Determinants of Non-Performing Loans: Banking Sector Listed in Indonesia Stock Exchange

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Abstract: This study proposes to obtain empirical evidence whether profitability has a negative effect on non-performing loans, whether income diversification has a positive effect on non-performing loans, whether bank capital has a negative effect on non-performing loans, and whether bank liquidity has a negative effect on non-performing loans. The sample used in this research are 28 banking companies listed on the Indonesia Stock Exchange during the 2017-2019 period. Sampling was carried out using purposive sampling technique and data were processed using Eviews 10 software. The results indicate that profitability has a negative effect on non-performing loans, income diversification has a positive effect on non-performing loans, bank capital has no negative effect on non-performing loans, and bank liquidity has no negative effect on non-performing loans.

Keywords: Non-Performing Loans, Profitability, Income Diversification, Bank Capital, Bank Liquidity.

Abstrak: Penelitian ini bertujuan untuk mendapatkan bukti empiris apakah *profitability* berpengaruh negatif terhadap *non-performing loans*, apakah *income diversification* berpengaruh positif terhadap *non-performing loans*, apakah *bank capital* berpengaruh negatif terhadap *non-performing loans*, serta apakah *bank liquidity* berpengaruh negatif terhadap *non-performing loans*. Sampel yang digunakan adalah 28 perusahaan perbankan yang terdaftar di Bursa Efek Indonesia selama periode 2017-2019. Pengambilan sampel dilakukan dengan menggunakan teknik *purposive sampling* dan data diolah dengan menggunakan *software* Eviews 10. Hasil penelitian menunjukkan bahwa *profitability* memiliki pengaruh yang negatif terhadap *non-performing loans*, *income diversification* memiliki pengaruh yang positif terhadap *non-performing loans*, *bank capital* tidak berpengaruh negatif terhadap *non-performing loans*, dan *bank liquidity* tidak berpengaruh negatif terhadap *non-performing loans*.

Kata kunci: Kredit Bermasalah, Profitabilitas, Diversifikasi Pendapatan, Kapasitas Modal Bank, Likuiditas Bank.

INTRODUCTION

Bank is the place of financial traffic with large and complex funds turnover. Bank can be defined as an institution that acts as a financial intermediary between parties who have excess funds (surplus units) and parties who have limited funds (deficit units), as well as an institution that functions to facilitate financial payment. One of the features used by banks to channel funds to parties who have limited funds is through credit approval. In granting credit to customers, bank must pay attention to how sufficient the circulation of existing fund is and adjust it to the amount of funds available through customer deposits and other sources. Types of loans provided by banks can be divided into three based on the tenor, namely short-term loans (less than one year), medium-term loans (1-3 years), and long-term loans (more than three years). The period of bank loans is mutually agreed between the bank as a creditor and the customer who needs fund as a debtor. Furthermore, the term, interest rate, and installments on those loans are also adjusted through mutual agreement and must be included in the loan agreement.

From the perspective of bank, credit interests are one of the income sources obtained periodically from debtors, while the installments on the principal of the loans are repayment scheme of loans provided by the bank. This shows the importance of the debtor's role in paying off the loan principal and interest in accordance with the loan agreement so that the bank can recognize the interest of the loan as income and the repayment of loans granted from debtors. If the approved loan cannot be paid out by the debtor according to the agreement, the bank will recognize the existence of non-performing loans. Banks in carrying out their business activities will always face various levels of risk, including risk related to credit management. Conceptually, non-performing loans measure the ability of banking companies to overcome the risk of credit failure where the existence of non-performing loans is one of the causes for banking companies to find it difficult to channel loans effectively (Kinanti, 2017). In relation to this mechanism, non-performing loans are not only considered from the debtor's perspective, but also internal problems from the banking sector regarding the occurrence of non-performing loans. On the other hand, the emergence of non-performing loans is also one of the indicators for management to detect and stimulate targeted loan disbursement plans.

Many researches on the determinants of non-performing loans have been conducted, but there are still inconsistent results between one researcher and another, so further research is necessary. This study is a replication of the research conducted by Khan et al. (2020) regarding the determinants of non-performing loans in banking companies listed on the Pakistan Stock Exchange during 2005-2017. The research of Khan et al. (2020) used four independent variables, namely profitability, income diversification, bank capital, and bank efficiency with a research period of 13 years. The difference between this study and the research of Khan et al. (2020) lies in the subject and research period, where the subject of this study is banking companies listed on the Indonesia Stock Exchange during 2017-2019. Another difference is that this study only takes three independent variables from the research of Khan et al. (2020) namely profitability, income diversification, and bank capital as well as adding one more independent variable, which is bank liquidity from the research of Laksono and Setyawan (2019). This study does not use the independent variable of bank efficiency because the measurement of the bank performance efficiency

with non-interest expense divided by non-interest income ratio is less relevant, considering that the bank's main income comes from interest income and the bank's main expense comes from interest expense. In addition, the efficiency of bank performance can also be measured through profitability.

THEORETICAL REVIEW

Agency Theory. Agency theory is a theory that describes the relationship between principals and agents. The principal generally authorizes the agent to manage the company he owns where the agent is expected to achieve goals that are in line with the principal. Jensen and Meckling (1976) explain that agency theory is characterized by the granting of authority from principal (shareholders) to the company's management as agent with the aim of emphasizing the relationship between the parties involved in order to minimize asymmetric information and prevent excessive agency costs. Management as the agent authorized by the shareholders must strive as much as possible to achieve the company's goals, including maximizing shareholder's wealth while also increasing company value. In exchange, management receives compensation in the form of rewards for their completed work. According to Eisenhardt (1989), mistakes made by agents might trigger losses in the company where agency problems can occur when there are differences in interest between agents and principals. When the difference occurs, the company's overall performance will begin to slow down and eventually deteriorate due to poor management. Regarding the aspect of non-performing loans, the management of banking companies through credit management will analyze and evaluate prospective debtor before accepting credit applications and evaluate their compliance in fulfilling their future obligations. The performance of bank management specifically affects the financial condition and characteristics of the bank aggregately (Prawira and Wiryono, 2020).

