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GENERAL MANAGEMENT

The Impact of Macroeconomic Structures for The Banking Stability in Indonesia

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Abstract

This study aims to find the impact of macroeconomic activities on the conditions of banking stability. Macroeconomic activity is reflected in movements in economic growth, exchange rates, inflation, trade balance, and monetary policy. While the condition of banking stability is reflected in several dimensions of banking risk such as Non-Performing Loans (NPL), Loan to Deposit Ratio (LDR) and Return on Assets (ROA). This study uses the Vector Error Correction Model (VECM) analysis technique The data used is in the form of time series data from January 2011 to October 2018 due to consideration of the limited data of each variable, especially Commercial Banks (according to the metadata from the Financial Services Authority). The results of the analysis show that a decrease in production and trade capacity can cause the NPL ratio to increase, the LDR and ROA ratio falls. Also, an important finding in this study is that monetary policy tightening in the form of a BI rate has a relatively significant impact on the increase in the NPL ratio. While tightening monetary policy the BI rate is not significant to changes in the LDR and ROA ratios. The possibility of this is due to the transmission of monetary policy The BI rate has a long lag or long transmission to LDR and ROA, so that it has a relatively long-term impact. The research contribution can be one of the references for financial services authorities and bank managers in Indonesia to be able to maintain stability and performance due to the spillover effect of the macroeconomic structure.

Keywords: *Production Index, Trade Balance, Exchange Rate, Banking Stability, Monetary Policy*

Introduction

The macroeconomic activity has always been the main focus for the Central Bank and the Government in determining policy steps and measuring their impact on the financial sector. Because the macroeconomic shock, especially changes in the exchange rate has always been the source of the causes of the failure of the real sector which then spread to the banking sector as a whole. Exchange rate depreciation can cause a trade balance deficit, especially oil and gas imports in Indonesia (Basri, 2017). Furthermore, depreciation of the exchange rate causes production costs which will then impact on sluggish economic growth and high inflation rates (Bhattarai, Chatterjee, & Park, 2018; Sahay, Arora, Arvanitis, Faruqee, & Diaye, 2014; Setiastuti, 2017). Systemic disaster in the real sector will have an impact on increasing non-performing loans (NPL). When economic activity experiences a decline, the banking NPL will increase (Mileris, 2014).

Furthermore, Ekananda (2017) conducted a study on the macroeconomic impact of non-performing loans of general banking / NPL. He found that macroeconomic activity had an impact on increasing NPLs. Also, the increase in banking NPLs will affect bank lending in the real sector. The findings of this study support the idea that macroeconomic conditions are closely related to the health conditions of the banking sector, especially the problem of bad credit. The fall in the business climate will affect the company's balance sheet and company profits. This condition will then trigger debtor defaults on banks. So that it will affect the condition of the overall banking balance. Higher congestion/ NPL has triggered a decline in sustainable ROA.

Meanwhile, sluggish economic activity and high inflation also caused a decline in Return of Assets (ROA) and an increase in Loan to Deposit Ratio (LDR) caused by a decrease in Third Party Funds (DPK). Aviliani's research, Siregar, Tubagus Nur Ahmad Maulana, & Hasanah (2015) also found that macroeconomics had an impact on banking performance such as NPL, ROE, NIM and BOPO. When banking health conditions decline, it will be risky for overall banking failure. This condition is referred to as systemic risk that is transmitted between banks to each other. The erosion of bank ROA will have an impact on the behavior of credit disbursement in the real sector. This condition could be the beginning of a period of a crisis originating from the financial sector.

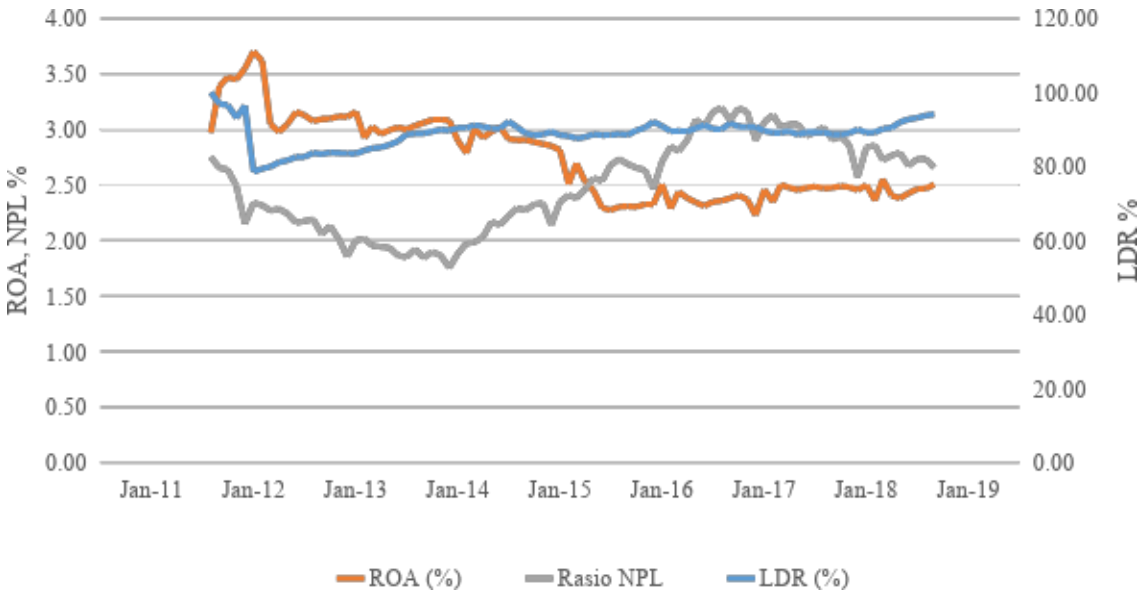


Figure 1. Banking Stability Conditions in Indonesia

Figure 1 describes banking stability in terms of Return of Assets (ROA), Non-Performing Loans (NPL) and Loan Deposit Ratio (LDR). Banking stability since 2011 has experienced instability caused by several pressures. The NPL ratio has increased relatively significantly since 2013. This increase was caused by weakening economic growth and export expansion. The highest increase in NPL ratio was around 3.16% in November 2016. After 2013, Indonesia experienced years of uncertainty caused by global factors. While ROA has experienced a downward trend since 2011 with the sharpest decline of 2.23% in December 2016. While the LDR ratio has increased by 94.09 in December 2018. This increase could be due to a decrease in third-party funds at commercial banks. This fact supports that there is a close link between real sector activities and banking health. Therefore, measuring the impact of macroeconomic shocks on overall banking stability is urgent to do. Considering the risk of the financial system can be a time bomb against a crisis like the 2008 financial crisis.

