DINASTI INTERNATIONAL JOURNAL OF EDUCATION MANAGEMENT AND SOCIAL SCIENCE (DIJEMSS)

The Impact of Macroprudential Policies on MSME Credit Growth and Risk

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Abstract: The aim of this research is to identify the impact of macroprudential policy related to the financing ratio for micro small medium enterprises (MSME) to each bank's MSME credit growth and non-performing loan (NPL). This research used a panel data analysis using the pooled least square (PLS) model conducted on the financial data of 40 public conventional banks for the observation during the period from 2012 to 2021 with MSME's credit growth and NPL as the dependant variables and the policy, bank's characteristics, and macroeconomic factors as independent variables. The results reveals that the policy significantly affects MSME's credit growth and NPL. This study ultimately provides input for banks to fulfill the financing ratio in order to comply with the regulator but should be selective in terms of MSME's financing. The findings of this research inquire regulator to re-evaluate the requirement target for all banks to achieve minimum financing MSME ratio.

Keyword: Conventional Banks, Credit Risk, Loan Growth, Macroprudential Policy, MSME.

INTRODUCTION

In controlling credit growth, any financial authority can use monetary policy and macroprudential policy (Andrieş et al., 2022). The objective of macroprudential policy is to identify and mitigate risks to systemic stability by reducing the economic costs of financial service disruptions that act on financial markets, for example on credit financing (Altunbas et al., 2018). Macroprudential policy is used to safeguard the banking system that is vulnerable and can have systemic impacts (Claessens et al., 2013).

The micro, small, and medium enterprise (MSME) credit financing ratio policy for commercial banks is one of the macroprudential policies issued by Bank Indonesia (BI) to increase the role of commercial banks in encouraging the growth of the MSME business sector in Indonesia. The MSME financing ratio policy as a multiyear 2010-2021 program is expected to encourage every commercial bank throughout Indonesia to support the growth of the MSME business sector that can produce products that can meet domestic needs. The indicator for achieving the MSME financing ratio is 20% per year of the total financing provided by each bank. Based on Bank Indonesia Regulation (PBI) Number 14/22/PBI/2022 on December 21, 2012, all commercial banks have adjusted their business plans with the

target of fulfilling the minimum MSME financing ratio of 20% of the total loan portfolio of commercial banks.
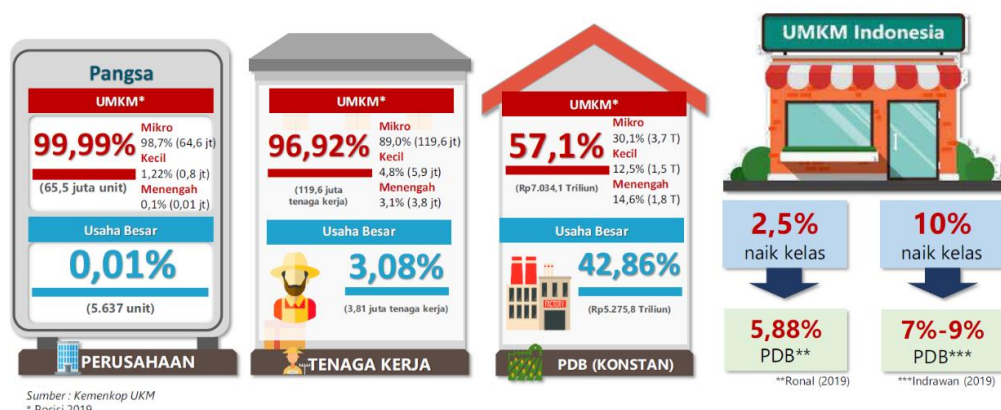
Figure 1. MSME Market Share in Indonesia
Source: Kementerian Koperasi dan UMKM

