Analyzing the Influence of Bank Competition on Credit Risk: Perspectives from Indonesia's Dual Banking System

ABSTRACT

This study analyzes the effect of competition banks on credit risk in the dual banking system in Indonesia. This research was conducted using a purposive sampling technique in selecting a sample of 5 conventional commercial banks and 5 Islamic commercial banks. The method used is the Generalized Method of Moments (GMM) from 2011 to 2020. Credit risk for Conventional Banks is measured by the value of Non-Performing Loan (NPL), while Islamic Bank Financing is measured by the value of Non-Performing Financing (NPF). The results of this study indicate that Return on Assets (ROA) for Conventional Banks and Islamic Banks has a significant effect on credit risk in the dual banking system, Loan to Deposit Ratio (LDR) for Conventional Banks does not have a significant effect on Non-Performing Loan (NPL) while Financing to Deposit Ratio (FDR) of Islamic Banks has a significant level 2 influence on Non-Performing Financing (NPF). Bank size does not have a significant influence on credit risk in the dual banking system, and the Lerner Index for Conventional Banks has a significant effect on Non-Performing Loan (NPL), while the Lerner Index for Islamic Banks has no effect on Non-Performing Financing (NPF). The Central Bank in making policies can see that the level of competition for banks in the dual banking system in Indonesia is categorized as a monopolistic competition market, where each bank has its own market segment so that it has market power that is strong enough to set prices that are relatively

Keywords: *Competition Bank, Credit Risk, Dual Banking System*

JEL Classification : E510, G210, G29

INTRODUCTION

The Indonesian banking system implements a dual banking framework, where Islamic and conventional banking operate together within a single system. The dual banking system has been in place since the enactment of Law No. 10 of 1998, which amended Law No. 7 of 1992 on Banking and introduced the concept of profit-sharing banks (Vicki, 2018).

Over the past 15 years, both domestic and international banking sectors have faced extraordinary turbulence. This situation arises not due to the influence of global economic upheavals but originates from the banking sector itself, particularly issues related to loans. One of the risks faced by banks is the risk of non-repayment of loans extended to debtors, commonly referred to as credit risk for conventional banks and financing risk for Islamic banks.

The issue of credit risk and financing represents the debtor's inability to make partial or full repayments of the loans provided by the bank. Seho et al (2021) revealed, for instance, the experience of the financial crisis in the U.S. property sector, which was caused by the ease with which financial institutions extended credit to individuals who were not financially eligible, triggering cases of non-performing loans (subprime mortgage). Based on the review conducted by Bank Indonesia (2017), the financial crisis that affected a significant part of Europe and America in 2008 to 2009 was caused

by aggressive increases in housing credit. The assessment by Bank Indonesia (2017) is also supported by Aimon & Syofyan (2020) who explained that the conditions associated with this credit risk would impact the stability of the monetary sector and the global level.

The phenomenon of problematic credit risk and financing arises when customers are unable to fulfill their obligations in fund repayment, including both principal debt and delayed payments. This is also articulated by Loffler (2019), stating that problematic credit and financing can be assessed based on the value of Non-Performing Loans (NPL) for conventional banks and Non-Performing Financing (NPF) for Islamic banks, expressed as a percentage. Non-Performing Loans (NPL) and Non-Performing Financing (NPF) can impact a bank's profitability, as lower NPL and NPF indicate better bank performance. Conversely, an increase in NPL and NPF suggests a higher occurrence of problematic credit and financing (Prasetyo, 2017).

Various literature extensively discusses factors influencing credit risk, including Ariwidanta (2016), which asserts that one of the factors affecting credit risk is the fundamental performance of debtors, comprising Profitability, Lerner Index, and Bank Size. Additionally, Ali Mohsin, Mudeer Ahmed Khattak (2021) states that ROA also significantly influences credit risk,

albeit indirectly. A different study by Pratiwi & Masdupi (2021) reveals that ROA has a positive and significant impact on credit risk. The last fundamental factor, disclosed by Brei et al (2020), indicates a positive relationship between the Lerner Index and credit risk. In contrast, Susanti (2020) on the Lerner Index's impact on credit risk shows that the Lerner Index does not have a statistically significant negative relationship with credit risk. Beyond fundamental and macroeconomic factors, there is another factor that can influence credit risk, namely, competition among banks.

Competition among banks is also a crucial factor influencing credit risk, as this competition drives innovation and efficiency levels higher, leading banks to take greater risks and potentially threatening the stability of a bank's financial system. According to Martinez (2019) the level of competition among banks in Indonesia, measured using the Lerner Index, tends to be low. This is because the banking competition in Indonesia is categorized as monopolistic competition, where each bank has its own market segment and possesses a relatively strong average market power to set higher prices.

