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The Effects of Credit Growth on Risk and Performance of Conventional Banks in Indonesia

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ABSTRACT

Indonesia is a developing country with a bank-based country structure. Credit is the largest component of banking assets. Credit growth with the low interest rates and low standard criteria for potential borrowers will have an impact on the credit risk faced by banks. The purpose of this study is to look into the effect of credit growth on the risk and performance of Indonesian conventional banks. This study uses dynamic panel data with the Generalized Method of Moment (GMM) approach. There are 3 hypotheses to be tested: first, the relationship between credit growth and credit risk using a credit loss approach. Second, the relationship between credit growth and bank profitability using a bank interest income approach. Third, the relationship between credit growth and bank solvency using the ratio of capital to assets. The data used in this study is taken from 93 conventional commercial banks registered with the Indonesia Financial Service Authority (Otoritas Jasa Keuangan) in the period of 2009-2019. The results showed that credit growth has a significant negative effect on credit risk and has a significant positive effect on the profitability and solvency of conventional commercial banks in Indonesia.

Keywords: Credit Growth, Credit Risk, Bank Profitability, Bank Solvency.

JEL Classification Codes: G20, G21, E51

INTRODUCTION

Indonesia is a developing country with a bank-based country structure (Besar, 2012). A banking crisis can drag the entire economy into recession. The consequences of the global financial crisis in 2008 are clear evidence showing the importance of maintaining a safe and healthy banking system. The banking industry in Indonesia has the largest market share of 79% in the financial system in Indonesia, so it is important to maintain a safe and healthy banking system. The economic development of a country is very dependent on the development and contribution of the banking sector because the role of financial institutions such as banking is needed to finance existing economic development (Sulistiyani, Gama & Astiti, 2019).

Banks are financial institution that have an important role in economic activity where banks become intermediaries between parties who have excess funds and parties who need or lack of funds (Lembong, 2020). The channeling of funds feature, also known as credit channeling, is characterized as a bank instrument with an intermediary function influenced by bank liquidity conditions. According to Manurung and Rahardja (2004), there are several important reasons why banks carry out various strategies to increase their credit levels. One of the reasons is that the activity of lending is a profitable asset in bank acceptance.

Lending activities are closely related to bank performance, which is reflected in profitability, particularly in the interest income received by banks (Manurung & Rahardja, 2004). Based on data from the Financial Services Authority (Otoritas Jasa Keuangan), credit is the largest component of banking assets as shown in the figure below. This

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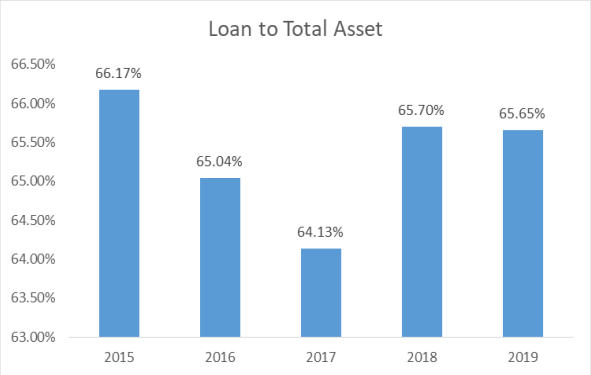
shows that credit activity has an important role in contributing to bank profitability. Healthy profitability is very important in maintaining the stability of the banking system (García-Herrero, Gavilá & Santabárbara, 2009). Profitability affects company value. This means that the higher the company's profitability, the higher the company's value (Dewi & Novitasari, 2021).

Figure 1. Loan to Total Asset



The banking sector needs to encourage credit growth in order to enhance its function as an intermediary institution. According to Keeton (1999), credit growth can be caused by three things, namely encouragement from the bank side (supply shift) and the debtor side (demand shift and productivity shift). According to the findings of research conducted by Dell'Ariccia and Marquez (2006) and Ogura (2006), banks can increase credit in a variety of ways, including lowering interest rates on loans offered, loosening the terms of collateral provided to obtain credit, and loosening the criteria for prospective debtors.