The MSME sector has become one of the pillars of the Indonesian economy (Tarigan et al., 2022). Based on data from the Ministry of Cooperatives and MSMEs in 2019 (Figure 1), 99.99% of the market share comes from the MSME sector. This shows the large number of MSME players in the economic market in Indonesia. The control of the economic market has led to the need for a large workforce. The MSME sector is able to absorb 96.92% of the labor market in Indonesia, which shows that the MSME sector has a significant contribution in reducing the unemployment rate in Indonesia. Apart from being a contributor to employment, the MSME sector is the largest contributor to Indonesia's Gross Domestic Product (GDP) at 57.1%. This is in line with the research of (Beck & Demirguc-Kunt, 2006) that the MSME sector has a significant role in the economy in developing countries.
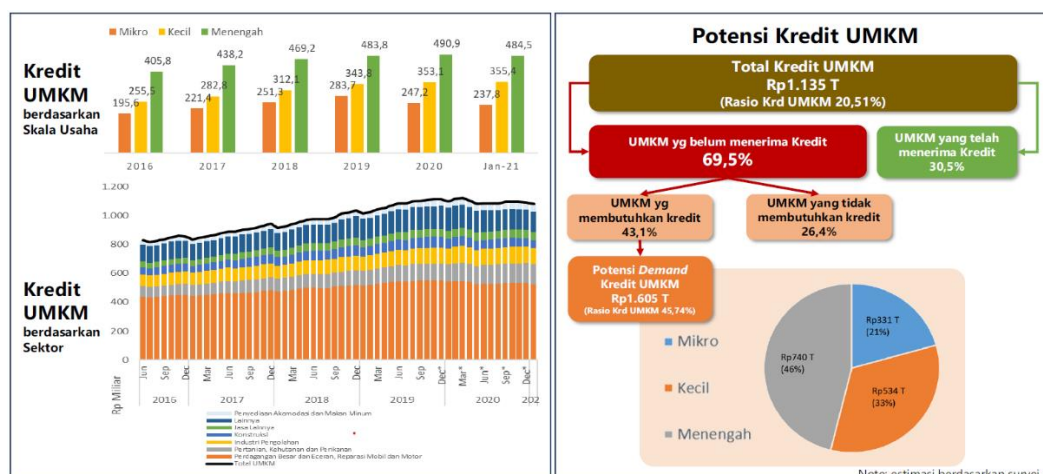
Figure 2. Potential of MSME Credit Demand
Source: Sosialisasi RPIM Bank Indonesia 2021

In carrying out its business activities, the MSME sector requires capital so that the potential for providing credit to the MSME sector is still wide open. Based on data on the potential for MSME credit in Bank Indonesia's RPIM socialization in 2021 (Figure 2), there are still 69.5% of MSME players who have not received credit, 43.1% of which are MSME players who need credit to help with operations and working capital so that they can grow bigger. From the credit needs of these MSME players, there is a potential demand for MSME credit of IDR 1.605 trillion.

As a form of the Indonesian government's support for the fulfillment of capital to the MSME sector, since 2012, the government through Bank Indonesia (BI) has issued a macroprudential policy in the form of PBI Number 14/22/PBI/2012 which was later refined through PBI Number 17/12/PBI/2015 concerning Lending or Financing by Commercial Banks and Technical Assistance in the Framework of MSME development. The substance of this regulation is that BI targets an increase in the ratio of lending by commercial banks to the MSME sector by a minimum of 20% each year. In times of financial crisis such as the Covid-19 pandemic, every country is faced with a situation of tightening or easing lending which has an impact on economic growth in the country. (Ćehajić & Košak, 2021). Data from the Indonesian MSME association in 2020 recorded a decrease in the contribution of MSMEs to GDP by 37.3%. This was caused by the declining performance of 82.9% of MSME players during the Covid-19 pandemic which affected the slowdown of the Indonesian economy. (Tarigan et al., 2022). The significant role of MSMEs in supporting the economy, reducing unemployment and poverty is the basis for the Indonesian government to restore MSME growth to positive. During the Covid-19 pandemic, the government issued several business stimulus policies that can be grouped into 8 (eight) policies in the framework of the National Economic Recovery (PEN) program, including relaxation policies in the form of postponement of MSME principal and interest installments, subsidies on MSME loan interest, Regional Incentive Funds (DID), tax incentives, special working capital stimulus for MSMEs affected by Covid-19, participation in Bank Himbara (Association of State Banks), productive Presidential Assistance (Banpres) and working capital guarantees. (Bappenas, 2020).