Information Asymmetry Theory. The decision-making process carried out by each individual (both internal and external) requires information that is relevant to the problem they face. If one party has more information than the others, a condition known as information asymmetry occurs. Stiglitz (2002) reveals that information asymmetry also occurs when people with different characteristics and goals knew various information at different levels. The more enclosed the information is, the more difficult it is for other parties to know the existence of the information. Moreover, parties who only get limited information tend to find it difficult to make an accurate decision. In a banking company, management as the creditor requires information relating to the debtor before signing the credit agreement. Debtor information can be obtained using the 5C system (character, capacity, capital, condition, and collateral) to measure the eligibility of prospective debtors and as a credit scoring indicator (Rachman et al., 2018). However, debtors only tend to convey general self-information so that banks do not know the characteristics of prospective debtors comprehensively. Ruslim and Bengawan (2019) explain that the information asymmetry causes market failures because banks as creditors cannot distinguish which debtors have a great opportunity to pay off their debts and which do not. This problem has an impact on bank performance, credit management, and the occurrence of non-performing loans in banking companies.

Management Behavior Theory. Berger and DeYoung (1997) explain the management behavior theory that affects banking conditions, especially related to non-performing loans. The study produced four hypotheses, which consisted of skimping hypothesis, bad luck hypothesis, bad management hypothesis, and moral hazard hypothesis. Nisa (2016) explains that the skimping hypothesis, bad luck hypothesis, and bad management hypothesis represent the relationship between the efficiency of bank performance and non-performing loans, while the moral hazard hypothesis represents the relationship between bank capital and non-performing loans. In the skimping hypothesis, banking companies that do savings tend to appear with good performance. In fact, these savings are only useful in short term, thus ignoring credit management in the long term (Khan et al., 2020). The bad luck hypothesis explains that there are events outside of the bank that cause banking companies to spend more than they should, so that it has an impact on non-performing loans. The bad management hypothesis describes a situation where a bank with poor management causes the supervision carried out on credit management to not be effectively conducted, thus triggering an indication of non-performing loans. Sarita and Zubadi (2018) explain that when corporate governance has degradation of performance and management is not well-organized, the credit risk will be even greater. The moral hazard hypothesis describes banks with low capital tend to be more courageous in taking risk by aggressively agreeing to loans while ignoring the subsequent effect of non-performing loans.

Non-Performing Loans. Dewi (2014) explains that non-performing loans occur when the debtor is unable to repay the loan and interest in accordance with the mutually agreed terms in the loan agreement. Non-performing loans also technically describe the inherent risk in loans extended to borrowers. Non-performing loans are loans for which the principal and interest payments are not fulfilled for more than 90 days (Prawira and Wiryono, 2020). According to Laksono and Setyawan (2019), the collectability of loans that are unable to be repaid in more than 90 days will be categorized as substandard (collectability 3), doubtful (collectability 4), and bad debt (collectability 5). This is in line with the explanation of non-performing loans provided by the International Monetary Fund. Non-performing loans are generally described as gross non-performing loans which compare the total of non-performing loans for more than 90 days to the total loans extended by bank (Barus and Erick, 2016). The existence of non-performing loans is the responsibility of banking company in developing credit policies and taking into account the potential losses carried out in each loan given to debtors. Based on the description above, non-performing loans can be described as a condition where the debtor fails to fulfill his obligations to the bank for more than 90 days in repaying the debt in accordance with the mutually agreed loan agreement, thereby creating credit risk in the banking company.

Profitability Against Non-Performing Loans. Hanafi and Halim (2018) illustrate that profitability through ROA analysis measures the company's ability to generate profits by using the total assets owned by the company after adjusting for the costs to fund these assets. Research conducted by Lee et al. (2020) revealed a positive relationship between profitability and non-performing loans because for the purpose of short-term reputation,

banking companies tend to increase profitability by ignoring credit policies and changing current earnings. This will have an impact on decreasing the company's performance in long term as well as increasing non-performing loans. This statement is divergent from the research conducted by Khan et al. (2020) where profitability has a negative effect on non-performing loans because good bank performance and productive management leads to increased profits and will have an impact on decreasing non-performing loans. This statement is also consistent with the research of Putri et al. (2020) where profitability has a negative effect on non-performing loans because the greater the profit of the bank, the credit risk attached to total loans will be lower so the risk of non-performing loans will decrease. The research conducted by Makri et al. (2014) and Ismail et al. (2017) show that profitability has no effect on non-performing loans. This is because although the increase in profitability indicates that the company has good performance efficiency in managing its assets, the bank's overall performance may experience a decline where income generating capabilities does not have a strong influence on credit management.

Income Diversification Against Non-Performing Loans. Putri et al. (2020) defines income diversification as one of the bank's efforts to increase its profit through other banking service income excluding interest income. Research conducted by Ismail et al. (2017) revealed that there is a positive relationship between income diversification and non-performing loans because the more sources of income other than interest, the bank eventually does not fully rely and concentrate on the credit sector, thereby increasing non-performing loans. Ahmed et al. (2021) also supports this statement. Moreover, income diversification increases the volatility of banking companies, thus triggering more non-performing loans. These results are different from the research conducted by Lee et al. (2020) where income diversification has a negative impact on non-performing loans. This is because banking companies that have high income diversification are less susceptible to risk taking and have lower non-performing loans. The research conducted by Rachman et al. (2018) and Putri et al. (2020) states that income diversification has no effect on non-performing loans because income diversification is related to the bank's efforts to earn profits excluding interest income and is not related to credit policies or non-performing loans.

