

Credit Risk, Market Risk, and Profitability: Case Study of Banks in Indonesia Stock Exchange 2015-2017

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This study aims to determine: 1) the influence of credit risk (NPL) and market risk (NIM) simultaneously on profitability (ROA); 2) the influence of credit risk (NPL) on profitability (ROA); and 3) the influence of market risk (NIM) on profitability (ROA). The banks listed on the Indonesia Stock Exchange in the period 2015-2017 as the population. The sampling technique uses purposive sampling, obtained by 21 banks. The method of data analysis uses pooled data with the program E-views version 10. The test results use a random effect model, obtained: 1) NPL and NIM simultaneously affect ROA; 2) NPL has a negative effect on ROA); and 3) NIM has a positive effect on ROA.

Key words: *Non-Performing Loan (NPL), Net Interest Margin (NIM), Profitability (ROA), Bank.*

Introduction

A bank is an institution that acts as a financial intermediary between the parties that hold the funds and those who need funds. Banks are the drivers of the economy, so banks must be able to improve their financial performance. Bank of Indonesia assesses the health of banks with ROA, prioritizing assessing the profitability of a bank from assets whose funds come mostly from public savings funds so that ROA is more representative in measuring the level of bank profitability. According to Halim Alamsyah (2017) The level of bank profitability has continued to decline over the past 5 years due to weak margins from lending plus a high ratio of non-performing loans. One of the causes of weak interest margins is the continuing trend of declining credit interest and banks must think hard to generate high profits. In addition, Halim highlighted the quality of loans that have not yet recovered and surmises that banks are carrying out their operations in the face of a variety of risks.

Credit risk is the risk of possible bank losses due to non-repayment of credit by the debtor. The Basel Committee on Banking Supervision (2011) in Sudiyatno and Fatmawati (2013), defines credit risk as the possibility of losing an outstanding loan in part or in whole, because of failure to manage credit (default risk). This failure will also have an impact on increasing bank operational costs, which can reduce the profit or performance of the bank. The Financial Services Authority (OJK) noted that the ratio of non-performing loans (NPLs) in banks in July 2017 reached 3 percent (gross) or increased when compared to the previous month which was recorded at 2.96 percent. However, the amount of the non-performing loan ratio in July 2017 is still relatively stable or below the regulatory provisions at the level of 5 percent. (Prabowo, 2017; Rostami & Balmaki, 2018)

According to the Indonesian Bankers Association (2015) market risk is a risk in the balance sheet position and administrative account, due to changes in market prices. Market Risk is proxied by NIM. Net Interest Margin is the ratio between net interest income to total assets. Lartey et al. (2013) state that net interest income is the difference between the interest earned on assets and interest paid on obligations. NIM as measured by the difference between the funding interest rate and the loan interest rate that is given or in absolute form is the difference between the total funding interest cost and the total loan interest cost. The higher the NIM, the interest income earned will increase profitability.

Table 1 shows inconsistencies in the results of research on credit risk and market risk on profitability.

Table 1: Conclusion of Research Results

No.	Conclusions	Researchers (Year)
1.	NPL has a positive effect on ROA	Sufian (2010); Roman and Danuletiiu (2013)
2.	NPL has a significant effect on ROA	Sudarmawanti and Pramono, (2017)
3.	NPL has a negative effect on ROA	Mawardi (2005); Ponco (2008); Trujillo-Ponce (2009); Alper and Anbar (2009); Ali, Akhtar, and Ahmed, H.Z. (2011); Kolapo et al. (2012); Purwoko and Sudiyanto (2013); Rahmat, Arfan, and Said (2014); Maheswari (2014); Herlina, Nugraha, and Purnamasari (2016); Putrianingsih, and Yulianto (2016)
4.	NPL does not affect ROA	Hutagalung, Djumahir, and Ratnawati (2011); Natalia (2015); Maria (2015); Pratiwi and Kurniawan (2017)
5.	NIM has a positive effect on ROA	Mawardi (2005); Purwoko and Sudiyanto

No.	Conclusions	Researchers (Year)
		(2013); Natalia (2015); Maria (2015)
6.	NIM has an effect on ROA	Ponco (2008); Pratiwi and Kurniawan (2017); Yusuf (2017)
7.	NIM has a negative effect on ROA	Rahmat, Arfan, and Said (2014)
8.	NIM does not affect ROA	Suyono (2005); Hutagalung, Djumahir, and Ratnawati (2011); Sudarmawanti and Pramono, (2017)

Based on this, it is necessary to re-examine the influence of credit risk and market risk on the profitability of banks in Indonesia.

