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Abstract

This study aims to determine the effect of competition on bank credit risk in ASEAN. In this study, the dependent variable used is credit risk with non-performing loan (NPL) as the indicator. The independent variable used in this study is competition which is calculated using the lerner index indicator, where the lerner index is the inverse proxy of the level of competition. This research is supported by six control variables including credit growth, return on assets (ROA), bank size, income diversification, return on equity (ROE), and risk weighted assets (RWA). This research uses descriptive quantitative research, where the regression model used is dynamic panel data estimated using the Generalized Method of Moment (GMM). The population for this research object is taken from 101 banks located in six countries in ASEAN. Determining the research sample based on the population used purposive sampling method, so that 84 banks were selected that met the criteria set by the researcher. The data source used in this study is secondary data, which is the annual financial publication report of each bank institution that is the object of research. Based on data testing and estimation, the research results obtained show that the independent variable of competition has a negative and significant effect on the dependent variable of credit risk.

Keywords: Competition; Credit Risk; Lerner Index; General Method of Moment (GMM)

1. Introduction

The impact of bank competition on financial stability remains a widely debated and controversial issue, both among policymakers and academics. The global financial crisis has shown how disruptive financial crises can be to the economy. [1] show that during 1970-2011, the world median output losses and fiscal costs caused by banking crises were 23.2 and 6.8 percent of GDP, respectively. Banking sector competition is generally seen as an important driver of investment and economic growth. It ensures efficient allocation of resources and capital, and prevents a situation where market dominance by a few large banks drives up the cost of credit and limits access to credit for small entrepreneurs and poorer segments of society. However, despite its potential benefits, greater competition can also have negative side effects in the form of excessive competition by new market entrants and reduced profit margins. This in turn may increase the risk-taking incentives of existing banks. On the one hand, more competition will reduce banks' ability to earn profits and generate lower value, which encourages banks to compensate by taking higher risks [2]. This can be explained through the competition-fragility view which explains that more bank competition will erode market power, lower profit margins, and result in reduced franchise value and ongoing concerns or the bank's market value exceeding its book value. On the other hand, more competition makes bank loans cheaper, which reduces the moral hazard incentive of borrowers to switch to riskier projects and attracts more borrowers [3]. This situation can be explained by the competition-stability view, which states that lower competition in the loan market can lead to higher interest rates charged to loan customers, making it harder for customers to repay loans and exacerbating borrowers' moral hazard incentives to switch to riskier projects. Higher interest rates may also result in riskier borrowers due to adverse selection considerations [3]. The effect of competition on bank financial stability can also be seen through the relationship between competition and bank credit risk. Some studies analyzed the impact of competition on bank risk, but these studies focused on overall bank risk and not on credit risk. However, some studies use bad debt ratio as overall bank risk, stating that credit risk is the main factor driving bank risk [4].

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2. Literature Review

A long-standing theory in the industrialized world holds that firms in monopoly markets may sacrifice some excess profits in favor of a quieter life. This was first stated by John Richard Hicks in 1935 in his paper "The Theory of Monopoly" which is now famous as: "The best of all monopoly profits is a quiet life". Given the increasing development of the behavioralist view of the firm over the past two decades, with its emphasis on non-profit profit maximizing behavior. The quiet life theory states that market concentration allows banks to accept a rental value that is perceived as the present value of a series of high future profits for the bank. Managers and shareholders tend to be more risk-averse, raising capital and/or reducing risk on their portfolio assets [5]. Under these conditions, it is considered that the value of bank receivables is an appropriate supervisory tool for supervisory authorities to reduce risk and ensure the financial stability of the banking system.

The theoretical foundation for financial stability in banking markets refers to two conflicting views on the relationship between banking market competition and bank stability. The first literature supports the competition-fragility view, where higher competition is expected to be accompanied by lower bank stability which in turn will increase the vulnerability or fragility of the banking system. Michael Keeley in his paper "Deposit Insurance, Risk, and Market Power in Banking" in the American Economic Review in 1990, found that the high rate of bank failures in the United States in the 1980s was (at least partly) due to various deregulation measures and market factors that reduced monopoly rents (denoted by 'rental value') and thus increased the value of bank managers' options on deposit insurance funds. Increased competition in the 1980s eroded monopoly rents and led to an increase in bank failures in the United States. In a situation where a large number of banks compete, profit margins erode and banks may take excessive risks to increase profits. As more and more marginal credit applicants receive financing, the quality of the loan portfolio tends to deteriorate and thus increases bank fragility.

