Artikel Nur Andriyani 2

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Determinants of Credit Risk and Financing Risk Level: Evidence of Conventional Banks and Islamic Bank in Indonesia

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Abstract

Banking stability plays an important role as an intermediary in the economy. Both the economy and the banking sector affect each other. This study aims to identify the effect of macroeconomic variables and internal bank variables on Non-Performing Loans (NPL) at Conventional Commercial Banks and Non-Performing Financing (NPF) at Islamic Commercial Banks. This current study utilizes macroeconomic variables, which are economic growth and inflation. While the bank's internal variables are included the Loan to Deposit Ratio (LDR), Financing to Deposit Ratio (FDR), and Capital Buffer. This study employs Vector Autoregressive Regression (VAR) to examine the time series data. The results showed that the variable Economic Growth (EG) at lag-1, LDR at lag-1, and Capital Buffer at lag-2 significantly affect NPL. While the variable that has a significant effect on NPF is only Economic Growth at lag-1. In addition, seen from the Impulse Response Function (IRF) curve, the NPF tends to be more stable toward shocks from the variables used than the NPL. The findings imply that it is recommended that Conventional Banks be more selective in their loans related to the response of NPLs to macroeconomic variables, including shocks. Islamic banks are advised to increase the level of Capital Buffer they have related to the positive response of the NPF to shocks in the Capital Buffer.

Keyword: bank risk level, Capital Buffer, macroeconomics

INTRODUCTION

The banking sector is one of the most important industries in a country's economy. Wijaya (2019) considered banks as the lifeblood of a country's economy, including Indonesia. Adeola & Ikpesu (2017) explain that the banking industry plays an important role in the financial system and economy. Therefore, it is essential to maintain economic and banking stability due to their correlation. Banks can become financial intermediaries (financial intermediaries) between parties who have excess funds (surplus of funds) and parties who lack funds (lack of funds) (Ahmadi, et.al, 2017). Therefore, banks are associated with various activities in various sectors of the economy. Specifically, the banking sector issue will significantly affect a country's economic condition both in the current and future periods (Dao, et.al, 2020).

Currently, supported by technological advances, banks have a more comprehensive and varied scope of activities with varying levels of complexity. Thus, banks must design policies that can prevent risk and help maximize revenue and market value (Qwader, 2019). One of the tools used to measure the level of banking risk is the ratio of Non-Performing Loans (NPL) for Conventional Commercial Banks and Non-Performing Financing (NPF) for Islamic Commercial Banks. In normal conditions, the increase in NPL and NPF at Conventional Commercial Banks and Islamic Commercial Banks can be influenced by various factors inside and outside the bank. Therefore, this current study aims to analyze the factors that affect both NPL and NPF ratio in Conventional Commercial Banks and Financing of Islamic Commercial Banks

LITERATURE REVIEW

According to Financial Services Authority (OJK) Regulation No. 15/PJOK.03/2017 regarding the Status Determination and Follow-Up Supervision of Commercial Banks, NPL or NPF is credit that is substandard, doubtful, or bad (OJK, 2017). According to Naibaho & Rahayu (2018), the level of credit risk arises when creditors/customers cannot fulfill their obligations on time according to the agreement or do not fulfill their obligations at all. From this description, it can be concluded that NPL and NPF are ratios to measure the credit failure or financing disbursed by banks.

The bank is responsible for the credit risk level Yusuf & Fakhruddin (2016). The Financial Services Authority (OJK) Regulation No. 15/PJOK.03/2017 stated that the level of credit risk or

non-performing financing is considered healthy if it is not more than 5% (OJK, 2017). Credit risk is a key factor in assessing bank performance (Hernando, et.al, 2020), (Fianto, et.al, 2021). Therefore, further examination of the health of the credit risk level is necessary to prevent the increased risk of credit failure (Jasman & Murwaningsari, 2022). The lower the level of non-performing loans, the better the bank's condition (Mahendra & Mahardika, 2019). On the other hand, the increase in NPL and NPF levels indicates the inability of banks to manage their business. The higher the debtor's credit failure rate, the decrease in the spread base. This is related to credit and financing as the main activities of banks in generating returns (Firmansyah, 2015).