Expanding on the context provided earlier, this study seeks to explore how Bank Competition affects Credit Risk within the Dual Banking System, assessed through Non-Performing Loan (NPL) and Non-Performing Financing (NPF)

values across both conventional and Islamic banks in Indonesia. To conduct a more intricate estimation of the research data, especially when faced with uncertainties regarding parameters, the research employs the Generalized Method of Moment (GMM) as the primary alternative method. The GMM method is selected for its flexibility, relying on minimal assumptions concerning what is known as moment conditions.

RESEARCH METHOD

This study employs the data analysis technique of Generalized Method of Moments (GMM), processed using the STATA 17 software application. Data sources were obtained from Annual Reports published on official websites such as the Financial Services Authority (OJK), Bank Indonesia (BI), World Bank, Banking Laboratory UNSRI, and the official websites of each researched bank, spanning the years 2011 to 2020. For this research, a sample of 10 banks was used, comprising 5 conventional banks and 5 Islamic banks, selected through the Purposive Sampling technique (Rai & Thapa, 2015). The selected banks with a dual banking system include Bank Mandiri, Bank BRI, Bank BNI, Bank BCA, Bank BTN, Bank Mandiri Syariah, Bank BRI Syariah, Bank BNI Syariah, and Bank BTN Syariah. The equation model for the Generalized Method of Moments (GMM) utilized in this study is as follows:

- Model 1 (Conventional Banks)

$$NPL_{i,t} = \beta_1 ROA_{i,t} + \beta_2 BS_{i,t} + \beta_3 LDR_{i,t} + \beta_4 LI_{i,t} + \beta_5 NPL_{i,t-n} + \mu_{i,t}$$

- Model 2 (Islamic Banks)

$$NPF_{i,t} = \beta_1 ROA_{i,t} + \beta_2 BS_{i,t} + \beta_3 FDR_{i,t} + \beta_4 LI_{i,t} + \beta_5 NPF_{i,t-n} + \mu_{i,t}$$

Dimana:

i = individual banks ($i = 1 , \ldots, n$)

t = time

$NPL_{i,t}$ = Non Performing Loan i

$NPF_{i,t}$ = Non Performing Financing i

$ROA_{i,t}$ = Return On Assets i

$BS_{i,t}$ = Bank Size i

$LDR_{i,t}$ = Loan Deposit ratio i

$FDR_{i,t}$ = Financing Deposit ratio i

$LI_{i,t}$ = Lerner Index i

$NPL_{i,t-n}$ = Non Performing Loan i = 1 ,…,n, t = ,…,n

$NPF_{i,t-n}$ = Non Performing Financing i = 1 ,…,n, t = ,…,n

$\beta_{1,2,3,}$ = Coefficient

$\mu_{i,t}$ = Error term

According to Dwihandayani (2017), Non-Performing Loan (NPL) serves as a measure to gauge the percentage of problematic credit within a bank, resulting from customers' failure to make installment payments. Non-Performing Financing (NPF) represents the risk of troubled financing extended by the bank, where customers are unable to repay funds or

make installments in accordance with the agreed-upon terms between the bank and the customer. Consequently, Non-Performing Financing (NPF) in Islamic banking can contribute to and influence fluctuations in financing levels.

RESULT AND DISCUSSION

Table 1. Assumption Test for AB GMM in Conventional Banks

Assumption Test GMM	Variable		Result
	ROA	Zstat	-7.18
		Prob	0.000*
	LDR	Zstat	0.79
		Prob	0.428
Serial Correlation T	Bank Size	Zstat	0.16
		Prob	0.545
	Lerner Index	Zstat	4.97
		Prob	0.000*
	NPL_{t-n}	Zstat	9.61
		Prob	0.000*
Sargan Test (ST)	Chi Squared (X^2)		54.21
	Prob		0.03*

Source: Analyzed by authors using Stata 17.
* = significance at 1%, ** = significance at 5%, *** = significance at 10%.

Table 1 displays the results of the assumption test conducted on the empirical model, revealing the presence of serial correlation in the independent variables Return on Asset and Lerner Index. The z-stat probability value for this correlation concerning the dependent variable Non-Performing Loan in Conventional Banks is 0.000*. Following this, the Sargan Test (ST) was applied to validate instrumental variables, exposing a Chi-Squared X2 value of 54.21 with a probability value of 0.03*. Put simply, the instruments employed in this empirical model are deemed valid. The analysis of regression results and the explanations provided lead to the conclusion that there are no issues with the underlying assumptions of Arellano-Bond's GMM.