Previous studies have different results regarding the relationship or transmission of macroeconomic structure to banking stability. Aviliani, Siregar, Maulana, & Hasanah's research (2015) analyzed the impact of macroeconomic indicators (including production index, inflation, Bank Indonesia exchange rate, Jakarta stock index, exchange rate, and crude oil price) on the performance of state-owned banks. Meanwhile, Aviliani et., al. (2015) conducted a study of banking stability related to macroeconomic indicators in Indonesia where macroeconomic indicators are reflected in the Gross Domestic Product (GDP) in US dollars, interest rates (IR) in percentages, and the Consumer Price Index (CPI). Whereas Vithessonthi (2016) observed the impact of credit expansion on non-performing loans accompanied by a decline in economic growth. Alodayni (2016) conducted a study of the drop in oil prices and banking stability, especially for oil-exporting countries. Ekananda (2017) reviews the non-performing loan ratio (NPL) and capital adequacy ratio (CAR) which are still a measure of banking health in various countries, including Indonesia.

Some recent research, such as Lee and Lee (2019), found that oil prices have a significant impact on banking performance because their increases trigger a decline in banking performance in terms of capital, management efficiency, profit power, and liquidity. However, this negative impact is mitigated by the country's stability, especially economic stability and political stability. From a managerial perspective, bank managers should consider building early warning and response mechanisms behind oil price shocks in order to operate with better performance. Furthermore, Albaity, Mallek, and Noman (2019) investigated the impact of competition on bank stability using data from 276 banks in eighteen MENA countries between 2006–2015. Using financial inclusion, productivity, and macroeconomic instability in addition to several different control variables, including bank size, efficiency, diversification, and leverage. As a result, banks that face less competition tend to have less bankruptcy and credit risk and enjoy more profitability. This study has implications for bank stability.

Subsequent research from (Kozaric and Delihodić 2020) analyzes the impact of macroeconomic conditions on non-performing loans and financial stability, the results show the importance of the macroeconomic environment for controlling bad loans and maintaining financial stability. In addition, it was revealed that better macroeconomic conditions ensured better conditions for maintaining financial stability in the banking sector. The latest issue of financial stability is related to climate change. Battiston, Dafermos, and Monasterolo (2021) assert that climate change has recently been recognized as a new source of risk for the financial system. Over the past few years, several central banks and financial authorities have recommended that investors and financial institutions assess their exposure to climate-related financial risks. However, the financial community does not have a methodology that allows for a successful analysis of climate change risks on financial stability.

Based on some of the previous research, this study still uses loan indicators. The variables used include a loan-to-deposit ratio (LDR), non-performing loan (NPL), and return on assets (ROA) because according to financial intermediation theorists (Leland and Pyle 1977) that one of the roles of a bank is as an institution provides capital or real economic investment, especially in developing countries.

Literature Review

Aviliani, Siregar, Maulana, & Hasanah (2015) analyze the impact of macroeconomic indicators (including production index, inflation, Bank Indonesia exchange rate, Jakarta stock index, exchange rate and, crude oil price) on the performance of state-owned banks. He used the Vector Error Correction Model (VECM) on banking data from 2006-2013. This study found that the biggest response was from bank overhead costs (BOPO) due to macroeconomic shocks. The loan amount and the ratio of loans to deposits (LDR) provide the weakest response due to macroeconomic shocks. This is in line with the results of the decomposite variance, where macroeconomic variables have the weakest impact on the Third NPL, of all macroeconomic variables observed, Bank Indonesia interest rate shocks generally provide the largest response from most bank performance indicators.

While Aviliani et.,al. (2015) conducted a study on banking stability related to macroeconomic indicators in Indonesia. Banking stability is measured by a Z-score while macroeconomic indicators are reflected in Gross Domestic Product (GDP) in US dollars, interest rates (IR) in percentages and the Consumer Price Index (CPI). Empirical findings indicate a long-term relationship between the stability of public banks and macroeconomic factors. This finding also shows the long-term relationship between the stability of the banking industry as a whole and macroeconomic factors. However, there is no evidence of a long-term relationship between the stability of Islamic banks and macroeconomic factors.

Shingjergji, (2013) also conducted research on the impact of macroeconomic activities on non-performing loan in Albania. Macroeconomic indicators are reflected by GDP, inflation rates, the euro exchange rate and, credit interest rates. The results of the study found that the decline in economic growth and exchange rates greatly affected Non-Performing Loan in Albania. This condition also has important consequences that the exchange rate problem is the cause of the collapse of the real sector which then spread to the banking sector.

While Vithessonthi (2016) observed the impact of credit expansion on bad credit accompanied by a decline in economic growth. Estimation technique used regression Ordinary Least Square (OLS) and Generalized Moment of Method (GMM). The sample consisted of 82 public banks that were publicly registered in Japan during the period 1993-2013. This study found that bank credit growth was positively correlated with bad credit before the 2007 global financial crisis but was negatively correlated with bad credit afterward. Also, credit growth and bad credit do not affect profitability.

