Role of Capital Adequacy

by Julia Safitri

Role Capital Adequacy and Liquidity to Improve Banking Performance

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Abstract

This study aims to test empirically the effect of liquidity and adequacy on bank performance through interest rate risk and credit risk. Capital adequacy and liquidity are variables that can affect the ups and downs of opinion, where the bank's performance in this study is the dependent variable. Good credit distribution can minimize the occurrence of defaults. This study uses banking companies in Indonesia that are listed on the Indonesian stock exchange, with a total of 43 banking companies, but this study only uses 30 companies ranging from 2014-2019, due to limited data. The data analysis technique in this study used PLS-SEM with the WarpPLS application. The research results show that capital adequacy and liquidity has a positive effect on bank performance, interest rate risk and credit risk can mediate capital adequacy on bank performance, interest rate risk can mediate liquidity on bank performance, interest rate risk has a positive effect on bank performance. However, credit risk can't mediate liquidity on bank performance and credit risk has not a positive effect on bank performance. This is in line with the commercial loan theory, shiftability theory and the doctrine of anticipated income, which explains how best to give credit, both long and short term.

Keywords: capital adequacy, liquidity, bank performance, financial intermediation

JEL Classification Code: G21, G24, G29

1. Introduction

Banks are intermediary institutions that collect funds from the public in the form of savings and channel them back to the public in the form of credit or other forms in order to accelerate the overall economic growth of a country. Banking in developing countries has become one of the institutions that plays a very important role in domestic economic activity because it is one of the sources of funding needed for domestic market activities when other sources of funding such as the capital market are still weak and limited so that they are unable to provide adequate funding sources for domestic market activities. economic activity and investment (Saci *et al.*, 2009).

A bank is a type of financial institution, thus a part of the financial system, so that in carrying out its function as an economic actor it is influenced by macro factors and bank internal factors or bank specific factors. Risk management is the essence of the implementation of prudential principles in managing the bank, in a changing environment banks are faced with a number of risks, for example: credit risk, liquidity risk, exchange rate risk, market risk and only banks are able to manage risks that can survive successfully. (Powers et al., 2007).

The purpose of the bank is guided by Law No.1 of 1998 is to support national development activities so as to create equality, national stability and economic growth that have an impact on increasing people's welfare. Where the purpose of the bank contains a large value so that it is often a burden for banks to carry out their duties and functions according to these objectives. So, banks are not solely aiming for profit, but far beyond that. Risk management increases volatility (risk) in exchange rates, interest rates and commodity prices. The existence of this increased risk has triggered the need for new financial instruments and analytical tools to manage risk. Risk management is the design of procedures and implementation of procedures to control risk. Risk management emerged as a response to the increasing volatility of global financial markets as a result of technological innovation. Risk management aims to manage these risks so that we can get the most optimal results. In an organizational context, the organization will also experience many risks. If the organization is not able to manage risk properly, then the organization can suffer significant losses. Therefore the risk faced by the organization must be managed, so that the organization can survive, or optimize risk. Companies often deliberately take certain risks, because they see the potential return behind these risks. Risk management is basically carried out through the following processes: Risk identification, risk evaluation and measurement, risk management. The next discussion is about credit risk, which is one of the risks faced by banks. Credit risk is a risk that promises cash flow from loan income and other securities owned by financial institutions that may not be fully repaid. Credit risk dominates the composition of the capital adequacy ratio, where 70% of capital is allocated for credit risk and 30% for market risk and operational risk. Thus credit risk is the main cause of bank failure and the risk is most visible to bank managers (Garr, 2013). There is limited empirical research that examines the factors that affect credit risk. Bank risk is closely related to economic conditions and business turnover. When economic conditions experience a downturn / sluggishness, problem loans will also increase in number, at a time when the economy is booming (booming economics) will increase the volume of cash held by businesses or households, this will increase people's purchasing power so that the ability to repaying loans is increasing. This has reduced bank credit risk.

