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Factors Affecting Commercial Bank Liquidity in Ethiopia: An Empirical Study of Selected Commercial Banks

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Research Article

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Abstract

The purpose of this study is to find out the factors affecting the liquidity of Ethiopian commercial banks. Eleven commercial banks operating in the country were involved in the analysis. In this study, the analysis was conducted using panel data for the years 2014/15–2023/24. Data utilized in this research are secondary in form. The data were collected from the annual financial statements of the selected banks, namely the National Bank of Ethiopia and macroeconomic analysis. Bank liquidity was measured using liquidity assets to deposits ratio. The variables used in the model include capital adequacy, profitability, bank size, loan growth, interest rate margin, deposit mobilization, NBE bills holding, inflation, money supply, and GDP growth. The estimation method employed is the random effects generalized least squares regression model. It was found out that capital adequacy and deposit mobilization affect bank liquidity positively and significantly, whereas loan growth, money supply and GDP growth affect bank liquidity negatively and significantly.

1. Introduction

Commercial banks act as intermediaries by raising money from surplus economic units and channeling it to investors and investments. Through this method, commercial banks are able to promote economic development via savings, investments, and payments. Nevertheless, commercial banks are vulnerable to liquidity and maturity transformation risks due to Illiquidity of assets against liquidity of liabilities (Bryant, 1980; Diamond & Dybvig, 1983).

In the context of banking, liquidity refers to the capability of the banks to fund their asset growth and honor financial obligations that are due without sustaining any loss (Bank for International Settlements, 2008). It is particularly important because depositors may demand their funds at short notice, while bank assets—especially loans—are generally less liquid. A bank that holds insufficient liquidity may be unable to meet withdrawals and payment obligations, while too much liquidity can lower profits since liquid assets usually earn less than loans and other forms of investments. (Greuning & Bratanovic, 2009; Eljelly, 2004).

The liquidity–profitability relationship creates an important management challenge. Banks must allocate sufficient resources to liquid assets while also investing in higher-yielding assets. Holding liquid assets provides protection against unexpected withdrawals and funding disruptions, but it also involves an opportunity cost because funds held in cash or near-cash instruments cannot be fully used for lending (Goddard et al., 2004). Consequently, liquidity management is important for depositors, shareholders, regulators, and the wider economy.

This problem is especially pertinent to Ethiopia inasmuch as the banking system constitutes the major part of its financial system. Ethiopian commercial banks mobilize deposits, provide credit, facilitate payments, and finance private and public economic activity. Their ability to perform these functions depends partly on the availability and management of liquid resources. Earlier works conducted in Ethiopia found contradicting evidence on the impact of capital adequacy, size of banks, profitability, and

growth of lending, interest spread, inflation, and macroeconomic environment on bank liquidity. (Tseganesh, 2012; Nigist & Laximinkantham, 2015; Belete, 2015; Mekbib, 2016; Abdu, 2019; Mekonnen, 2021).

The inconsistent results reported in the literature may indicate that the determinants of bank liquidity may vary according to the countries, time periods, sample sizes, and methods used. Furthermore, considering the current developments in the case of banks and money in Ethiopia, it appears that more recent analysis using data on banks and macroeconomics is needed. In light of the above discussion, this study aims to identify the variables that determine bank liquidity in Ethiopia.

2. Statement of the Problem

Some of the risks associated with commercial banks include credit risks, market risks, operational risks, and liquidity risks. Liquidity risk arises when a bank is unable to repay its debts in a timely manner without suffering losses. Deposits are placed in commercial banks; however, they can withdraw their deposits anytime, but some of those deposits are given on loans that take longer than the time of maturity (Diamond & Rajan, 2005).

Poor liquidity management could have severe ramifications. A bank that is illiquid will be forced to liquidate assets at less than favorable prices, borrow at high costs, or fail to meet customer withdrawals. Such difficulties may damage public confidence and increase the risk of insolvency. In contrast, having too much liquidity can reduce profits since liquid assets generate less profit compared to loans and other investments (Greuning & Bratanovic, 2009; Eljelly, 2004).