In contrast to Alodayni (2016) who conducted a study of the decline in oil prices and banking stability, especially for oil-exporting countries. Basically, this study aims to assess how the volatility in oil prices has an impact on the macroeconomy and how macro shocks are transmitted to bank balance sheets. The estimation technique in this study uses the System Generalized Method of Moments (GMM) and the Fixed Effect Model Panel to estimate non-performing loan (NPL) responses to macroeconomic determinants. Meanwhile, to answer the second problem, this study uses the VAR Panel model to explore macro-financial linkages between the banking systems. This study found that oil prices, GDP, interest rates, stock prices, and housing prices were the main factors in the movement of NPLs in all banks. Credit risk shocks tend to trigger disruptions to GDP credit, and share prices across the economy. A higher NPL level limits bank credit growth and can reduce economic growth.

Last review from Ekananda (2017) The ratio of non-performing loans (NPL) and capital adequacy ratio (CAR) is still a measure of the health of banks in various countries including Indonesia. This study uses the PVAR model in capturing the complexity between macroeconomic variables and bank health. This study found that bank NPLs with small assets will increase rapidly when interest rates fluctuate. For banks with large assets, an increase in interest rates leads to a greater reduction in CAR. On the other hand, banks with smaller capital are less able to adapt quickly to an increase in NPL due to exchange rate depreciation, therefore banks with smaller capital must be careful with exchange rate risk.

Methods

Analysis Techniques and Empirical Models

This study uses time series data from August 2011 to September 2018. General banking data was obtained from the Indonesian Banking Statistics Financial Services Authority. While macroeconomic data were obtained from the Economic and Financial Statistics of Bank Indonesia and Bank for International Settlements (BIS). This study uses the Vector Error Correction Model (VECM) analysis technique. Consideration of this analysis technique is the first long-term cointegrated data. Second, the technique makes it possible to see responses between independent and bound variables, so that each variable has the potential to be an exogenous variable. Third, this technique can accommodate the existence of bias estimation as a result of classical assumptions such as autocorrelation. This research is built based on empirical development from previous studies. The development of the model in this study refers to Ndari Surjaningsih & Indriani (2018) and Betz et al. (2017). So the basic model of this research is as follows:

$$SB_t = b0_t + b1\,Inflation_t + b2\,Production\,Index_t + b3\,Trade_t + b4\,REER_t + b5\,BI\,rate_t + \varepsilon_t$$

The above equation can be formulated into the VECM rules so it becomes the following equation:

$$\Delta SB_t = \sum_i a_i L^i\,\Delta Z_i + \sum_i a_i L^{i-1}\,\Delta SB_i - d_i\,L\eta_{it} + e1\,\Delta Macro\_S_t + e2\,L\,Macro\_S_i + \varepsilon_t$$

ΔSB_t is the first derivative form of stability banking. Banking stability is proxied into three parts, namely Non-Performing Loans (NPL), Return on Assets (ROA) and Loan to Deposit Ratio (LDR). $\sum_i a_i L^i\,\Delta Z_i$ is an error correction model (ECM). $a_i L^i$ is operator lag. $\sum_i a_i L^{i-1}\,\Delta SB_i - d_i\,L\eta_{it}$ is the operator lag in the first derivative of banking stability. $e1\ Macro\_S_t$ is the surprise of macroeconomic variables in the first derivative which consists of inflation, production index, trade, real effective exchange rate and BI rate. Trade is the ratio between exports and imports as research conducted by (Setiastuti, 2017). Whereas $e2\ L\ Macro\_S_i$ is a form of operator lag from a surprise macroeconomic variable.

Results And Discussion

Estimated Results of Vector Error Correction Model (VECM)

The results of the data stationarity test using the Augmented Dickey-Fuller Test (ADF) and Phillips Perron are shown in Table 1. The data stationarity test aims to find out whether the data has a spread of stationary data or not. If the

data is not stationary then the data distribution must be derived I (1) so that it becomes stationary. The analysis shows that all data are stationary at the 1st difference level using the Phillips Perron test, while the NPL is not stationary using the ADF test. Stationary data at level levels include LDR, production index and trade using either the ADF test or Phillips Perron.

Variabel	Augmented Dickey-Fuller (ADF)		Phillips Perron (PP)	
	Level I(0)	1st different I(1)	Level I(0)	1st different I(1)
NPL	0.7135	0.5849	0.6575	0.0001*
LDR	0.0090*	0.0001*	0.0081*	0.0001*
ROA	0.4469	0.0001*	0.5999	0.0001*
Inflasi	0.2118	0.0000*	0.1490	0.0000*
Indeks Produksi	0.0000*	0.0001*	0.0000*	0.0001*
Trade	0.0469*	0.0001*	0.0000*	0.0001*
REER	0.3532	0.0000*	0.2568	0.0000*
BI rate	0.5057	0.0031*	0.6281	0.0000*

(*) is significant at level α = 5%.

Table 1.Test Results of the Data Stationarity

Furthermore, after testing the data stationarity, the next step is to do the Johansen cointegration test. Johansen's Cointegration Test aims to determine whether the model in the vector system has cointegration in the long run. If the model has cointegration properties in the long run, an analysis will be done using Cointegration Vector Autoregression. Cointegration test can be known by looking at the value of Trace Statistics with Critical Value. If the value of Trace Statistics is greater than Critical Value the equation is cointegrated in the long run. The cointegration test results are shown in Table 2. The analysis results show that the NPL and ROA models are cointegrated to equation five (5). While the LDR model is cointegrated only in equation one (1).

Model NPL		Model ROA		Model LDR	
Trace Statistic	0.05 Critical Value	Trace Statistic	0.05 Critical Value	Trace Statistic	0.05 Critical Value
186.15	95.75	203.42	95.75	107.17*	95.75
125.52	69.82	144.14	69.82	64.07	69.82
68.15	47.86	85.86	47.86	40.30	47.86
45.23	29.80	43.57	29.80	22.52	29.80
22.86*	15.49	22.14*	15.49	12.44	15.49
2.34	3.84	2.25	3.84	3.24	3.84

(*) cointegrated at the equation

Table 2.Results of Johansen Cointegration Test

Cointegrated next step after conducting the cointegration test is to do the longest and shortest optimum lag test. This step is very important considering that each model has an optimal lag efficiency limit that is related to significance. Akaike Information Criterion (AIC) shows the longest lag while Schwarz Information Criterion and Hannan-Quinn Information Criterion show the shortest lag on a model. The NPL and ROA models are in the second lag (AIC), while the LDR model is in the 1st lag (AIC and SC and HQ).