Credit growth with the low interest rates given and the low standard criteria for potential borrowers will have an impact on the credit risk faced by banks (Foos, Norden & Weber, 2010). Based on research conducted by Salas and Saurina (2002), credit growth has a significant positive effect on credit risk experienced by banks in the next three to four years. According to Dell'ariccia, Igan and Laeven(2008), credit growth which is supported by low interest rates on loans will result in credit losses to banks. According to Sinkey and Greenawalt (1991), the average credit growth in the past has had a significant positive effect on the level of credit losses. According to Harun, Rachmanira and Nattan (2013), one source of credit risk is the failure of the debtor to make payments or fulfill his obligations related to financial activities.

Indonesia now has 109 banks, making it one of the Southeast Asian countries with a very large number of banks compared to other Southeast Asian countries. State-owned banks or Persero Banks, National Private Commercial Banks (BUSN) both foreign exchange and non-foreign exchange, regional development banks (BPD), foreign banks, and joint venture banks are all classified by the Financial Services Authority based on the type of ownership.

In a fairly comprehensive study of credit growth, (Foos, Norden & Weber, 2010) discovered that in most OECD countries, high credit growth has led to higher risks for banks in subsequent years, implying that implementing a growth strategy based on fast credit causes banks to perform worse. There is some previous research done in developing countries, such as Vietnam (Dang, 2019), but the author wants to test the result in Indonesia. The author tries to do research in an aggregate manner to analyze the effect of credit growth on credit risk through the credit loss approach, profitability with

the interest income approach, and solvency with the capital to asset ratio change approach.

Based on research conducted by Foos, Norden and Weber (2010) and Amador, Gómez-González, and Pabón (2013), use a measure of abnormal credit growth to see its effect on risk and banking performance. However, the author only applies it to credit growth in this study because, in the author's opinion, there has been no abnormal credit growth in Indonesia. In addition, according to the analysis conducted by Laidroo and Männasoo, 2013), the study has several weaknesses that make the relationship between abnormal credit growth and provision for credit losses weak, namely ignoring bank-specific differences in terms of credit growth problems as well as making long-term growth trends in the banking market hard to determine.

In this study, the author also modifies by adding a dummy variable based on the category of bank ownership according to the division of the Financial Services Authority (Otoritas Jasa Keuangan), namely state-owned banks, private banks, bank branch offices domiciled abroad and local government banks. The author wants to see if there are differences in lending to the risk and performance of each group of banks. This is because based on research conducted by Goldberg, Dages and Kinney (2000) suggested that foreign banks can outperform domestic banks in developing countries, possibly because foreign banks have been able to implement better systems and management than domestic banks. According to Lannotta, Nocera and Sironi (2007), differences in ownership status affect bank profitability and cost efficiency. This difference stems from differences in the risk-taking behavior of each bank. Based on the results of research conducted by Claessens and van Horen (2012), foreign banks located in developing countries will operate significantly better than domestic banks, and foreign banks are stated to have better risk management than domestic banks.

This research is expected to provide important implications for bank managers and policy makers to realize the duality of rapid credit growth and the urgent need for risk governance and capital management. This is very important for Indonesia, where economic growth is mainly financed by loans extended by banks.

RESEARCH METHOD

This study uses dynamic data panels from 93 conventional commercial banks registered with the Financial Services Authority (Otoritas Jasa Keuangan). These banks were observed for 10 years from 2009 - 2019. However, because there is a lag of up to 3 years for the independent variables, the research period for each variable is from 2013 - 2019. The data sources of this study were obtained from the Thomson Reuters application and the website of the Financial Services Authority. Data processing in this study using Microsoft Excel and Eviews 11 software.