Table 2. Results of Estimation for the Empirical Model in Conventional Banks.

	Coefficients	Probability
Non Performing Loan (t-n)	0.66	0.000*
Return on Asset	-0.82	0.000*
Loan to Deposit Ratio	0.36	0.561
Bank Size	0.12	0.326
Lerner Index	1.64	0.001*
constant	0.06	0.979
Wald-Stat (4)	139.73	
Number of Instrumental Variables	45	
Number of Observation	50	
Number of Groups (Banks)	10	

Source: Analyzed by authors using Stata 17.
* = significance at 1%, ** = significance at 5%, *** = significance at 10%.

Based on the above Table 2, the results indicate that Non-Performing Loan in the previous period has a significantly positive relationship with Non-Performing Loan, showing a coefficient of 0.66 and a probability of 0.000*. The Return on Asset variable exhibits a significant negative coefficient of -0.82 with a probability of 0.000* in relation to Non-Performing Loan. The Loan to Deposit Ratio variable has a positive coefficient of 0.36, but it is not statistically significant for Non-Performing Loan. Bank Size, represented by the variable 'Bank Size,' also has a positive but non-significant coefficient of 0.12 with a probability of 0.326 concerning Non-Performing Loan. Meanwhile, the Lerner Index variable shows a significant negative coefficient of 1.64 with a probability of 0.001*. Additionally, based on the Wald-Statistic value, a significant result is obtained with a Chi-Squared X2 value of 139.73 at a 1 percent significance level.

Table 3. Assumption Test for AB GMM in Islamic Banks

Assumption test GMM	Variable		Result
Serial Correlation T	ROA	Zstat	-3.24
		Prob	0.001*
	FDR	Zstat	1.95
		Prob	0.051**
	Bank Size	Zstat	0.67
		Prob	0.502
	Lerner Index	Zstat	-0.65
		Prob	0.513
	NPF_{t-n}	Zstat	10.01
		Prob	0.000*
Sargan Test (ST)	Chi Squared (X^2)		68.52
	Prob		0.0012*

Source: Analyzed by authors using Stata 17.

* = significance at 1%, ** = significance at 5%, *** = significance at 10%.

Based on Table 3, this empirical model indicates the presence of serial correlation in the variables Return on Asset and Financing to Deposit Ratio concerning Non-Performing Financing, with probability values of 0.001* and 0.051**. Furthermore, the validity testing of instruments through the Sargan Test (ST) shows a Chi-Squared (X2) value of 68.52 with a probability of 0.0012*, indicating that the instrumental variables used in this empirical research model are valid. Based on these explanations, it can be concluded that there are no deviations from the underlying assumptions of Arellano-Bond's GMM.

Table 4. Results of Estimation for the Empirical Model in Islamic Banks

Dependent Variable: Non-Performing Financing	coefficient	Prob.
Non-Performing Financing (t-n)	0.78	0.000*
Return on Asset	-0.20	0.001*
Financing to Deposit Ratio	1.08	0.051**
Bank Size	0.19	0.502
Lerner Index	-0.16	0.513
Constant	-5.04	0.046
Wald-Stat (4)		184.53
Number of Instrumental Variables		45
Number of Observation		50
Number of Groups(Banks)		10

Source: Analyzed by authors using Stata 17.
* = significance at 1%, ** = significance at 5%, *** = significance at 10%.

From the above Table 4, estimation results reveal a significantly positive relationship between Non-Performing Financing and the previous period, with a coefficient of 0.78 and a probability of 0.000*. The Return on Asset variable shows a significant negative coefficient of -0.20 with a probability of 0.001*. Additionally, Financing to Deposit Ratio is significant at a 5% level, with a probability of 0.051 and a positive value. As for the Bank Size variable, it has a positive but not significant coefficient of 0.19 with a probability of 0.50. On the other hand, the competitiveness variable, Lerner Index, has a non-significant negative coefficient of -5.04 with a probability of 0.51.

The Wald-Statistic value indicates a Chi-Squared X2 of 184.53 with 1% significance. In other words, simultaneously, the independent variables Return on Asset (ROA) negatively and significantly influence, the Financing to Deposit Ratio positively and significantly influences at a 5% level the dependent variable Non-Performing Financing in Islamic Banks. The Bank Size variable positively and insignificantly influences the dependent variable Non-Performing Financing. Meanwhile, the Lerner Index does not significantly and negatively influence the dependent variable Non-

Performing Financing in Islamic Banks in this empirical research model.