Lag	Model NPL			Model ROA			Model LDR		
	AIC	SC	HQ	AIC	SC	HQ	AIC	SC	HQ
0	15.22	15.40	15.29	15.09	15.27	15.16	24.20	24.38	24.27
1	11.96	13.23*	12.47*	11.80	13.07*	12.31*	14.62*	15.88*	15.12*
2	11.66*	14.02	12.60	11.78*	14.14	12.72	15.09	17.42	16.02
3	11.82	15.27	13.20	12.07	15.51	13.45	15.21	18.63	16.58
4	11.85	16.38	13.66	12.18	16.72	14.00	15.35	19.85	17.15
5	11.85	17.47	14.10	12.24	17.85	14.48	15.45	21.03	17.68
6	12.03	18.74	14.72	12.48	19.18	15.16	15.55	22.20	18.21
7	12.04	19.83	15.16	12.39	20.19	15.51	15.70	23.44	18.80

* indicates lag order selected by the criterion

AIC =Akaike information criterion
SC =Schwarz information criterion
HQ =Hannan-Quinn information criterion

Table 3.Results Lag Longest and Shortest Optimization

Next, the most important part of the Vector Error Correction Model (VECM) is response analysis otherwise known as analysis Impulse Response Function (IRF). Figure 2. Shows the IRF results from a surprise macroeconomic variable on the NPL. An increase in one standard deviation in inflation causes a decrease in the NPL until the 4th period. The increase in one standard deviation in the production index causes a decrease in the NPL until the 6th period. The increase in one standard deviation trade also caused a decline in NPLs until the 6th period. While the appreciation of the exchange rate and the tightening of monetary policy led to a significant increase in NPLs.

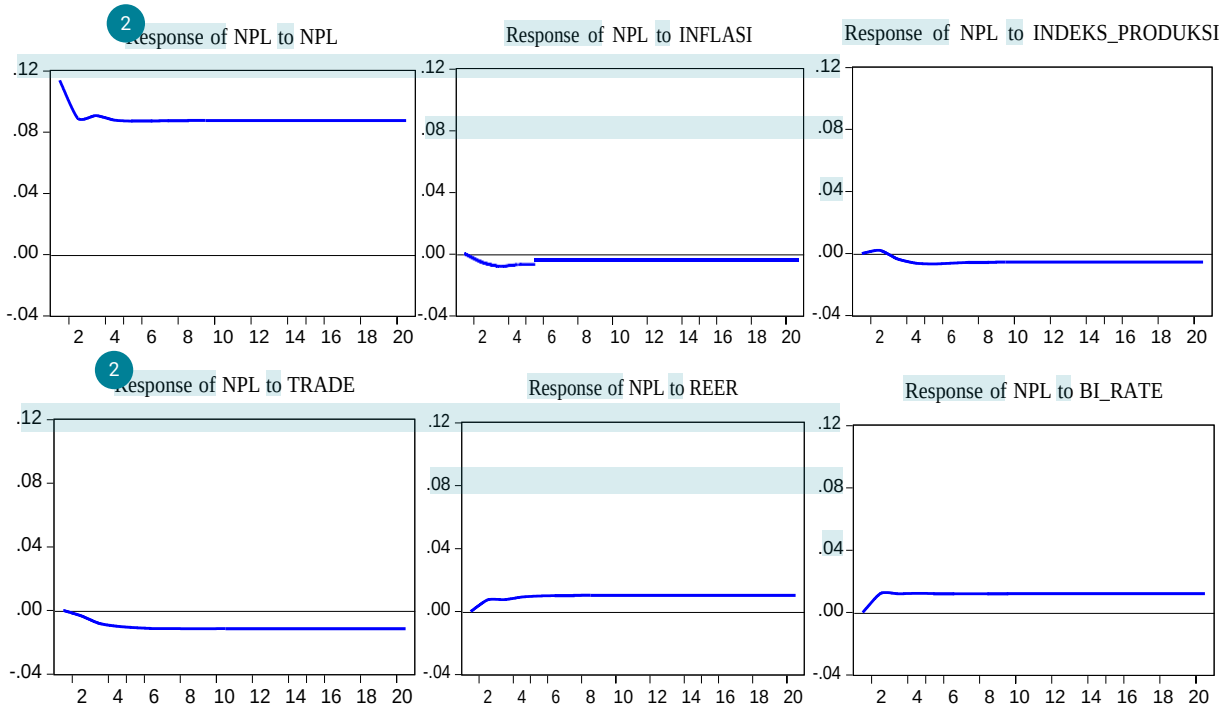


Figure 2. Analysis of Macroeconomic Shock Responses to Non-Performing Loans

An increase in the production index is usually characterized by an increase in overall inflation. In this condition, the economic condition is undergoing a process of improvement, of course with controlled inflation. This condition will encourage improvements in business and business so that the ability to pay credit is also getting better. This is also supported by research (Beaton, Imf, Thompson, & Caribbean, 2016; Dimitrios, Helen, & Mike, 2016) which emphasizes that improving the macroeconomic fundamentals is very important to maintain banking stability. The increase in trade also led to a massive decline in NPLs, especially in the mining and plantation sectors. While the tightening of the BI rate will encourage bad credit, higher. This is also confirmed by the results of studies from (Ndari Surjaningsih & Indriani, 2018) and (Ghosh, 2015) who found the same thing.

