

# FLUCTUATION OF CREDIT RISK AND COMPANY SIZE ON LIQUIDITY

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## ABSTRACT

This study aims to provide empirical evidence on the effect of credit risk and company size on liquidity in the banking sector. Liquidity is an important aspect in assessing a bank's financial performance because it reflects the institution's ability to meet short-term obligations and maintain operational continuity. This study focuses on Bank Mandiri, which consistently shows liquidity stability during the 2013–2023 period, even amidst various economic conditions. The research approach used is quantitative with a time series regression model. Secondary data is obtained from Bank Mandiri's audited annual financial statements. The dependent variable, namely liquidity, is measured using the Loan to Deposit Ratio (LDR); while the independent variables are credit risk measured by the Non-Performing Loan (NPL) ratio, and company size measured by the natural logarithm of total assets. To ensure the validity of the model, classical assumption tests such as normality, multicollinearity, heteroscedasticity, and autocorrelation are carried out. The results of the study show that credit risk and company size have a positive and significant effect on liquidity, both partially and simultaneously. This finding indicates that increasing credit risk encourages banks to strengthen liquidity reserves, and large-scale companies have wider access to funding. This result differs from several previous studies, indicating that institutional characteristics and risk management strategies can affect the direction and strength of the relationship between variables. This study contributes to the literature by presenting time-series evidence on the determinants of liquidity at one of the largest state-owned banks in Indonesia.

## 1. INTRODUCTION

As intermediate entities in the financial sector, banks and the banking sector at large play a significant role in a nation's economy (Challoumis & Eriotis, 2024). To support the operations of interested parties, banks operate on a micro level by transferring money from consumers with surplus finances to individuals and business actors in need of funding. At the macro level, the banking sector serves as a vehicle for monetary policy implementation and a source of funding for economic growth.

Rahmayati (2021) states that a bank is a company that operates as a financial institution and collects money from people who have extra money (surplus money) and gives it to people who don't have any money (lack of money). It also offers other banking services for profit and social reasons to raise people's standard of living.

One measure of the health of the banking system that shows whether the bank can fulfil its debts to its depositors is liquidity. A bank is dealing with a significant issue that has to be fixed right away if it encounters a liquidity shortage (Gleeson, 2020). Because the bank is formally deemed unsuitable to function, it is likely to be liquidated otherwise.

The liquidity value of a number of financial institutions dropped below the predetermined level, putting them in a precarious situation to ensure the safety of their clients' deposits and endangering the ongoing operations of the banking institutions (Michail, 2021). In the meantime, the liquidity ratios of a number of other banks that are listed on the IDX actually increased to above the upper limit. An excessively high liquidity ratio is a sign of poor cash management, which leaves a significant quantity of idle cash and slows down the company's operational growth.

A ratio called liquidity is used to assess a bank's capacity to pay short-term debts when they become due (Wijayanti, 2022). In other words, it can fulfil the credit requests that have been made and reimburse the depositors' money when billed. If the bank can pay when billed, it is considered liquid. Additionally, the bank must be able to process all credit applications that qualify for financing. The Loan to Deposit Ratio (LDR) is the liquidity ratio employed in this study because it may be used to gauge how well bank management is able to create credit distribution using funds from outside sources (Saleh & Winarso, 2021).

In Indonesia, bank liquidations resulting from failure to meet short-term obligations are not uncommon. Since the 1998 crisis, when the government salvaged the majority of the banks,

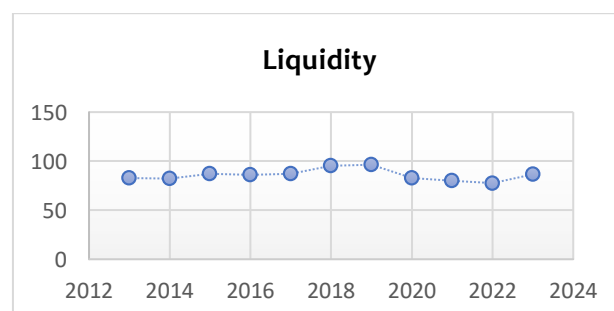
Indonesia has seen a rise in bank insolvency. Even though BI has put in place highly stringent controls, a number of examples beyond the financial crisis have also arisen in this reform era.