This study employs two main indicators as dependent variables, measuring Credit Risk in the Dual Banking System in Indonesia. These indicators include the Non-Performing Loan (NPL) for Conventional Banks and the Non-Performing Financing (NPF) for Islamic Banks (Awaliah et al, 2022).

Based on the research findings, Return on Asset has a significant negative impact on Non-Performing Loan with a probability value of 0.000. This aligns with the study by Kusuma et al, (2021) , which also found a significant negative influence of Return on Asset on Non-Performing Loan. In other words, an increase in Return on Asset is associated with a decrease in Non-Performing Loan in Conventional Banks, and conversely, a decrease in Return on Asset is linked to an increase in Non-Performing Loan.

The research results in Islamic Banks indicate that the Return on Asset variable has a significantly negative influence on the level of Non-Performing Financing in the five Islamic banks examined in this study. These findings support the research conducted by Isnaini et al (2021) and Febrianti et al (2022), which assert that Return on Asset is capable of measuring the banking sector's ability to generate profits for future projections. Consequently, the provision of financing to customers is less likely to result in significant adverse effects for Islamic banks.

The results of this study indicate that the Loan to Deposit Ratio variable does not have a significant influence on Non-Performing Loan in Conventional Banks. This finding contradicts the research conducted by Arniati et al (2020), which stated that Loan to Deposit Ratio has a significant positive impact on Non-Performing Loan. However, it aligns with another study by Kusuma (2021), which found that Loan to Deposit Ratio does not have a significant influence on Non-Performing Loan. In other words, these results suggest that a decrease in the Loan to Deposit ratio leads to a decrease in Non-Performing Loan.

In Islamic Banks, Financing to Deposit Ratio shows results that have a significant influence on Non-Performing Financing. This is consistent with the findings of Munandar (2022), who stated that Financing to Deposit Ratio has a significant impact on Non-Performing Financing. This implies that as third-party funds increase, more financing is issued, and the higher the Financing to Deposit Ratio of a bank, the higher the Non-Performing Financing for that bank.

The research results also show that Bank Size does not have a significant influence on Non-Performing Loan. This finding aligns with the research conducted by Laksono (2019), which

stated that Bank Size does not have a significant impact on Non-Performing Loan. However, it contradicts the study by Niagasi (2020), which revealed that Bank Size has a significant influence on Non-Performing Loan.

The results for Islamic Banks indicate a non-significant relationship between Bank Size and Non-Performing Financing. This finding contradicts Suli Astrini (2018), , who found a significant relationship between Bank Size and Non-Performing Financing. However, it aligns with the results of Putra & Syaichu (2021), which showed that Bank Size does not have a significant influence on Non-Performing Loan.

In this study, the Lerner Index shows a significantly positive result. This is in contrast to the findings of Siantoro (2018), who stated that the Lerner Index does not have a significant impact on Non-Performing Loan. From the perspective of competition-stability, where high market power tends to drive higher credit risk, increased credit risk can be mitigated by maintaining a higher equity capital ratio, thereby preventing an overall increase in bank risk. Therefore, the results of this study indicate that the Lerner Index has a significantly positive impact on Non-Performing Loan.

Regarding Islamic banks, the research shows that the Lerner Index has a non-significant impact on Non-Performing Financing. This finding is consistent with Anggraini (2018), who stated that the Lerner Index does not have an impact on Non-Performing Loan in Islamic banks.

CONCLUSION

In both Conventional and Islamic Banks, Return on Asset has a significantly negative impact on Non-Performing Loan and Non-Performing Financing in the Dual Banking System in Indonesia. The results indicate that Loan to Deposit Ratio does not have a significant influence on credit risk in the Dual Banking System in Indonesia. On the other hand, Financing to Deposit Ratio has a significant influence at the 2% level on credit risk in the Dual Banking System in Indone sia.T he research findings also conclude that Bank Size does not have a significant impact on Non-Performing Loan and Non-Performing Financing (credit risk) in the Dual Banking System in Indonesia. As for competition among banks, in Conventional Banks, the Lerner Index has a significant impact on Non-Performing Loan, while in Islamic Banks, the Lerner Index does not have a significant influence on Non-Performing Financing. The divergent impact of the Lerner Index in Conventional and Islamic Banks highlights the nuanced nature of competition in shaping credit risk. Regulators should consider tailoring competition policies to the specific characteristics of conventional and Islamic banking. Monitoring and regulating

market power and competition dynamics can contribute to a balanced and stable credit environment.

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