Figure 3. shows the results of the response analysis (IRF) of the impact of the macroeconomic shock on ROA. The increase in inflation can cause a decrease in Return of Assets (ROA) in the second period, meaning that uncontrolled inflation, especially for the needs of basic commodities and manufactured goods causes a decrease in ROA. While an increase in the production index has a fluctuating impact on the movement of ROA, so it is relatively difficult to analyze. However, an increase in the production index responded positively in the 6th period by ROA. This is in line with the research of Mileris (2014) and Shingjergji (2013) which emphasized the importance of macroeconomic aspects as an early warning system (EWS) for banks. The increase in exports was also responded positively in the 4th period by ROA. While the appreciation of the exchange rate and the tightening of monetary policy have an impact that is difficult to detect on ROA.

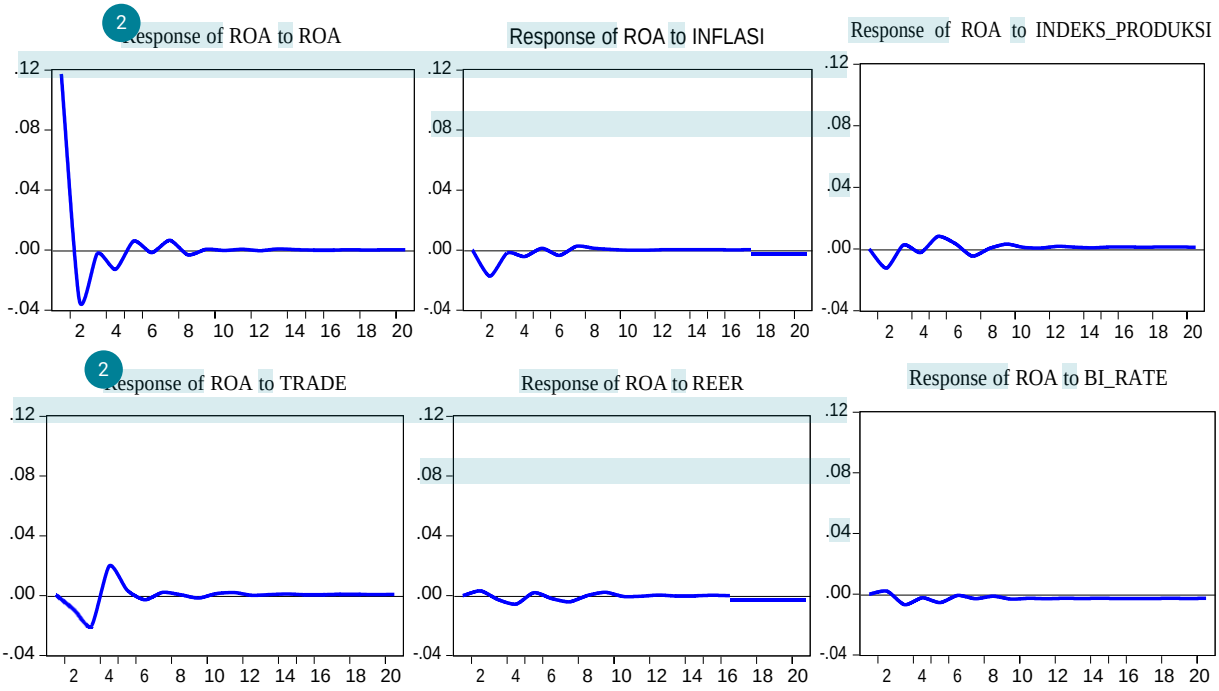
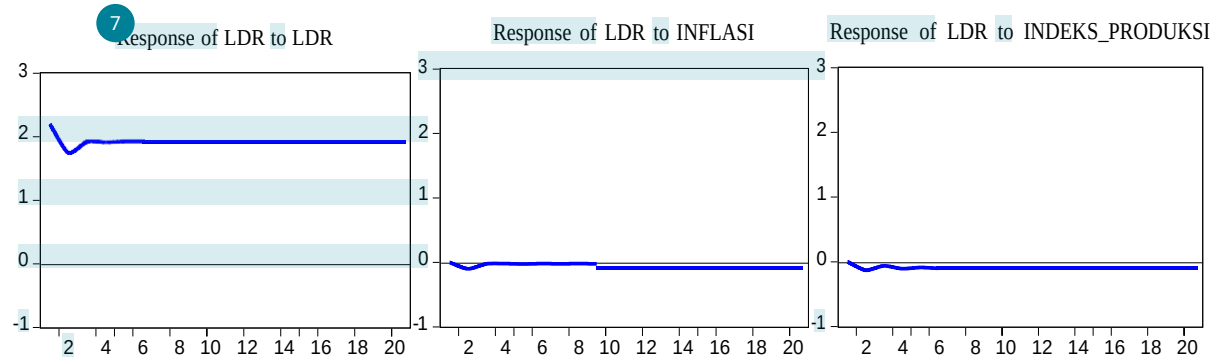


Figure 3. Analysis of Macroeconomic Shock Response to Return of Asset

While Figure 4. shows that the increase in inflation can cause a decrease in the Loan to Deposit Ratio (LDR) in the first period. Uncontrolled inflation causes third party funds to decline which will further impact on the LDR ratio. Decreasing the LDR ratio can trigger bank failure (fraud) so that it has a systemic impact on banking (Arnold, Borio, Ellis, & Moshirian, 2012). While the increase in the production index can cause a decrease in the LDR ratio. This is due to the improving business climate so that many depositors save their savings in the form of Third Party Funds (TPF). Bahadir & Gumus (2016) states that an increase in the business cycle will add to the overall accumulation of deposits.

An increase in trade capacity can increase economic improvement which will further increase third party funds (DPK). So that the increase in trade capacity, especially the increase in exports, can reduce the LDR ratio in commercial banks. Alodayni (2016); Poghosyan & Hesse (2009); Zhu, Wang, & Wu (2015) explained that the increase in exports would improve banking health conditions, especially from adding deposits as liquidity funds to banks. While exchange rate depreciation can also improve the condition of the LDR ratio, because Indonesia's trade structure that is relatively vulnerable when exchange rate depreciation occurs often causes a trade deficit. While the BI rate policy is relatively insignificant to changes in the LDR ratio. The possibility of this condition is caused by people's interest in saving less responding to changes in the BI rate.