Giving money to debtors is one of the operational actions that banks do to boost their profitability. Credit or loans are used to disburse the money. Every credit that is given out has some degree of credit risk, namely in the form of irregular credit payments (Budianto, 2023). The danger of potential bank losses due to the debtor's failure to return the credit extended by the bank is known as credit risk. The risk of loss associated with the possibility of not meeting commitments when they are due is known as credit risk. Stated differently, credit risk is the risk associated with the borrower's failure to make payments on his obligation.

Additionally, a bank's size has a larger chance of raising the risk that the bank must assume (Huang et al., 2021). There is a chance to invest money in the credit industry if the bank's assets grow. This occurs if the bank's assets are not properly managed and utilized for its operating activities, which might result in increased asset management expenses for the bank. An organization's ability to extend credit increases with the size of its assets. Larger banks are preferred because they can offer a greater range of financial services. The variety of financial services provided has an impact on preserving the bank's liquidity.

Notwithstanding exchange rate swings brought on by political and economic unrest, Bank Mandiri makes sure that the present liquidity situation remains stable. Bank Mandiri has adopted a strategy to maximize asset liability management in order to maintain liquidity. This approach is closely monitored while still executing all facets of risk management. Including hazards related to markets and liquidity.

According to PT Bank Mandiri (Persero) Tbk. (BMRI), the rise of third-party funds (TPF) has slowed and the national banking liquidity situation remains tight until August 2024. While credit expanded 11.4% YoY, TPF growth was just 7% yearly (year over year).



**Figure 1. Bank Mandiri Liquidity for the Period 2013-2023**

Based on the data, it shows that the liquidity of Bank Mandiri Company has always been maintained since 2013 to 2023. This condition indicates that in various economic situations, such as the economic crisis due to Covid, Bank Mandiri Company has maintained liquidity. In these conditions, it is necessary to look for factors that influence the liquidity of Bank Mandiri Company. Theoretically, there is a signal theory which states that the Company's activities are highly determined by the Company's fundamental factors, because it is a sign that the Company is doing well or not.

Bernardin & Chaniago (2017) came to the partial conclusion that there is a strong detrimental effect from research on credit risk and liquidity. Liquidity will rise when credit risk decreases and vice versa. Credit risk, according to Gautama, Annisa, and Waspada (2018), has a detrimental impact on liquidity. This implies that a rise in credit risk will always lead to a fall in liquidity, and vice versa.

Based on the study's findings, Desda & Yuliza (2021) concluded that credit risk had a negative and significant impact on liquidity as shown by the current ratio, with an effect of -0.879 and a t-count result of -7.457 and sig 0.018. This indicates that there is a partial inverse proportionality between credit risk and liquidity. This finding contradicts the findings of Yudana, Cipta, and Suwendra's (2015) study, which examined the impact of non-performing loans on credit institution liquidity and found negligible results; in contrast, Bernardin and Chaniago's (2017) study, which examined the impact of credit risk on cooperative liquidity, found a significant effect. It seems sense that the more liquidity there is, the lower the credit risk. This BPR's low level of liquidity results from a rise in loans or bad debts owed by this client, which impairs the BPR's capacity to fulfil its responsibilities.

Most previous studies found that credit risk has a negative effect on liquidity (Gautama et al., 2018; Desda & Yuliza, 2021). Many studies use cross-bank data (panel data) or cross-sectional, rather than focusing on one bank in the long term. Research that emphasizes the relationship between credit risk, company size, and liquidity is more often conducted in the corporate or cooperative sector (Bernardin & Chaniago, 2017), rather than in large state-owned banks.