Figure 3. NPL Banking Industry in Indonesia
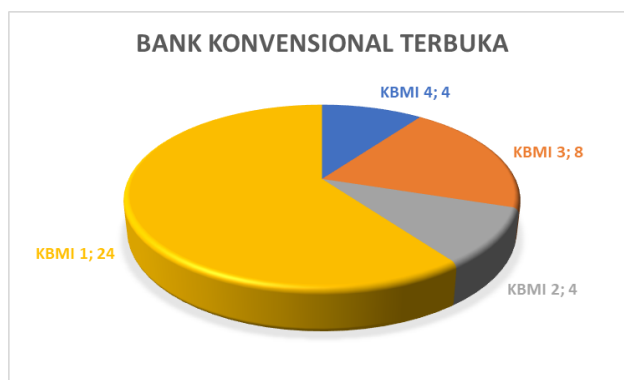Source: Statistik Perbankan Indonesia – OJK

With the potential of the MSME business, banks are faced with credit risk in the MSME business sector which is one of the financing business channels. Lending to the MSME sector has a higher risk than financing to other sectors such as commercial and corporate businesses (Ćehajić & Košak, 2022). The Covid-19 pandemic has caused MSME business actors to experience difficulties in running operations so that it affects the ability to repay bank loans which then has an impact on increasing the NPL rate of the banking industry. Banking statistics from 2012 to the Covid-19 pandemic in 2020 related to the NPL rate of the banking sector industry in Indonesia, although assisted by several government

stimulus policies, the NPL rate continues to show an increase so that a more in-depth analysis is needed from the bank towards MSME business actors (Figure 3). Competition in the banking industry in providing credit financing is also a challenge for each bank in managing its credit risk (Wardhani, 2012).

The large potential of MSMEs that have not received credit from banks and the stimulus of relaxation policies from the government to MSME business actors during the Covid-19 pandemic, still causes an increase in NPLs. This is an interesting study to see whether the issuance of macroprudential policies on the MSME financing ratio at public conventional banks in Indonesia can increase credit growth in the MSME sector. In addition, it also looks at how the impact of macroprudential policies on the level of credit risk in the MSME sector as seen from the NPL level. The results reveals that the policy significantly affects MSME's credit growth and NPL.

METHOD
Sample

Figure 4. Public Conventional Banks – KBMI
Source: Statistik Perbankan Indonesia - OJK

The sample used is 40 public conventional banks from a total of 47 banks listed on the Indonesia Stock Exchange. The 40 samples are grouped into categories of bank groups based on core capital (KBMI), which consists of 4 (four) banks in the KBMI 4 (four) category, 8 (eight) banks in the KBMI 3 (three) category, 4 (four) banks in the KBMI 2 (two) category and 24 (twenty-four) banks in the KBMI 1 (one) category. The criteria used to select the sample are (1) Bank ownership criteria is private and state-owned and (2) Business conducted by the bank is conventional.

Data Types and Sources
The data used is in the form of cross section and also time series starting from 2012 to 2021, obtained from annual reports that have been released on the website of each publicly listed conventional bank and summarized on the Indonesian stock exchange website. The year 2012 was chosen based on the first year of the effectiveness of the PBI regarding the MSME loan financing ratio.

Data Collection and Techniques
Research data collection is carried out by directly recording the required data from the website of each bank, the Indonesia Stock Exchange (IDX), the Financial Services Authority (OJK), Bank Indonesia (BI) and also the Central Statistics Agency (BPS).

Research Model

To test the first hypothesis, this study will examine the effect of macroprudential policy on the fulfillment of MSME loan financing ratio on MSME loan growth. The independent variables used in this study consist of internal and external factors of each bank. The internal factors in each bank selected are macroprudential policies on MSME loan financing ratio, MSME loan growth in the previous year, and bank characteristics which in this study the selected variables are bank size based on ROA and LDR in the previous year. External factors included in the research model are macroeconomic variables including inflation, BI interest rates, gross domestic income (GDP) figures and GDP growth in Indonesia.