Although numerous studies have been done concerning liquidity in Ethiopian banks, there has been inconsistent finding. While some researchers found positive effects of capital adequacy, bank size, and interest rate spread on liquidity, others reported negative or non-significant effects (Tseganesh, 2012; Nigist & Laximinkantham, 2015; Mekonnen, 2021). The same applies for loan growth, inflation, and GDP growth. This could be attributed to differences in sample selection, period of study, measure of liquidity, model specification, and method of estimation. This study aims to solve the problem through examination of ten factors of banks, including macroeconomic factors and regulation factors simultaneously using panel data from selected banks in Ethiopia..

1.2. Objectives of the Study

The overall objective of the current research is to investigate the factors that affect the liquidity of commercial banks in Ethiopia. The specific objectives of the study include:

- To investigate the effect of capital adequacy on the liquidity of commercial banks in Ethiopia.
- To examine the relationship between profitability and liquidity of commercial banks.
- To investigate the impact of bank size on the liquidity of commercial banks.

- To examine the effect of loan growth on the liquidity of commercial banks.
- To examine the effect of interest rate spread (net interest spread) on the liquidity of commercial banks.
- To examine the effect of deposit creation on the liquidity of commercial banks.
- To examine the impact of holding of NBE bills on the liquidity of commercial banks.
- To examine the effect of inflation on the liquidity of commercial banks.
- To examine the effect of money supply on the liquidity of commercial banks.
- To examine the relationship between GDP growth and the liquidity of commercial bank

1.3. Research Hypotheses

The study tests the following hypotheses:

- **H1**: Capital adequacy has a positive and significant relationship with bank liquidity.
- **H2**: Profitability has a negative and significant relationship with bank liquidity.
- **H3**: Bank size has a negative and significant relationship with commercial bank liquidity.
- **H4**: Loan growth has a negative and significant relationship with bank liquidity.
- **H5**: Interest-rate margin has a negative and significant relationship with bank liquidity.
- **H6**: Deposit mobilization has a positive and significant relationship with bank liquidity.
- **H7**: NBE bill holdings have a negative and significant relationship with bank liquidity.
- **H8**: Inflation has a negative and significant relationship with commercial-bank liquidity.
- **H9**: Money supply has a negative and significant relationship with bank liquidity.
- **H10**: GDP growth has a negative and significant relationship with bank liquidity.

1.4. Significance of the Study

The study produces some results that can aid the managers of commercial banks in making policies concerning liquidity management. This study can also aid managers in finding out how capital, deposits, loan growth, and macroeconomic factors influence liquidity. The results of this study can aid in designing suitable policies by the National Bank of Ethiopia as well as other policymakers.

2. Literature Review

2.1. Definition of Bank Liquidity

Liquidity refers to the capacity of the bank to honor its liabilities on time without suffering any losses (BIS, 2008). Bank liquidity is composed of cash balances, balances in the central bank, treasury bills and other assets that can easily be liquidated without significant losses. Liquidity does not equal solvency. While the former is an issue regarding a long term capacity of bank to have more assets than its

liabilities, the latter is the issue related to having cash or easily marketable assets to satisfy short term liabilities. The bank can be solvent but still suffer from liquidity issues if it cannot liquidate its assets on time (Rochet, 2008).

2.2. Theories

2.2.1. Liquidity-Creation Theory

Bank liquidity is created through financing less liquid assets, for instance, loans, through more liquid liabilities, such as demand deposits (Bryant, 1980; Diamond & Dybvig, 1983). It helps depositors and borrowers but poses a problem for the banks. The banks might have to seek funding elsewhere or liquidate their assets in case of high withdrawal demands.

