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The Correlation Between the Type of Customer Deposits and the Adequacy of Liquid Assets for Liquidity Risk Compliance in the Liquidity Coverage Ratio (LCR) And Its Impact on Profitability (ROA)

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ABSTRACT: Liquidity risk management in banking is crucial and must be maintained at all times. Banking history has shown that bank failures are often caused by the bank's inability to meet obligations, particularly those arising from customer deposit withdrawals. When a bank fails to meet its deposit obligations, it can trigger a wave of withdrawals, resulting in a loss of customer trust in the bank.

Since the implementation of liquidity risk monitoring using the Liquidity Coverage Ratio (LCR) indicator, specifically by the Otoritas Jasa Keuangan (OJK) in 2015, many banking practitioners until now still emphasize it as a mandatory reporting requirement for regulatory compliance. However, within the context of the LCR, banks are required to understand the characteristics of the deposits they manage through several established parameters. Banks are directed to focus more on stable and sustainable deposit growth to support their intermediary business. Therefore, the liquidity requirements are highly dependent on the characteristics and types of deposits held by the bank.

The results of this study shown that a stable deposit composition directly impacts the interest costs that must be paid by the Bank and will certainly also impact the achievement of profitability that the Bank wants to achieve through the Return On Ass et (ROA) indicator and simultaneously comply with regulatory liquidity risk compliance.

KEYWORDS: Stable Deposit, Operational Deposit, Liquidity Risk, LCR, ROA, Liquid Asset and Correlation

I. INTRODUCTION

Liquidity management, particularly the management of liquid assets, significantly impacts a bank's profitability. Several components or variables tested include the number of liquid assets (Liquid Assets), Cash Reserve Ratio (CSR), Quick Ratio (QR), Current Ratio (CR), Loan to Deposit Ratio (LDR), Return on Assets or Return on Equity (ROA/ROE), Loan Quality (NPL), and the amount of capital or bank size (Ida Susanti, 2024).

As a source of funding, banks desperately need stable and sustainable funding sources from the public to ensure the continuity of their business processes. The funding sources managed by banks are in the form of debt received or provided by depositors in various products such as checking accounts, savings accounts, time deposits, and other forms of savings. Therefore, these funding sources can be concluded as funds deposited from the public as a form of trust and the public's need to support their financial activities at the bank they choose. The main thing to emphasize is the stability of deposits, which is divided into several criteria based on the principal amount held, actively used by customer, and interest rate offered. This division concludes that deposits that do not require a high interest rate and are actively used for transactions by customers are assumed to be longer-lasting and more stable. Conversely, if a customer has a large amount of deposit and requests a high interest rate, their stability will be low, and they will be more likely to leave the bank and move to another bank if the required interest rate was not given.

The objection of research to highlight are:

1. Will maintaining adequate liquidity ratios by fulfilling LCR have a negative or inverse relationship to the profitability achieved by the Bank?.
2. Is the liquidity management carried out by the Bank as a residual or merely excess liquidity held by the Bank before being distributed as Loan? The Bank's primary function is to act as an intermediary between customer Funds and debtor Loan.

3. Is there a correlation between the fulfillment of the LCR liquidity ratio figure and the movement of profitability figures which reflected in ROA?
4. Is the sorting of deposit type criteria reported by the Bank in accordance with the provisions stipulated in the POJK regarding the division of deposit criteria already accurate?
5. Will the larger composition of Stable and Operational deposits that will be reflected in lower Interest Costs and impact to increasing ROA as an indicator of profitability or will the larger Unstable and Non-Operational deposits that increase Interest Costs and thus reduce profitability?
6. After fulfillment and collection of deposits based on LCR criteria by the Bank, which is then reflected in the amount of liquid assets that must be managed, been optimized in asset management to achieve profitability?
7. Does the Bank have the ability or control to place more emphasis on stable and operational deposit growth in collecting community funds?

Until now, the general public views and even banking practitioners, still consider the preparation of the Liquidity Coverage Ratio (LCR) report stipulated by regulators to be merely a mandatory reporting requirement for national banks. Based on the author's experience as an instructor and consultant at several banks, many still hold this view. However, by delving deeper into the preparation of the LCR Report, banks can extract information that can support their business plans and positively impact the achievement of their desired profit targets. Therefore, these efforts are not only aimed at fulfilling regulatory reporting obligations but can also be used to support the bank's business growth targets. Specifically, the sorting of deposits allows banks to better understand the criteria for the deposits they manage. As previously stated, deposit management is crucial, considering that deposits are a source of funding that will then be allocated into assets that will generate income. If the bank determines that the deposits it manages are stable and operational, based on its processing results, this means the bank has the flexibility to allocate assets and does not need to manage a large amount of liquid assets. This allows for more optimal asset allocation to generate higher interest income. Meanwhile, if it turns out that the managed deposits are deposits that are less stable and non- operational, then it is a consequence for the Bank to manage larger liquid assets, considering that these deposits are more volatile deposits and can be withdrawn at any time in large amounts. The greater the probability of the outflow, the greater the need for liquid assets or HQLA (High Quality Liquid Assets) that must be managed by the Bank to maintain the possibility of cash outflow from the Deposits, so that the allocation to the form of Loans as a component that provides the highest interest rate for the Bank will be held back so that it will affect the profitability reflected in the Bank's ROA (Return On Asset) and ROE (Return On Equity).

II. LITERATUR REVIEW

Risk is defined as the possibility of causing or implying loss or danger (Regan, 2003). While other opinion argues that events that can result in risk can be divided into two, namely external factors and internal factors (Chen, 2010). The definition of risk is the potential loss due to a particular event occurring while Liquidity Risk is the risk resulting from the Bank's inability to meet maturing obligations from cash flow funding sources and/or from high-quality liquid assets that can be used as collateral, without disrupting the Bank's activities and financial condition (OJK, 2016). The data information used in this research were using secondary data collected from banks official website on Bank Quarterly Financial Report and Basel III Regulatory Report. Data period was December 2020 to December 2024 from 9 (nine) Bank in Indonesia.