Problem Statement

Statement of the problems in this study:

1. Does credit risk (NPL) and market risk (NIM) have a simultaneous effect on profitability (ROA)?
2. Does credit risk (NPL) effect profitability (ROA)?
3. Does market risk (NIM) effect profitability (ROA)?

Literature Review and Hypothesis Development

Literature Review

According to Kasmir (2011) Return on Assets (ROA) is a ratio that shows the results (return) of the amount of assets used in the company. In addition, ROA provides a better measure of company profitability because it shows management effectiveness in using assets to earn income. ROA analysis is used to measure the ability of a company to generate profits by using the total assets or assets owned by the company after adjusting for the costs to fund the asset. The greater the ROA, the greater the company's profitability, which means that the company's performance is getting better and vice versa. According to Bank of Indonesia Circular No. 13/24/ DPNP/2011, ROA can be formulated as follows:

$$ROA = \frac{\text{Net Income After Tax}}{\text{Total Asset}} \times 100\%$$

The existence of banks is not only determined by the amount of funds that can be collected from the people, but also from the amount of credit that can be channelled to the people. The bank provides credit to the public with credit risk. Credit risk is the most significant risk facing banks and the success of their business depends on accurate measurement and a higher level of efficiency in managing this risk than other risks (Gieseche,2004). Credit risk will be faced by

the bank when the customer fails to pay the debt for the credit received at maturity (Saudi et al., 2019). According to Bank of Indonesia Regulation No.11 / 25 / PBI / 2009, credit risk is a risk due to the failure of the debtor and / or other parties to fulfil obligations to the bank (Sinaga et al., 2019).

This risk arises because of uncertainty about repayment of loans by debtors. In this study credit risk assessment uses the ratio of Non-Performing Loans. Based on Bank of Indonesia Circular No.13/24/DPNP/2011 NPL can be calculated using the formula:

$$NPL = \frac{\text{Non Performing Loans}}{\text{Total Loans}} \times 100\%$$

According to Mahardian (2018) market risk is a risk because of the movement of market variables from the portfolio owned by the bank, where the movement can result in losses (in this case is the movement of interest rates and exchange rates). Market risk can be proxied by Net Interest Margin (NIM). NIM is a ratio used to measure the ability of bank management to manage earning assets to generate interest income from bank operations. NIM compares net interest income with total loans. Net interest income is derived from the interest income received from the loan minus the interest costs from the sources of funds collected. A high NIM shows the effectiveness of banks in the placement of productive assets. That is, interest income on earning assets managed by banks will increase and have an impact on the bank's net income. Thus, the higher the NIM will result in higher ROA as well.

Based on Bank of Indonesia Regulation No. 14/24/PBI/2012 NIM is calculated by the formula:

$$NIM = \frac{\text{Net Interest Income}}{\text{Average Earning Assets}} \times 100\%$$

Hypothesis Development

The Influence of Credit Risk (NPL) and Market Risk (NIM) Simultaneously on Profitability (ROA)

According to Rahmat, Arfan, and Musnardi (2014); Erna and Joko (2017); and Kansil, Murni, and Tulung (2017) simultaneously NPL and NIM have an effect on ROA.

H₁: Credit Risk (NPL) and Market Risk (NIM) simultaneously affect Profitability (ROA)

The Influence of Credit Risk (NPL) on Profitability (ROA)

According to Bratanovic (2011), credit risk or partner risk is a situation when the debtor or issuer of financial instruments in this case individuals, companies, and countries will not repay

the principal and other cash related to investments in accordance with the provisions stipulated in the credit agreement. Previous research showed different results. According to Sufian (2010); Roman and Danuletiu (2013), NPL has a positive effect on ROA. According to Sudarmawanti and Pramono (2017) the NPL has a significant effect on ROA. Mawardi (2005); Ponco (2008); Trujillo-Ponce (2009); Alper and Anbar (2009); Ali, Akhtar, and Ahmed, H.Z. (2011); Kolapo et al. (2012); Purwoko and Sudiyanto (2013); Rahmat, Arfan, and Musnardi (2014); Maheswari (2014); Herlina, Nugraha, and Purnamasari (2016); Putrianingsih and Yulianto (2016), NPL has a negative effect on ROA. While according to Hutagalung, Djumahir, and Ratnawati (2011); Natalia (2015); Maria (2015); Pratiwi and Kurniawan (2017), NPL does not affect ROA.