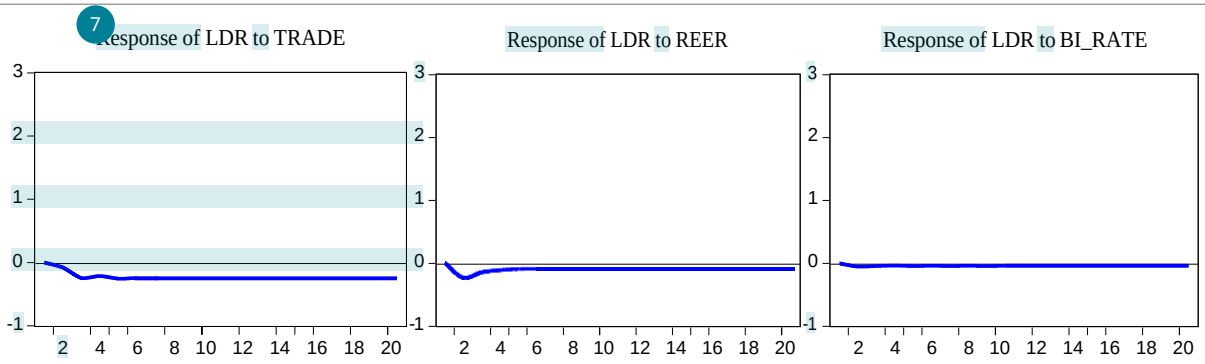


Figure 4. Analysis of Macroeconomic Surprise Response to Loan to Deposit Ratio

Figure 5. presents the results of the variance decomposition for the NPL model. The analysis shows that the NPL movement is relatively dominant influenced by the NPL movement itself. While the increase in the production index has a large role in the decline in NPLs in commercial banks when compared to other macro variables. The tightening of the BI rate monetary policy also has a relatively large impact on the increase in NPL when compared to other macroeconomic variables such as inflation, trade and exchange rates. This provides an important analysis that Bank Indonesia as the mandatory monetary policy must be prudent in implementing the BI rate regulations. Given that the transmission of the BI rate monetary policy relatively has a direct impact on the increase in NPLs through an increase in interest expense (Agung, 2010).

The rupiah exchange rate in this modeling has a large role in the movement of the NPL. Besides inflation, the exchange rate has always been a major concern for the Central Bank to oversee the economy in a better direction. Considering that the impact of the exchange rate on the real sector especially trades conditions is relatively large (Choudhry, Kallummal, & Varma, 2013; Kabir, Salim, & Al-Mawali, 2017; Susanto, Rosson, & Adcock, 2007). After the exchange rate, the export-import trade is also a major cause in the movement of the NPL. This is due to the condition of Indonesia's economic growth which is still supported by commodity-based exports such as palm oil, coffee and, coal. Finally, the inflation problem does not have a relatively large impact on the movement of the NPL.

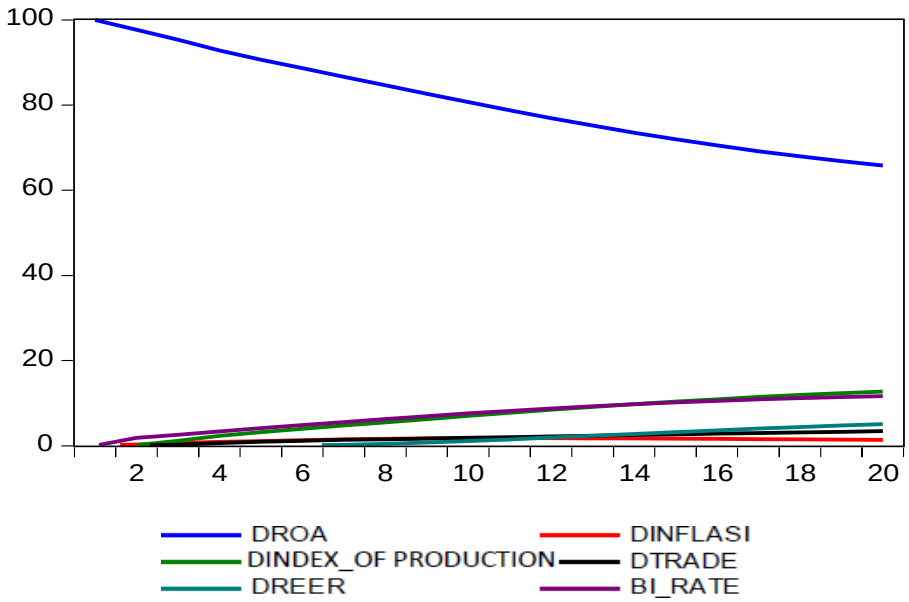


Figure 5. Variance Decomposition Macroeconomic Surprise of Non-Performing Loans

Figure 6. shows the results of the variance decomposition of surprise macroeconomic variables on ROA in commercial banks. Overall a decrease in ROA is caused by the movement of ROA itself. Whereas in macroeconomic variables trading capacity has a relatively dominant impact on increasing ROA. Trade capacity tends to always be the main role in the movement of the business cycle, so it has a direct impact on banks (Abid, Ouertani, & Zouari-Ghorbel, 2014; Bank Indonesia, 2015). Between the increase in production index and inflation also has a role in the increase in ROA. Inflation that is at the target threshold of Bank Indonesia will encourage businesses to increase their investment. While the tightening of monetary policy BI rate is relatively not dominant towards the movement of ROA. This is due to the transmission of a long BI rate policy towards ROA.