A. ROA (Return On Asset/Y)

To represent the profitability, we will use ROA indicator. Bank business also has targeted on profitability, which one of them in ROA indicator. ROA as a ratio that measures how well a company generates profit from its total assets. This ratio indicates the company ability to effectively manage assets to create income and manage liabilities for its expense (Brigham & Houston, 2020). This information available in banks Quarterly Financial report published in official website.

B. LCD (Low-Cost Deposit/X1)

Stable and operational deposits are deposits that have good value in the LCR calculation. Furthermore, as outlined in the criteria that must be met, these two deposits are stable, meaning they are always held at the bank and have low interest rates. Therefore, in the research process, researchers will examine the weight or proportion of these two types of deposits to the total deposits managed by the bank. The goal is to determine whether stable and operational deposits are dominant factors in the total deposits managed by the bank. This type of deposits was available in banks Basel III regulatory report published in official website.

C. RSD (Retail and SME Deposit/X2)

Retail and SME customer deposits were identic as stable instead of Wholesale customer deposits. These kinds of deposits were spreading customer in small amount, consider less sensitive to interest rate and stickier. In this process, these types of deposits will examine by the weight or proportion to the total deposit. This information available in banks Basel III regulatory report publish in official website.

D. COF (Cost Of Fund/X3)

Cost of funds is the total interest costs incurred by banks to obtain deposits funds in the form of current accounts, savings or deposits (Kasmir, 2008). To have parameter cost of fund, we use data information interest expense from Bank quarterly financial report divide by total deposits and annualized.

E. HQLA (HQLA to Total Asset/X4)

High Quality Liquid Asset (HQLA) is stock of unencumbered Asset that consists of Cash, Central Bank Instrument, Bonds or other components asset that can be converted into cash at little or no loss of value in private markets (BIS-BCBS, 2013). There were some criteria to fulfill and will identify as HQLA Level 1, Level 2A and Level 2B. The HQLA number was available in Banks Basel III regulatory report published in official website.

F. LCR (Liquidity Coverage Ratio/X5)

This standard aims to ensure that a bank has an adequate stock of unencumbered HQLA that consists of cash or assets that can be converted into cash at little or no loss of value in private markets, to meet its liquidity needs for a 30 calendar day liquidity stress scenario. At a minimum, the stock of unencumbered HQLA should enable the bank to survive until Day 30 of the stress scenario, by which time it is assumed that appropriate corrective actions can be taken by management and supervisors, or that the bank can be resolved in an orderly way (BIS-BCBS, 2013). This information available in banks Basel III regulatory report published in official website.

G. YOA (Yield On Asset/X6)

To represent return that bank received, we use interest income from official bank financial report. To have appropriate parameter and equal with other, the quarterly interest income divides by total Asset and annualized. This information available in banks Quarterly Financial report published in official website.

H. Conceptual Framework

This study will examine the relationship between Stable and Operational Deposits and Interest Costs. As previously stated, these two deposit criteria represent deposits that should receive low interest rates. With these low interest rates, the interest costs, or cost of funds on deposits issued should also be low, which in turn impacts the bank's return in ROA. At the moment, to maintain the liquidity risk compliance which is LCR as regulatory reporting, Bank more focusing on maintain their liquid assets or HQLA. But if bank more focusing on their customer deposit character and prefer to growth on stable and operational customer deposit which more actively use, sticky and low interest rate, bank will achieved compliance for liquidity risk LCR, more allocated fund to loan which contribute higher yield. And these will be increasing their profitability, by lower interest expense from deposits and higher interest income from loan due to efficient on liquid asset allocation. Banks can achieve adequate liquidity risk compliance and also increase profitability. The paradigm that liquidity risk is incompatible with profitability can be corrected, as meeting liquidity risk compliance can support the bank's profitability.