NPL and NPF can be affected by various factors, both inside and outside the bank, including macroeconomic factors (Dwihandayani, 2017), (Yusuf & Fakhruddin, 2016), (Fianto et al., 2021), (Messai & Jouini, 2013), (Waemustafa & Sukri, 2015) (Abid, et.al, 2014). Oino (2021) and de Leon (2020) stated that high-risk financing projects would lead to high NPL levels, reducing bank liquidity. Nkusu (2011) found a reciprocal relationship between NPL and macroeconomics. Prasetyo, (2020) concluded that macroeconomic variables such as economic growth, credit interest rates, inflation, and unemployment significantly affect the NPL of Conventional Banks in ASEAN. The GDP, effective interest rate, inflation rate, foreign exchange rate, type of bank, risk-taking behavior, ownership concentration, leverage, and credit quality are significant determinants of NPL in Chinese banks (Umar & Sun, 2015). NPL in the Greek banking system can be explained mainly by macroeconomic variables, including GDP, unemployment, interest rates, public debt, and management quality (Louzis, et.al, 2012). The same case was also found in the US (Ghosh, 2015). In addition, Amri & Harianti (2018) revealed several conclusions. Economic growth and interest rates have a positive and significant effect on NPL, while CPI has a negative effect on NPL. On the other hand, according to (Muqorrobin, et.al, 2021) it is concluded that GDP has a negative and significant impact on NPF. Furthermore, Qwader (2019) research concluded that there is a strong relationship between grants, loan interest rates, and GDP and NPL in both the long and short term. In line with Qwader, a study conducted by Espinoza & Prasad (2010) also concluded that GDP growth (not oil) has a significant relationship to NPL. A decline in GDP growth (not oil) has been shown to increase NPLs (Khemraj & Pasha, 2013). More specifically, research conducted by Fofack (2005), Kang (2016) and Setiawan (2021) states that GDP growth and the market stock index have a significant and negative effect on NPL. Adeola & Ikpesu (2017) and Bhattarai (2017) find that economic growth has no significant effect on NPL. Meanwhile, the

unemployment rate, exchange rate, and national debt have a significant and positive relationship to the NPL ratio. According to Anjom and Karin in the journal Prasetyo (2020), the increase in economic growth describes an increase in people's income and profits. This will increase the ability of the individual and firm to pay their loan. It will lead to a decreasing level of NPL and NPF.

Inflation is defined as a continuous increase in general prices over a certain period, which affects individuals, entrepreneurs (private parties), and the government (Mishkin, 2013). The increase in these prices will raise public spending, reducing the debtor's ability to pay their obligations to the bank. This is related to household needs which are the largest consumption (Fakhrunnas, et.al, 2021). High inflation causes non-performing loans (Badar, et.al, 2013). A number of research conducted by Polat (2018), Naibaho & Rahayu (2018), Damanhur, et.al (2018), Msomi (2022) and Adeola & Ikpesu (2017) concluded that inflation has a positive and significant effect on the NPL ratio. Therefore, keeping the inflation rate low lead to cheaper and more realistic loan (Msomi, 2022). Different from previous research, Waemustafa & Sukri (2015) conclude that inflation has a negative and significant effect on credit risk for Conventional Commercial Banks and has a negative but not significant effect on credit risk for Islamic Commercial Banks.

Several studies have focused on the effect of factors from the internal bank on NPL and NPF. Prastowo & Usman (2021) concluded that NPF is only positively and significantly affected by FDR and negatively and significantly affected by inflation, ROA, BOPO, and GDP. Meanwhile, NPL is positively and significantly affected by CAR, LDR, and BOPO and negatively and significantly affected by inflation and ROA. Dwihandayani (2017) revealed that credit, inflation, LDR, LAR, and BI rates strongly affect NPL. Another study by Munifatussa'idah (2020) concluded that partially FDR and KPPM had a negative and significant effect on NPF. Furthermore, Kang (2016) concluded that the debit scale and ratio positively and significantly affect NPL.

One of the factors expected to affect NPL and NPF is Capital Buffer. Capital Buffer is a mandatory capital owned by a bank beyond the minimum required capital. A capital buffer is a backup for banks when loan activity is low, or there is a credit failure. Capital buffers help banks to have a stronger system.

Capital buffers were initially mandated by reforming the Basel III regulations. Basel III was constructed in 2010 and started to be implemented in 2012. As an update to Basel II, Basel III

focuses on bank specifications and risk systematics (Santos & Bernabe, 2012). In this regulation, banks must improve the quality and quantity of capital. Furthermore, it can be a backup for risks that may occur.