Table 1. Explanation of Independent Research Variables

Independent Variable	Explanation
$RP_{i,t}$	Macroprudential policy The financing ratio of bank i MSME sector credit in year-t. The calculation method is the total MSME credit of bank i in year-t divided by the total credit distribution of bank i in year-t. Based on PBI, the MSME financing ratio by each bank is 20%.
$CGi,t-1$	Growth rate of bank i MSME sector credit in the previous year. The calculation method is the total MSME credit of bank i in year-t minus the total MSME credit of bank i in year t-1 then divided by the total MSME credit of bank i in year t-1
$BCi,t-1$	Bank Characteristics i in year-t (ROA, LDR) This variable consists of several variables, namely: - ROAi,t-1, return on asset bank i in previous year. - LDRi,t-1, loan to deposit ratio bank i in previous year.
$Macrot$	Macroeconomy condition in Indonesia in year-t (inflation, GDP nominal, GDP growth) This variable consists of several macroeconomic variables, namely: - INFt , annual inflation in Indonesia - BIt , Bank Indonesia's interest rate - RGDPt , Gross Domestic Product Nominal (GDP) in Indonesia annually. - PGDPt , Annual GDP Growth in Indonesia
CBi,t	Capital Buffer bank i in year-t Capital Buffer is part of the bank's capital or in other words, reserve capital outside the minimum core capital set by Bank Indonesia based on PBI No.10/15/PBI/2008 by 8% The calculation method is the difference between the capital adequacy ratio (CAR) owned by bank i in year-t and the minimum requirement ratio of 8%.

The model in this research on the first hypothesis will apply several research variables regarding macroprudential policy, bank character, macroeconomic conditions that affect bank credit growth that have been done by Marius, et al, (2022). The model to be tested is as written in the equation below:

$$CGi,t = \alpha + \beta1RPi,t + \beta2CGi,t + \beta3BCi,t-1 + \beta4Macrot \cdots\cdots\cdots\cdots\cdots..(1)$$

Remarks :
CGi,t   The growth rate of bank i MSME sector credit in year-t and is the dependent variable in this study.
RPi,t   Macroprudential policy The financing ratio of bank i MSME sector credit in year-t.
CGi,t-1   Growth rate of bank i MSME sector credit in the previous year.
BCi,t-1   Bank Characteristics i in the previous year (ROA, LDR)
Macrot   Macroeconomy condition in Indonesia in year-t (inflation, GDP nominal, GDP growth)

To test the second hypothesis, this study will examine the effect of macroprudential policies on the fulfillment of the MSME loan financing ratio on the level of MSME credit risk represented by the NPL variable in the MSME sector. The independent variables used in this study consist of internal and external factors of each bank. The internal factors in each bank selected are the financing ratio of MSME loans, capital buffers and bank characteristics which in this study the selected variables are bank characteristic based on ROA and LDR at each bank. External factors included in the research model are macroeconomic variables including inflation, BI interest rates, gross domestic income (GDP) figures and GDP growth in Indonesia. An explanation of each independent variable can be seen in the description in Table 1.

The model in this second hypothesis research will apply several research variables regarding the financing ratio and capital buffer, affecting the level of bank credit risk conducted by (Behncke, 2023) combined with other variables related to the characteristics of each bank and macroeconomic factors. The model to be tested is as written in the equation below:

$$NPLi,t = \alpha + \beta1RPi,t + \beta2CBi,t + \beta3BCi,t - 1 + \beta4Macrot \cdots\cdots\cdots\cdots\cdots(2)$$

Remarks :
NPLi,t NPL of the MSME sector of bank i in year-t is the dependent variable in this study.
RPi,t   Macroprudential policy The financing ratio of bank i MSME sector credit in year-t.
CBi,t   Capital Buffer bank i in year-t
BCi,t   Bank Characteristics i in year-t (ROA, LDR)
Macrot   Macroeconomy condition in Indonesia in year-t (inflation, GDP nominal, GDP growth).