Based on this background, it is important to conduct research related to the influence of credit risk and company size on the liquidity of independent banking companies which empirically show consistent liquidity for decades. Combining several theories (Signaling, Risk-Return Trade-

Off, Intermediation, RBV) to explain the relationship between variables comprehensively, which is rarely done integratively.

## **2. LITERATURE REVIEW**

### **Signaling Theory**

Spence introduced the signaling theory, which states that businesses communicate their internal quality and perspective to external stakeholders through quantifiable signaling, such as financial ratios or strategic decisions. In a bank, a high and stable liquidity ratio can be a sign of good credit risk management and sound financial management. Liquidity is not just an operational necessity for large organizations like Bank Mandiri, but it is also a strategic tool for ensuring stability, particularly during uncertain economic times (Spence, 1973).

### **Risk-Return Trade-Off Theory**

The risk-return trade-off is a fundamental concept in finance that states that a higher potential return is typically associated with a higher risk. The main component of banking risk is credit risk, which is defined as the ability for a borrower to default. When credit risk increases, banks frequently respond by strengthening their position to reduce the likelihood of a bank failure and ensure solvency throughout the uncertain period (Leland, & Pyle, 1977).

### **Financial Intermediary Theory**

The financial intermediary theory explains the role of banks as intermediary organizations that transfer money from investors to consumers. This function's efficiency and stability are largely dependent on the bank's ability to manage credit risk and liquidity. Larger banks typically have more diverse deposit amounts, more advanced technology, and better access to the capital market, all of which collectively increase their ability to maintain optimal liquidity (Diamond, 1984).

### **Resource Based View (RBV)**

According to Barney's (1991) resource-based view (RBV), a company may effectively manage and strengthen its competitiveness through the strategic use of internal resources. Resources such as capital strength, skilled labor force, technological infrastructure, and brand reputation all contribute to effective liquidity management in banks (Barney, 1991).

Based on the literature review, the hypothesis in this study is formulated as follows:

### **The Effect of Credit Risk on Liquidity**

$H_{01}$ : Credit risk does not have a significant partial effect on Bank Mandiri's liquidity.

$H_{11}$ : Credit risk has a significant partial effect on Bank Mandiri's liquidity.

### **The Effect of Company Size on Liquidity**

$H_{02}$ : Company size does not have a significant partial effect on Bank Mandiri's liquidity.

$H_{12}$ : Company size has a significant partial effect on Bank Mandiri's liquidity.

## **3. METHODOLOGY**

This study uses a quantitative approach with a causal explanatory design that aims to determine the causal relationship between independent variables (credit risk and company size) and the dependent variable (liquidity) (Mohajan, 2020). This study is designed to test the hypothesis and measure the magnitude of the influence of each variable in a certain period of time. The object of this study is Bank Mandiri's financial performance in the period 2013–2023. The subject of this study is the study of Bank Mandiri's annual financial report which includes data related to liquidity, credit risk, and company size. The type of data used is secondary data, in the form of annual financial reports published by: Indonesia Stock Exchange (IDX), Bank Mandiri's official website, OJK Report. This study uses time series regression analysis, using Eviews software. The variables used in this study are Liquidity (Y), which is measured through the Loan to Deposit Ratio (LDR) in percentage (%), then the credit risk variable ( $X_1$ ), which is measured through Non-Performing Loan (NPL) in percentage (%), finally the company size variable ( $X_2$ ), which is measured through the natural logarithm of total assets (Ln Total Assets).

## **4. RESULT AND DISCUSSIONS**

### **Classical Assumption Test**

Classical assumption testing is necessary when using statistical methods for multiple regression (Hu & Plonsky, 2021). This is required to prevent regression issues, namely issues with traditional assumption tests, which are typically encountered in research using time series data and more than two explanatory factors. The coefficient cannot be utilized as a highly accurate estimator if the classical assumption is broken.