H₂₀: Credit Risk (Non-Performing Loan) has a positive effect on Profitability (ROA)

The Influence of Market Risk (NIM) on Profitability (ROA)

Net Interest Margin (NIM) reflects market risk that arises due to the movement of market variables, which can be detrimental to the bank. Previous research showed different results. According to Mawardi (2005); Purwoko and Sudiyanto (2013); Natalia (2015); Maria (2015), NIM has a positive effect on ROA. According to Ponco (2008); Pratiwi and Kurniawan (2017); Yusuf (2017), NIM has an effect on ROA. According to Rahmat, Arfan, and Musnardi (2014), NIM has a negative effect on ROA. While according to Suyono (2005); Hutagalung, Djumahir, and Ratnawati (2011); Sudarmawanti and Pramono (2017), NIM does not affect ROA.

H₃: Market Risk (Net Interest Margin) has a negative effect on Profitability (ROA)

Research Methods

This study uses secondary data, the annual financial statements of banks listed on the Indonesia Stock Exchange (BEI) in 2015-2017. The population in this study were as many as 81 banks, all banks listed on the Indonesia Stock Exchange (IDX) in 2015-2017. Sampling method uses non probability sampling (purposive sampling) obtained a sample of 21 banks.

The dependent variable in this study is ROA (Y) while the independent variables are NPL (X₁) and NIM (X₂) (Abdul Hadi et al., 2018). The model in the study used multiple linear regression using E-Views version 10 Linear regression describes how much the independent variable affects the dependent variable. The multiple regression model is as follows:

$$ROA_{it} = \alpha + \beta_1 NPL_{it} + \beta_2 NIM_{it} + \varepsilon$$

The method of data analysis uses panel data (pooled data) which is a combination of cross section data and time series data (Ghozali, 2016). According to Nachrowi and Usman (2006),

to estimate the parameters of the model with panel data, there are several techniques offered, namely: 1) Pooled Least Square (Common Effect); 2) Fixed Effect Model; and 3) Random Effect Model. There is a testing step that must be done to determine the exact estimation model. These steps are: Chow test, Hausman test, and lagrange multiplier test. Ghozali (2016)

Hypothesis Testing:

H₀₁: NPL and NIM simultaneously have no effect on ROA

H_{a1}: NPL and NIM simultaneously have effect on ROA

If the value of Prob (F-Statistic) < 0.05 then H₀₁ is rejected and accepts H_{a1}.

H₀₂: NPL does not negatively affect ROA

H_{a2}: NPL has a negative effect on ROA

H₀₃: NIM does not positively affect ROA

H_{a3}: NIM has a positive effect on ROA

If the value of Prob (t-Statistic) < 0.05 then H₀ is rejected and accepts H_a.

Results and Discussion

Results

The descriptive statistical results of three research variables with EViews version 10 can be seen in table 2.

Table 2: Descriptive Statistics 2015 - 2017

	NIM	NPL	ROA
Mean	5.10	3.49	0.98
Maximum	9.30	15.82	4.19
Minimum	0.93	0.70	-11.15
Std. Dev.	1.60	2.36	2.71

Based on table 2, the average NIM is 5.10%. This means that the bank's NIM is quite large because it has an average of above 3%. Based on the average value, banks are able to manage their productive assets to generate interest income from bank operations.

Based on table 2, the average NPL is 3.49%. This means that bank NPLs are in good category because they are still below the figure of 5.00% in accordance with the maximum standards set by Bank of Indonesia in circular letter No.13/24/DPNP/2011.



Based on table 2, the average ROA is 0.98%. That is, bank ROA is quite good. Based on these averages, the level of bank operational efficiency in using its assets to generate profits is quite good.

Based on the results of testing three models that have been done (Chow Test, Hausman Test, and Lagrange Test), the Chow Test shows the probability (p-value) of the cross section F of $0.2499 > 0.05$; then in the Hausman Test the p-value of cross-section random is $0.6632 > 0.05$, and in the Lagrange Test shows (Breusch-Pagan) LM is $0.0000 < 0.05$, the Random Effect model is the right model for this study (Table 3).