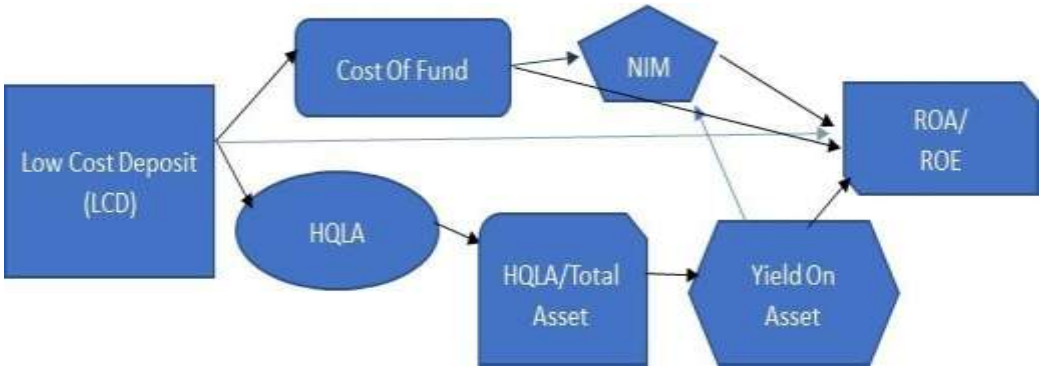

Figure 1. Conceptual Framework Related Component

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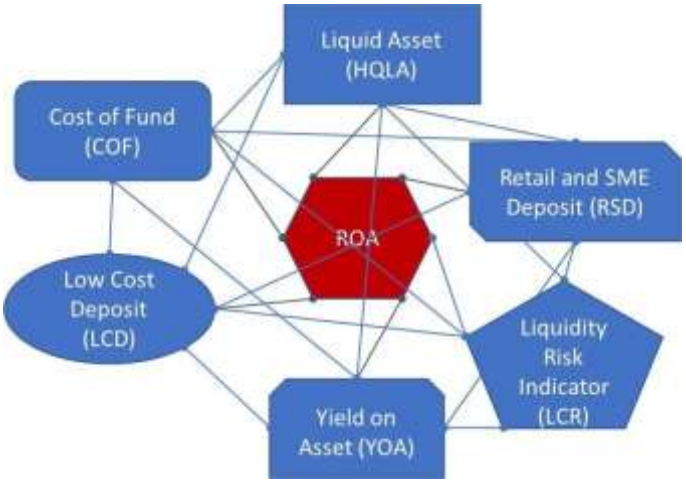


Figure 2. Conceptual Framework Variable Hypothesis Variable

On figure 1, showing the related and impact from deposit to ROA, where Low Cost Deposit will reflect in lower Cost Of Fund that Bank should paid and also will impact to less required HQLA to maintain. This will give Bank to optimized allocation to Loan which will receive higher yield which will increase ROA.

On figure 2, describes the factors that influence the ROA variable as dependent variable, where researchers will use 6 (six) independent variables in the context of managing liquidity risk.

III. METHOD

Therefore, it can be concluded that the adequacy of liquid asset management is a reflection of the nature of deposits managed by the Bank. This liquid asset requirement is necessary to ensure that the Bank can always meet the demands of its obligations, especially those originating from Public Deposits. If the type or character of deposits managed by the Bank is deposits that are easily withdrawn from the Bank in large amounts and within a short period, then the Bank is obliged to manage a large amount of liquid assets with a short term or easy to resell. However, if the character of deposits managed by the Bank is stable deposits, have the potential for relatively small outflows from the Bank and have a long term, then the Bank does not need to manage too much liquid assets. Because of the Bank's inadequacy in providing liquid assets when fulfilling its obligations to the Public, especially to meet the demand for disbursement of these deposits, the Bank's liquidity risk will have an impact as a result of the Public's distrust in the security of their deposits in the Bank. Or we can conclude, this will trigger excessive queues for deposit withdrawals by customers at a Bank, or what we call a "Bank Rush.".

A. Data Processing

After all data information are collected from Bank publish report, we gather and classified as follow :

Tabel 1. Data Feeding Preparation

Original Data	Data Character	New Name Variable	New Data Character	Data Feeding
HQLA	Numeric	Liquid Asset (HQLA)	Percentage	Numeric, two decimals
Total Asset	Numeric			Numeric, two decimals
Retail and SME Stable Deposit	Numeric	Low Cost Deposit (LCD)	Percentage	Numeric, two decimals
Wholesale Operational Deposit	Numeric			Numeric, two decimals
Total Deposit	Numeric			Numeric, two decimals
Retail Stable & Less Stable Deposit	Numeric	SME Deposit (RSD)	Percentage	Numeric, two decimals
SME Stable & Less Stable Deposit	Numeric			Numeric, two decimals
Total Deposit	Numeric			Numeric, two decimals
Annualize Interest Income	Numeric	Cost Of Fund (COF)	Percentage	Numeric, two decimals
Annualized Average Total Asset	Numeric			Numeric, two decimals
Annualize Interest Expense	Numeric	Yield On Asset (YOA)	Percentage	Numeric, two decimals
Annualized Average Deposit	Numeric			Numeric, two decimals
ROA	Percentage	ROA	Percentage	Numeric, two decimals

B. Types of Research

The research conducted is a Descriptive Quantitative Analysis, where the collected data will be explained based on the results and conclusions drawn from the numerical data. According to Sugiyono (2019), quantitative descriptive research is consistent with the research variables, focuses on actual problems and current phenomena, and presents research results in the form of meaningful numbers.

In this research we will use Correlation and Regression Analysis. Eddy Roflin, Rohana, and Freaza Riana (2022) state in their book "Correlation and Regression Analysis" that correlation analysis is used to determine the direction, strength, and significance of the relationship between two or more variables. Regression, on the other hand, is a statistical technique used to predict the relationship between dependent and independent variables. We exercising the data correlation and regression where ROA as dependent variable (Y), LCD (X1), RSD (X2), COF (X3), HQLA (X4), LCR (X5) and YOA (X6). Total data point used was 1.071 from 9 (nine) Banks in Indonesia (Bank Mandiri, BNI, BRI, BCA, BTN, CIMB Niaga, Bank Danamon, MayBank and Bank Permata) and with period December 2020 – December 2024.

C. Data Testing

1. Descriptive Statistical Analysis

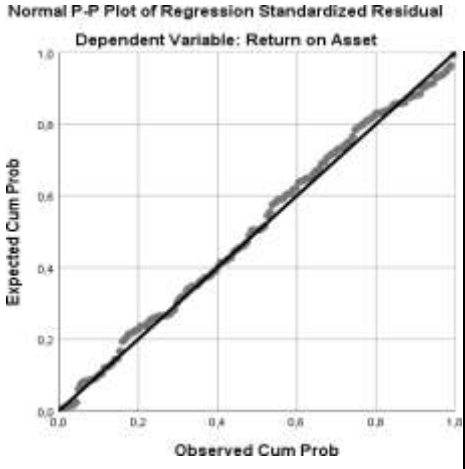
This analysis was conducted to provide an overview of the distribution and characteristics of data from each research variable. In this study, the data used covers the quarterly period from December 2020 to December 2024, with a focus on the dependent variable Return on Assets (Y) and independent variables including Low-Cost Deposits (X_1), Retail SME Deposits (X_2), Cost of Funds (X_3), Liquidity Coverage Ratio (X_4), Yield on Assets (X_5), and Liquid Assets (X_6). This analysis aims to identify data distribution patterns, mean values, and variability of each variable, thus providing a strong foundation for further regression and hypothesis testing. The result as follow:

Tabel 2. Results of Descriptive Statistical Analysis of Combined Data

	N	Minimum	Maximum	Mean	Std. Deviation
Return on Asset (Y)	153	-,00630	,04860	,0221078	,01175142
LCD (X1)	153	,11015	,83049	,4475351	,19236978
RSD (X2)	153	,18615	,79072	,4255121	,16262711
COF (X3)	153	,00769	,05878	,0284647	,01127731
LCR (X4)	153	,01309	,04819	,0235150	,00748836
YOA (X5)	153	,05010	,10610	,0657560	,01048279
HQLA (X6)	153	,15488	,43446	,2701548	,07415754
Valid N (listwise)	153				

2. Normality Testing Data

The normality test aims to ensure that the data used in this study comes from a normally distributed population. The normality test is a crucial step in regression analysis to verify whether the model residuals meet the assumptions of a normal distribution.



		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Bank	Statistic	Df	Sig.	Statistic	Df	Sig.
Unstandardized Residual	BCA	,159	17	,200*	,927	17	,19
	BNI	,203	17	,062	,871	17	,02
	BRI	,175	17	,176	,894	17	,05
	BTN	,176	17	,166	,919	17	,14
	CIMB Niaga	,228	17	,019	,861	17	,01
	Danamon	,101	17	,200*	,982	17	,97
	Mandiri	,138	17	,200*	,958	17	,60
	Maybank	,151	17	,200*	,944	17	,36
	Permata	,142	17	,200*	,929	17	,20

*. This is a lower bound of the true significance.

Figure 3. Results of Normality Test PP Plot and Kolmogorov-Smirnov

Based on figure 3, the analysis results show that most banks (8 out of 9 samples) have a significance value above 0.05, with only CIMB Niaga showing a deviation from the normal distribution (p=0.019). Visually, the PP-Plot also confirms the residual pattern that follows a diagonal line without systematic deviations (Denis, 2018). This finding indicates that the assumption of normality is generally met, except for CIMB Niaga, which requires further examination. Further examination of the QQ-plot for CIMB Niaga revealed that the residuals were visually spread along the diagonal line without any systematic deviation. This suggests that the non-normality detected in the Kolmogorov-Smirnov test is likely minor and does not violate the basic assumptions of the regression.

3. Autocorrelation Test

An autocorrelation test is performed to identify any correlation between residuals from different observations in a regression model. Autocorrelation can lead to inefficient parameter estimation and compromise the validity of hypothesis testing. In this study, the Durbin-Watson method was chosen as the primary test due to its ability to detect first-order autocorrelation.

Tabel 3. Autocorrelation Durbin-Watson and Cochrane-Orcutt

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,867[a]	,751	,741	,00598388	,641

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig.
1	(Constant)	-6,267E-5	,000		-,179	,858
	LAG_RES	,675	,060	,678	11,282	,000

Model	R	R Square	Adjusted R Square	Error of the Estimate	Durbin-Watson
1	,734[a]	,539	,520	,00419299	2,109

Based Table 3, it can be seen that the initial test results indicate a significant positive autocorrelation problem, with the Durbin-Watson value (0.641) being below the lower limit (dL = 1.731) because the dU value < DW < 4-dU (1.878 < 0.641 < 2.182). To overcome this problem, a transformation was carried out using the Cochrane-Orcutt method. On the bottom table is the result Durbin-Watson after transform using Autokorelasi Cochrane-Orcutt.

4. Heteroscedasticities Test

The heteroscedasticity test aims to determine whether there is inequality in the residual variances from one observation to another in a regression model. Heteroscedasticity can lead to inefficient parameter estimation, although it remains unbiased. This study used two approaches: the Glejser test (statistical method) and residual scatterplot analysis (visual method) to obtain comprehensive results.

Tabel 4. Results of Heteroscedasticity Test with Glejser Statistics

	nstandardized Coefficients		tandardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	,005	,003		1,802	,074
LCD (X1)	,002	,002	,139	1,043	,299
RSD (X2)	,004	,003	,191	1,229	,221
COF (X3)	,007	,049	,025	,154	,878
LCR (X4)	4,548E-5	,078	,000	,001	1,000
YOA (X5)	-,029	,034	-,089	-,861	,391
HQLA (X6)	-,005	,007	-,117	-,730	,466

Based on Table 4, it can be seen that no independent variables significantly affect the absolute value of the residuals (all p-values > 0.05). This indicates that the regression model meets the assumption of homoscedasticity.

IV. ASSESSMENT

A. Pearson Correlation Analysis

This was aimed to see whether the correlation between the variable components tested will be different for each research object, form object data research for the period December 2020 to December 2024.