2. Literature Review

2.1. Grand Theory

There are three theories used in this paper, namely risk management theory, financial intermediation theory, and liquidity preference theory. Credit is the provision of money or an equivalent claim, based on a loan agreement or agreement between a bank and another party which requires the borrowing party to pay off its debt after a certain period of time with interest. Risk management in bank operations includes risk identification, measurement and assessment, and the objective is to minimize the negative effects of risk on financial results and bank capital. Banks are required to establish a special organizational unit for risk management purposes. As an intermediary financial institution that receives public funds, and subsequently distributes them

back in the form of credit, banks must apply the principle of prudence in carrying out their operational activities so that the bank remains an institution that is trusted by the public (prudential banking activity). Credit risk is the risk where a customer / debtor or counterpart is unable to fulfill its financial obligations according to the contract / agreement that has been entered into. This definition can be expanded, namely that credit risk is a risk that arises due to decreasing credit quality. Boffey and Robson (1995) The main reason why proper management of credit risk is very important is because banks have a limited capacity to absorb loan losses. In a broad sense, the capacity of a bank to absorb loan losses comes, in the first example, from the income generated by other profitable loans and, in the second example, with the bank's capital. The income that a bank generates from a profitable loan is usually modest.

Financial Intermediation Theory was first put forward by (Schumpeter in 1939), which states that financial intermediation is based on minimizing the production costs of information to solve intensive problems. Financial intermediation is the key to understanding why there is an advantage in supervision of an intermediary that depositors do not (Diamond, Douglas W, 1984). Financial intermediation allows the best contracts as well as a large allocation as a positive role for the financial intermediation process. In general, loans and deposits with no high leverage result in a low probability of default (default). However, with the model of supervision and diversification, the possibility of default is still low. A number of other theories include Allen and Santomero (1997), Bikker et al. (2003), further stated that why banks and financial intermediaries in general can exist because they can mitigate the liquidity risk that occurs on the flow of funds from surplus parties (depositors) by becoming agents of parties who need funds (borrowers). The basis of the intermediation theory of financial intermediary institutions is to see banks as a solution to these problems, because banks have a comparative advantage regarding all information regarding the crediting values of debtors (Pyle, 1971), (Scholes et al., 1976) banks are better able to monitor debtors than individual creditors (Leland and Pyle, 1977), banks can provide greater liquidity than funds collected from the household and business sectors and can issue demand deposit that can be exchanged for funds (Fama, 1980).

Liquidity Preference Theory, which was originally developed by (J.M. Keynes, 1946) analyzes the equilibrium interest rate through the interaction of the money supply with the public's aggregate demand for holding money. Keynes assumed that most individuals hold wealth in only two forms: money and bonds. Liquidity preference theory is structured based on the supply and demand of money supply and the view that all financial decisions emphasize the monetary side of liquidity. Therefore, the loan fund model is developed based on the flow of funds in the financial system and views that financial decisions are made on a broader basis of liquidity. Historically, interest rates are almost as old as human civilization, in other words, interest rates have been around for a long time. This is in accordance with the opinion expressed by (Modigliani, 1944) which states that people who have borrowed goods from others and sometimes they have asked for compensation for services rendered. This reward is called rent, which is the price of borrowing someone else's property. Whereas Tobin (1958) stated that interest is a number of funds, valued in money, received by the lender (creditor), while the interest rate is the ratio of the interest to the amount of the loan. So the interest rate is the price of borrowing money to use its purchasing power. The interest rate is one of the variables in the economy that is constantly being watched carefully because of its wide-ranging impact. Interest directly affects people's daily lives and has an important impact on the health of the economy from the perspective of consumption, credit, bonds and savings.

2.2. Hypothesis Development

2.4.1. The Effect of Capital Adequacy on Bank Performance

The capital adequacy standard for banks operating internationally is a major concern for regulatory banks around the world. Because of this, the Bank for International Settlements (BIS) established a framework for measuring capital adequacy for banks in the group of ten (G10) banking industry countries in the world. Capital adequacy standards affect bank performance (Prawitasari, et al., 2020; Ha, 2019; Ezike and Oke, 2013). Capital Adequacy Ratio (CAR) as an indicator of a bank's ability to cover a decline in assets as a result of losses suffered by a bank, the size of the CAR is determined by the bank's ability to generate profits and the composition of funds allocated to assets according to the level of risk. Some studies show that partially CAR has a positive effect on ROA, namely (Chavarín, 2015), (Albulescu, 2015), (Malik et al., 2015), (Mayes and Stremmel, 2012), (Rahman et al., 2015), (Islam and Nishiyama, 2016), (Boadi et al., 2016), while (Owoputi et al., 2014), (Putranto et al., 2014). Based on these descriptions relating to capital adequacy and bank performance, the hypotheses proposed in this study are:
H_1: Capital Adequacy has a Positive Effect on Bank Performance.