Bank Capital Against Non-Performing Loans. Bank capital is the level of capital adequacy owned by banks as a way to anticipate various risks that occur in banking companies (Laksono and Setyawan, 2019). Dhar and Bakshi (2015) also illustrate that a bank's capital capacity through the capital adequacy ratio is an indicator of bank's internal strength in absorbing risks at different levels, including the risk of non-performing loans. Research conducted by Sarita and Zubadi (2018) explains that bank capital has a positive relationship with non-performing loans where the capital adequacy contained in banking companies involves developing credit risk so that banks eventually channel a lot of their capital to provide credit to the debtors and increase the potential occurrence of non-performing loans. This statement contradicts with the research of Indrajaya (2019) which implied that bank capital has a negative effect on non-performing loans. This is because low capital adequacy makes the overall capital capacity owned by banks will be used more often to maintain the accumulation of non-performing loans as explained in the moral

hazard hypothesis from management behavior theory. Research of Putri et al. (2020) also found that bank capital has a negative impact on non-performing loans because the higher the capital owned, the more banks provide loans with minimum risk, hence resulting in a decrease of non-performing loans. It also differs from the research of Umar and Sun (2018) and Lee et al. (2020) which states that bank capital has no effect on non-performing loans. The absence of such influence could be due to the fact that capital activities within the bank are not directly related to credit activities, considering that the main activities of banks are not limited to the credit sector. Moreover, the use of capital is not favorable if it is directed only to reduce non-performing loans.

Bank Liquidity Against Non-Performing Loans. According to Laksono and Setyawan (2019), bank liquidity is a ratio used to reflect the bank's policy on using its funds from customer derived deposits to provide loans to borrowers. The research conducted by Ruslim and Bengawan (2019) revealed that there is a positive relationship between bank liquidity and non-performing loans because the higher the loans extended to debtors using deposit funds, the potential for non-performing loans to occur also increases. This statement is different from research conducted by Kinanti (2017) and Sarita and Zubadi (2018) which show a negative influence between bank liquidity and non-performing loans where the higher the bank liquidity is, the supervision of credit management will increase and eventually stipulate a decrease in credit risk and a decrease in non-performing loans. It also differs from the research conducted by Dhar and Bakshi (2015) and Dimitrios et al. (2016) which show that bank liquidity has no effect on non-performing loans. This lack of influence might occur because the degree for high and low value of loans and deposits contained in banking companies does not depend on the quantity, but the quality. Therefore, bank liquidity is considered not to reflect the condition of non-performing loans.

Prior Research. Research conducted by Makri et al. (2014) used non-performing loans as the dependent variable with the independent variables consist of bank capital, bank liquidity, lagged non-performing loans, profitability (ROA), and profitability (ROE). The number of samples used in this study were 120 banks located in 14 countries out of the 17 countries in the Eurozone during 2000-2008. The results of the research by Makri et al. (2014) show that lagged non-performing loans has a positive effect on non-performing loans, while profitability (ROE) has a negative effect on non-performing loans. Meanwhile, profitability (ROA) has no positive effect on non-performing loans, and bank capital and bank liquidity have no negative effect on non-performing loans.

Research conducted by Dhar and Bakshi (2015) used non-performing loans as the dependent variable with the independent variables consist of bank liquidity, unsecured loans, lending to the sensitive sector, ratio of priority sector lending, profit per employee, bank capital, net interest margin, profitability (ROA), and investment-deposit ratio. The number of samples used in this study were 27 banks out of 28 state-owned banks in India during 2001-2005. The results of the research by Dhar and Bakshi (2015) show that lending to the sensitive sector has a positive effect on non-performing loans, while bank capital and net interest margins have a negative effect on non-performing loans. Meanwhile, the ratio of priority sector lending has no positive effect on non-performing

loans, and bank liquidity, unsecured loans, profit per employee, profitability (ROA), and investment-deposit ratio have no negative effect on non-performing loans.

Research conducted by Ekanayake and Azeez (2015) used non-performing loans as the dependent variable with the independent variables consist of operating inefficiency, profitability (ROA), ratio of loans to total assets, loan loss provisions, credit growth, bank size, and lagged non-performing loans. The number of samples used in this study were nine banks from 12 licensed domestic commercial banks located in Sri Lanka during 1999-2012. The results of the research by Ekanayake and Azeez (2015) show that operating inefficiency, ratio of loans to total assets, and lagged non-performing loans have a positive effect on non-performing loans, while profitability (ROA) and credit growth have a negative effect on non-performing loans. Meanwhile, loan loss provisions have no positive effect on non-performing loans, and bank size has no negative effect on non-performing loans.

Research conducted by Dimitrios et al. (2016) used non-performing loans as the dependent variable with the independent variables consist of profitability (ROA), profitability (ROE), and bank liquidity. The number of samples used in this study were 138 commercial banks located in 15 European countries during 1990-2015. The results of the research by Dimitrios et al. (2016) show that profitability (ROE) has a negative effect on non-performing loans. Meanwhile, bank liquidity has no positive effect on non-performing loans, and profitability (ROA) has no negative effect on non-performing loans.

Research conducted by Ismail et al. (2017) used non-performing loans as the dependent variable with the independent variables consist of profitability (ROA), ratio of loans to total assets, loan loss provisions, bank size, and income diversification. The number of samples used in this study were seven local commercial banks in Malaysia during 2008-2015. The results of the research by Ismail et al. (2017) show that loan loss provisions and income diversification have a positive effect on non-performing loans, while the ratio of loans to total assets and bank size have a negative effect on non-performing loans. Meanwhile, profitability (ROA) has no negative effect on non-performing loans.