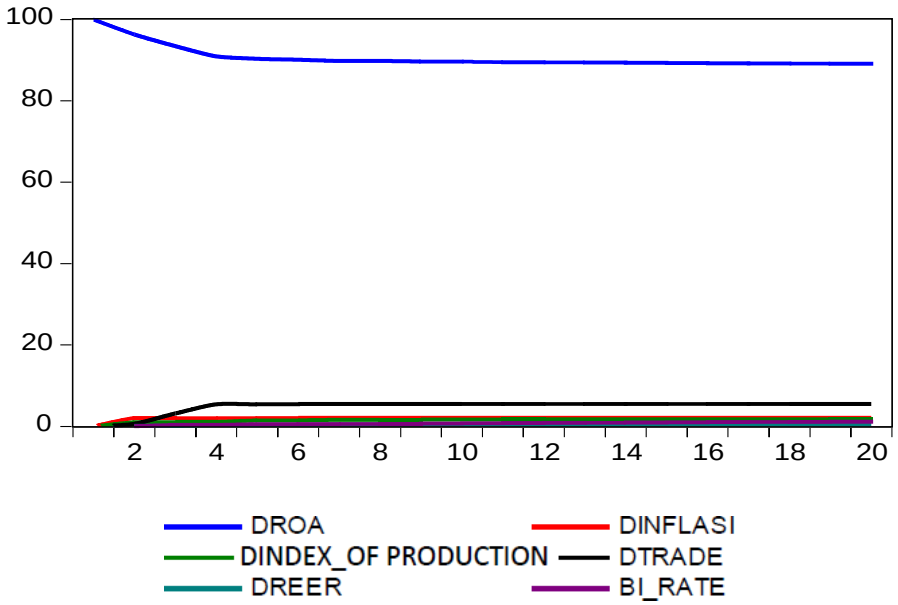


Figure 6. Variance Decomposition Macroeconomic Surprise of Return of Asset

Figure 7. shows the analysis of variance decomposition in LDR. The results of the analysis show that the movement of the LDR is more dominantly affected by the movement of the LDR itself. While in terms of macroeconomic variables, trade capacity and production indexes have a relatively large impact on the movement of LDR. Dimitrios et al. (2016) and Vithessonthi (2016) explain that trade capacity, especially exports and increased production is a positive sentiment for health and banking expansion. While the monetary policy of the BI rate is relatively not having a big impact on the movement of the LDR. Inflation and the exchange rate also did not predominantly influence the movement of LDRs at commercial banks.

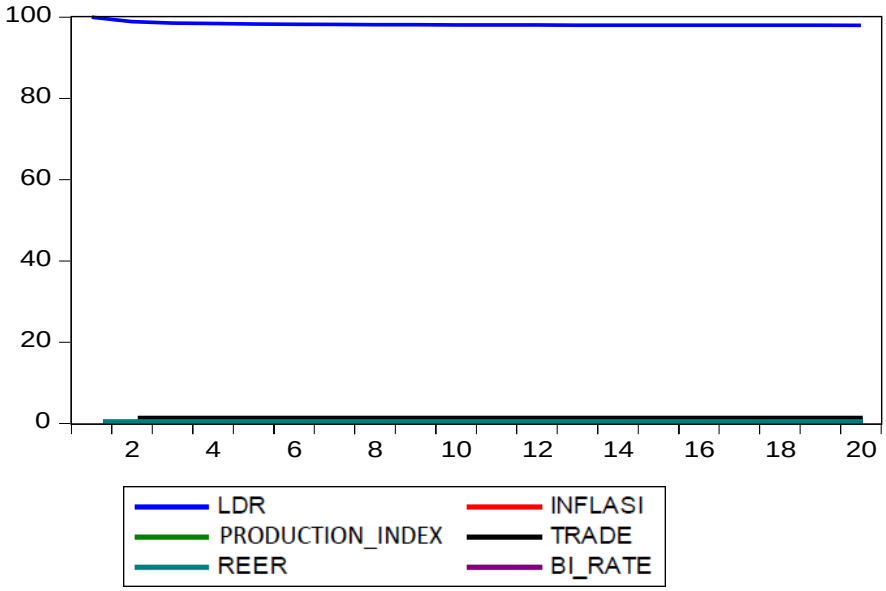


Figure 7. Variance Decomposition Macroeconomic Surprise of Loan to Deposit Ratio

Policy Recommendation

There are many policy recommendations that can be elaborated from the empirical findings of this research. As for the policy recommendations can be extracted in the sections below:

The central bank as the manager of monetary policy should be more careful in conducting monetary policy in the form of BI because it will increase the bad loans / Non-Performing Laon (NPL).

Macroprudential supervision needs to pay attention to business cycle movements and export expansion as an early warning of bank failures, especially an increase in NPL and a decrease in the Loan to Deposit Ratio (LDR).

Although the movement of the production index, trade balance and tightening of the BI rate did not have a rapid effect on the decline in ROA, the Central Bank and the government still had to be prudent towards the situation and changes in conditions of external shocks, especially exchange rates.

Conclusion

The empirical findings of the impact of the macroeconomic shock on banking stability with the VECM estimation technique can be drawn into several forms of conclusions. First, a decrease in the production index and trade capacity (exports and imports) can cause an increase in the NPL ratio, a decrease in ROA and a decrease in the LDR ratio in commercial banks. Second, the depreciation of the exchange rate can cause the ratio of LDR reserves to decline, this could be due to a decrease in real sector credit. Third, the tightening of monetary policy in the form of a BI rate can cause an increase in the NPL while not too significant towards ROA and LDR. Fourth, as a whole, the Central Bank as the manager of monetary policy must strengthen coordination with the relevant government to maintain banking stability and health. The research limitation was the difficulty of completeness of data in recent years. For future research, consider non-financial variables such as climate.

References

[1] Abid, L., Ouertani, MN, & Zouari-Ghorbel, S. (2014). Macroeconomic and Bank-specific Determinants of Non-performing Household's Loans in Tunisia: A Dynamic Data Panel. Procedia Economics and Finance, 13(December 2013), 58–68. https://doi.org/10.1016/S2212-5671(14)00430-4

[2] Agung, J. (2010). Integrating Monetary and Macroprudential Policy: Towards a New Paradigm of Monetary Policy in Indonesia After the Global Crisis. Bank Indonesia Working Paper.