2.4.2. Effect of Liquidity on Bank Performance

The relationship between bank liquidity as measured by the loan to deposit ratio (LDR) and profitability return on assets (ROA) has been studied in European banks with significant positive results (Bourke, 1989). These findings indicate that the greater the amount of credit extended, the greater the loan interest income received by the bank so that the return on assets increases. The results of this study also show that the greater the source of idle funds, the smaller the profitability.

The ability of a bank to provide sufficient funds to meet all obligations and commitments that have been issued to its customers at any time is called liquidity. Assessment of bank soundness using the Camel method contains, among others, the LDR ratio for liquidity measurement (Bank Indonesia, 2004). A bank with a low LDR, which means that the amount of credit extended is relatively low, means that the opportunity to obtain interest income from loans is also low. A bank with a high LDR means that the opportunity to earn income from credit interest is relatively high (Camba, 2020). Money in the form of securities (Eichengreen and Gibson, 2001). The results of this study concluded that the greater the lending by the bank, the higher the profitability. Empirical research which states that LDR has a positive effect on ROA (Lartey1 et al., 2013), (Filomena Jasevičienė1, 2013), (Herman PALENI, 2017), (Zainelden, 2018). Based on these descriptions relating to bank liquidity and performance, the hypotheses proposed in this study are:
H_2: Liquidity has a positive effect on Bank Performance.

2.4.3. Interest Rate Risk as a Mediator of Capital Adequacy on Bank Performance

Capital adequacy is a policy or regulation of a company or a bank in handling its capital. Capital is a fund that is invested by the owner in the context of establishing a business entity which is intended to finance bank business activities in addition to meeting the regulations set by the monetary authority (Hrishikes Bhattacharya, 2013). Adequate capital can increase public confidence, because it indicates that the bank can accommodate the possible risk of losses that will

be experienced by the bank due to bank operations. That way, capital adequacy will have an impact on increasing profits or profitability obtained by banks through loan interest rates. CAR is an indicator that is often used to measure the level of bank capital adequacy. CAR can be obtained by calculating the ratio or comparison between own capital and RWA. (Mayes and Stremmel, 2012), (Owoputi et al., 2014), (Jha and Hui, 2012). Based on this description, the hypotheses proposed in this study are:

H_3: Interest rate risk can mediate capital adequacy on bank performance

2.4.4. Credit Risk as a Mediator of Capital Adequacy on Bank Performance

Signaling theory or signal theory developed by Ross (1977) states that company executives who have better information about their company will be encouraged to convey this information to potential investors so that the company's stock price increases. The positive thing in the signaling theory is that companies that provide good information will differentiate them from companies that don't have "good news" by informing the market about their situation, a signal about good future performance given by companies whose past financial performance is not good, will be trusted by the market. Based on this description, the hypotheses proposed in this study are:

H_4: Credit risk can mediate capital adequacy on bank performance

2.4.5. Interest Rate Risk as a Liquidity Mediator on Bank Performance

Market risk is defined as the risk that arises due to the movement of market variables from the bank's portfolio which can harm the bank (Adverse Movement) (Goodfriend, 1991). The first effect, IRR has a positive or unidirectional effect on interest rate risk and negative or opposite direction to the level of the bank's ability to manage the income received with the costs incurred which is influenced by the interest rate. The second effect, namely the negative effect occurs when the IRR increases when the interest rate trend decreases. This will result in a smaller decrease in interest income than a decrease in interest costs, so that profit and ROA will also decrease. (L., 1998), (Zagonov, 2011), (Oberoi, 2017), (Papadamou and Siriopoulos, 2014). Based on this description, the hypotheses proposed in this study are:

H_5: Interest rate risk can mediate liquidity on bank performance

2.4.6. The effect of credit risk as a liquidity mediator on bank performance

If the IRR increases, it indicates an increase in Interest Rate Sensitive Assets (IRSA) with a greater percentage than the percentage increase in Interest Rate Sensitive Liabilities (IRSL). This situation will increase the risk of interest rates if interest rates decline, which means there is a negative relationship, but this situation will reduce the risk of interest rates if interest rates increase, which means there is a positive relationship. If interest rates increase, there will be an increase in interest income with a greater percentage than the percentage increase in interest costs, so that interest income and ROA will increase (Gallitschke et al., 2017), (Drehmann et al., 2010), (Fernandez , 2004; Esposito et al., 2015). Based on this description, the hypotheses proposed in this study are:

H_6: Credit risk can mediate liquidity on bank performance

Based on hypotheses 1, 2, 3, 4, 5 and then hypotheses 7 and 8 can be submitted, namely:

H7: Interest rate risk has a positive effect on bank performance

H8: Credit risk has a positive effect on bank performance

3. Research Method

The object of this research is banking companies listed on the stock exchange from 2014 to 2019. The population in this study are banking companies listed on the Indonesia Stock Exchange. In this study, the data analysis technique used Partial Least Squares (PLS) - Structural Equation Modeling (SEM) with the WarpPLS 6.0 application. based on that this research is predictive and exploratory. The use of PLS-SEM considers several advantages, including; SEM PLS can work efficiently with small sample sizes and complex models, the assumption of data distribution in SEM-PLS is relatively more loose than other methods such as CB (Covariance-based) -SEM (Sholihin and Ratmono, 2013). To test hypotheses 1 to hypothesis 8, the following model equation can be made:

$$ROA = \alpha 1 + \beta 1\ CARt + \beta 2LDR + \beta 3IRR + \beta 4RAROC + \epsilon 1 \qquad (1)$$
$$IRR = \alpha 2 + \beta 1CAR + \beta 2LDR + \epsilon 2 \qquad (2)$$
$$RAROC = \alpha 1 + \beta 1CARt + \beta 2LDR + \epsilon 3 \qquad (3)$$

4. Results

The results of testing the first hypothesis show that liquidity has a positive effect on bank performance, this is indicated by a coefficient value of 0.148 and a p-value of 0.021, so the first hypothesis is accepted. For testing the second hypothesis, namely capital adequacy has a positive effect on bank performance with a coefficient value of 0.265 and p-value <0.001 consistent with the hypothesis so this hypothesis is accepted. Furthermore, the third hypothesis, namely interest rate risk can mediate the effect of capital adequacy on bank performance, with a coefficient value of 0.152 and a p-value of 0.019, this third hypothesis is accepted. The fourth hypothesis is that credit risk can mediate the effect of capital adequacy on bank performance, where the coefficient value is 0.705 and the p-value is <0.001, this hypothesis is accepted. And then the fifth hypothesis of interest rate risk can mediate the influence of liquidity on bank performance with a coefficient value of 0.139 and a p-value of 0.028, so this hypothesis is accepted. The sixth hypothesis is that credit risk can mediate the effect of liquidity on bank performance, where the coefficient value is -0.036 and the p-value is 0.134, so this hypothesis is rejected. Furthermore, the seventh hypothesis, namely interest rate risk has a positive effect on bank performance, with a coefficient value of 0.123 and a p-value of 0.046, this hypothesis is accepted. The eighth hypothesis that credit risk has a positive effect on bank performance, with a coefficient value of -0.012 and a p-value of 0.434, this hypothesis is rejected.

Table 1: Path coefficient and P-Value

Descriptive Path	Path Koefisien	P-Value
LDR → ROA	0.148	0.021
CAR → ROA	0.265	<0.001
CAR→ IRR	0.151	0.019
CAR →RAROC	0.705	<0.001
LDR → IRR	0.139	0.028
LDR→ RAROC	-0.036	0.134
IRR → ROA	-0.123	0.046

RAROC → ROA	-0.012	0.434

Source: WarpPLS 6.0 data processing
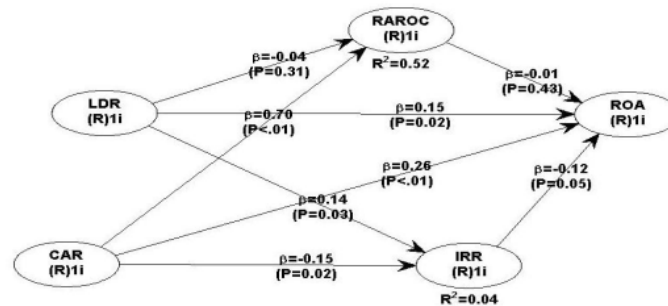
Source: WarpPLS 6.0 data processing
Figure 1. Full Model Research

