on banking, however only credit and liquidity risks are taken in this study.

Credit and liquidity risks were chosen because previous research (Imbierowicz & Rauch, 2014) stated that if the two risks carry out risk management together it can substantially improve banking stability. Meanwhile, capital adequacy was chosen because in previous research (Aruwa & Naburagi, 2014) stated that capital adequacy has a protective function for banks by absorbing losses so that it can have a good impact on stability and the consequences of instability in the bank can be avoided.

Credit risk is the possibility of losing part or total of the loan because it cannot pay back the loan on time (Basel, 2000). The ratio used to measure credit risk is NPL (non-performing loan). Based on previous research Ali, et al (2019) and Tan, et al. (2017) argue that credit risk has a negative effect on bank stability. However Ali, et al. (2019) also stated that credit risk is not significant with stability, this happens when banks have reserve funds to cover the NPL.

Liquidity risk is the risk that occurs if a company is unable to meet its cash flow efficiently so that it affects the company's financial condition (Basel, 2008). The ratio used to measure liquidity risk is LDR (Africa, 2016). According to previous research, liquidity risk has a positive effect on bank stability (Ali, et al. 2019) and (Tan, et al. 2017). However (Ghenimi et al., 2017) and (Ali & Puah, 2019), show that an increase in credit risk and liquidity will lead to bank instability, this happens when a bank is unable to reduce its NPL ratio, thereby reducing stability.

Capital Adequacy is considered as capital that can effectively prevent banking industry failures by absorbing losses (Aruwa & Naburagi 2014). The ratio used to measure capital adequacy is the CAR (Capital Adequacy Ratio). Based on previous research Ghenimi, et al. (2017), Imbierowicz & Rauch, (2014) & Pratama, et al. (2020) argue that capital adequacy has a positive effect on bank stability. However Pratama, et al. (2020) also argue that capital adequacy has a negative effect, this happens if in the short term CAR increases, so it will have an impact on decreasing stability.

So based on these previous studies, it can be concluded that the occurrence of credit risk, liquidity risk and capital adequacy can play an important role in bank stability. This is because an increase in credit risk and liquidity can reduce stability, while a good capital adequacy can absorb losses in the bank. So it is expected that the findings of this study can provide an overview of bank managers to improve or maintain risk and capital management so that banks with good stability can be achieved.

2. Literature Review and Hypothesis

2.1 Literature Review

2.1.1 Credit risk

Credit risk is the possibility of losing part or total of the loan because the customer cannot pay back the loan on time (Basel, 2000). Credit risk occurs when a customer obtains a credit facility, but fails to complete a payment. The theory used is the portfolio. The theory states that bank provide their customers a guidelines for loans such as credit limits given to third parties (Khitinji, 2010). The ratio used to measure credit risk is NPL (Africa, 2016).

Bank Indonesia states that NPL (Non Performing Loans) are loans of less normal quality, doubtful and loss. NPL is used to measure non-performing loans from the total credit (Ekinci & Poyraz, 2019). According to Bank Indonesia (2015) NPL that less than 5% consider to be good. According to SE 3/30 / DPNP dated December 14, 2001, NPL formula is as follows;

NPL: $$\frac{Non\ peforming\ loans}{Total\ credit} \quad (1)$$

2.1.2 Liquidity Risk

Liquidity risk is a risk when a company cannot efficiently fulfill its current and future cash flows, thereby affecting the company's financial condition (Basel, 2008). The theory used is the liquidity asset theory. According to Ngwu in (Ejoh, et al. 2014) Liquidity Asset theory argues that banks must hold a large number of liquid assets in order to overcome major unforeseen circumstances. The ratio used to measure liquidity risk is LDR (Africa, 2016). According to Bank Indonesia (2015) a good LDR is 78% -92%. The following is the formula for calculating LDR according to SE 3/30 / DPNP dated December 14, 2001:

LDR: $$\frac{Credit}{Third\ party\ funds} \quad (2)$$

2.1.3 Capital Adequacy

Capital Adequacy is considered as capital that can effectively prevent banking industry failures by absorbing losses (Aruwa & Naburagi 2014). The theory used is the Capital Adequacy Support. According to this theory, banks prefer to hold excess capital to reduce the possibility of capital falling (Aruwa & Naburgi, 2014). The ratio used to measure capital adequacy is CAR (Capital Adequacy Ratio). Basel (2006) argues that CAR can be calculated using the regulatory definition of risk-weighted capital and assets. The CAR cannot be lower than 8%. According to SE 3/30 / DPNP dated December 14, 2001, CAR can be calculated using the following formula:

CAR: $$\frac{Capital}{risk\ weighted\ asset} \quad (3)$$

2.1.4 Bank Stability

Banking stability is how effective and efficient a bank as an intermediary in surviving internal and external sector disturbances (Ali, et al. 2019). The theory used is portfolio regulation. This theory suggests that banks must be well regulated to maintain the security, stability and health of the banking system so that they can easily fulfill their obligations at maturity (Igbinosa & Naimo, 2020). The stability measurement used in this study was the Z-score stability. Z-score is used to determine how close a company or bank is to bankruptcy (Imbierowicz & Rauch, 2014) and (Beck, et al. 2013). The formula for the Stability Z-score is as follows:

ZSTAB: $$\frac{ROA+CAR}{Standar\ Deviation\ bank\ on\ ROA} \quad (4)$$

2.2 Hyphotesis

2.2.1 The effect of credit risk on the stability of the Bank

Credit risk occurs when cutomers fail to complete payments on time (Africa, 2016). Portfolio theory in banking is applied following guidelines regarding loans that banks must provide to their customers, such as limits on credit that must be given to third parties (Khitinji, 2010). Several previous studies stated that credit risk has a negative effect on stability (Ali, et al.

2019), (Ghenimi, et al. 2017) & (Tan, et al. 2017). This happens when banks are unable to reduce the volume of non-performing loans, which increases banking costs, thereby reducing bank stability. But Ali, et al. (2019) also argued that credit risk is not significant with stability, this happens when banks have reserve funds to cover the NPL that occurs.

H1. Credit risk has a negative effect on bank stability

2.2.2 The effect of liquidity risk on the stability of the bank

Liquidity risk occurs if a bank cannot provide liquid funds to meet the obligations and credit requests submitted (Africa, 2016). According to Ngwu in (Ejoh, et al. 2014) Liquidity Asset theory argues that banks must hold a large number of liquid assets in order to overcome major unforeseen circumstances.

Liquidity risk has a positive effect on stability (Ali, et al. 2019) & (Tan, et al. 2017). However, there are several studies that state differently Ghenimi et al., (2017) and Ali & Puah, (2019), suggesting that an increase in credit risk and liquidity risk has a negative impact and causes bank instability, this occurs when a bank is unable to reduce its NPL ratio, thus decreasing stability.

H2. Liquidity risk has a negative effect on bank stability

2.2.3 The effect of capital adequacy on the stability of the bank

Capital Adequacy is considered as capital that can effectively prevent banking industry failures by absorbing losses (Aruwa & Naburagi 2014). The theory used is the Capital Adequacy Buffer Theory. According to this theory, banks prefer to hold excess capital to reduce the possibility of capital falling (Aruwa & Naburgi, 2014).

Based on previous research Ghenimi, et al. (2017), Imbierowicz & Rauch, (2014) & Pratama, et al. (2020) argue that capital adequacy has a positive effect on bank stability. However Pratama, et al. (2020) also argue that capital adequacy has a negative effect, this happens if in the short term CAR increases, so it will have an impact on decreasing stability.

H3. Capital adequacy has a positive effect on Bank Stability.

3. Methodology

3.1 Research Design

This research uses quantitative research methods where the data is obtained in the form of numbers and the analysis uses statistics. The type of data used in this study is secondary data. Secondary data used are in the form of quarterly and annual financial reports with total 60 data from banks that are listed on the OJK or BEI. The sample was selected using purposive sampling technique with the criteria of 10 banks that have gone public with the most assets in Q1 2019 and are listed in OJK and the Indonesia Stock Exchange (IDX) for the 2019-2020 period.

3.2 Data Analysis

The data that has been collected in this study are then analyzed using the following analysis tools:

3.2.1 Descriptive Statistics

Descriptive statistics provide description of data that can be seen from the mean, standard deviation, variant, maximum, minimum, sum, range, kurtosis and skewness. This analysis is

used to describe the profile of the sample data before use statistical analysis techniques to test hypotheses (Ghozali, 2018).