Research conducted by Kinanti (2017) used non-performing loans as the dependent variable with the independent variables consist of operating inefficiency, bank liquidity, and profitability (ROA). The number of samples used in this study were four state-owned banks listed on the Indonesia Stock Exchange during 2006-2012. The results of the research by Kinanti (2017) show that bank liquidity has a negative effect on non-performing loans. Meanwhile, operating inefficiency has no positive effect on non-performing loans, and profitability (ROA) has no negative effect on non-performing loans.

Research conducted by Rachman et al. (2018) used non-performing loans as the dependent variable with the independent variables consist of credit growth, profitability (ROA), operating inefficiency, bank capital, and income diversification. The number of samples used in this study were 36 banks listed on the Indonesia Stock Exchange during 2008-2015. The results of the research by Rachman et al. (2018) show that credit growth and profitability (ROA) have a negative effect on non-performing loans. Meanwhile, operating inefficiency, bank capital, and income diversification have no positive effect on non-performing loans.

Research conducted by Sarita and Zubadi (2018) used non-performing loans as the dependent variable with the independent variables consist of bank liquidity, bank capital, bank size, and operating inefficiency. The number of samples used in this study were 31 banks listed on the Indonesia Stock Exchange during 2013-2016. The results of the research by Sarita and Zubadi (2018) show that bank capital and bank size have a positive effect on non-performing loans, while bank liquidity has a negative effect on non-performing loans. Meanwhile, operating inefficiency has no positive effect on non-performing loans.

Research conducted by Umar and Sun (2018) used non-performing loans as the dependent variable with the independent variables consist of operating inefficiency, income diversification, bank risk-taking behavior, ownership concentration, profitability (ROA), credit growth, bank capital, and loan loss provisions. The samples used in this study were all banking companies in China during 2005-2014. The results of the research by Umar and Sun (2018) show that loan loss provisions have a negative effect on non-performing loans. Meanwhile, income diversification and ownership concentration have no positive effect on non-performing loans, and operating inefficiency, bank risk-taking behavior, profitability (ROA), credit growth, and bank capital have no negative effect on non-performing loans.

Research conducted by Indrajaya (2019) used non-performing loans as the dependent variable with the independent variables consist of bank liquidity, bank capital, operating inefficiency, exchange rate, inflation, and gross domestic product. The number of samples used in this study were 13 sharia banks registered in Otoritas Jasa Keuangan during 2014-2018. The results of the research by Indrajaya (2019) show that bank capital and operating inefficiency have a negative effect on non-performing loans. Meanwhile, bank liquidity, exchange rate, and inflation have no positive effect on non-performing loans, and gross domestic product has no negative effect on non-performing loans.

Research conducted by Laksono and Setyawan (2019) used non-performing loans as the dependent variable with the independent variables consist of bank capital, operating inefficiency, bank liquidity, and bank size. The number of samples used in this study were 38 conventional commercial banks registered in Otoritas Jasa Keuangan during 2012-2017. The results of the research by Laksono and Setyawan (2019) show that operating inefficiency, bank liquidity, and bank size have a positive effect on non-performing loans. Meanwhile, bank capital has no positive effect on non-performing loans.

Research conducted by Ruslim and Bengawan (2019) used non-performing loans as the dependent variable with the independent variables consist of bank capital, bank liquidity, and operating inefficiency. The number of samples used in this study were 41 banks out of 45 banks listed on the Indonesia Stock Exchange during 2016-2018. The results of the research by Ruslim and Bengawan (2019) show that bank liquidity and operating inefficiency have a positive effect on non-performing loans. Meanwhile, bank capital has no negative effect on non-performing loans.

Research conducted by Khan et al. (2020) used non-performing loans as the dependent variable with the independent variables consist of profitability (ROA), income diversification, bank capital, and bank efficiency. The number of samples used in this study were nine banks listed on the Pakistan Stock Exchange during 2005-2017. The results of the research by Khan et al. (2020) show that profitability (ROA) and bank

efficiency have a negative effect on non-performing loans. Meanwhile, income diversification and bank capital have no negative effect on non-performing loans.

Research conducted by Lee et al. (2020) used non-performing loans as the dependent variable with the independent variables consist of lagged one non-performing loans, lagged two non-performing loans, bank capital, operating inefficiency, ratio of loans to total assets, profitability (ROA), bank size, income diversification, loan loss provisions, gross domestic product growth, unemployment, inflation, domestic credit to private sector, business cycle, credit cycle, and financial crisis. The number of samples used in this study were 1.053 conventional banks located in 28 member countries of the European Union during 2007-2016. The results of the research by Lee et al. (2020) show that lagged one non-performing loans, profitability (ROA), loan loss provisions, and unemployment have a positive effect on non-performing loans, while lagged two non-performing loans, operating inefficiency, ratio of loans to total assets, income diversification, business cycle, and credit cycle have a negative effect on non-performing loans. Meanwhile, bank capital, inflation, and domestic credit to the private sector have no positive effect on non-performing loans, and bank size, gross domestic product growth, and financial crisis have no negative effect on non-performing loans.

Research conducted by Putri et al. (2020) used non-performing loans as the dependent variable with the independent variables consist of profitability (ROA), bank capital, and income diversification. The number of samples used in this study were 20 banks out of 43 banks listed on the Indonesia Stock Exchange during 2014-2018. The results of the research by Putri et al. (2020) show that profitability (ROA) and bank capital have a negative effect on non-performing loans. Meanwhile, income diversification has no positive effect on non-performing loans.