Tabel 3. Result Pearson Correlation

		ROA (Y)	LCD (X1)	RSD (X2)	COF (X3)	LCR (X4)	YOA (5)	HQLA (X6)
ROA	Pearson Correlation	1	,781**	,683**	-,578**	,143	,203*	,043
	Sig. (2-tailed)		,000	,000	,000	,078	,012	,596
	N	153	153	153	153	153	153	153
LCD	Pearson Correlation	,781**	1	,735**	-,545**	,428**	,087	,195*
	Sig. (2-tailed)	,000		,000	,000	,000	,286	,016
	N	153	153	153	153	153	153	153
RSD	Pearson Correlation	,683**	,735**	1	-,746**	,412**	-,055	,295**
	Sig. (2-tailed)	,000	,000		,000	,000	,502	,000
	N	153	153	153	153	153	153	153
COF	Pearson Correlation	-,578**	-,545**	-,746**	1	-,335**	,411**	-,407**
	Sig. (2-tailed)	,000	,000	,000		,000	,000	,000
	N	153	153	153	153	153	153	153
LCR	Pearson Correlation	,143	,428**	,412**	-,335**	1	-,229**	,811**
	Sig. (2-tailed)	,078	,000	,000	,000		,004	,000
	N	153	153	153	153	153	153	153
YOA	Pearson Correlation	,203*	,087	-,055	,411**	-,229**	1	-,335**
	Sig. (2-tailed)	,012	,286	,502	,000	,004		,000
	N	153	153	153	153	153	153	153
HQLA	Pearson Correlation	,043	,195*	,295**	-,407**	,811**	-,335**	1
	Sig. (2-tailed)	,596	,016	,000	,000	,000	,000	
	N	153	153	153	153	153	153	153

1. Correlation Calculation Results – Return On Assets (ROA) to Other Variable

The correlation with Low-Cost Deposits (X_1) is 0.781, which falls within the criteria for a strong correlation (0.61-0.80). A p-value of 0.000 (<0.05) indicates a highly significant relationship. Low-cost deposits are a key driver of bank profitability due to their low and more stable funding costs, thus increasing net interest margins. Banks with a large low-cost deposit base tend to have more consistent and sustainable financial performance.

The correlation with Retail SME Deposits (X_2) is 0.683, which falls within the criteria for a strong correlation (0.61-0.80). A p-value of 0.000 (<0.05) indicates a significant relationship. Retail deposits contribute positively to profitability, but require stricter liquidity risk management due to their more volatile nature than low-cost deposits.

The correlation with Cost of Funds (X_3) is -0.578, which falls within the criteria for a moderate negative correlation (0.41- 0.60). A p-value of 0.000 (<0.05) indicates a significant relationship. High funding costs directly reduce bank profit margins, making efficient management of funding costs key to increasing profitability.

The correlation with the Liquidity Coverage Ratio (X_4) is 0.143, which falls within the weak correlation criteria (0.00- 0.20). A p-value of 0.078 (>0.05) indicates an insignificant relationship. High liquidity levels do not directly increase profitability, as liquid assets generally provide lower returns.

The correlation with Yield on Assets (X_5) is 0.203, which falls within the weak correlation criteria (0.21-0.40). A p-value of 0.012 (<0.05) indicates a significant relationship. A strategy of increasing asset returns by investing in higher-risk instruments can improve profitability, albeit with limited impact.

The correlation with Liquid Assets (X_6) is 0.043, which falls within the very weak correlation criteria (0.00-0.20). A p- value of 0.596 (>0.05) indicates an insignificant relationship. Excessive ownership of liquid assets can actually depress profitability due to low returns from liquid assets.

2. Correlation Calculation Results – Low Cost Deposit (X2) to Other Variable

The correlation with Retail Deposits (X_2) is 0.735, which falls within the criteria for a strong correlation (0.61-0.80). A p- value of 0.000 (<0.05) indicates a highly significant relationship. Banks tend to manage a combination of these two types of deposits to

balance funding stability and flexibility in dealing with market fluctuations.

The correlation with Cost of Funds (X_3) is -0.545, which falls within the criteria for a moderate negative correlation (0.41- 0.60). A p-value of 0.000 (<0.05) indicates a significant relationship. Increasing funding costs can reduce customer interest in low-cost savings products, so banks need to optimize competitive pricing strategies.

The correlation with the Liquidity Coverage Ratio (X_4) is 0.428, which falls within the moderate correlation criteria (0.41- 0.60). A p-value of 0.000 (<0.05) indicates a significant relationship. Low-cost deposits contribute positively to banks' ability to meet liquidity requirements due to their more stable nature.

The correlation with Yield on Assets (X_5) is 0.087, which falls within the very weak correlation criteria (0.00-0.20). A p- value of 0.286 (>0.05) indicates an insignificant relationship. The stability of low-cost deposits does not directly influence banks' investment strategies in generating higher returns.

The correlation with Liquid Assets (X_6) is 0.195, which falls within the weak correlation criteria (0.21-0.40). A p-value of 0.016 (<0.05) indicates a significant relationship. Banks with a large low-cost deposit base tend to allocate a portion of their funds in liquid assets to mitigate the risk of withdrawals.

The correlation between Low-Cost Deposits in banks on average has an inverse relationship with LCR. However, on average, it has a significant positive relationship with ROA (Y), but with COF (X3), only Bank BNI has a significant positive correlation.

3. Correlation Calculation Results – Cost Of Fund (X3) to Other Variable

The correlation with the Liquidity Coverage Ratio (X_4) is -0.335, which falls within the criteria for a weak negative correlation (0.21-0.40). A p-value of 0.000 (<0.05) indicates a significant relationship. High funding costs can limit a bank's ability to meet liquidity requirements because expensive funding sources are generally less stable and short-term.

The correlation with Yield on Assets (X_5) is 0.411, which falls within the moderate correlation criteria (0.41-0.60). A p- value of 0.000 (<0.05) indicates a significant relationship. Banks with high cost of funds tend to take greater investment risks to obtain higher returns to cover funding costs.

The correlation with Liquid Assets (X_6) is -0.407, falling within the criteria for a moderate negative correlation (0.41- 0.60). A p-value of 0.000 (<0.05) indicates a significant relationship. Banks with high cost of funds tend to reduce liquid asset allocation to optimize income, indicating an aggressive strategy that potentially increases vulnerability to liquidity shocks.