According to Baron and Kenny (1986) in an analysis model that utilizes mediating variables, it can be seen whether there is full mediation or partial mediation. Full mediation is a time when the independent variable does not have a significant effect on the dependent variable when there is no mediator. Meanwhile, partial mediation is when the independent variable can directly influence the dependent variable without involving the mediator variable. In addition, the mediating variable occurs because the independent variable can predict the dependent variable directly, but its value is smaller than the predicted value of the mediator variable. In this case, if the coefficient of the prediction variable is greater than the coefficient of the mediating variable on the dependent variable, it should not be called a mediator. Testing the indirect effect and the total effect to determine the coefficient value of the indirect relationship. In this study, following the procedures as formulation and the stages of mediation testing proposed by (Baron and Kenny, 1986).

Table 2: Indirect Effect dan Total Effect

Indirect Effect	Path Coeffisien	P-Value
LDR→IRR→RAROC→ROA	0.017	0.041
CAR→IRR→RAROC→ROA	0.010	0.447
Total Effect	Path Coeffisien	P-Value
LDR→IRR→RAROC→ROA	0.131	0.036
CAR→IRR→RAROC→ROA	0.274	<0.001

Source: WarpPLS 6.0 data processing

Based on the results of testing the mediation effect in the table above the indirect effect coefficient for testing the mediation hypothesis of LDR → IRR → RAROC → ROA is 0.017 with a p-value of 0.041 (p <10%). These results explain that the IRR and RAROC values are able to insignificantly mediate the effect of liquidity on bank performance. In testing the direct path relationship LDR → ROA is significant at 0.036. Meanwhile, the direct connection path is CAR → IRR → RAROC <0.001. Likewise, the direct connection path IRR → RAROC → ROA is 0.028. It can be concluded that there is partial mediation in the liquidity relationship (LDR) to bank performance (ROA) through INRISK as a partial mediation variable.

According to Latan and Ghozali (2016), to find out how much the variance of the mediating variable is able to absorb the previously significant direct effect of the model without mediation,

the VAF calculation measure is used. This VAF calculation method is seen as a more suitable measurement model, because it does not require any assumptions about the distribution of the variables so that it can be applied to small sample sizes. The VAF (variance accounted for) values ranged between 0 and 1 where the higher the VAF value, the more perfect the mediation effect was. The calculation of VAF can be used to test the effect of mediation by referring to the VAF criteria> 80%, it means that there is full mediation, if $20\% \leq VAF \leq 80\%$ means partial mediation and VAF <20% means no. there is a mediating effect in the model (no mediation). The results of mediation testing with the VAF method can be seen.

Table 3: VAF Calculation

	Indirect Effect	Total Effect	VAF (Indirect/total effect)
LDR→IRR→RAROC→ROA	0.017	0.139	0.122 = 12.2%
CAR→IRR→RAROC→ROA	0.010	0.274	0.274 = 27.4%

Source: WarpPLS 6.0 data processing

The results of data processing shown in the table above show that the IRR and RAROC variables are the mediating variables for the relationship between liquidity (LDR) and bank performance (ROA), the VAF value is 0.122 or 12.2% which means that IRR and RAROC do not mediate because 12.2% <20% . Furthermore, capital adequacy (CAR) on bank performance (ROA) through IRR and RAROC as mediation has a value of 0.274 or 27.4%, which means that IRR and RAROC can mediate what is called partial mediation.

5. Conclusion

The results of this study found that liquidity has a direct effect on financial performance and an indirect effect. Where hypotheses 1, 2, 3, 4, 5, 8 are accepted, but hypothesis 6, 8 is rejected. So it can be concluded that the higher the liquidity, the higher the bank profit. This is in line with the objectives of liquidity and in line with several theories about liquidity which are proxied by the LDR (loan to deposit ratio), which is where the important purpose of calculating the LDR is to find out and assess to what extent a bank is in a healthy condition in carrying out its operations or business activities. Furthermore, capital adequacy proxied by CAR (capital adequacy ratio) has a positive effect on bank performance. This is in line with the definition of CAR, which is a capital ratio that indicates a bank's ability to provide funds for business development needs and accommodate the risk of loss of funds caused by bank operations. CAR shows the extent to which the decline in bank assets can still be covered by available bank equity, the higher the CAR the better the condition of a bank.

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