Research conducted by Ahmed et al. (2021) used non-performing loans as the dependent variable with the independent variables consist of lagged non-performing loans, credit growth, loan loss provisions, income diversification, operating inefficiency, bank size, profitability (ROA), net interest margin, government ownership, family ownership, interest rate, exchange rate, political risk, and gross domestic product growth. The number of samples used in this study were 20 banks in Pakistan during 2008-2018. The results of the research by Ahmed et al. (2021) show that lagged non-performing loans, credit growth, loan loss provisions, income diversification, government ownership, interest rate, exchange rate, and political risk have a positive effect on non-performing loans, while bank size, profitability (ROA), net interest margin, and family ownership have a negative effect on non-performing loans. Meanwhile, operating inefficiency has no positive effect on non-performing loans, and gross domestic product growth has no negative effect on non-performing loans.

Hypothesis Development. Profitability is the ability of a company to generate profits and reflects on how the company's performance is. The high value of profitability shows how banking companies can manage their assets, including credit management. With tighter supervision on credit management to increase potential profits, the inherent credit risk in non-performing loans is also reduced. This shows that the higher profitability of a bank is, the occurrence of non-performing loans will decrease sufficiently (Khan et al., 2020).

Income diversification includes sources of bank income other than interest income. The increase in sources of income excluding interest indicates that the bank is starting to expand new productive activities outside of lending. With these new activities, the main focus of controlling is no longer directed to credit policy and credit management. With a decrease in credit management activities, non-performing loans will increase (Ismail et al., 2017).

Bank capital describes the adequacy of bank capital in anticipating different levels of risk. One of the risks contained in banking companies is credit risk. Putri et al. (2020) explains that the higher the capital owned by a bank, the bank will act more careful in taking risks. The bank's management will prioritize the interests of shareholders as principals so they choose to reduce high risk borrowings and ultimately decreasing non-performing loans.

Bank liquidity represents the main activities of a bank in the form of providing loans to debtors using funds collected from customers in the form of deposits. Bank liquidity is also an indicator of credit culture on the risk preference of banks in approving loans submitted by prospective borrowers (Dhar and Bakshi, 2015). The more credit given by bank, the higher the bank liquidity will be. The large number of granted loans indicates that credit management tends to be more prepared to deal with credit risk, thereby reducing non-performing loans.

Based on the explanation above, the research framework is presented in Figure 1. The hypotheses formulated for this research are as follows:

Ha_1: Profitability has a negative effect on non-performing loans.
Ha_2: Income diversification has a positive effect on non-performing loans.
Ha_3: Bank capital has a negative effect on non-performing loans.
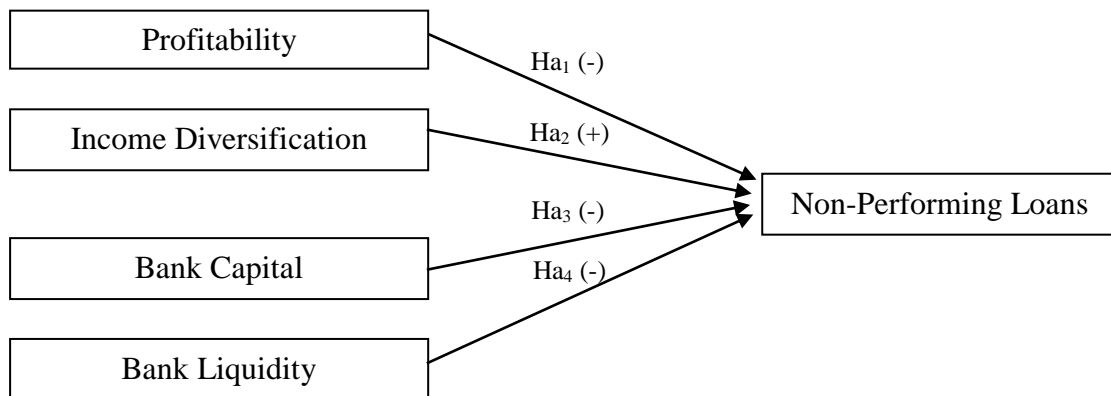Ha_4: Bank liquidity has a negative effect on non-performing loans.

Figure 1. Research Framework

METHODS

Population and Sampling Method. The population used in this study are banking companies that are consistently listed on the Indonesia Stock Exchange during the year of 2017-2019. Sampling was conducted by using purposive sampling technique. The criteria

of the sample are: (1) Banking companies that present financial statements as of December 31, (2) Banking companies that have interest income, and (3) Banking companies that earn consecutive net income during 2017-2019. Based on these criteria, the sample obtained are 28 banking companies. The research period is three years, so the data used are 84.

Data Collection Technique. The data used in this research are secondary data in the form of ratios from the financial statements of the banking companies that comply with the sample criteria for the 2017-2019 period. Data from financial statements were processed using Eviews 10 software. Eviews 10 is used because the data processed are panel data.

Operationalization Variables. This study uses non-performing loans as the dependent variable and profitability, income diversification, bank capital, and bank liquidity as the independent variables. Research conducted by Umar and Sun (2018), Khan et al. (2020), and Putri et al. (2020) used the gross non-performing loans ratio which is symbolized with NPLR. Non-performing loans as an indicator of credit risk can be measured with the ratio of non-performing loans to total loans. Khan et al. (2020) and Lee et al. (2020) assert that profitability is an indicator to determine bank performance that can be measured with return on assets (net income to total assets) and is symbolized with ROA. Ismail et al. (2017) and Khan et al. (2020) emphasize that income diversification, symbolized with NII, calculates the source of income for banking companies apart from interest income. Therefore, income diversification can be measured with non-interest income divided by total income. Research conducted by Sarita and Zubadi (2018), Rachman et al. (2018), and Khan et al. (2020) explain that bank capital can be measured by the capital adequacy ratio (CAR). Bank capital which is used to measure the bank's capital capacity can be calculated with the ratio of total equity to total assets. Bank liquidity is a benchmark for credit culture where funds collected from customers in the form of deposits can be channeled back to borrowers in the form of credit (Dhar and Bakshi, 2015). Therefore, bank liquidity can be measured by the loans to deposits ratio (LDR) which is calculated with total loans divided by total deposits (Laksono and Setyawan, 2019). The definition of operational variables are summarized in table 1 below.

