Effects of Credit Risk Management to the Financial Performance of Commercial Banks in the Indonesian Stock Exchange

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Abstract: The purpose of this study is to analyse the effect of credit risk management on the financial performance of 30 listed Indonesian stock exchange trading banks. The research aimed to analyse patterns in how commercial banks focused on foreign and non-foreign exchange categories demonstrated the effects of credit risk financial performance from 2015-2019 on. Return on Assets (ROA) and Return on Equity (ROE) were the measurement predictor variables for financial performance, while loan deposit ratio (LDR), capital adequacy ratio (CAR) and non-performing loans (NPL) utilized for credit risk indicators. A research method used in this study is causal associative analysis. The research also used the process of deliberate sampling to assess the sample size. Secondary data collected from www.idx.co.id has deployed in this study. Multiple regression analysis used in this study in order to analyse panel data. The impact of credit risk management on financial performance has positively influenced and significantly affected by the LDR, ROA, and ROE of the stock exchange of banks as the finding results of the study indicates. In the other hand, the CAR and NPL have an indirect and important influence on the financial performance of credit risk management. In this study, the finding also shows that banks, in particular, focused more on the loan deposit ratio, asset return, and equity return to boost successful risk management of their financial performance operations.

1. Introduction

Commercial Banks are financial institutions that plays important role in a given economy. Particularly, they are channels of financial resources from savers to lenders in developmental state perspective. The high level of credit default risk on financial performance in the banking industry has been a hindrance to economic stability. This problem is however a global problem. In fact, higher bank capital requirements affect economic growth [1]. In developing economies, banks help borrower to have no access to capital markets [2]. In fact, credit problems are a part of the major reasons behind banking difficulties. Banks develop effective credit risk management and related mechanisms in order to minimize loan losses [3]. On the other hand, with the continuous development of international financial market, domestic commercial banks will be under the impact of international and domestic factors more, take more internal and external risk [4] . The effect of LDR, NPL, and CAR on ROA factors in banking companies plays an intervening role in banks in increasing ROA [5]. In addition, banks can only benefit from credit if the profitability generated from increased sales exceeds the added costs of receivables [6]. Credit risk defined as the chance of loss that will occur when the loan or any other line of credit by a particular debtor is not repaid [7]. Credit risk is the possibility of loss to the lender on non-performing loans [8]. Credit risk management affected by LDR, CAR, NPL, ROA, and ROE. Banks to improve their credit risk management to achieve more profits, in that banks should take into consideration, the indicators of Non-performing loans, that were found significant in determining credit risk management [9]. The effects of credit risk management (CRM) on financial performance affected significantly by the bank CAR [10]. The influence of liquidity risk on ROA is significant for the Islamic and conventional banks [11]. In addition, when there is a significant increase in credit risk of a loan, extra provisions charged to the income statement on Banks need to set for each loan a threshold defining what such a significant increase in credit risk constitutes [12]. There is a positive

relationship between effective credit risk management on financial performance of the banks [13]. LDR and NPL have a significant and indirect impact on effective credit risk management; CAR has a positive relationship and significant effect; NPL and CAR have significance influence on ROA [5].

1.1 Types of Commercial Banks in Indonesia:

Based on their ability to serve the wider community, commercial banks have grouped into two types. This type of category named as a division-based position. The position shows a measure of a bank's ability to serve the public in terms both foreign and non-foreign exchange banks as follows: A non-foreign exchange bank is a type of bank that doesn't yet have a license to carry out transaction activities like a foreign exchange bank. As a result, financial institution plays various role in supporting economies in Indonesia, banks become to face increasingly complex credit risks and challenges. That's why this study intends to focus in this area.

1.2 Objectives, Research Questions and Hypothesis;

The main objective of this study is to analyze the effect of credit risk management on financial performance in case of 30 listed commercial banks on Indonesian stock exchange. The study also examines the trends of credit risk management starting from 2015 up to 2019 financial performance by using LDR, CAR, NPL, ROA, and ROE based on performance and risk indicators measurement.

This study tried to identify the following research questions through the stated objectives.

1)What factors influence effective credit risk management on financial performance of commercial banks in relation to foreign and non-foreign stock exchange?

2)What extent effective credit risk management affected by loan deposit ratio, capital adequacy ratio, non-performing loan, return on asset, and return on equity?

3)Is there any relationship between all variables (how one variable associate with other variable)?

Based on the above research questions the following hypothesis are stated and tested by considering both foreign & non-foreign exchange.

H_1- Loan deposit ratio has positive and significant impact on effective credit risk management.

H_2- Capital adequacy ratio has indirect and significant influence with credit risk management.

H_3- Non-performing loan has indirect and significant impact on credit risk management.

H_4- Return on asset has positive relationship and significant with financial performance.

H_5- Return on equity has positive and significant influence on financial performance.