#### **a. Multicollinearity Test**

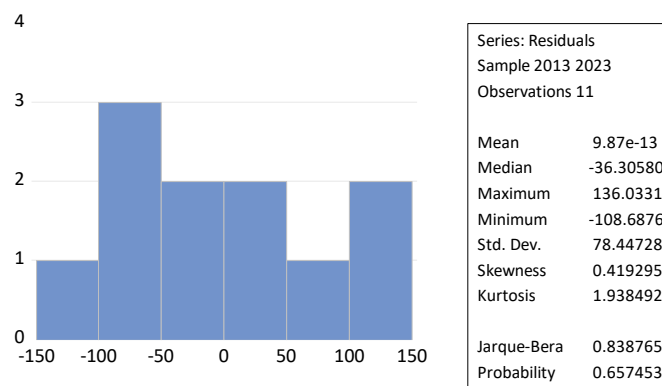
The multicollinearity test aims to determine whether there is a collinear relationship between independent variables (Lindner et al., 2020). Almost all variable data in financial research have the potential for multicollinearity. This is because the variables used are usually derivatives of other variables. As a result, the use of two variables that have a derivative relationship in one model will cause multicollinearity problems.

**Table 1. Multicollinearity Test Results**

Variable	Coefficient Variance	Uncetered VIF	Centered VIF
C	276365.4	395.1942	NA
Credit Risk	49.27506	359.2905	1.065981
Company Size	14.21549	9.570863	1.065981

#### b. Normality Test

Finding out if the independent variable, dependent variable, or both have a normal distribution is the goal of the normality test (Knief & Forstmeier, 2021). The Jarque-Bera (JB) approach is one way to determine if the residual is normal. The data is regularly distributed if the probability is higher than 5%.



**Figure 2. Normality Test Results**

#### c. Autocorrelation Test

In a linear regression model, autocorrelation is used to determine if nuisance errors in period "t" and nuisance errors in period "t1" (before to that) from a set of data organized in a time series are correlated. It is referred regarded be an autocorrelation problem if there is a correlation (Kumar, 2023). The Durbin Watson Test is used to determine if autocorrelation is present or not. Autocorrelation does not exist if the DW value is at the top limit.



**Table 2. Autocorrelation Test Results**

F-statistic	1.470753	Prob. F(2,6)	0.3021
Obs*R-squared	3.618693	Prob. Chi-Square(2)	0.1638

d. Heteroscedasticity Test

A situation known as heteroscedasticity occurs when the disturbing error's variance varies across all independent variable values (Abdullah et al., 2022). The OLS-based parameter estimates are still "unbiased and consistent" in the presence of heteroscedasticity, but they are inefficient since their variance exceeds the "minimum variance." Confidence intervals become prejudiced (biased confidence intervals) in order to influence future estimations of parameter variation and lead to erroneous hypothesis testing about parameters.

**Table 3. Heteroscedasticity Test Results**

F-statistic	1.329567	Prob. F(2,8)	0.3173
Obs*R-squared	2.744170	Prob. Chi-Square(2)	0.2536
Scaled explained SS	1.174978	Prob. Chi-Square(2)	0.5557

e. Linearity Test

The purpose of the linearity assumption test is to ascertain if the independent and dependent variables have a linear relationship. Regression and correlation analysis require this linearity test. The independent and dependent variables must have a linear connection for a regression model to be effective. The Ramsey Regression Equation Specification Error Test, often known as the Ramsey RESET test, is one of the most widely used linearity tests (Domínguez & Lobato, 2020). According to the test findings, the nonlinear model is not superior than the linear model since the probability value is higher than  $\alpha = 0.05$ . Consequently, this regression model satisfies the linearity assumption.