2.2.2. Financial-Fragility Theory

The financial-fragility view emphasizes that banks perform maturity transformation and are therefore vulnerable to liquidity shortages. Greater liquidity creation may increase exposure to losses because banks hold more illiquid assets while promising depositors access to funds on demand (Diamond & Rajan, 2001).

2.2.3. Keynesian Liquidity Preference

Keynes (1936) identified transaction, precautionary, and speculative motives for holding liquid resources. Banks may hold liquidity to meet ordinary payment needs, protect themselves against unexpected withdrawals, and take advantage of future investment opportunities.

2.2.4. Inventory-Management Theory

The Baumol model (1952) and the Miller-Orr model (1966) use inventory management to justify the reasons behind keeping cash. Both companies and financial institutions need to consider the pros of keeping cash and its opportunity cost.

2.3. Measurement of Bank Liquidity

Methods of calculating bank liquidity can be flow-based or stock-based method. Flow-based methods involve liquidity gap calculation which involves calculation of the difference between the cash inflows and outflows at different time periods (Bessis, 2011). Stock-based methods involve the application of ratios such as liquid asset ratio of total assets, liquid assets/deposits and loans/deposits.

In this research, bank liquidity is measured by:

$$\text{Liquidity}_{it} = \frac{\text{Total Assets}_{it}}{\text{Liquid Assets}_{it}}$$

This measure captures the capacity of a bank to meet deposit withdrawals using its liquid assets. Similar balance-sheet measures have been used in studies of bank liquidity in different countries (Vodová, 2011; Malik & Rafique, 2013; Chagwiza, 2014).

2.4. Bank Liquidity Determinants

Capital Adequacy

Capital serves as cushion for loss coverage and also increases the ability of banks to absorb any shocks to liquidity. In terms of risk absorption perspective, banks with strong capital can better absorb losses and thus have greater liquidity (Allen & Gale, 2004; Repullo, 2004). Nevertheless, based on financial fragility perspective, an increase in capital stock might affect liquidity generation negatively due to lower reliance on deposits (Diamond & Rajan, 2001). Therefore, the theoretical prediction is ambiguous.

Profitability

Profitability may increase liquidity because profitable banks can generate internal funds and absorb adverse shocks. However, profitable banks may also invest more heavily in loans and other assets, reducing their liquid-asset holdings. Keeping liquid assets also leads to opportunity cost that results in negative association between liquidity and profitability (Eljelly, 2004; Goddard et al., 2004).

Size of the Bank

It may be easier for large banks to get funding, diversification, and economies of scale. All these factors can affect liquidity in a positive way. However, large banks might hold less liquid assets due to greater access to the market or implicit assumption of being too big to fail (Iannotta et al., 2007). Hence, the expected relationship is uncertain.

Growth in Loans

Given that loans are less liquid than cash, central bank reserve balances, and treasuries, there should be a decrease in liquidity due to rapid growth of loans. There is an inverse relationship between loans growth and liquidity (Diamond & Rajan, 2005; Pilbeam, 2005).

Interest Rate Margin

An increase in interest rate margin encourages banks to extend more loans due to higher profitability. This process may result in lower amounts of liquid assets. On the other hand, high margin will increase incomes of the banks and enhance liquidity. Previous research has demonstrated both negative and positive relationships (Malik & Rafique, 2013; Mazreku et al., 2019).

Deposit Mobilization

Deposits are a major source of bank funding. An increase in deposits may improve liquidity if banks retain part of the additional funds in liquid assets. However, deposits may also support loan expansion, in which case the effect on liquidity may be weaker or negative (Kashyap et al., 2002).

NBE Bill Holdings

The purchase of NBE bills may affect liquidity by transferring funds from banks into securities with particular maturity and liquidity characteristics. If banks are required to invest in relatively illiquid long-term instruments, NBE-bill holdings may reduce immediately available liquidity.

Inflation

Inflation reduces the purchasing power of money and may increase the demand for credit and withdrawals. Higher inflation may therefore reduce bank liquidity. However, if inflation encourages banks to hold more liquid assets as protection against uncertainty, the relationship may be positive (Vodová, 2011; Moussa, 2015).