RESULTS AND DISCUSSION
Pooled Least Square (PLS) Model

Table 2. Pooled Least Square Model Estimation Results for Macroprudential Policy on MSME Loan Growth

Variabel	Koefisien	Prob t-statistic
C	0,494526	
RPi,t	0,931880	0,05
CGi,t-1	-0,270795	0,15
ROAi,t-1	8,750396	0,03
LDRi,t-1	0,097016	0,47
INFt	-16,41467	0,00
BIt	34,90087	0,00
RGDPt	0,000610	0,19
PGDPt	5,839802	0,20
Adusted R2	0,064590	
Sum Square Resid	1117,791	
F-Statistic	6,510219	
Prob (F-Statistic)	0,000008	

Source: eViews

The estimation results in table 2 show that the probability of the F-statistic model (0.00%) < probability $\alpha = 5\%$, meaning that all independent variables together significantly

explain the dependent variable even though the Adjusted R2 value is 6,46% which is relatively small.

Furthermore, based on the results of the PLS model processing again on the second research hypothesis, the sign of the coefficient of the independent variable macroprudential policy on the financing ratio of MSME loans is in line with the hypothesis. The t-statistic probability value shows that the independent variable macroprudential policy financing ratio significantly affects the MSME NPL level variable at α = 5%. Other supporting variables show a positive influence such as LDR and real GDP. Other supporting variables show a negative such capital buffer, ROA, inflation rate, BI interest rate and GDP growth on credit risk variables with their respective significance.

Table 3. Pooled Least Square Model Estimation Results for Macroprudential Policy on MSME NPL

Variabel	Koefisien	Prob t-statistic
C	0,023404	
RPi,t	0,015259	0,02
CBi,t	-0,003555	0,41
ROAi,t	-0,161986	0,00
LDRi,t	0,000809	0,60
INFt	-0,121775	0,00
BIt	-0,138404	0,15
RGDPt	1,24E-06	0,75
PGDPt	-0,029592	0,43
Adusted R2	0,084407	
Sum Square Resid	0,113550	
F-Statistic	8,356646	
Prob (F-Statistic)	0,000000	

Source: eViews

The estimation results in table 3 show that the probability of the F-statistic model (0.00%) < probability α = 5%, meaning that all independent variables together significantly explain the dependent variable with an Adjusted R2 of 17,25% which is relatively small.

Descriptive Statistics

The following are the results of descriptive statistics after the winsorizing method:

Table 4. Descriptive Statistics

| Variabel	N	Mean	Std. Deviasi	Min	Maks
Variabel Dependen					
MSME Credit Growth	400	0,2222	1,7415	-0,8086	33,64
Credit Risk (NPL)	400	0,0205	0,0178	0	0,1055
Independent Variable					
MSME Financing Ratio	400	0,2249	0,1802	0,0113	1
Variabel Kontrol					
ROA	400	0,0111	0,0234	-0,1475	0,083
LDR	400	0,9418	0,6083	0,1235	7,6415
Capital Buffer	400	0,1812	0,2086	-0,0541	1,9357
Inflation	400	0,0385	0,0268	-0,1589	0,0838
BI rate	400	0,0558	0,0151	0,035	0,0775
GDP real	400	3.774	278,71	3332	4292
GDP growth	400	0,0434	0,0221	-0,0206	0,065

Source : eViews

The results of data collection based on Indonesian Banking Statistics along with the annual reports of each public conventional bank sampled in Table 4 and Figure 5 show that there is a decrease in compliance to meet the MSME financing ratio target of 20% from 2012 to 2021. At the time of the implementation of the MSME financing ratio macroprudential policy in 2012, there were 24 public conventional banks that could meet the MSME financing ratio target. In 2021, there were only 13 public conventional banks that can meet the target of fulfilling the MSME financing ratio.