The COF (X3) relationship has a significant positive relationship with the YOA component (X5), which means that any increase in COF will be directly translated into an increase in the imposition of interest rates on the Asset side. Banks actually allocate increased interest costs and apply them to the imposition of interest income. The average bank has a p- value above 0.5. Meanwhile, the relationship to the SM (X1) and SR (X2) components as managed savings components is relatively diverse in each bank.

Only Bank Danamon, Bank Mandiri, and Bank BRI showed a significant negative correlation between the cost of funds and their deposit components. This means that the interest rates offered to Stable and Operational (SM) customers (X1) and Retail and MSME (SR) customers (X2) should be insensitive to interest rates.

B. **Multiple Linear Regression Analysis**

Multiple linear regression analysis is used to test the influence of independent variables on Return on Assets (ROA) as a proxy for bank financial performance. This model measures the extent to which Low-Cost Deposits (X_1), Retail Deposits (X_2), Cost of Funds (X_3), Liquidity Coverage Ratio (X_4), Yield on Assets (X_5), and Liquid Assets (X_6) influence bank profitability. Basic assumptions that must be met before interpreting the regression results include residual normality, absence of multicollinearity, homoscedasticity, and non-autocorrelation, which have been tested previously. The formed regression equation will show the magnitude of the influence of each variable, both partially and simultaneously. The estimation results of the multiple linear regression model can be seen in the following table:

Table 4. Result Multiplier Linear Regression

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig.
(Constant)	,003	,005		,579	,563
LCD (X1)	,036	,004	,594	8,548	,000
RSD (X2)	,004	,006	,052	,647	,519
COF (X3)	-,408	,087	-,391	-4,710	,000

The Correlation Between the Type of Customer Deposits and the Adequacy of Liquid Assets for Liquidity Risk Compliance in the Liquidity Coverage Ratio (LCR) And Its Impact on Profitability (ROA)

LCR (X4)	-,343	,138	-,218	-2,487	,014
YOA (X5)	,306	,060	,273	5,079	,000
HQLA (X6)	,003	,013	,021	,255	,799

Referring to Tabel 4, the regression equation formed is:

$ROA = 0{,}003 + 0{,}036X_1 + 0{,}004X_2 - 0{,}408X_3 - 0{,}343X_4 + 0{,}306X_5 + 0{,}003X_6$

Label:

X_1 = Low Cost Deposit
X_2 = Retail & SME Deposit
X_3 = Cost of Funds
X_4 = Liquidity Coverage Ratio
X_5 = Yield on Assets
X_6 = Liquid Assets/HQLA

The interpretation of this regression equation is as follows:

1. A constant of 0.003 or 0.30% indicates the baseline ROA level when all independent variables are zero. This positive coefficient ($p>0.05$) indicates intrinsic profitability in banking operations that is not entirely dependent on the modeled variables. This value reflects the contribution of other factors such as fee-based income and basic operational efficiency.
2. Low-Cost Deposits (X_1) has a coefficient of 0.036 ($p<0.001$), indicating a significant effect on increasing ROA. Every 1% increase in low-cost deposits increases ROA by 3.60%. This reflects the advantage of low-cost funding from loyal retail/corporate customers, which supports asset transformation with optimal spreads and reduces dependence on volatile wholesale funding.
3. Retail Deposits (X_2) has an insignificant coefficient of 0.004 ($p>0.1$), indicating the limited contribution of retail deposits to ROA. Although positive, the statistical insignificance suggests that the management costs and liquidity risks of short- term deposits tend to neutralize their potential benefits.
4. Cost of Funds (X_3) has a coefficient of -0.408 ($p<0.001$), confirming the critical impact of funding costs on profitability. Every 1% increase in funding costs decreases ROA by 40.80%, indicating the extreme sensitivity of profitability to increases in funding costs.
5. The Liquidity Coverage Ratio (X_4) has a coefficient of -0.343 ($p<0.01$), reflecting the trade-off between liquidity and profitability. A 1% increase in LCR correlates with a 34.30% decrease in ROA due to the allocation of funds to low- yielding instruments. However, this negative impact must be weighed against the systemic stability benefits of liquidity compliance.
6. Yield on Assets (X_5) has a coefficient of 0.306 ($p<0.001$), confirming the key role of asset quality in driving ROA. Every 1% increase in yield on productive assets increases profitability by 30.60%, emphasizing the importance of effective asset management, including strict credit selection and competitive pricing.
7. Liquid Assets (X_6) has an insignificant coefficient of 0.003 ($p>0.1$), confirming its primary function as a liquidity risk

mitigation tool, not a source of income. The low contribution to ROA is due to the minimal returns from liquid assets.

The implications of the regression results include:

a. ROA Drivers: Low-Cost Deposits (X_1) and Yield on Assets (X_5) are the main drivers of profitability. Banks need to strengthen their low-cost funding base and improve the quality of productive assets through rigorous pricing strategies and credit selection.

b. Inhibiting ROA: Cost of Funds (X_3) and Liquidity Coverage Ratio (X_4) are significant inhibitors. Banks must optimize

their cost of funds and balance liquidity allocation to minimize their negative impact.

c. Variables with limited influence: Retail Deposits (X_2) and Liquid Assets (X_6) are not statistically significant. Banks need to reduce their reliance on short-term funding and maintain sufficient liquid assets to comply with regulations without sacrificing profitability.