The second theoretical literature supports the competition-fragility argument, where higher banking market competition is expected to improve bank stability and thus financial system stability. [3] in their paper "The Theory of Bank Risk Taking and Competition Revisited" argued that greater market power in the credit market may result in higher bank risk because higher interest rates charged to loan customers will make it harder for customers to repay loans and exacerbate the moral hazard incentives of borrowers to switch to riskier projects. A highly concentrated banking market may result in greater levels of risk-taking if institutions are perceived as too big to fail and are more likely to be directly or indirectly protected by the government guarantee system. A low level of competition will cause the banking market to increase interest rates on loans, which will cause borrowers to take on riskier ventures to cover the interest costs. The likelihood of default by borrowers will be greater, increasing the risk to the bank.

3. Methods

This study uses secondary data or a type of data that is not collected directly but rather data that contains information that has been collected and compiled by other parties previously, such as scientific papers, company documents, or government documents. In this study, the data used is financial statement data available and published on the website of each banking company and obtained bank-level financial statement data from Refinitiv (LSEG) streaming data during the period 2011-2022. The research to be conducted uses panel data which is a combination of data between cross-section data and time series data. This study uses one dependent variable, namely credit risk calculated by Non-Performing Loan (NPL). competition calculated using the Lerner Index as an independent variable, and six control variables, namely annual real credit growth, return on assets (ROA), bank size or market share (Size), income diversification (HHI), Return on Equity (ROE), and RWA to capital (RWA).

A more competitive banking system will be more stable (competition-stability view). [3] introducing their model of credit market competition, argue that higher lending rates in a more concentrated system encourage bank borrowers to bear greater risk which results in increased bad debts. This effect can be amplified if lower competition is associated with credit rationing, unfavorable selection and larger loans. Other models suggest that less competitive environments with larger banks are distorted by implicit government guarantees and have higher systemic risk.

Hypothesis I: Competition is negatively and significantly correlated with bank credit risk.

Data processing and hypothesis testing were carried out using the help of Microsoft Office Excel 2019 and Stata 17 applications. The use of panel data regression analysis using static models is not very effective because it can cause several econometric problems. The inclusion of lags in the dependent variable in a model where there are individual effects will cause biased effects. Ordinary Least Square assumptions such as heteroscedasticity and autocorrelation will be difficult to meet in panel data regression analysis due to the tendency of influence between individuals and between time observations in the model. The Generalized Method of Moment (GMM) method is the best estimation method for panel data involving lags in the dependent variable, namely the existence of autocorrelation due to the presence of lags in the dependent variable, causing a dynamic relationship between data [6]. Dynamic relationships in the model will result in the emergence of endogeneity problems, so that when estimating with static panel data analysis will produce biased and inconsistent estimates [7]. In the Generalized Method of Moment (GMM) estimation method, there are 2 model approaches that can be used to analyze dynamic panel data, including First Difference GMM (FD-GMM) and System GMM (Sys-GMM). [8] and [9] included lagged dependent variables as regressors in the model to reduce the

possibility of endogeneity, so they developed GMM estimators for dynamic panel modeling. This study uses the two-step GMM estimation technique to handle the endogeneity problem that may occur in the given model. This study uses the two-step system GMM estimator instead of the difference GMM estimator because the former allows for the inclusion of more instruments by adding a second equation which should improve estimation efficiency. To examine the determinants of credit risk, this study uses dynamic panel regression. The basic estimation model is specified as follows:

$$NPL_{it}=\beta_0+\beta_1 NPL_{it-1}+\beta_2 Komp_{i,t}+\beta_3 Credit_{i,t}+\beta_4 ROA_{i,t}+\beta_5 Size_{i,t}+\beta_6 Div_{i,t}+\beta_7 ROE_{i,t}+\beta_8 RWA_{i,t}+u_{i,t}$$

In the above equation i, t describes the combination of cross section and time series data, i indicates cross section, and t indicates time or time series with the following information:

NPL = Credit Risk/ Non-Performing Loan
β0 = Constant
β1-β8 = Regression Coefficient
NPLit-1 = Credit Risk/ Non-Performing Loan Previous Period
Komp = Competition/ Lerner Index
Credit = Real Credit Growth
ROA = Return on Asset
Size = Bank Size
Div = Income Diversification
ROE = Return on Equity
RWA = Risk Weighted Asset
ui, t = error term

Table 1. Description of the variables.