Table 3: Random Effect Model

Dependent Variable : ROA			
Method : Panel EGLS (cross-section random effects)			
Date : 06/19/19		Time: 14.29	
Sample: 2015 2017		Periods included: 3	
Cross-sections included:21			
Total panel (balanced) observations:63			
Swamy and Arora estimator of component variances			
	C	NPL	NPM
Coefficient	0.178052	-0.747212	0.667900
Std. Error	0.794054	0.079005	0.123997
t-Statistic	0.224231	-9.457.755	5.386.429
Prob.	0.8233	0.0000	0.0000
Effects Specification			
		S.D.	Rho
Cross-section random		0.443562	0.1095
Idiosyncratic random		1.264.901	0.8905
Weighted Statistics			
R-squared	0.746754		
Adjusted R-squared	0.738313		
S.E. of regression	1.252.415		
F-statistic	8.846.211		
Prob(F-statistic)	0.000000		
Mean dependent var	0.834077		
S.D. dependent var	2.448.258		
Sum squared residu	9.411.258		
Durbin-Watson stat	1.391.380		
Unweighted Statistics			
R-squared	0.769667		
Sum squared residu	1.048.452		
Mean dependent var	0.975873		
Durbin-Watson stat	1.248.949		

Based on table 3, the panel data regression model equation that explains the effect of NPL and NIM on ROA is:

$$ROA = 0.178052 - 0.747212 NPL + 0.667900NIM + \varepsilon$$

Determination Coefficient Analysis (R²) measures the ability of an independent variable in explaining the dependent variable. Based on Table 3 the value of Adjusted R-Squared research model is 0.738313 or 73.8%. That is, the independent variables (NPL and NIM) can explain or influence the dependent variable (ROA) of 73.8%, while the remaining 26.2% is influenced by other variables.

Based on Table 3, the probability (F-statistic) value of $0.000000 < 0.05$ can be concluded that H₀₁ is rejected and H_{a1} is accepted, then NPL and NIM simultaneously have a significant effect on ROA. Probability (t-statistic) NPL $0.0000 < 0.05$ with a regression coefficient of -0.747212, it can be concluded that NPL partially has a significant negative effect on ROA. While the Probability (t-statistic) NIM $0.0000 < 0.05$ with a regression coefficient of 0.667900, it can be concluded that NIM partially has a significant positive effect on ROA.

Discussion

The Influence of Credit Risk (NPL) and Market Risk (NIM) Simultaneously on Profitability (ROA)

Based on the Probability Value (F-statistic) NPL and NIM of 0.0000 This value shows that NPL and NIM simultaneously influence ROA. Based on the coefficient of determination (R²), NPL and NIM simultaneously affect ROA of 73.8%. This shows that the influence of NPL and NIM on ROA is quite large. The results of this study are in line with Rahmat, Arfan, and Musnardi (2014); Sudarmawanti and Pramono (2017); and Kansil, Murni, and Tulung (2017).

The Influence of Credit Risk (NPL) on Profitability (ROA)

Partially NPL affects profitability. The negative influence shown by the NPL indicates that the higher the non-performing loans in the management of bank loans as indicated in the NPL, the lower the level of bank profitability reflected through ROA. The results of this study are in line with Mawardi (2005); Ponco (2008); Trujillo-Ponce (2009); Alper and Anbar (2009); Ali, Akhtar, and Ahmed, H.Z. (2011); Kolapo et al. (2012); Purwoko and Sudiyanto (2013); Rahmat, Arfan, and Musnardi (2014); Maheswari (2014); Herlina, Nugraha, and Purnamasari (2016); Putrianingsih, and Yulianto (2016).

The Influence of Market Risk (NIM) on Profitability (ROA)

NIM partially affects profitability, with a positive effect direction. A positive relationship means that any addition to the NIM value will have implications for increasing profitability. The higher the NIM, the more effective the bank is in the placement of earning assets in the form of credit, the greater the profit derived from interest income which will affect the increase

in profitability (ROA). The results of this study are in line with Mawardi (2005); Purwoko and Sudiyanto (2013); Natalia (2015); Maria (2015).

Conclusions and Recommendations

Conclusions

1. Simultaneously NPL and NIM have a significant effect on ROA
2. Partially NPL has a significant negative effect on ROA
3. Partially NPL has a significant positive effect on ROA

Recommendations

Investors or customers should pay attention to a bank's financial performance, especially the NPL and NIM, which shows how much net interest the bank receives in order to measure relative potential future increased performance in order to predict the magnitude of bank refund rates which can then be used for decision making.

Suggestions for further research can be developed by adding other independent variables, for example, other banking risks in addition to credit risk and market risk.

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