There is a research gap found in previous studies. The differences appear not only in conventional and Islamic bank models but also in comparing the two banks, as revealed in research by Imaduddin (2011). The study concluded that conventional banks have better performance in dealing with credit failures. The finding is in line with Sawafta (2021), which stated that conventional banks have a lower level of credit risk than Islamic banks. The findings are different from Poetry & Sanrego's (2011) research, which concluded that NPF in Islamic banks is more stable against micro and macro variables shocks than NPL. Based on the research gap, this study aims to analyze the internal and external factors that affect NPL and NPF.

The hypotheses of this study are as follow:

H1 : Economic growth negatively affect NPL

H2 : Economic growth negaticely affect NPF

H3 : Inflation positively affect NPL

H4 : Inflation positively affect NPF

H5 : LDR negatively affect NPL

H6 : FDR negatively affect NPF

H7 : Capital Buffer negatively affect NPL

H8 : Capital Buffer negatively affect NPF

METHODS

This study utilizes time series data from 2008Q1 to 2021Q2. The data was generated from Bank Indonesia, the Financial Services Authority, and the Central Bureau of Statistics Indonesia in the form of monthly and quarterly reports. This study employs a quantitative analysis approach with the Vector Autoregressive (VAR) regression model. The VAR model is one approach used to project variables consisting of time series data. This method explains that each variable in the model depends on the past movement of the variable itself and other variables related to that variable in an equation model. In addition, the VAR method can also analyze the dynamic impact of disturbances contained in the model.

Before preparing an estimation model, there are several stages that need to be performed. Stationary tests, optimal lag tests, and polynomial tests are employed to find out whether the VAR test can be continued. Furthermore, a co-integration test was executed to observe the extent of the balance of the relationship of each variable used in the long term. The next test is the granger causality test. This test aims to analyze causality or reciprocity between observed variables. The IRF test is a test performed to estimate and identify the effect of shock on one of the variables in the model. It aims to determine the duration of the shock until the variable can find its equilibrium point.

The VAR model assumes that all economic variables are interdependent due to its endogenous trait. Therefore, several models can be utilized in one study. In general, the formulation of the model is as follows:

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This study employed model as follow:

- Conventional Bank Model

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- Islamic Bank Model

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RESULT AND DISCUSSION

Before running any regression, stationary tests are performed to see if there are root units in the model. As shown in the Table A1. (Appedix), Phillips Perron test revealed that no variable has a probability above alpha 5% (0.05). This means that all variables for conventional and Islamic Commercial Banks are stationary in the Phillips Perron test at the first different level. Table A2. (Appedix), shows the Optimum Lag results. The optimum lag test showed that the optimum lag length for Conventional Commercial Bank data is 4. This is indicated by the most asterisks being at lag 4, namely for LR, FPE, AIC, and HQ criteria. As for Islamic Commercial Bank data, the optimum lag length is 2. This is indicated by the most asterisks being at lag 2, namely for the LR, FPE, AIC, and HQ criteria. The result showed that the two models pass the Polynomial test. This can be seen from the modulus values of the two models not greater than 1 for Conventional Commercial Bank data with a lag of 4 and Islamic Commercial Banks with a lag of 2. This means that both models are stable (Table A3. Appedix). The cointegration test employed the Maximum Eigenvalue and showed two conclusions. First, there is only one cointegration in the Conventional Commercial Bank data model. Second, there are two cointegrations in the Islamic Commercial Bank data model. This means that the VAR model can be applied to both Conventional and Islamic Commercial Banks (Table A4. Appedix). In Table A5. (Appedix) shows that conventional banks, economic growth, LDR, and Capital Buffer are proven to affect NPL but not vice versa. In Islamic banks, only economic growth and inflation are proven to affect NPF in the form of a one-way relationship.

The estimation results in Tabel A6. (Appendix) show that the variables EG(-1), LDR(-1), and CB_BUK(-2) have a significant relationship to NPL. It is confirmed by the t-statistic value of each variable greater than the t-table value. Variables EG(-1) and LDR(-1) have a negative effect, while the variable CB_BUK(-2) has a positive effect on NPL.