Variables	Describtion	Source
Non-Performing Loan (NPL)	The ratio of non-performing loans (NPLs) to total loans issued by the bank.	Refinitiv (LSEG)
Lerner Index	A measure of bank market power and defined as the ratio between mark-up (price minus marginal cost) and price, the bank's marginal cost is estimated using the translog cost function.	Own Estimation
Credit Growth	The growth rate of loans granted by banks as a percentage change in total loans from the previous year to the current year.	Refinitiv (LSEG)
Return on Asset (ROA)	The percentage of net income of the company in relation to the total assets owned by the company.	Refinitiv (LSEG)
Bank Size	Bank size can be defined as the extent of its business coverage, measured in terms of its assets, calculated by the natural logarithm of the bank's total assets.	Refinitiv (LSEG)
Income Diversification (HHI)	Accounts for variations in the breakdown of net operating income into two broad categories: net interest income and non-interest income.	Own Estimation
Return on Equity (ROE)	A measure of the amount of net profit generated by a company compared to its shareholders' equity.	Refinitiv (LSEG)
Risk Weighted Asset (RWA)	Different risk weights on different types of assets held by the bank.	Refinitiv (LSEG)

Source: Research Processed Data with Stata 17

Hypothesis testing in this study as for the criteria set-in decision-making is at the $\alpha = 5\%$ or 1% level in the hope that the hypothesis is accepted. Statistical testing is a very important step in analyzing quantitative data generated in research. This test aims to determine and determine whether the data being analyzed is outside the projection and range of values predicted by the hypothesis.

4. Results

Descriptive statistical analysis in this study aims to provide an overview of the estimated value of statistical data in the form

of mean value, minimum value, maximum value and standard deviation value calculated according to each variable processed by the Stata 17 application. Descriptive analysis in this study was carried out by describing the statistical data of banks that became research samples in the 2011-2022 period.

Table 2. Descriptive Analysis Results

Variable	Mean	Median	Std. Deviasi	Minimum	Maximum
Non-Performing Loan (NPL)	0,031874	0,0249	0,030779	0,0001	0,3455
Lerner Index	0,823546	0,850814	0,080568	0,400294	0,950898
Credit Growth	0,174246	0,107	0,544938	-0,639	9,764
Return on Asset (ROA)	0,011626	0,013	0,018314	-0,147	0,061
Bank Size	15,50963	15,25692	2,9276	7,890583	21,47497
Income Diversification (HHI)	0,357929	0,403272	0,230545	-5,09093	0,5
Return on Equity (ROE)	0,103486	0,1225	0,145325	-1,333	0,61
Risk Weighted Asset (RWA)	15,0741	14,80751	2,947326	6,683281	20,83114

Source: Research Processed Data

Figure 1. explains the fluctuations in the average value of the NPL variable as an indicator of credit risk which is the dependent variable and the Lerner Index variable as an indicator of competition which is an independent variable from 2011 to 2022. In the graph, it can be concluded that the value of the NPL variable decreased from 2011 to 2013, then increased until 2018, and again showed a decrease towards 2022. For the Lerner Index variable, it also shows varying fluctuations, which shows a downward trend until 2017, then increases again until 2019, and experiences fluctuations that tend to decrease until 2022.