Table 5. Financing Target Compliance of Public Conventional Banks

KBMI	#Bank	RP Comply	RP No Comply	%
1	24	10	14	42%
2	4	4	0	100%
3	8	1	7	13%
4	4	1	3	25%
Total	40	16	24	40%

Source: Annual Report of Public Conventional Banks in 2021

Figure 5. Financing Target Compliance of Public Conventional Banks
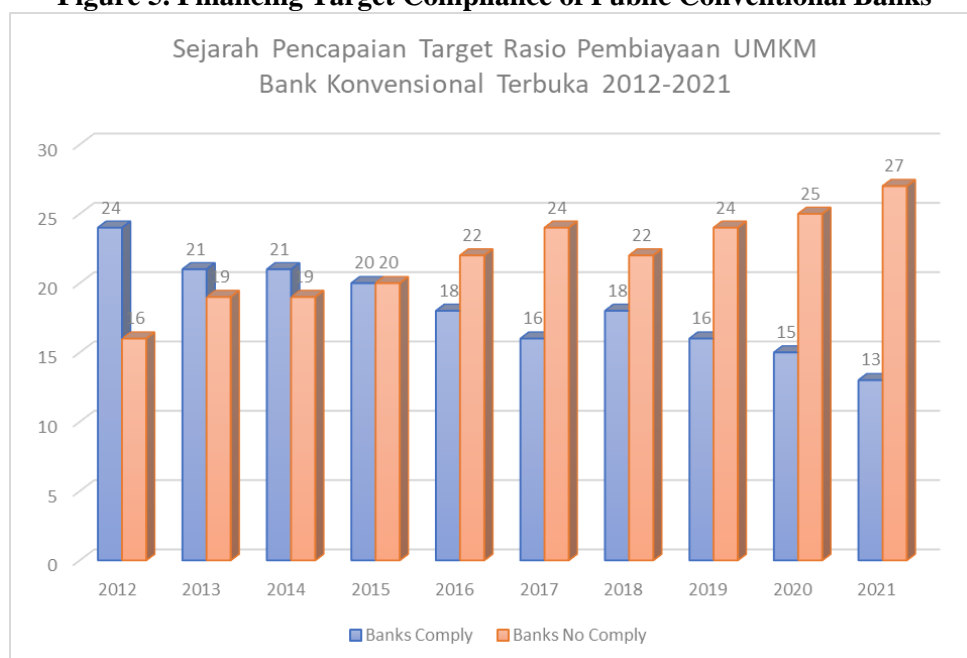
Source : Statistik Perbankan Indonesia – OJK

Discussion

The aggregate equation of the selected model, namely the Pooled Least Square Model. Based on the results of the regression model for first hyphothesis, it can be seen that the independent variable macroprudential policy MSME credit financing ratio used in the study is in accordance with the hypothesis that the independent variable has a positive and significant effect at the 5% confidence level. The macroprudential policy variable explains that there is a positive relationship between the macroprudential policy variable and the MSME credit growth rate in the sense that if there is an increase in the MSME financing ratio of a bank, the credit growth rate will increase by the variable coefficient. The results of this hypothesis are in line with the research of (Andrieş et al., 2022; Aslamah, A.N. & Pratama, 2022; Behncke, 2023; Foos et al., 2010; Gómez et al., 2020) who examined the effect of macroprudential policy on credit growth, especially MSMEs in the research of Cehajic, et al. (2022). This can be interpreted that macroprudential policies by setting targets for achieving

MSME financing ratios can help increase the amount of bank lending to the MSME sector which still has a need for capital assistance to run its business.

Based on the results of descriptive statistics, the average fulfillment of the MSME financing ratio at public conventional banks in the 2012-2021 period was 22.22%. The average fulfillment of the MSME financing ratio is in line with the average MSME credit growth at public conventional banks in the 2012-2021 period, which amounted to 22.46%. This shows that the macroprudential policy on MSME financing ratio has a positive impact on MSME loan growth at public conventional banks in the 2012-2021 period. Although in trend the number of public conventional banks that meet the MSME financing ratio target is decreasing and only banks in the KBMI 2 category are able to consistently meet the financing ratio target, on average it can still show positive MSME credit growth.