Table 1. Definition of Operational Variables

Variable	Measurement	Measurement Scale	Source
NPLR	$\dfrac{\text{Non-Performing Loans}}{\text{Total Loans}}$	Ratio	Khan et al. (2020)
ROA	$\dfrac{\text{Net Income}}{\text{Total Assets}}$	Ratio	Khan et al. (2020)
NII	$\dfrac{\text{Non-Interest Income}}{\text{Total Income}}$	Ratio	Khan et al. (2020)
CAR	$\dfrac{\text{Total Equity}}{\text{Total Assets}}$	Ratio	Khan et al. (2020)
LDR	$\dfrac{\text{Total Loans}}{\text{Total Deposits}}$	Ratio	Laksono and Setyawan (2019)

RESULTS

Descriptive Statistic. Presented below are the results of descriptive statistics analysis for each variable (Table 2).

Table 2. Descriptive Statistic

	NPLR	ROA	NII	CAR	LDR
Mean	0,029215	0,012491	0,162903	0,163604	0,909725
Median	0,026383	0,012124	0,136077	0,156057	0,904152
Maximum	0,084653	0,031343	0,483733	0,385543	1,785644
Minimum	0,000462	0,000185	0,008134	0,063498	0,506113
Std. Dev.	0,015756	0,007934	0,103131	0,055520	0,189254
Observations	84	84	84	84	84

Table 2 shows that the total data processed and used as observations for this study are 84 data. In general, the average value of each variable is close to the median. Non-performing loans (NPLR) has an average value of 0,029215. The median of non-performing loans is 0,026383. The maximum value of non-performing loans is 0,084653 and the minimum value is 0,000462. The standard deviation of the overall non-performing loans data is 0,015756. This means that non-performing loans has a low variation where the standard deviation is lower than the average value.

Profitability (ROA) has an average value of 0,012491. The median of profitability is 0,012124. The maximum value of bank profitability is 0,031343 and the minimum value is 0,000185. The standard deviation of the overall profitability data is 0,007934. This means that profitability has a low variation where the standard deviation is lower than the average value.

Income diversification (NII) has an average value of 0,162903. The median of income diversification is 0,136077. The maximum value of income diversification is 0,483733 and the minimum value is 0,008134. The standard deviation of the overall income diversification data is 0,103131. This means that income diversification has a low variation where the standard deviation is lower than the average value.

Bank capital (CAR) has an average value of 0,163604. The median of bank capital is 0,156057. The maximum value of bank capital is 0,385543 and the minimum value is 0,063498. The standard deviation of the overall bank capital data is 0,055520. This means that bank capital has a low variation where the standard deviation is lower than the average value.

Bank liquidity (LDR) has an average value of 0,909725. The median of bank liquidity is 0,904152. The maximum value of bank liquidity is 1,785644 and the minimum value is 0,506113. The standard deviation of the overall bank liquidity data is 0,189254. This means that bank liquidity has a low variation where the standard deviation is lower than the average value.

Estimation Model Selection. Chow test, Hausman test, and Lagrange Multiplier test were carried out to determine the appropriate estimation model for this study. The estimation

model for panel data consists of three types, which is common effect model, fixed effect model, and random effect model. The estimation model selection results are summarized in table 3.

Table 3. Estimation Model Selection Results

Tests	Probability	Model
Chow Test (Cross-section Chi-square)	0,0000	Fixed Effect Model
Hausman Test (Cross-section Chi-square)	0,4796	Random Effect Model
Lagrange Multiplier Test (Breusch-Pagan p value)	0,0000	Random Effect Model

The result of the Chow test shows a cross-section chi-square value of 0,0000 where the probability is < 0,05 so the estimation model chosen is fixed effect model. The result of the Hausman test shows a cross-section chi-square value of 0,4796 where the probability is > 0,05 so the estimation model chosen is random effect model. The result of the Lagrange Multiplier test shows a Breusch-Pagan probability value of 0,0000 where the probability is < 0,05 so the estimation model used for this study is random effect model.

Multicollinearity Test. Multicollinearity test results are summarized in table 4 below. The results of the multicollinearity test show that the correlation coefficient of all independent variables are less than 0,8 so there is no multicollinearity.

Table 4. Multicollinearity Test Results

	ROA	NII	CAR	LDR
ROA	1,000000	0,367289	0,200264	0,165580
NII	0,367289	1,000000	-0,156679	0,222691
CAR	0,200264	-0,156679	1,000000	0,043062
LDR	0,165580	0,222691	0,043062	1,000000

Regression Test Results. Presented below are the regression test results that were used to form the regression model equation (Table 5).