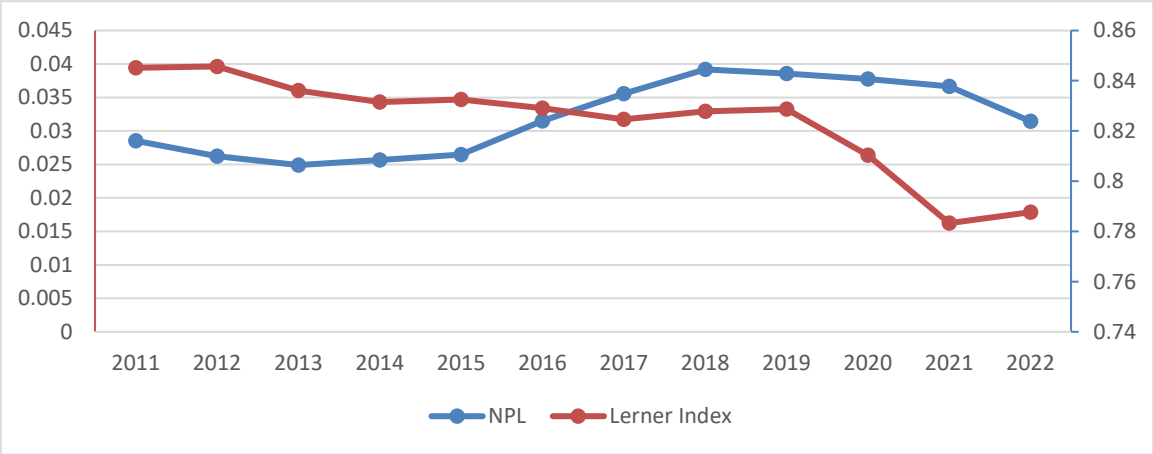

Figure 1. Movement of NPL Variables and Lerner Index Period 2011 – 2022
Source: Research Processed Data with Stata 17

Based on the test results using the previous Generalized Method of Moment (GMM) estimation, it shows that the Lerner Index has a positive and significant effect on credit risk (Non-Performing Loan). The estimation results explain that the higher the Lerner Index value, the greater the credit risk value (Non-Performing Loan). The coefficient value on this variable explains the amount of credit risk value (Non-Performing Loan) formed by the amount of the Lerner Index. This shows that every one-point increase in the Lerner Index will increase credit risk (Non-Performing Loan). However, it must be noted that the Lerner Index is an inverse proxy of bank competition. The Lerner Index has a value scale between 0 and 1, which indicates that if the Lerner Index value is closer to 1, the level of bank competition will be lower, otherwise if the Lerner Index value is closer to 0, the level of competition will be lower. In other words, the higher the Lerner Index, the lower the competition and vice versa. Therefore, it can be concluded, based on the GMM estimation results, that competition has a negative and significant effect on credit risk (Non-Performing Loan). The estimation results explain that the higher the bank competition, the lower the value of credit risk (Non-Performing Loan).

Table 3. Regression Estimation of Competition (Lerner Index) and Credit Risk (NPL)

	Non-Performing Loan (NPL)
Non-Performing Loan $(NPL)_{t-1}$	0,5501707 (0,000***)
Lerner Index	0,0869482 (0,000***)
Credit Growth	-0,0044719 (0,000***)
Return on Asset (ROA)	0,4039089 (0,000***)
Bank Size	0,0128347 (0,000***)
Income Diversification (HHI)	0,0051252 (0,000***)
Return on Equity (ROE)	-0,0894152 (0,000***)
Risk Weighted Asset (RWA)	-0,0118049 (0,000***)

Source: Research Processed Data with Stata 17

A higher level of banking competition in the credit market can result in lower bank risk. A higher level of competition leads to lower lending rates to attract more borrowers so that they can compete in the banking market. Due to the lower interest rates charged to credit customers, it will make it easier for customers to repay their loans. Therefore, the possibility of bad credit or default will be lower, thereby reducing credit risk to banks. These results are in accordance with research conducted by [10] on the Commonwealth of Independent States (CIS) banking transition market in the period 2005-2013 which verified the competition-stability hypothesis and showed that competition contributed to financial stability in these countries. However, this study contradicts the results of [11] on banking in developing countries for the period 1999-2005 which provides empirical support for the traditional view that increased competition can weaken bank stability, increase credit risk, and can have significant implications for stressed banking systems in developing countries.