The VAR estimation results are in line with Prasetyo (2020). The research stated that economic growth has a negative effect on NPL. Furthermore, Messai & Jouini (2013) also conclude that economic growth negatively affects NPL. Economic growth will increase individual income and profits in the private sector, leading to a higher probability of paying the loan and a lower NPL level. Slightly different from previous research, Amri & Harianti (2018) stated that economic growth has a negative and insignificant relationship to NPL. In the study,

it was stated that economic growth only showed an increase in personal income. Increased income does not necessarily indicate that the NPL will decrease. This is because the decision to pay credit lies in the will of the community, not absolutely on their income.

Research conducted by Mahendra & Mahardika (2019) has different results on the LDR effect. The study concluded that LDR had a positive and significant effect on NPL. This difference may be due to the utilization of different research methods. Research using VAR sometimes has different results concerning the lag used. Yusuf & Fakhruddin (2016) concluded that CAR positively and significantly affects the NPL ratio. This means that a capital increase increases the NPL ratio. This is in line with the VAR estimation result in this study stating that Capital Buffer as a derivative variable of CAR positively affects NPL.

The result of R^2 estimation is relatively high, which is 0.962582. This means that the model's independent variable can explain the NPL by 96.26%. At the same time, the remaining 3.74% is explained by other variables outside the model.

The VAR estimation results of Islamic commercial banks are quite different from the estimation result of conventional commercial banks. Only the EG (-1) variable significantly affects the NPF variable. Variable EG (-1) has a negative effect on NPF. This is in line with the assumption that the variable economic growth will have a negative effect on the NPF. An increase in economic growth indicates an increase in the personal financial capacity that leads to a higher probability of paying the loan. This is in line with research conducted by Muqorrobin et al. (2021) that GDP has a negative and significant effect on NPF. It means that an increase in GDP will reduce the level of NPF. Islamic banks are more prudent in disbursing credit in a state of economic boom or increased economic activity. The estimation showed the coefficient determination (R^2) value of 0.802297. It means that the independent variable can explain the NPF of 80.23%. At the same time, the remaining 19.77% is explained by other variables outside the model.

The VAR estimation result showed that economic growth has a negative effect on NPL and NPF. In the first lag, economic growth significantly negatively affects NPL and NPF. This is in line with Prasetyo (2020) that economic growth negatively and significantly affects NPL. An increase in economic growth is assumed by increasing income. Thus, the debtors can pay for bank loans. Research conducted by Yusuf & Fakhruddin (2016) also states that an increase in GDP has a negative and significant effect on NPL. This is due to an increase in GDP, which

indicates an increase in economic activity. Increased economic activity will increase income which then increases the capacity of debtors to pay their loans.

The VAR estimation showed that inflation has a positive and insignificant effect on NPL and NPF. Inflation has a negative effect on NPL in the fourth lag. It implies that inflation does not affect NPL and NPF. This shows that creditors commit to paying for the loans and financing despite inflation. The results of this study contradict the results of research conducted by Prastowo & Usman (2021) which stated that inflation has a negative and insignificant effect on NPL and NPF.

The VAR estimation showed that there are differences in results for conventional commercial banks and Islamic commercial banks. In conventional commercial banks, LDR negatively and significantly affects the first lag. In contrast, in Islamic commercial banks, FDR has a negative effect on the first lag and a positive on the second lag, but both are insignificant. This means that an increase in the distribution of funds to conventional commercial banks can significantly reduce the level of NPL. This is in line with Poetry & Sanrego (2011), which states that LDR and FDR have a negative effect on NPL and NPF. Furthermore, the study added that the results indicate that credit and financing banks provide are good quality. Thus, the additional or expansion can increase returns and reduce credit failure rates. Another study by Yusuf & Fakhruddin (2016) also concluded that LDR negatively and significantly affected NPL.

The VAR estimation highlights that there are differences in the results between the effects on the NPL and the NPF. Capital Buffer has a positive and significant effect on NPL in the second lag. While in NPF, Capital Buffer has a negative effect on the first lag and positive in the second lag but both are not significant. This means that the increase in Capital Buffer does not have much impact on the level of financing failure of Islamic commercial banks. This is supported by research conducted by Yusuf & Fakhruddin (2016) which concludes that CAR has a positive and significant effect on NPL. An increase in CAR will also increase the level of Capital Buffer. This means that the addition of capital actually increases the NPL ratio. This can happen when the increase in capital is not followed by an increase in the RWA (Risk Weighted Assets). This will cause the increase in capital is not able to absorb the rate of credit failure.