3.2.2 Multiple Linear Regression analysis

Linear Regression analysis is a statistical technique to investigate the effect of one or more independent variables on one dependent variable (Nihayah, 2019). If there is more than one independent variable affecting one variable dependent it can be called multiple linier regression (Priyono, 2016).

$\gamma = \alpha + \beta 1\ NPL + \ \beta 2\ LDR + \ \beta 3\ CAR + \ \varepsilon$ **(5)**

Where:

Y = Z-score Stability

α = constant

β1, β2, β3 = regression coefficient

ε = residual/error

4. Result

4.1 Descriptive Statistic Analysis

Descriptive analysis used in this study, there are 3 independent variables and 1 dependent variable. In descriptive statistical analysis, table 1 show the average value (mean), standard deviation, maximum and minimum value of each variable. The following is a descriptive statistics table:

Tabel 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
NPL	60	.73	5.23	2.5645	1.03294
LDR	60	73.28	171.32	100.2143	20.84295
CAR	60	16.07	26.70	20.7658	2.48055
ZSTAB	60	3.71	8.94	6.4893	1.21035
Valid N (listwise)	60				

4.2 Normality Test

Nihayah (2019) argues that to determine whether data is normally distributed or not, skewness and kurtosis ratio can be used as an indication. The skewness ratio is the skewness value divided by the standard error skewness; while the ratio of kurtosis is the value of kurtosis divided by the standard error of kurtosis. If the ratio of kurtosis and skewness is between –2 to +2 the data distribution is normal.

Table 2. Normality Test

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error

Unstandardized Residual	60	.088	.309	-.197	.608
Valid N (listwise)	60				

It can be seen that the skewness ratio = 0.088 / 0.309 = 0.284; and kurtosis ratio = -0.197 / 0.608 = - 0.324. Since the skewness ratio and the kurtosis ratio are between –2 to +2, it can be concluded that the data distribution is normal.

4.3 Multicollinearity Test

Ghozali (2018) states, there is no multicollinearity symptom if the Tolerance value ≥ 0.100 and the VIF value ≤ 10.00. Tolerance and VIF values of each variable independent are shown in Table 2. Tolerance values of the NPL; 0.862, LDR; 0.920, CAR; 0.913, the tolerance value for each variable ≥ 0.100. VIF value of the NPL; 1,161, LDR; 1,087, CAR; 1.095, the VIF value of each variable ≤10.00. So it can be concluded that there are no symptoms of multicollinearity.

Table 3. Multicollinearity Test

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	4.387	.854		5.140	.000		
	NPL (X1)	-.464	.080	-.396	-5.778	.000	.862	1.161
	LDR (X2)	-.031	.004	-.534	-8.056	.000	.920	1.087
	CAR (X3)	.308	.032	.632	9.490	.000	.913	1.095
a. Dependent Variable: ZSTAB (Y)								

4.3 Autocorrelation Test

Ghozali (2018) states, there are no symptoms of autocorrelation if the Durbin Watson value between du to (40-du). This test is only used for first order autocorrelation and requires an intercept in the regression model and no lag variable between the explanatory variables.

Table 4. Autocorrelation Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.879[a]	.773	.761	.59145	1.819
a. Predictors: (Constant), CAR (X3), LDR (X2), NPL (X1) b. Dependent Variable: ZSTAB (Y)					

The value of Du in the Durbin Watson table value distribution based on k (3) and N (60) with a significance of 5%. Du (1,688) <Durbin Watson (1,819) <4-du (2,312). The Durbin Watson value between du to 4-du, so it can be concluded that there are no autocorrelation symptoms.

4.4 Heteroscedasticity Test

The Heteroscedasticity test is a method to determine whether a model is free from heteroscedasticity problems or not. The statistical method that can be used is the Glejser test. In the Glejser test, if the significance value between the independent variable and the residual asbolut is greater than 0.05, heteroscedasticity does not occur (Nihayah, 2019).