There are three research hypotheses for this research:
Hypothesis 1 examined whether the previous period's increase in credit distribution had an effect on bank credit risk. The model is:

$$LL_{i,t} = \alpha + \beta_1 LL_{i,t-1} + \sum_{k=1}^{3} \left(\beta_{k+1} LG_{(i,t-k)}\right) + \beta_5 SIZE_{i,t} + \beta_6 EQASSETS_{i,t} + \beta_7 OWN_{i,t} + \varepsilon_{i,t}$$

with $LL_{i,t}$ is loan losses period t, $LL_{i,t-1}$ is loan losses period t-1, $LG_{(i,t-k)}$ is loan growth with a lag of 1 - 3 years, $SIZE_{i,t}$ is bank size, $EQASSETS_{i,t}$ is capitalization of the bank and $OWN_{i,t}$ is the bank specialization variable in this study was divided into 4 categories based on the type of ownership, namely government banks, private banks, foreign banks and local government banks.

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The formula for loan losses variable is loan losses provision at period t divided by total customer loan at period t-1 and the formula for loan losses lag 1 variable is loan losses provision at period t-1 divided by total customer loan at period t-2. Next, formula for loan growth variable is:

$$LG_{i,t} = \frac{Total\ customer\ loans_{i,t} - Total\ customer\ loans_{i,t-1}}{Total\ customer\ loans_{i,t-1}}$$

And the formula for the variable bank size variable is logarithm total customer loans.

Hypothesis 2 investigated whether the expansion of credit distribution has an impact on bank profitability. The model is:

$$\Delta RII_{i,t} = \alpha + \beta_1 LG_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 EQASSETS_{i,t} + \beta_4 OWN_{i,t} + \varepsilon_{i,t}$$

with $\Delta RII_{i,t}$ is delta bank interest income and other variable same with hypothesis 1. The formula for $\Delta RII_{i,t}$:

$$\Delta RII_{i,t} = RII_{i,t} - RII_{i,t-1}$$

The formula for $RII_{i,t}$:

$$RII_{i,t} = \frac{Gross\ Interest\ Income_{i,t}}{Average\ (Total\ customer\ loans_{i,t-1} + Total\ customer\ loans_{i,t})}$$

Hypothesis 3 investigated whether the expansion of bank lending has an effect on bank solvency. The model is:

$$EQASSETS_{i,t} = \alpha + \beta_1 LG_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 OWN_{i,t} + \varepsilon_{i,t}$$

For the calculation of the ratio of capital to assets is total equity at period t divided by total asset at period t.

RESULTS AND DISCUSSION

Descriptive statistics provide an overview of the variables used in the study. The following are the results of descriptive statistics in this study:

Table 1. Descriptive Statistics (N=651)

Variable	Mean	Median	Standard Deviation	Maximum	Minimum
LOAN_LOSSES	0.0319	0.0148	0.0686	0.6839	0.0005
LOAN_GROWTH	0.1739	0.1103	0.3291	4.1780	-0.5579
EQUITYASSET	0.1669	0.1421	0.2215	3.9643	-0.0090
SIZE	7.0573	7.0169	0.7071	8.9627	5.3848
DELTARII	0.0141	0.0075	0.0301	0.4123	8.7E-06

It can be seen from the table above that the mean for variable loan losses (LOAN_LOSSES) of commercial banks in Indonesia is 0.0319 with a standard deviation of 0.0686. The lowest value of 0.0005 and the largest value of 0.6839. This shows that the average commercial bank studied had a low level of credit losses during the study period, namely 3.19% of the total credit.

The average of variable loan growth (LOAN_GROWTH) was 0.1739 with a data distribution of 0.1103. The lowest value was -0.5579 while the largest was 4.1780. This shows that the average credit growth rate of conventional commercial banks under study is relatively high, namely 17.39%.

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For bank capitalization (EQUITYASSET), the average was 0.1669 with a spread of data of 0.2215. The smallest value for bank capitalization was -0.0090 and the largest value was 3.9643.

The average size of the commercial bank (SIZE) was 7.0573 with a spread of data of 0.7071. The average size of this bank is considered good considering the range of bank sizes, from the smallest is 5.3848 and the largest 8.9627.

The average difference in interest income in the previous period (DELTARII) of the conventional commercial banks studied was 0.0141 with a spread of data of 0.0301. The lowest value of 8.7E-06 while the highest value of 0.4123.