**Table 4. Linearity Test Results**

	Value	df	Probability
t-statistic	0.412620	7	0.6922
F-statistic	0.170255	(1, 7)	0.6922
Likelihood ratio	0.264342	1	0.6072
F-test summary:			
	Sum of Sq.	df	Mean Squares
Test SSR	1461.238	1	1461.238
Restricted SSR	61539.76	8	7692.471
Unrestricted SSR	60078.53	7	8582.647
LR test summary:			
	Value		
Restricted LogL	-63.07081		
Unrestricted LogL	-62.93864		



## Multiple Regression Test

### a. F-Test

Finding out if the independent factors have a simultaneous impact on the dependent variable is the goal of the F test. To determine how each independent variable affects the dependent variable at the same time, the F test is used. At the 0.5 or 5% level, it is possible to conclude that the independent variables have a simultaneous impact on the dependent variable or vice versa if the significant value of F is less than 0.05 (Lee, 2022).

**Table 5. F-Test Results**

R-squared	0.981901	Mean dependent var	8584.000
Adjusted R-squared	0.977376	S.D. dependent var	583.1077
S.E. of regression	87.70673	Akaike info criterion	12.01288
Sum squared resid	61539.76	Schwarz criterion	12.12139
Log likelihood	-63.07081	Hannan-Quinn criter.	11.94447
F-statistic	217.0048	Durbin-Watson stat	1.835380
Prob(F-statistic)	0.000000		

The study's findings indicate that this research approach significantly influences our comprehension of shifts in Bank Mandiri Company's liquidity. With only 2% of other factors having an impact, this study model accounts for 98% of the company's liquidity.

### b. T-Test

The study hypothesis about the partial effect of each independent variable on the dependent variable is tested using the t-test. A statistical test called the T-test is used to determine if the hypothesis that there is no significant difference between two sample averages drawn at random from the same population is true or not (Norvadewi et al., 2023).

**Table 6. T-Test Results**

Variable	Coefficient	Std.Error	t-Statistic	Prob.
C	-2170.838	525.7047	-4.129386	0.0033
Credit Risk	146.1188	7.019620	20.81577	0.0000
Company Size	16.44144	3.770343	4.360729	0.0024

Based on the results of the study, it shows that credit risk has a positive effect on liquidity, this indicates that the higher the credit risk, the higher the liquidity of the banking company. Then, the size of the company also shows a positive effect, which means that the larger the size of the company, the greater the liquidity of the banking company. The results of this study indicate that both variables show a positive effect on the liquidity of the banking company.

The study's findings contrast from those of several other investigations, including one by Sugiono & Christiawan (2007) that examined the variables affecting liquidity in the retail sector listed on the Indonesia Stock Exchange between 2007 and 2012. The study's findings showed that while firm size and growth prospects have little effect on liquidity, working capital turnover does.

Yudana, Cipta, and Suwendra (2015) examined how cash turnover and non-performing loans affected liquidity at the Seririt District Village Credit Institution. At the LPD of Seririt District in 2011–2013, the study's findings demonstrated that non-performing loans and cash turnover had a significant impact on liquidity, that non-performing loans had a negative and significant impact on cash turnover, that non-performing loans had no effect on liquidity, and that cash turnover had a positive and significant impact on liquidity.

Bernardin and Chaniago (2017) investigated how credit risk affected Harapan Jaya Cooperative's liquidity through receivables turnover. The study's findings suggest that other factors do not considerably affect the relationship between credit risk and receivables turnover. They also partially demonstrate that while credit risk has a big impact on liquidity, receivables turnover has a significant impact on liquidity. Additionally, credit risk has a major impact on the turnover and liquidity of receivables at the same time. This study differs in that it examines the people's credit bank financing institution (PT. BPR Swadaya Anak Nagari, Simpang Empat) and conducts tests to validate the findings of previous research (Bernardin & Chaniago, 2017), which concurrently demonstrates the importance of credit risk and the impact of accounts receivable turnover on liquidity.

The reason for the discrepancy in study findings is that financial ratio-based measurements are still heavily reliant on the accounting technique or treatment—such as the value-added approach—used to prepare the company's financial statements (Udiyana et al., 2015). Size is a theoretical indicator of a company's size. This aspect explains why it is simpler for large corporations to access the capital market than it is for small companies. Easy access to the capital market refers to the company's flexibility and capacity to raise more money or take on debt, provided that it has a greater dividend payout ratio than small businesses.