Table 5. Heteroscedasticity Test

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.766	.505		1.518	.135
	NPL (X1)	-.023	.048	-.071	-.492	.625
	LDR (X2)	.000	.002	-.022	-.157	.876
	CAR (X3)	-.010	.019	-.074	-.528	.599
a. Dependent Variable: Abs_Res						

From the table above, the significance value of the independent variable is more than 0.05. So it can be taken a decision that there is no heteroscedasticity problem

4.5 Partial T Test

Nihayah (2019) states, if the value of the T-count> T-table, the independent variable (X) partially affects the dependent variable (Y). The value of T-count for each variable in Table 3; NPL (X1); -5,778, LDR (X2); -8.056, CAR (X3); 9,490. The formula to find the T-table = (a / 2; n-k-1) = (0.05 / 2; 60-3-1) = (0.025; 56) = 2.003

4.7 Simultaneous F Test

Table 6. F Test

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	66.842	3	22.281	63.694	.000[b]
	Residual	19.589	56	.350		
	Total	86.432	59			
a. Dependent Variable: ZSTAB (Y) b. Predictors: (Constant), CAR (X3), LDR (X2), NPL (X1)						

Nihayah (2019) states, if the F-count> F-Table, it means that the independent variable (X) simultaneously affects the dependent variable (Y). The formula for finding F-Table is = (k; n-k) = (3; 60-3) = (3; 57) = 2.77. Because the value of F-count> F-Table, it can be conclude that variables NPL (X1), LDR (X2) and CAR (X3) simultaneously affects ZSTAB (Y)

5. Discussion

5.1 The effect of credit risk on stability

Based on the results of the partial test using SPSS 25, it is known that the T-count value for the effect of credit risk on stability is -5,778 with a significance of 0.00 which is less than <0.05.

This shows that the effect of credit risk on stability has a significant negative effect on changes in stability. So this research succeeds in proving the first hypothesis which states that credit risk has a significant negative effect on bank stability. The results of this study support previous research (Ali, et al. 2019), (Ghenimi, et al. 2017) & (Tan, et al. 2017) who argue that credit risk has a negative effect on stability. Credit risk is measured using Non-Performing Loans (NPL) originating from bad, doubtful and less normal loans. According to Bank Indonesia, if a bank's NPL is more than or equal to 5%, this will result in a reduction in demand deposits by 0.5%.

5.2 The effect of liquidity risk on stability

Based on the results of the partial test using SPSS 25, it is known that the T-count value for the effect of liquidity risk on stability is -8.056 with a significance of 0.00, which is less than <0.05. This shows that the effect of liquidity risk on stability has a significant negative effect on changes in stability. So that this research succeeds in proving the second hypothesis which states that liquidity risk has a significant negative effect on bank stability. The results of this study support previous research (Ghenimi et al., 2017) and (Ali & Puah, 2019) who argue an increase on liquidity risk will lead to bank instability. Liquidity risk is measured using the Loan to Deposit Ratio (LDR). Bank Indonesia stated that a safe bank LDR is at 78% to 92%. If the LDR is more than 92%, this proves that the bank channeled funds greater than the bank's savings.

5.3 The effect of capital adequacy on stability

Based on the results of the partial test using SPSS 25, it is known that the T-count value for the effect of liquidity risk on stability is 9,490 with a significance of 0.00, which is less than <0.05. This shows the effect of capital adequacy on stability has a significant positive effect on changes in stability. So this research succeeds in proving the third hypothesis which states that liquidity risk has a significant positive effect on bank stability. Capital adequacy is measured using the Capital Adequacy Ratio (CAR). Bank Indonesia stated that a safe CAR is a CAR that is not less than 8%. The results of this study support previous research (Ghenimi, et al. 2017), (Imbierowicz & Rauch, 2014) & (Pratama, et al. 2020) who argue that capital adequacy has a positive effect on stability.

6. Conclusion

Based on the results and discussion mentioned in the previous chapter, the following conclusions can be drawn: 1) Credit risk partially has a negative and significant effect on bank stability, with a sig value of 0.00 <0.05 and beta -5.778. 2) Liquidity risk partially negatively affects bank stability, with a sig value of 0.00 <0.05 and beta -8.056. 3) Capital adequacy partially has a positive and significant effect on bank stability, with a sig value of 0.00 <0.05 and beta -9.490. There are suggestions that can be given by researchers, namely for bank management to be able to maintain or improve credit risk management, liquidity risk and capital adequacy to be better in order to maintain bank stability.

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