This research uses the Generalized Method of Moment (GMM) approach because there are advantages of GMM estimation are that it is possible to estimate in more detail on research data that has parameter uncertainty problems such as when the dependent variable has unknown parameters and must be estimated (Bontemps & Meddahi (2005)). GMM can also be used on data that ignores the distribution of the distribution function and does not require assumptions to be met like other classical estimation methods. Unlike other estimation methods, Research conducted by (Hsiao, 2003) argued that GMM does not have to fulfill several assumptions such as normal distribution, homoscedasticity and non-autocorrelation.

The following are the results of the regression for Model 1, 2 and 3:

Table 2. Regression Results Model 1, 2, 3

Model 1 **R squared: 0.743501**			**Model 2** **R squared: 0.467179**			**Model 3** **R squared: 0.425323**		
Dependent Variable	Loan_losses		Dependent Variable	Delta_RII		Dependent Variable	EquityAsset	
Independent Variable	Coeff	P Val	Independent Variable	Coeff	P Val	Independent Variable	Coeff	P Val
Loan_losses_lag1	0.7799	0.0000	Loan_growth	0.0299	0.0003	Loan_growth	0.0134	0.0458
Loan_growth_lag1	-0.0139	0.0036	Size	-0.0095	0.0027	Size	-0.0286	0.0342
Loan_growth_lag2	0.0003	0.8631	EquityAsset	0.0067	0.2416	Dummy_ Government Bank	-0.0057	0.9470
Loan_growth_lag3	-0.0001	0.9538	Dummy_ Government Bank	0.0064	0.3823	Dummy_ Privated Bank	-0.0019	0.9659
Size	-0.0809	0.0581	Dummy_ Privated Bank	-0.0009	0.7281	Dummy_ Foreign Bank	-0.0960	0.0732
EquityAsset	0.0028	0.4713	Dummy_ Foreign Bank	0.0024	0.3435	Constant	0.3760	0.0424
Dummy_ Government Bank	-0.0006	0.8924	Constant	0.0746	0.0091			
Dummy_ Privated Bank	0.0025	0.3781						
Dummy_ Foreign Bank	-0.0026	0.5586						
Constant	0.0139	0.1871						

Model 1 has an R-squared value of 0.743501. This means that the variables in this model are able to explain the variation in the dependent variable, namely the credit loss of 74.35%. Meanwhile, model 2 has an R-squared value of 0.467179. This means that the independent variables used in the model are able to explain the variation in the dependent variable, namely the interest income of 46.72%. And model 3 has an R-squared value of 0.425323. This means that the independent variables used in the model are able to explain the variation in the dependent variable, namely the bank's solvency of 42.53%.

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Based on the estimation results for model 1, the variables that significantly affect credit losses are Loan Losses Lag 1, Loan Growth Lag 1 and Size. For model 2, the variables that significantly are Loan Growth and Size. Meanwhile, for model 3, the variables that significantly affect are Loan Growth, Size and Dummy_Foreign Bank.
The coefficient for the Loan Losses lag 1 variable in model 1 is 0.7799, indicating that credit losses in the previous period had a significant positive effect on credit losses in year t. The previous period's high credit loss will influence the bank's decision to increase provision for credit losses. This is done to anticipate the possibility of bad loans. This previous period of credit loss is included as a variable to control the overall risk characteristics of the bank.

For Loan Growth Lag 1 variable significantly affects the dependent variable. The coefficient of loan growth lag 1 is -0.0139. An increase in credit risk occurs because credit is extended to risky debtors.

Based on the theory put forward by (Keeton, 1999), credit growth that occurs in Indonesia is based on the existence of demand shifts and productivity shifts, so that credit growth does not increase credit risk experienced by banks. A demand shift is an increase in credit demand originating from the debtor side. The increase in demand for credit resulted in an increase in the expected rate of return of loans. Banks not only increase the interest rates given but also raise credit standards in lending. The tightness of credit standards provided will reduce the possibility of giving credit to unworthy debtors, so this will reduce the possibility of credit losses in the future.