The results also show that credit risk (Non-Performing Loan) in the previous period has a positive and significant effect on credit risk (Non-Performing Loan). The estimation results explain that the greater the credit risk (Non-Performing Loan) of the previous period, the greater the current value of credit risk (Non-Performing Loan). The coefficient value on this variable explains that the amount of credit risk (Non-Performing Loan) is formed by the amount of credit risk (Non-Performing Loan) in the previous period. This shows that every one-point increase in credit risk (Non-Performing Loan) in the previous period will increase credit risk (Non-Performing Loan). In general, it shows a positive long-term relationship between risk and profitability, banks with high NPL ratios may experience significant losses in a given year. The relationship indicates increased supervision and screening of borrowers, but at the same time, specialized banks may be willing to take on more risk. Thus, the level of risk will drive the credit risk each period. This result is consistent with research conducted by [4] on banking in Spain credit risk (Non-Performing Loan) in the previous period is significant at the 1% level with a parameter value of around 0.5, confirming the persistence shown in the NPL ratio. This study shows that the control variables return on assets (ROA), income diversification, and bank size have a positive and significant effect on the dependent variable credit risk, while credit growth, return on equity (ROE), and risk weighted assets (RWA) have a negative and significant effect on the dependent variable credit risk.

5. Conclusions

Based on the formulation of the problem and through the test results and processing estimates carried out, it can be concluded that this study found that the independent variable of competition has a negative and significant effect on the dependent variable of credit risk at 84 banks in ASEAN in the period 2011-2022. The dependent variable of credit risk in the previous period has a positive and significant effect on the dependent variable of credit risk in the current period at 84 banks in ASEAN in the period 2011-2022. The control variables return on assets (ROA), income diversification, and bank size have a positive and significant effect on the dependent variable credit risk. The control variables of credit growth, return on equity (ROE), and risk weighted assets (RWA) negatively and significantly affect the dependent variable of credit risk at 84 banks in ASEAN in the period 2011-2022.

References

[1] Laeven, L., & Valencia, F. (2013). "Systemic banking crises database". IMF Economic Review, 61(2), 225–270. https://doi.org/10.1057/imfer.2013.12
[2] Repullo, R. (2004). "Capital requirements, market power, and risk-taking in banking". Journal of Financial Intermediation, 13(2), 156–182. https://doi.org/10.1016/j.jfi.2003.08.005
[3] Boyd, J. H., & De Nicoló, G. (2005). "The theory of bank risk taking and competition revisited". Journal of Finance, 60(3), 1329–1343. https://doi.org/10.1111/j.1540-6261.2005.00763.x

[4] Jiménez, G., Lopez, J. A., & Saurina, J. (2013). "How does competition affect bank risk-taking?" Journal of Financial Stability, 9(2), 185–195. https://doi.org/10.1016/j.jfs.2013.02.004
[5] Hicks, J. R. (1935). "Annual Survey of Economic Theory: The Theory of Monopoly". Econometrica, 3(1), 1–20. https://doi.org/10.2307/1907343
[6] Baltagi, B. H., Bratberg, E., & Holmås, T. H. (2005). A panel data study of physicians' labor supply: the case of Norway. Health economics, 14(10), 1035-1045.
[7] Yuniasih, A., Firdaus, M., & Fahmi, I. (2013). "Disparitas, Konvergensi, dan Determinan Produktivitas Tenaga Kerja Regional di Indonesia". Jurnal Ekonomi Dan Pembangunan Indonesia, 14, 63. https://doi.org/10.21002/jepi.v14i1.447
[8] Arellano, M., & Bond, S. (1991). "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations". The Review of Economic Studies, 58(2), 277–297. https://doi.org/10.2307/2297968
[9] Blundell, R., & Bond, S. (1998). "Initial conditions and moment restrictions in dynamic panel data models". Journal of Econometrics, 87(1), 115–143. https://doi.org/https://doi.org/10.1016/S0304-4076(98)00009-8
[10] Clark, E., Radić, N., & Sharipova, A. (2018)."Bank competition and stability in the CIS markets". Journal of International Financial Markets, Institutions and Money, 54, 190–203. https://doi.org/https://doi.org/10.1016/j.intfin.2017.12.005
[11] Turk Ariss, R. (2010). "On the implications of market power in banking: Evidence from developing countries". Journal of Banking & Finance, 34(4), 765–775. https://doi.org/https://doi.org/10.1016/j.jbankfin.2009.09.004