2. Methodology

The study used both qualitative and quantitative research method. It follows a causal case study approach. The study used secondary sources of data. In this study, 30 selected commercial banks on Indonesian stock exchange annual performance report for five years from 2015 – 2019. The five main credit risk and financial performance indicators used as independent variables, and effective credit risk management has considered as dependent variable. Then, all the data coded, inserted and processed using SPSS and Stat Tools program all necessary multivariate analysis techniques are used. The stated hypotheses tested using Chi-square goodness-of-fit. Therefore, measuring the degree of effective credit risk financial performance has measured by the study variable indicators.

2.1 Conceptual Framework and Model Specification

In this study, the proposed model that analyzes the effects of credit risk management on financial performance designed through five both performance and risk indicator variables as shown in the following figure.
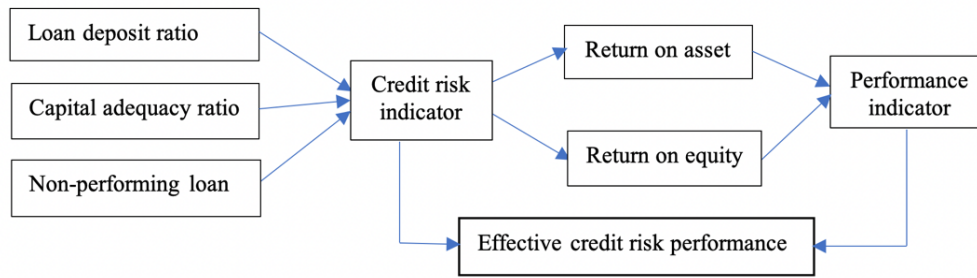
Fig.1 : the Authors Own Proposed Model

The linear regression model is drives as:

$$Zit = \beta i + \gamma Yit + uit \qquad (1)$$

That means;

Zit = the profitability for bank i in period t

Yit = the selected explanatory variables

vit = the error term

β = the constant term and γ is the vector of regression coefficients

Hence, the empirical model has estimated is as follows:

$$Zit = \beta 0 + \gamma 1(NPL)it + \gamma 2(CAR)it + \gamma 3(LDR)it + eit \qquad (2)$$

Where; Z is the measure of profitability in terms of ROA and ROE, ROA and ROE used as dependent variables to proxy profitability and LDR, CAR, NPL used as explanatory variables.

The outcome variable used static panel data models, which has specified as follows:

$$ROAit = \beta 0 + \gamma 1(NPL)it + \gamma 2(CAR)it + \gamma(LDR)it + eit \qquad (3)$$
$$ROEit = \beta 0 + \gamma 1(NPL)it + \gamma 2(CAR)it + \gamma 3(LDR)eit \qquad (4)$$

3. Result and Discussion

3.1 Measuring All the Association of Effective Credit Risk Performance Indicators

This study intended to analyze the effect of credit risk management for financial performance in 30 commercial banks of Indonesia stock exchange by using the same measurement indicator variables as shown as follows.

The association of indicators on Banks foreign exchange function:

Table 1 Correlation Analysis Result of Predictors in Banks Foreign Exchange

		Effective credit risk performance	Loan deposit ratio	Capital adequacy ratio	Non-performing loan	Return on asset	Return on equity
Effective credit risk performance	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	5					
Loan deposit ratio	Pearson Correlation	.768	1				
	Sig. (2-tailed)	.000					
	N	5	5				
Capital adequacy ratio	Pearson Correlation	-.922*	-.685	1			
	Sig. (2-tailed)	.026	. 250				
	N	5	5	5			
Non-performing loan	Pearson Correlation	-.965**	-.196	.980**	1		
	Sig. (2-tailed)	.008	.752	.003			
	N	5	5	5	5		
Return on asset	Pearson Correlation	.965**	.196	.980**	.820**	1	
	Sig. (2-tailed)	.008	.752	.003	.000		
	N	5	5	5	5	5	
Return on equity	Pearson Correlation	.691	.795	-.880	-.456	-.456	1
	Sig. (2-tailed)	.004	.039	.000	.440	.440	
	N	5	5	5	5	5	5

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

As shown in Table 1, in the case of foreign exchange functions, there is a positive relationship between the LDR, the ROA and the ROE with an effective credit risk performance and a significant p-value of 0.000, 0.008 and 0.004 respectively. In comparison, there is an indirect or negative association between the CAR and the non-performing loan with the better operation of credit risk, but they are significant at p-value levels between 0.045 and 0.006.