In addition to the demand shift, credit growth that does not increase credit risk is due to the productivity shift (Keeton, 1999). A productivity shift is an increase in the overall productivity of the debtor. The existence of a productivity shift will increase the ability of debtors to repay their loans. Therefore, banks can lower their credit standards. This decrease in credit standards was not followed by an increase in credit losses. This is because, even if a prospective debtor is accepted despite having a poor credit history, this will be offset by an increase in the debtor's ability to repay loans as a result of the productivity shock.

Meanwhile, credit growth with a lag of 2 and 3 years is not statistically significant in affecting the dependent variable. Therefore, credit growth is assumed to have a statistically significant effect on credit losses only in the short term but not in the medium term.

In model 1, the Size variable describes the size of a bank as measured by the total credit extended by the bank. By using a significance level of 10%, this variable has a statistically significant negative effect on the dependent variable. This means that large banks tend to have lower credit risk than small banks. This negative relationship means that the larger the size of the bank, the greater the credit distributed, the lower the credit losses faced by the bank. This is because the larger the size of the bank, the better risk management will be compared to smaller banks (Foos, Norden & Weber, 2010). Therefore, with better risk management compared to small banks, large banks tend to have smaller credit losses. Bank size has a significant negative effect on bank risk because large banks are more risk averse than small banks (Delis & Kouretas, 2011). Large banks have a higher chance of diversifying their credit portfolios than small banks (Salas & Saurina, 2002).

The capitalization variable (Equity Assets) in model 1 is considered not statistically significant to affect credit risk. As this result, capitalization does not affect credit losses. The capitalization variable coefficient (Equity Assets) obtained from the estimation results is 0.0028. The results also show that the dummy control variable for bank

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specialization based on the type of ownership (state banks, private banks, foreign banks and BPD banks) has no effect on credit losses.

For model 2, the variable coefficient of credit growth (Loan growth) of 0.0299 means that when there is an increase in credit growth of 1 unit, it will increase bank interest income (Delta_RII) by 0.0299 units. The results of this study are in line with research conducted by (Claessens & van Horen, 2012) which says that an increase in loans disbursed will increase bank profitability. What can be concluded from this research is that credit growth in Indonesia has a significant positive effect on profitability due to an increase in the volume of loans disbursed with prudence principles so as to maintain the quality of loans. The increase in credit provided was based on the demand shift and productivity shift, not from the supply shift. The interest income received by the bank is not only determined by the interest rate but is also influenced by the probability of being repaid the loans disbursed. So that improving the quality of credit provided is one of the important things to pay attention to.

Meanwhile, the Size variable has a significant negative effect on the dependent variable, namely bank interest income. This is not in line with the research conducted by (Foos, Norden & Weber, 2010). According to Foos, Norden & Weber (2010) banks with large sizes have a tendency to be able to increase the lending rate compared to banks with small sizes. The larger the bank, the greater the credit interest rate charged to debtors. However, the results of this study are in line with (Amador, Gómez-González & Pabón, 2013) and (Maudos, 1998). Bank size has a significant negative effect on profitability indicating the effect of intense competition on the market (Maudos, 1998). The negative relationship between bank size and bank profitability is because large banks tend not to charge higher loan interest rates than small banks. This is due to competition in getting debtors. Therefore, bank size has a negative relationship to bank profitability which is reflected in bank interest income.

Furthermore, the variable of bank capitalization (Equity Assets) is considered not statistically significant affecting the dependent variable, namely Delta RII. The capitalization variable coefficient (Equity Assets) obtained from the estimation results is 0.0067. These coefficients indicate that the capitalization variable has a positive relationship with bank profitability which is reflected in bank interest income. This is not in line with research conducted by (Foos, Norden & Weber, 2010) that the higher the capitalization rate, the bank will set a low interest rate so that it reduces its profitability and conversely, the lower the capitalization rate, the bank will set a high interest rate so that it will increase profitability, the bank's profitability. In research in Indonesia, banks with high capitalization rates will set high interest rates as well, and this will increase bank profitability. The positive relationship between the level of capitalization and bank profitability is in line with the research of (Athanasoglou, Brissimis & Delis, 2008). The study explains that there is a positive influence of the level of capitalization on bank profitability because capital reflects the amount of internal funds owned by the bank available to support banking business activities, so that the higher the bank's capitalization is expected to increase its profitability. In addition, based on (Iannotta et al., 2007), the more capitalized a bank is, the more it describes the quality of good management so that it will have a positive impact on profitability.