Table 5. Regression Test Results

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	0,038253	0,009994	3,827760	0,0003
ROA	-1,352223	0,263349	-5,134721	0,0000
NII	0,054327	0,021067	2,578792	0,0118
CAR	-0,004430	0,037925	-0,116820	0,9073
LDR	-0,000300	0,008657	-0,034620	0,9725
R-squared	0,286608			
Adjusted R-squared	0,250487			
Prob (F-statistic)	0,000020			

The regression model equation of this study:

NPLR = 0,038253 - 1,352223 ROA + 0,054327 NII - 0,004430 CAR - 0,000300 LDR + e

Description:
NPLR = Non-Performing Loans
ROA = Return on Assets (Profitability)
NII = Non-Interest Income (Income Diversification)
CAR = Capital Adequacy Ratio (Bank Capital)
LDR = Loans to Deposits Ratio (Bank Liquidity)
e = Error

The regression model used in this study has fulfilled the goodness of fit standard and is feasible to be used as a research model. The probability value of the F-statistic in table 5 depicts a value of 0,000020 and is below the significance value of 0,05. This value indicates that the independent variables which consist of profitability, income diversification, bank capital, and bank liquidity simultaneously have an influence on non-performing loans.

Based on table 5, the constant value of the regression model has a coefficient value of 0,038253. This signifies if all independent variables do not change or equals to zero, then non-performing loans (NPLR) will increase by 0,038253 units. The regression coefficient value for profitability (ROA) is -1,352223. If profitability increases by one unit, then non-performing loans will decrease by 1,352223 units while the other independent variables remain constant, and vice versa. The regression coefficient value for income diversification (NII) is 0,054327. If income diversification increases by one unit, then non-performing loans will also increase by 0,054327 units while the other independent variables remain constant, and vice versa. The regression coefficient value for bank capital (CAR) is -0,004430. If bank capital increases by one unit, then non-performing loans will decrease by 0,004430 units while the other independent variables remain constant, and vice versa. The regression coefficient value for bank liquidity (LDR) is -0,000300. If bank liquidity increases by one unit, then non-performing loans will decrease by 0,000300 units while the other independent variables remain constant, and vice versa.

The result of the Adjusted R-squared test depicts that the coefficient of determination for non-performing loans (NPLR) is 25,0487%. This means that 25,0487% of non-performing loans can be explained by variations of profitability (ROA), income diversification (NII), bank capital (CAR), and bank liquidity (LDR), while the remaining 74,9513% can be explained by other independent variables outside of this research model.

DISCUSSION

Hypothesis Testing 1. According to table 5, the regression coefficient of profitability has a negative value of -1,352223. The probability value is 0,0000 which is smaller than 0,05 so the first hypothesis is supported. This means that profitability has a negative effect on non-performing loans.

This study is consistent with the research conducted by (Ekanayake and Azeez, 2015), (Khan et al., 2020), and (Putri et al., 2020). However, this study is not consistent with the research of (Dhar and Bakshi, 2015), (Dimitrios et al., 2016), and (Ismail et al., 2017) which state that profitability has no negative effect on non-performing loans. This study also shows inconsistent result with (Lee et al., 2020) which reveals that profitability has a positive effect on non-performing loans. This result is also different from the findings of (Makri et al., 2014) where profitability has no positive effect on non-performing loans.

If the bank's profitability gets higher, it means that the bank management is able to perform well. Bank performance is not only limited to the value of high income, but also includes proper asset management or sufficient internal monitoring. Basically, management as an agent will try to maximize shareholder's wealth and increase the value of the company so that the company's productive performance shows an existence of good management system. The extensive ability of the bank to generate profits also makes the bank more assertive to supervise credit policy which in turn will reduce overall credit risk. The low credit risk also refers to management's attention to the credibility of the borrowers and various application of credit agreements that relied on the risk indicators set by the bank. This supports the bad management hypothesis in management behavior theory which states that low performance efficiency in bad management will lead to an increase of non-performing loans. On the other hand, good management will handle credit risk carefully so that the occurrence of non-performing loans will undergo a significant reduction because bank has considered various risk aspects which are translated into credit procedures.

Hypothesis Testing 2. According to table 5, the regression coefficient of income diversification has a positive value of 0,054327. The probability value is 0,0118 which is smaller than 0,05 so the second hypothesis is supported. This means that income diversification has a positive effect on non-performing loans.

This study is consistent with the research conducted by (Ismail et al., 2017) and (Ahmed et al., 2021). However, this study is not consistent with the research of (Rachman et al., 2018), (Umar and Sun, 2018), and (Putri et al., 2020) which state that income diversification has no positive effect on non-performing loans. This study also shows inconsistent result with (Lee et al., 2020) which reveals that income diversification has a negative effect on non-performing loans. This result is also different from the findings of (Khan et al., 2020) where income diversification has no negative effect on non-performing loans.

Increase in non-interest income indicates that bank maximizes its potential income by obtaining other sources of income that do not entirely come from interest on loans. With other sources of income, management's focus on credit will decrease because banks will concentrate on new income sectors that are considered productive. With reduced supervision of interest income, credit management will tend to be more flexible in granting loans to debtors and increase the inherent credit risk. Banks with lots of income variations start to look at the management from the perspective of the company as a whole, no longer being specifically loan-oriented. Although the diversification of income portfolio aims to reduce the risk profile, the allocation of company resources that are

starting to get divided makes the performance of credit management no longer adequate, thereby increasing non-performing loans. In addition, income diversification can also indicate that the bank no longer considers credit business activities as a top performer and notices the opportunities in other sectors (e.g., insurance) while begins to ease credit policies so that in the end it will have an impact on the occurrence of non-performing loans.

Hypothesis Testing 3. According to table 5, the regression coefficient of bank capital has a negative value of -0,004430. However, the probability value is 0,9073 which is greater than 0,05 so the third hypothesis is not supported. This means that bank capital has no negative effect on non-performing loans.

This study is consistent with the research conducted by (Makri et al., 2014), (Umar and Sun, 2018), and (Khan et al., 2020). However, this study is not consistent with the research of (Dhar and Bakshi, 2015), (Indrajaya, 2019), and (Putri et al., 2020) which state that bank capital has a negative effect on non-performing loans. This study also shows inconsistent result with (Sarita and Zubadi, 2018) which reveals that bank capital has a positive effect on non-performing loans. This result is also different from the findings of (Rachman et al., 2018), (Laksono and Setyawan, 2019), and (Lee et al., 2020) where bank capital has no positive effect on non-performing loans.