Table 1. IRF estimation results

Conventional Bank Model Response of NPL					
Period	NPL	EG	Inflasi	LDR	CB
1	0.001318	0.000000	0.000000	0.000000	0.000000
2	0.001323	-0.00047	0.000234	-0.0004	8.29E-05
3	0.001529	-0.0005	0.000329	-0.00024	0.000155
4	0.001274	-0.00043	0.000829	-0.00019	6.87E-05
5	0.001243	0.000270	0.000976	-0.0002	0.000158
6	0.001199	-0.0003	0.000918	-7.76E-05	0.000367
7	0.001220	-0.00022	0.000766	1.09E-05	0.000184
8	0.000854	4.28E-05	0.000574	-5.07E-05	0.000258
9	0.000843	0.000383	0.000434	7.01E-05	0.000291
10	0.000714	-8.73E-05	0.000279	0.000175	0.000550
Islamic Bank Model Response of NPF					
Period	NPF	EG	Inflasi	FDR	CB
1	0.004486	0.000000	0.000000	0.000000	0.000000
2	0.001935	-0.00123	0.000147	-0.00035	-0.00026
3	0.003336	-0.00064	0.001207	-0.00019	1.37E-06
4	0.002473	0.000316	0.001532	-0.00015	-0.00022
5	0.002219	0.000307	0.001882	-7.97E-05	-0.00016
6	0.001624	-0.00015	0.001776	-1.82E-05	-0.00044
7	0.001604	9.96E-05	0.001544	-1.99E-05	-0.00068
8	0.001378	0.000507	0.001308	-1.25E-05	-0.00071
9	0.001056	0.000347	0.001138	9.29E-05	-0.00062
10	0.000822	5.24E-05	0.000922	0.000226	-0.00065

As shown in the Table 1 that the NPF graph tends to be more stable than the NPL curve. It means that shocks to economic growth have a more significant impact on NPLs than NPFs. It indicates that Islamic commercial banks are not too affected by shocks to economic growth. This is in line with Prastowo & Usman (2021) stated that NPL is more reactive to economic growth than NPF. Conventional commercial banks tend to increase the

amount of loan disbursement. Thus, the NPL will be more affected when there is a decline in economic activity. The NPL and NPF responses will begin to stabilize in the fiftieth period in the long term. Based on the IRF test result, the NPL and NPF response graphs are almost identical. When viewed in a longer period (this study utilizes 100), the NPL and NPF responses also have a graph that is almost the same and is equally stable in the fiftieth period.

The IRF test showed that the NPF response curve has a graph that is relatively more stable than the NPL response curve. This means that shocks to the FDR do not greatly affect NPF. However, the NPL has a much more stable response than the NPF response in a longer period,. The NPL response will stabilize faster in the forty-fifth period while the NPF response will only stabilize in the seventy-fifth period.

The IRF test revealed that there is a difference in response between NPL and NPF in the short term. NPL gave a positive response while NPF gave a negative response. This means that the Capital Buffer mechanism is more effectively applied to Islamic commercial banks compared to conventional commercial banks. In a longer period the NPL still gave a positive and stable response in the fortieth period while the NPF gave a negative and stable response in the sixtieth period.

CONCLUSION

This study aims to analyze the effect of economic growth, inflation, LDR/FDR, and Capital Buffer on the NPL and NPF of conventional commercial banks and Islamic commercial banks in Indonesia. In addition, this study also aims to identify the response of NPL and NPF to the independent variables.

According to the finding, it can be concluded that conventional commercial banks tend to be more responsive to shocks in economic growth. There is a different effect between LDR and FDR on NPL and NPF. LDR has a negative and significant effect on NPL while FDR has no significant effect on NPF. This means that additional loans made by conventional commercial banks are of better quality that lead to the significant NPL reduction. On the other hand, the additional financing disbursed by Islamic commercial banks has not been able to reduce the NPF level. This implies that the financing expansion has the potential to increase the credit failure rate in the long term. Capital buffer is more

effectively applied by Islamic commercial banks compared to conventional commercial banks.

The findings provide new insights that conventional commercial banks are expected to be more sensitive to economic conditions. In that way, credit failures can be avoided. Conventional commercial banks are expected to be more selective in expanding lending. Regarding the NPL's positive response to the Capital Buffer shock, conventional commercial banks are expected to be more selective in managing the additional incoming capital. Thus, it can reduce the level of NPL.

Artikel Nur Andriyani 2

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