The bank characteristics variable represented by ROA in the previous year has a positive and significant effect on MSME credit growth in the sense that the better a bank's ROA shows the better profitability of a bank. The profit earned by the bank can be used to increase the amount of credit in the following year and is significant because the large profit is in line with the increase in available cash so that each bank can increase the portion of financing to the MSME sector to the maximum. This is in accordance with the term cash is the king. When referring to the balance sheet or cash flow of a business, the amount of cash available is a positive sign for the company. Cash shows real profitability that can help the company's business sustainability. The test results of the ROA variable are in line with the research of (Andrieş et al., 2022). Conversely, LDR in the previous year did not affect MSME credit growth. The results of this LDR variable test are in line with the research of (Pasaribu, 2021). This shows that both small and large banks have their own risk appetite in addressing LDR in the previous year for MSME financing in the following year. Macroeconomic variables such as real GDP figures, GDP growth rates and BI interest rates in the current year have a positive effect on MSME credit growth in the sense that an increase in GDP figures, GDP growth and BI interest rates indicates a growing Indonesian economy, so this has an impact on MSME credit growth which has a large contribution to Indonesia's GDP. This is in line with (Haryati, 2009) which examines the influence of macroeconomic variables on bank credit growth in Indonesia. On the other hand, macroeconomic variables, namely the inflation rate in the current year, did not significantly affect MSME loan growth. In addition, the variable MSME credit growth rate in the previous year did not affect MSME credit growth in the current year. This means that each bank has not made MSME credit growth the main target in managing the bank's business.

Based on the regression model results for second hyphothesis, it is known that the macroprudential policy variables used in the study are in accordance with the hypothesis, namely variables that have a positive and significant effect at the 5% confidence level. The macroprudential policy variable explains that there is a positive relationship between the MSME financing ratio variable and the MSME sector NPL level in the sense that if there is an increase in the MSME financing ratio of a bank, the MSME sector NPL level will increase by the variable coefficient. The results of this hypothesis are in line with the research of (Behncke, 2023; Foos et al., 2010) who examined the effect of macroprudential policies on credit risk.

The capital buffer variable of a bank in a particular year does not affect the NPL level of the MSME sector. The test results of the capital buffer variable are in line with the research of (ANISA & SUTRISNO, 2020; Behncke, 2023), capital buffers do not directly affect credit risk at a bank. The bank characteristics variable represented by LDR has a positive but insignificant effect on the growth of MSME credit risk in the sense that any bank with banking intermediation in a small or large LDR ratio will get an increased MSME credit

risk when MSME loans at the bank experience growth. This result is in line with the research of (Gaganis et al., 2013; Meuleman & Vander Vennet, 2020).

Macroeconomic variables in the form of real GDP have a positive but insignificant effect on MSME credit risk. Other macroeconomic variables such as the GDP growth rate, inflation rate and BI interest rate in the current year do not affect the credit risk of the MSME sector. The results of this macroeconomic variable test are in line with the research of (Fakhrunnas et al., 2022; Kim & Bachman, 2019).

CONCLUSION

The first conclusion from the results of hypothesis testing is that the results of this study indicate that macroprudential policy of MSME financing ratio has a positive and significant effect on MSME loan growth of public conventional banks. In the partial analysis to identify the effect of each independent variable on MSME loan growth, it is found that ROA in the previous year and BI rate have a positive significant effect. LDR in the previous year, nominal GDP and GDP growth have a positive but insignificant influence. In addition, the inflation rate and MSME loan growth in the previous year had no influence at all on MSME loan growth.

The second conclusion is that macroprudential policy of MSME financing ratio has a positive and significant effect on the growth of MSME credit risk, in this case NPLs in public conventional banks. In a partial analysis to identify the influence of each independent variable on the growth of MSME credit risk, it is found that LDR and nominal GDP have a positive but insignificant influence. In addition, capital buffer, ROA, inflation rate, BI interest rate and GDP growth have no influence at all on MSME credit risk.

Suggestions from this study, among others, for regulators, in making policies that have an impact on banks, they should look at each group of banks because a policy has a different effect on each bank so that it cannot make a reference or target that is the same for every bank. For practitioners in public conventional banks, in an effort to support the Indonesian government to increase financing to the MSME sector, they can start conducting their own assessments to determine the amount of achievement targets that can be achieved. For further researchers, all banks registered with OJK can be the object of research to see the effectiveness of this macroprudential policy on the growth of the MSME sector in Indonesia.

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