The higher the capital capacity of a banking company, the bank will be more well-prepared to face variety of risks from the use of assets. High bank capital causes bank to be more careful in making decisions and pay attention to the impact on shareholders as principals, as explained in agency theory. Conversely, a lower capital adequacy ratio encourages bank to be more daring in taking risks and reduce the supervision level of their business activities. The capital adequacy of a bank can be used as a tool to anticipate the risks that exist in the bank, and credit risk is no exception. However, the comparison of credit risk to the overall risk composition of the bank may not be dominant so that the existing capital capacity in banking companies does not necessarily accommodate credit risk mitigation. This no effect result can be explained by how the company utilizes its equity for various productive purposes. Therefore, bank capital is not only related to credit management so it does not have a significant effect on non-performing loans. This result also contradicts the moral hazard hypothesis in management behavior theory which states that the low capital of a bank will trigger the occurrence of non-performing loans.

Hypothesis Testing 4. According to table 5, the regression coefficient of bank liquidity has a negative value of -0,000300. However, the probability value is 0,9725 which is greater than 0,05 so the fourth hypothesis is not supported. This means that bank liquidity has no negative effect on non-performing loans.

This study is consistent with the research conducted by (Makri et al., 2014) and (Dhar and Bakshi, 2015). However, this study is not consistent with the research of (Kinanti, 2017) and (Sarita and Zubadi, 2018) which state that bank liquidity has a negative effect on non-performing loans. This study also shows inconsistent result with (Laksono and Setyawan, 2019) and (Ruslim and Bengawan, 2019) which reveal that bank liquidity has a positive effect on non-performing loans. This result is also different from

the findings of (Dimitrios et al., 2016) and (Indrajaya, 2019) where bank liquidity has no positive effect on non-performing loans.

High amount of bank liquidity indicates that funds collected from customers in the form of deposits are used more often to provide loans to debtors. Bank liquidity frankly describes the main activities of the bank by observing how favorable the allocation of funds are. With an increase in bank liquidity, banking companies will tend to increase supervision of loans, thereby contribute to reducing credit risk. Supervision is carried out not only internally, but also on the credibility of the prospective debtor. Based on the information asymmetry theory, asymmetric information between the bank and the debtor will lead to high credit risk so that increased supervision of loans is a crucial part of credit management. However, the high amount of loans provided by the bank could also be caused by the bank's decision to ease credit policy so the credit risk gradually increased while the contribution to non-performing loans is uncertain. In addition, an increase in loans or decrease in deposits does not certainly reflects credit quality where the occurrence of non-performing loans is not always associated with credit growth. Moreover, bank liquidity also reflects how sufficient the use of deposits as a means to gain profit for the bank by providing credit and expecting interest income. However, the use of these deposits cannot be portrayed as an indicator of credit policy or credit risk for non-performing loans, considering that the amount of deposits also depends on the customer's decision.

CONCLUSION

The objective of this study is to obtain empirical evidence whether profitability has a negative effect on non-performing loans, whether income diversification has a positive effect on non-performing loans, whether bank capital has a negative effect on non-performing loans, and whether bank liquidity has a negative effect on non-performing loans.

Profitability has a negative effect on non-performing loans. The bank's ability to generate profits shows management's capability in managing the bank. Good performance also influences how a bank manages loans given to debtors and how well-prepared the bank is to face credit risk. High profitability indicates that the bank has an efficient performance, including successful control on credit system in order to minimize unnecessary loss. With higher profits, credit policy will be more on point and credit risk will eventually decrease, leading to a considerable degression of non-performing loans as well.

Income diversification has a positive effect on non-performing loans. The increase in non-interest income shows how banking companies are trying to increase potential sources of income so that they are not dependent on loans and interest income. Income diversification does not only aim to increase overall profits, but also as a preparation to mitigate constraints related to loans given to debtors. With the new business line, the resources owned by the bank will be allocated to other divisions outside of credit management so the credit supervision is no longer preeminent. Loose credit management increases credit risk and triggers non-performing loans.

Bank capital has no negative effect on non-performing loans. This is due to the capital capacity of the bank is not a factor causing the emergence of non-performing loans. Bank capital depicts the interest of shareholders where the capital can be used by banking companies to carry out its operational activities and overcome certain problems related to performance. Capital adequacy of banking companies is not only used for credit management purposes, but also for other important bank needs. In addition, the use of capital to overcome the risks that exist within the bank with the main objective of mitigating credit risk is not effective considering that non-performing loans may be caused by non-financial factors.

Bank liquidity has no negative effect on non-performing loans. This is because credit management is prioritizing mostly on credit policy and credit indicator of prospective debtor to accept loan applications, not on how they properly use deposits from customers. Changes in the quantity of loans and deposits also do not reflect the credit quality of the bank and therefore have no impact on non-performing loans. Deposits are funds deposited from customers, so that the decision to make deposits or to withdraw funds from deposits might depends on each customer.

There are several limitations in this research. First, this research only used profitability, income diversification, bank capital, and bank liquidity as determinants of non-performing loans. For further research, it is expected to use other independent variables that are estimated to affect non-performing loans, such as bank size or loan loss provisions. Second, this research only used the 2017-2019 observation period. For further research, it is recommended to use a longer observation year so that the trend of determinants of non-performing loans can be discovered. Third, this research used the gross non-performing loans ratio to measure the variable of non-performing loans. For further research, different measurement formula can be used, such as the net non-performing loans ratio.

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