The study explains that there is a positive influence on the level of capitalization on bank profitability because capital reflects the amount of internal funds available to the bank to support banking business activities, so that the higher the bank capitalization is expected to increase its profitability. In addition, based on (Iannotta et al., 2007), the more capitalized a bank is, the more it describes the quality of good management so that it will have a positive impact on profitability.

The results also show that the dummy control variable for bank specialization based on the type of ownership (state banks, private banks, foreign banks and BPD banks) has no effect on interest income.

For model 3, the credit growth coefficient (Loan growth) of 0.0134 means that an increase in credit growth of 1 unit will increase the solvency (Equity Assets) of 0.0134 units. Credit growth has a significant positive effect on solvency. Credit growth has a positive relationship with bank solvency because credit growth carried out by banks is financed based on new equity, which causes an increase in the ratio of capital to total assets (Foos, Norden & Weber, 2010). The growth of channeled credit will increase the profitability of the bank, so the bank will have larger retained earnings. The retained earnings will be used as new equity so that it will result in an increase in bank solvency.

Credit growth has a positive relationship with bank solvency because credit growth carried out by banks is financed based on new equity, causing an increase in the ratio of capital to total assets (Foos, Norden & Weber, 2010). The growth of loans disbursed will increase the profitability of the bank, then the bank will have larger retained earnings, the retained earnings will be used as new equity so that it will result in an increase in solvency in the bank. These results indicate that there is an increase in assets, namely loans disbursed accompanied by an increase in capital by banks. The positive relationship between the variables of credit growth and bank solvency is in line with the existence of credit disbursement carried out with the principle of prudence based on the adequacy of the bank's authorized capital (Neven, 2002).

The bank size variable (Size) in model 3 has a significant negative effect on bank solvency. This means that large banks tend to have a lower level of solvency than small banks. This is due to the influence of the too-big-too-fail policy. Banks with large sizes can enjoy guarantees from the government or regulators not to be allowed to fail (Foos, Norden & Weber, 2010). In addition, based on Awdeh, Moussawi & Machrouh (2011) that the size of the bank affects the capital chosen by the bank, the larger the size of the bank, the easier it is for the bank to get funds from the capital market. Therefore, larger banks will choose a lower capitalization level than banks with smaller sizes.

The dummy foreign bank variable is significant at level 10%. Based on research conducted (Claessens & van Horen, 2012), foreign banks tend to be easier to raise capital internationally than domestic banks. The assumption that the researcher can convey is that foreign banks tend to be easier to increase solvency compared to domestic banks. This allegation requires further research to obtain more concrete evidence.

CONCLUSIONS

Based on the results of research in Indonesia using a sample of conventional commercial banks in the period 2009 to 2019, it can be concluded that credit growth has a significant negative impact on credit risk, which is reflected in credit losses. Credit growth that does not increase credit losses is credit growth driven by the demand shift and/or the productivity shift. Overall, credit growth has a significant negative effect on credit risk only in the short term but does not have a significant effect in the medium term.

Credit growth has a significant positive effect on profitability, which is reflected in bank interest income. Although lending rates tend to decline, the rapid increase in credit volume has resulted in an increase in average bank interest income. In addition, an increase in the volume of loans extended on a prudent basis to maintain the quality of loans also contributed to an increase in interest income received by banks. The bank interest income is not only determined by the loan interest rate but is also influenced by the probability of repayment of loans extended.

Credit growth has a significant positive effect on solvency, which is reflected in changes in the ratio of capital to total assets. This is because the credit growth carried out by banks is financed based on new equity, which causes an increase in the ratio of capital to total assets. The growth of channeled credit increases the profitability of the bank, so the bank will have larger retained earnings. The retained earnings will be used as new equity so that it will result in an increase in bank solvency. This means that the growth of credit extended is accompanied by an increase in solvency.

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