Comparing the scale of a company's operations, which may be categorized in a number of ways such as total assets, stock market value, and others, can be considered a measure of the company's size. The larger a firm is, the more investors are likely to pay attention to it, which will raise the company's perceived worth. This relates to the company's size, which determines

whether it qualifies as a small, medium, or big business. Small businesses are typically less lucrative and very susceptible to shifts in the economy. While big businesses have the ease of accessing the capital market, they also have the flexibility and capacity to get loans.

The results of the study indicate that credit risk and company size have a positive and significant effect on Bank Mandiri's liquidity, both partially and simultaneously. This finding provides important implications for liquidity management in the banking sector, especially in large institutions such as Bank Mandiri that show consistency in maintaining financial stability.

Theoretically, these results can be explained through the Signaling Theory and Risk-Return Trade-Off Theory approaches. In the context of signaling, high liquidity stability can be a signal that Bank Mandiri is managing credit risk carefully and is confident in its ability to pay short-term obligations. The positive relationship between credit risk and liquidity seems contradictory to traditional theory, which generally states that increasing credit risk will reduce liquidity. However, in the case of Bank Mandiri, increasing credit risk can encourage banks to strengthen liquidity reserves in order to anticipate potential defaults, in accordance with the principle of prudence (prudential banking).

In addition, the large company size (seen from total assets) allows Bank Mandiri to have wider access to funding sources, both from financial markets and from a strong customer base. This is in accordance with the Resource-Based View (RBV) which emphasizes that the competitive advantage of large banks lies in their ability to manage resources to maintain liquidity and stability. This finding supports the research results of Bernardin and Chaniago (2017) which show that credit risk has a significant effect on liquidity, but contradicts the research of Yudana, Cipta, and Suwendra (2015), which states that the effect of credit risk on liquidity is not significant. This difference could occur due to variations in research objects, risk management policies of each institution, or different bank scales. In addition, the research results show that liquidity ratio management plays a crucial role in financial performance. This is consistent with the findings of Bank Mandiri, where LDR increases as liquidity is strategically controlled (Sari, Novari, Fitri, & Nasution, 2022).

The results of this study provide several important implications for: (1) Bank managers: Need to maintain a balance between credit expansion and risk control to ensure optimal liquidity. When credit risk increases, banks must adopt a liquidity strengthening strategy. (2) Regulators (OJK/BI): Can use indicators of company size and credit risk as parameters in assessing bank risk

profiles periodically. (3) Investors: Can use liquidity and asset size as positive signals of a bank's ability to maintain financial stability amidst risk fluctuations.

## 5. CONCLUSION

This study aims to analyze the effect of credit risk and company size on liquidity at Bank Mandiri during the period 2013–2023. Based on the results of time series regression analysis and classical assumption testing, it was found that both independent variables, namely credit risk and company size, have a positive and significant effect on liquidity, both partially and simultaneously.

Specifically, this finding shows that increasing credit risk does not necessarily reduce liquidity; instead, it encourages banks to strengthen liquidity reserves as a form of mitigation against potential defaults. Meanwhile, a larger company size provides flexibility in accessing wider funding sources, thereby strengthening the company's liquidity capabilities.

These results are not entirely in line with several previous studies, which generally show a negative effect of credit risk on liquidity. This difference indicates that institutional factors, company scale, and the risk management strategy implemented can influence the direction of the relationship between these variables.

Theoretically, the results of this study are strengthened by the Signaling Theory and Risk-Return Trade-Off approaches, where liquidity stability is a signal of market confidence in bank risk management. Meanwhile, from the perspective of Resource-Based View, company size reflects the capacity of internal resources that can strengthen financial position, including liquidity.

This study provides practical contributions for bank management in designing risk and liquidity management strategies, as well as for regulators in formulating banking sector supervision policies. Further research is suggested to involve more than one bank entity and include macroeconomic variables so that the results obtained are more general and comprehensive.

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