C. **Partial Test (t-Test)**

The t-test is used to examine the partial influence of each independent variable on Return on Assets (ROA). This test is conducted by comparing the calculated t-value to the t-table and observing the significance level to determine whether a variable has a significant influence. According to Imam Ghozali (2018), a variable is considered to have a significant influence if the Sig. value is <0.05. Meanwhile, according to Sujarweni (2015), a significant influence can also be seen when the calculated t- value > t-table. In this study, the t-table value is calculated using the formula ($\alpha/2$; n-k-1) = (0.05/2; 153-6-1) = (0.025; 146), which produces a value of 1.976. The complete test results can be seen in the following table:

Tabel 5. Result Partial Test

	nstandardized Coefficients		tandardized Coefficients		
	B	Std. Error	Beta	T	Sig.
(Constant)	,003	,005		,579	,563
LCD (X1)	,036	,004	,594	8,548	,000
RSD (X2)	,004	,006	,052	,647	,519
COF (X3)	-,408	,087	-,391	-4,710	,000
LCR (X4)	-,343	,138	-,218	-2,487	,014
YOA (X5)	,306	,060	,273	5,079	,000
HQLA (X6)	,003	,013	,021	,255	,799

Based on Table 5, the partial test results obtained are as follows:

1. Low-Cost Savings (X_1) has a very significant effect on ROA with a t-count of 8.548 > t-table of 1.976 and Sig. 0.000 < 0.05 indicating that this variable has a very strong statistical influence.
2. Retail & SME Deposits (X_2) does not have a significant effect on ROA with a t-count of 0.647 < t-table of 1.976 and Sig. 0.519 > 0.05 indicating that this variable does not have a statistically significant effect.
3. Cost of Funds (X_3) has a very significant effect on ROA with a t-count of -4.710 > t-table of 1.976 (absolute value) and Sig. 0.000 < 0.05 indicating that this variable has a very strong negative effect statistically.
4. Liquidity Coverage Ratio (X_4) has a significant effect on ROA with a t-count of -2.487 > t-table of 1.976 (absolute value) and Sig. 0.014 < 0.05 indicating that this variable has a statistically significant negative effect.
5. Yield on Assets (X_5) has a very significant effect on ROA with a t-count of 5.079 > t-table of 1.976 and Sig. 0.000 < 0.05 indicating that this variable has a very strong positive effect statistically.
6. Liquid Assets (X_6) does not have a significant effect on ROA with a t-count of 0.255 < t-table of 1.976 and Sig. 0.799 > 0.05 indicating that this variable does not have a statistically significant effect.

D. **Simultaneous Test (F Test)**

The F-test is used to examine the simultaneous influence of all independent variables on Return on Assets (ROA). This test is conducted by comparing the calculated F-value to the F-table and observing the significance level to determine whether the overall regression model is significant. According to Sujarweni (2015), a model is considered simultaneously significant if the calculated F-value>F-table. In this study, the F-table value was calculated using the formula (k; n-k) = (6; 153-6) = (6; 147) which produces a value of 2.16 at a significance level of 0.05. The results of the F-test can be seen in the following table:

Tabel 5. Result Simultaneous Test

	Sum of Squares	df	Mean Square	F	Sig.
Regression	,016	6	,003	73,370	,000[b]
Residual	,005	146	,000		
Total	,021	152			

Based on Table 5, it can be seen that F_calculated (73.370) > F_table (2.16) with Sig. 0.000 < 0.05, indicating that the six variables together have a very significant effect on ROA. Sum of Squares Regression (0.016) > Residual (0.005) indicates that the model is able to explain most of the variation in ROA. These results are consistent with the theory of financial intermediation, that funding, liquidity, and asset productivity factors simultaneously determine bank performance.

E. **Coefficient of Determination Test**

The coefficient of determination test is used to measure the extent to which the independent variables in a regression model are able to explain variation in the dependent variable. The R Square value indicates the proportion of variation in the dependent variable that can be explained by the independent variables, while the Adjusted R Square provides an adjustment for the number of independent variables in the model. The closer the R Square value is to 1, the better the model's ability to explain variation in the dependent variable. The results of the coefficient of determination test can be seen in the following table:

Tabel 6. Result Simultaneous Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,867[a]	,751	,741	,00598388

Based on Table 6, it can be seen that the constructed regression model has excellent explanatory power. The R^2 value of 0.751 indicates that 75.1% of the variation in Return on Assets (ROA) can be explained by the independent variables in the model, namely Low-Cost Deposits (X_1), Retail Deposits (X_2), Cost of Funds (X_3), Liquidity Coverage Ratio (X_4), Yield on Assets (X_5), and Liquid Assets (X_6). The Adjusted R^2 of 0.741, which remains high after adjustment for the number of independent variables, further strengthens the validity of the model used. The remaining 24.9% of the variation is explained by other factors outsid e the model, such as operational efficiency, management quality, or macroeconomic conditions. The good level of model accuracy is also indicated by the relatively low Standard Error of Estimate value, namely 0.00598.

F. Overall Results of Analysis and Hypothesis Testing

Based on the overall analysis and hypothesis testing results, it can be concluded that: (1) Low-Cost Deposits (X_1) and Yield on Assets (X_5) are the main driving factors that have a positive and significant effect on ROA; (2) Cost of Funds (X_3) and Liquidity Coverage Ratio (X_4) have a significant negative effect on ROA, thus acting as inhibiting factors; (3) The regression model built is proven to be statistically significant based on the F test and has high explanatory power with R^2 reaching 75.1%. These findings confirm that funding, liquidity, and asset productivity factors together play a crucial role in determining banking financial performance.

CONCLUSIONS

Based on the results of the research conducted, we have the conclusion related to the issues that have been brought.