The association of indicators on Banks non-foreign exchange functions:

Table 2 Correlation Analysis Result of Indicators in Banks Non-Foreign Exchange

		Effective Credit risk performance	Loan deposit ratio	Capital adequacy ratio	Non-performing loan	Return on asset	Return on equity
Effective Credit risk performance	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	5					
Loan deposit ratio	Pearson Correlation	.852	1				
	Sig. (2-tailed)	.000					
	N	5	5				
Capital adequacy ratio	Pearson Correlation	-.946*	-.676	1			
	Sig. (2-tailed)	.015	.210				
	N	5	5	5			
Non-performing loan	Pearson Correlation	-.973**	-.559	.907*	1		
	Sig. (2-tailed)	.005	.327	.034			
	N	5	5	5	5		
Return on asset	Pearson Correlation	.586	1.000*	-.600	-.612	1	
	Sig. (2-tailed)	.000	.000	.285	.272		
	N	5	5	5	5	5	
Return on equity	Pearson Correlation	.938*	.535	-.981**	-.896*	.732	1
	Sig. (2-tailed)	.018	.353	.003	.039	.160	
	N	5	5	5	5	5	5

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

As the above table 2 indicates that in case of non-foreign exchange functions, there is a positive relationship between LDR, ROA, and ROE with effective credit risk performance and significant at 0.000, 0.000, 0.018 level of p-value respectively. Moreover, the relationship between ROE and effective credit risk performance is positive and very strong. While, there is indirect and strong relationship between CAR and NPL with effective credit risk performance but significant at 0.015 and 0.005 level of p-value.

Implications of the above two categorical correlation analysis:

In the correlation regression analysis, as the above two consecutive tables indicate that the relationship between all effective credit risk performance indicator variables are significant at 0.01 level (2-tailed) and 0.05 level (2-tailed). On the other hand, there is a positive or direct association between all indicators except CAR and NPL in relation to effective credit risk financial performance.

The hypotheses test analysis for both foreign & non-foreign exchange indicator variables:

Hence, from both foreign and non-foreign exchange functions of the bank correlation result, this study test and accept hypotheses accordingly. The decision has made by using the calculated p-value and variables relationship whether to accept or reject as shown in the following table.

Table 3 Summary of Hypotheses Test Results of Foreign & Non-Foreign Exchange Variables

Variables	Decision on stated hypothesis					
	Expected association	Computed association	Accept or reject	Expected p-value (P< 0.05)	Calculated p-value	Accept or reject
Loan deposit ratio	Positive	Positive	Accept H_1	0.05	0.000	Accept H_1
Capital adequacy ratio	Indirect	Negative	Accept H_2	0.05	0.006 & 0.015	Accept H_2
Non-performing loans	Indirect	Negative	Accept H_3	0.05	0.008 & 0.005	Accept H_3
Return on asset	Positive	Positive	Accept H_4	0.05	0.008 & 0.000	Accept H_4
Return on equity	Positive	Positive	Accept H_5	0.05	0.004 & 0.018	Accept H_5

According to the above summary table 3, the entire stated hypotheses are accepted. Because of the relationship and p-values of variables. From foreign and non-foreign exchange categorical indicator variables analysis result, all credit risk performance and financial performance indicator variables value of their relationship is the same, which has stated before on the hypothetical assumptions. In addition, all indicator variables value is significance at p-value < 0.05. To conclude, in this study, all the stated hypotheses of effective credit risk management on financial performance indicator variables accepted by using Chi-square goodness-of-fit tests.

3.2 Regression Analysis Results

The study has intended to regress all the study outcome and predictor variables using linear regression model. So that the regression model summary, regression coefficient analysis, and the

regression equation has computed by considering both foreign and non-foreign exchange indicator variables as follows consecutively.

The regression model Goodness of Fit:

Because the adjusted R square value is .709 (70.9%). This indicates that effect of credit risk management on financial performance is highly affected by all credit risk and financial performance indicator variables. Besides, all credit risk management indicators variable is significant at p-value .000. On the other hand, as the residual value of R square indicates that .291 (29.1%) unknown study variables affected both the foreign and non-foreign stock exchange over-all functions of banks. As a result, the fitness of the model has done through stat tools statistical software as follows:

Table 4 Model Summary[b]

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
.848[a]	.719	.709	.491	.719	67.717	5	30	.000

The regression coefficient analysis:

As per the coefficient regression analysis result of each indicators of credit risk and financial performance R-square value indicates that LDR 72.7% (.727), NPL 56.8% (.568), CAR 78.6% (.786), ROA 82.6% (.826), and ROE 69.3% (.693) directly affects the outcome variable the effect of credit risk management on financial performance.