[3] Alodayni, S. (2016). Oil Prices, Credit Risks in Banking Systems, and Macro-Financial Linkages across GCC Oil Exporters. International Journal of Financial Studies, 4(4), 23. https://doi.org/10.3390/ijfs4040023.

[4] Arnold, B., Borio, C., Ellis, L., & Moshirian, F. (2012). Systemic risk, macroprudential policy frameworks, monitoring financial systems and the evolution of capital adequacy. Journal of Banking & Finance, 36(12), 3125–3132. https://doi.org/10.1016/j.jbankfin.2012.07.023.

[5] Aviliani, Siregar, H., Tubagus nur ahmad maulana, & Hasanah, H. (2015). the Impact of Macroeconomic Condition on the Bank's Performance in Indonesia. Bulletin of Monetary and Banking Economics, 17, 24. https://doi.org/10.3109/00365540903501624

[6] Bahadir, B., & Gumus, I. (2016). Credit decomposition and business cycles in emerging market economies. Journal of International Economics, 103, 250–262. https://doi.org/10.1016/j.jinteco.2016.10.003.

[7] Bank Indonesia. (2015). Financial Stability Study No. 24, March 2015. Bank Indonesia, KSK, (1), 1–5. https://doi.org/10.1007/s13398-014-0173-7.2

[8] Basri, M. C. (2017). India and Indonesia: Lessons Learned from the 2013 Taper Tantrum. Bulletin of Indonesian Economic Studies, 53(2), 137–160. https://doi.org/10.1080/00074918.2017.1392922.

[9] Beaton, K., Myrvoda, A., & Thompson, S. (2016). Non-Performing Loans in the ECCU: Determinants and Macroeconomic Impact. IMF Working Papers, 16(229), 1. https://doi.org/10.5089/9781475555714.001.

[10] Betz, J., Krüger, S., Kellner, R., & Rösch, D. (2020). Macroeconomic effects and frailties in the resolution of non-performing loans. Journal of Banking & Finance, 112, 105212. https://doi.org/10.1016/j.jbankfin.2017.09.008.

[11] Bhattarai, S., Chatterjee, A., & Park, WY (2018). Effects of US Quantitative Easing on Emerging Market Economies. ADBI Working Paper Series EFFECTS, (803).

[12] Choudhry, S., Kallummal, M., & Varma, P. (2013). Trade Creation and Trade Diversion in India - Center for WTO Studies, Indian Institute of Foreign Trade. The Working Paper Center for WTO Studies, Indian Institute of Foreign Trade, (January).

[13] Dimitrios, A., Helen, L., & Mike, T. (2016). Determinants of non-performing loans: Evidence from Euro-area countries. Finance Research Letters, 18, 116–119. https://doi.org/10.1016/j.frl.2016.04.008.

[14] Ekananda, M. (2017). Macroeconomic Condition And Banking Industry Performance In Indonesia. Buletin Ekonomi Moneter Dan Perbankan, 20(1), 71–98. https://doi.org/10.21098/bemp.v20i1.725.

[15] Ghosh, A. (2015). Banking-industry specific and regional economic determinants of non-performing loans: Evidence from US states. Journal of Financial Stability, 20, 93–104. https://doi.org/10.1016/j.jfs.2015.08.004.

[16] Kabir, M., Salim, R., & Al-Mawali, N. (2017). The gravity model and trade flows: Recent developments in econometric modeling and empirical evidence. Economic Analysis and Policy, 56, 60–71. https://doi.org/10.1016/j.eap.2017.08.005.

[17] Mileris, R. (2014). Macroeconomic Factors Of Non-Performing Loans In Commercial Banks. Ekonomika, 93(1), 22–39. https://doi.org/10.15388/ekon.2014.0.3024.

[18] Surjaningsih, N., Kurniati, I. N., & Indriani, R. (2018). Credit Risk Models For Five Major Sectors In Indonesia. Buletin Ekonomi Moneter Dan Perbankan, 20(4), 376–396. https://doi.org/10.21098/bemp.v20i4.900.

[19] Hesse, H., & Poghosyan, T. (2009). Oil Prices and Bank Profitability: Evidence From Major Oil-Exporting Countries in the Middle East and North Africa. IMF Working Papers, 09(220), 1. https://doi.org/10.5089/9781451873672.001.

[20] Sahay, R., Arora, V., Arvanitis, A., Faruqee, H., N'Diaye, P., & Mancini Griffoli, T. (2014). Emerging Market Volatility: Lessons from The Taper Tantrum. Staff Discussion Notes, 14(9), 1. https://doi.org/10.5089/9781498318204.006.

[21] Setiastuti, S. U. (2017). Time-Varying Macroeconomic Impacts Of Global Economic Policy Uncertainty To A Small Open Economy: Evidence From Indonesia. Buletin Ekonomi Moneter Dan Perbankan, 20(2), 129–148. https://doi.org/10.21098/bemp.v20i2.809.

[22] Shingjergji, A. (2013). The Impact of Macroeconomic Variables on the Non Performing Loans in the Albanian Banking System During 2005 - 2012. Academic Journal of Interdisciplinary Studies. https://doi.org/10.5901/ajis.2013.v2n9p335.

[23] Susanto, D., Rosson, C. P., & Adcock, F. J. (2007). Trade Creation and Trade Diversion in the North American Free Trade Agreement: The Case of the Agricultural Sector. Journal of Agricultural and Applied Economics, 39(1), 121–134. https://doi.org/10.1017/s1074070800022793.

[24] Vithessonthi, C. (2016). Deflation, bank credit growth, and non-performing loans: Evidence from Japan. International Review of Financial Analysis, 45, 295–305. https://doi.org/10.1016/j.irfa.2016.04.003.,

[25] Zhu, N., Wang, B., & Wu, Y. (2015). Productivity, efficiency, and non-performing loans in the Chinese banking industry. The Social Science Journal, 52(4), 468–480. https://doi.org/10.1016/j.soscij.2014.10.003.

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