1. The correlation between the liquidity ratio (LCR/X4) and profitability (ROA/Y) is weak and shows an insignificant relationship. This explains that a high level of liquidity does not directly increase profitability, because liquid assets generally provide lower returns. A high level of liquidity is perceived as managing larger liquid assets. However, when directed to the type of deposit criteria, it will directly have a positive impact on ROA achievement. If the Bank focuses more on stable and operational deposits with low funding costs, it will have a positive impact on ROA achieved.
2. The amount of liquid assets (X6) managed and reflected in the LCR ratio (X4) has a very weak correlation and shows no significant relationship to ROA profitability. Excessive ownership of liquid assets can actually suppress profitability due to low returns from liquid assets. As previously stated, in carrying out its intermediary function, the Bank focuses on credit distribution as the asset component that provides the largest interest income. Suboptimal credit distribution will affect the ROA profitability that the Bank will achieve.
3. The relationship between the LCR figure that banks are required to maintain has no significant relationship with ROA profitability. However, banks are required to ensure that the LCR figure set by the regulator is truly achieved optimally, where the stipulation is that the figure must be maintained at 100%. If a bank has an LCR ratio far above 100%, it indicates that the bank is not optimizing credit distribution as the largest contributor to interest income or ROA profitability.
4. In selecting the established deposit criteria, the composition of Low-Cost Deposits (X1) must be reflected in Interest Costs (X3). Based on existing research, there is a moderate negative correlation and a significant relationship between the two components. This indicates that the Bank has correctly selected the deposit criteria based on applicable regulations. That is, the greater the Low-Cost Deposits managed, the lower the Bank's Cost of Funds.
5. The relationship between Interest Costs (X3) and ROA profitability (Y) is significant and has a moderate negative correlation. The lower the interest costs incurred, the higher the profitability achieved by the bank.
6. The collection of Low-Cost Deposits (X1) has a low correlation criterion but has a significant relationship to the Liquid Assets (X6) it manages. This indicates that the Bank's Asset management is not optimal, where the Bank should place more emphasis on Credit distribution. This may be done by the Bank because the cost of funds issued is relatively low for these deposits, so if the Bank allocates these funds in liquid assets, the Bank still has a margin/difference on the interest income received and has a low risk and has the convenience if it wants to liquidate.
7. In general, from the 9 (nine) banks case studied, overall, they have a positive growth trend in Low-Cost Deposits (X1) from December 2020 to December 2024 and have a strong negative correlation and significant relationship to Interest Costs (X3). Where the banks that have this condition, the largest are shown by BTN, MayBank and BCA. Meanwhile, for Bank Mandiri,

Bank Danamon, BNI, Bank Permata, Bank CIMB Niaga and BRI, the composition of Low-Cost Deposits experienced an increase during the study period but was not reflected in a decrease in their Interest Costs which were relatively stable and even tended to increase.

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From the conclusion that we have highlighted, we have input for improvement that can be apply:

1. Liquidity risk management is generally inversely proportional to profitability. However, in implementing this LCR, where banks are required to maintain a ratio above 100%, banks need to have appropriate internal limits that are neither too low nor too high. If the limit is too low and close to the regulatory limit, there is a risk that the bank will easily exceed the regulatory limit. However, if it is too high, funding allocation on the asset side will be suboptimal.
2. In the context of managing liquidity risk, it is explained that the Bank must always be able to meet its obligations with liquid assets or from cash inflows. This indicates that liquidity risk management places greater emphasis on optimization. Excessive liquid asset management is not the goal of liquidity risk management. However, it is important to ensure that the Bank's liquid asset management reflects the potential outflow of liabilities from deposits managed by the Bank, based on their characteristics.
3. As previously stated, liquidity risk management will have a negative correlation with the profitability achieved. However, to meet the adequacy of the liquidity ratio, banks should focus more on managing more stable and sustainable deposits rather than focusing on allocating the amount of liquid assets. Banks need to develop a comprehensive strategy to strengthen the low-cost savings base through customer loyalty programs, the development of competitive long-term savings products, and improving services to support customer transaction convenience by developing digital-based customer service applications.
4. The regulation does not specify in detail the interest rate limits that are considered unstable or non-operational. However, it only states that the greater a customer's dependence on the product facilities provided by the bank to support their banking activities, the more loyal they will be in managing their savings balances. Such customers will prioritize ease of transactions or product facilities provided by the bank over the interest rate offered on their deposits. Banks need to ensure that the selection criteria for deposits they carry out are in accordance with existing regulations, so that this information can serve as business information for the bank in developing its savings products.
5. Banks need to develop their customer service systems to create a state of customer dependency on the services they receive from their savings. This will "force" customer loyalty to their savings, encouraging them to continue managing or maintaining their balances at the bank. This will be reflected in the interest costs incurred by the bank and also in profitability achieved in the form of ROA (Return on Assets).
6. The research conducted showed that the average LCR ratio managed by these banks was around 200%. Only by the end of 2024 did several banks experience a decline in their LCR ratios to 150%. This indicates that the allocation to managed liquid assets remains higher than the established target. Banks should optimize this by channeling it into credit, which will undoubtedly have a positive impact on profitability.
7. The composition of deposits in the Stable and Operational categories continues to show a positive trend, indicating that the Bank is continuously increasing the deposit components used by customers. However, it should be noted that to ensure deposits with these characteristics, the Bank must place greater emphasis on enriching the facilities and features offered by its deposit products, rather than on offering excessive interest rates.
8. For next research, longer data processing is necessary to obtain more comprehensive information. With a longer data period, more comprehensive results are likely to be obtained to support the conclusions drawn.

For regulators and supervisory authorities, the findings of this research provide several important policy implications. Policies that promote bank funding stability while maintaining industry competitiveness should be considered, including incentives for the development of long-term deposit products or deposits with facilities that support customer banking activities. Liquidity regulations should be designed with consideration for their impact on bank profitability, particularly in volatile market conditions. Furthermore, authorities can facilitate the development of a more diverse liquid instrument market to help banks meet their liquidity obligations without significantly sacrificing profitability.

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