Table 5 Regression Coefficient Analysis for Both Foreign and Non-Foreign Exchange

Regression Table	Coefficient	Standard Error	Standard coefficients Beta	t-Value	p-Value	Multicollinearity Checking	
						VIF	R-Square
Constant	.804	.181		4.451	0.000		
LDR	.2179	0.071	.266	3.049	0.003	3.586	0.727
NPL	- .1935	0.066	- .242	- 2.951	0.004	6.172	0.568
CAR	- .2648	0.076	- .341	- 3.201	0.000	4.307	0.786
ROA	.7883	0.053	.994	10.385	0.000	5.013	0.826
ROE	.6405	0.042	.156	5.206	0.002	8.048	0.693

In addition, the coefficient values of each indicator variables are the bases to construct the derived model depending on the stated empirical equation. Consequently, the regression equation is obtainable from the panel data of both foreign and non-foreign exchange activities of 30 commercial bank of Indonesia stock exchange as follow.

Regression Equation:
ECRM = .804 + .2179 LDR - .1935 NPL – .2648 CAR + 7883 ROA + 6405 ROE
Where:
ROA = .802 - .1935 NPL - .2648 CAR + .2179 LDR + .181(4.451)
ROE = .804 - .1935 NPL - .2648 CAR + .2179 LDR

The effects of regression coefficient analysis:

Accordingly, as the above regression coefficients analysis table indicate that there are three important points. First, the Beta Coefficients, which indicates the positive or negative relationship of each variable to the model, whereas t and p-values shows the impact of the credit risk and financial performance indicator variables on the effect of credit risk financial performance. Second, when one unites of credit risk, and financial performance indicator variables changed by 1%; the overall effect of credit risk financial performance increases on the calculated coefficient vales by considering other variables are constant. Third, Multicollinearity checking VIF value by variance inflation factor indicates that if the values of VIF is above 1, as a result, all the five indicator variables are correlated each other because their VIF values are above 1. The indicator variable LDR has a positive relationship with the effect of credit risk performance (outcome variable) and significant at p-value (0.003). This implies that, other things are being constant when LDR

increases by one unit, the effect of credit risk financial performance increases by a factor of .2179. The indicator variable non-performing loan has indirect relationship with the effect of credit risk financial performance and significant at p-value (0.004). This indicates that citrus paribus are constant, when the non-performing loan impact decreases by one unit, the effect of credit risk financial performance also decreases by a factor of -0.1935. The indicator variable CAR has indirect influence on the effect of credit risk financial performance and significant at p-value (0.000). This indicates that all things are constant, when CAR impact decreases by one unit, the effect of credit risk financial performance also decreases by a factor of -0.2648. The indicator variable ROA has a positive relationship with the effect of credit risk financial performance and significant at p-value (0.000). This shows that other things constant, when there is an incremental change in ROA by one unit, the effect of credit risk financial performance highly increases by a factor of .7883. The indicator variable ROE has a positive relationship with the effect of credit risk financial performance and significant at p-value (0.002). This implies that all things are constant, when ROE increases by one unit, the effect of credit risk financial performance moderately increases by a factor of 0.6405.

4. Conclusion and Recommendation

4.1 Conclusion

The study analyses the data of 30 commercial banks by categorizing the operations of foreign and non-foreign exchanges. For both categories, the report used LDR, CAR, NPL, ROA, and ROE. Access to the LDR, therefore demonstrates the role of commercial bank deposits in the funding of stock exchange-based loans. Most of the time, the LDR is used to measure the liquidity of a bank by comparing the total loans of a bank to its total deposits for a given period. If the ratio is too high, it indicates that there could be insufficient liquidity for the bank to meet any unexpected fund requirements. The CAR measures the efficiency of the activity of commercial banks in transferring funds to revenue generating assets. A high CAR gives an indicator of ineffectiveness in the activities of a bank. Therefore, the higher CAR increases the higher the risk of a commercial bank suffering cash shortage problems. The asset return ratio measures the capacity of commercial banks to generate incremental earnings from each asset unit. Here, as the analysis shows the higher, the lower the risk of banks experiencing cash liquidity issues has indicated by the ROA. The ROE ratio tests the banks' ability to produce profits from each equity unit. This also indicates that the higher the ROE, the lower the risk of problems faced by banks.

4.2 Recommendation

As the findings show, variables such as LDR, ROA, and ROE have a positive relationship and an important influence on the effects of the financial performance of credit risk in the credit risk and financial performance predictor variables in both foreign and non-foreign exchange categories. In all five-measurement indicator variables for foreign and non-foreign exchange categories, the response-effective credit risk financial performance variable significantly affected by 70.9%. In addition, as the residual values show that other variables not analysed in this analysis affected the remaining 29%. Further studies in this field should also conduct an investigation by other researchers in addition, commercial banks need to have expertise in recognizing, understanding, evaluating and mitigating the management of credit risk depending on their financial performance, especially those with more bondage to financial sources on stock exchanges. They will have to include their sustainability from the general performance point of view, in comparison to trend analysis. This helps to change the culture of risk symptom resolution before problems encountered. As the stock market becomes unpredictable and highly volatile, foreign and non-foreign markets should controlled independently by banks.

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