Money Supply

An increase in money supply may have the result of increasing money supply to the banking system. However, an increase in the money supply may encourage credit creation and reduce the liquidity ratio.

GDP Growth

Economic growth may increase deposits and improve banking-sector liquidity. However, during economic expansions, banks may increase lending and investment, reducing their liquid-asset holdings. Several studies suggest that banks may become less liquid during times of economic boom (Aspachs et al., 2005; Shen et al 2018).

2.5. Empirical Literature and Research Gap

International evidence provides mixed results. Vodová (2011) examined Czech commercial banks and found that bank-specific and macroeconomic variables significantly influenced liquidity. Malik and Rafique (2013) reported significant effects for non-performing loans, profitability, capital adequacy, inflation, and financial-crisis conditions in Pakistan. Moussa (2015) found that inflation and other bank-specific factors affected Tunisian bank liquidity.

Ethiopian studies also report inconsistent findings. Tseganesh (2012) established that capital adequacy, bank size, non-performing loans, interest rate margin, inflation, and short-term interest significantly affected commercial-bank liquidity. Nigist and Laximinkantham (2015) reported significant negative effects of capital adequacy, profitability, and real GDP growth. Mekonnen (2021), using a dynamic panel approach, found that deposits and lagged liquidity were positively associated with liquidity, whereas bank size, capital adequacy, GDP, and interest-rate margin had negative effects.

The differences in prior findings indicate a need for additional evidence using recent observations and a model that jointly considers bank-specific, macroeconomic, and regulatory variables. This study addresses that gap by examining eleven selected Ethiopian commercial banks using panel data and a random-effects estimator.

3. Methods

This study applied quantitative research methodology, as it makes use of statistical methods in analyzing numeric data in finance and macroeconomic areas (Creswell, 2009). The explanatory research design is adopted to investigate the relationships between the indicators of bank liquidity.

3.2. Population and Sample

The population comprises commercial banks that operate in Ethiopia. The following eleven banks were purposefully chosen on the grounds that similar financial data is available from the banks for the study period:

No.	Name of the commercial bank	Year of est.(GC.)	Operational sector
1.	Abay	2010	Banking sector
2.	Bank of Abyssinia	1996	Banking sector
3.	Awash International Bank	1994	Banking sector
4.	Berhan	2009	Banking sector
5.	Bunna	2009	Banking sector
6.	Commercial Bank of Ethiopia	1963	Banking sector
7.	Dashen	1995	Banking sector
8.	Lion	2006	Banking sector
9.	Nib	1999	Banking sector
10.	United	1998	Banking sector
11.	Zemen	2008	Banking sector

The study period and number of observations must be verified against the final dataset. The regression output in the thesis reports 110 observations, which is consistent with eleven banks and ten annual observations.

3.3. Data Sources

The study uses secondary data obtained from:

- Audited annual reports of selected commercial banks.
- National Bank of Ethiopia annual reports and statistical publications.
- Central Statistics Agency macroeconomic data.
- Other official economic sources, where applicable.

3.4. Variable Measurement

Variable	Symbol	Measurement
Liquidity	LIQ	Liquid assets divided by total deposits
Capital adequacy	CAR	Capital divided by total assets, as reported in the study
Profitability	ROA	Net income after tax divided by total assets
Size	SIZE	Natural logarithm of total assets
Loan growth	LG	Annual growth rate of gross loans and advances
Interest-rate margin	IRM	Lending rate less deposit rate
Deposit mobilization	DEPO	Annual deposit-growth rate
NBE bill holdings	BILL	NBE bills held relative to the relevant bank-size measure
Inflation	INFL	Annual inflation rate
Money supply	MONS	Annual growth in money supply
GDP growth	GDP	Annual real GDP-growth rate

The final manuscript should state the precise definitions used in the dataset and ensure that they correspond to the definitions in the regression model.

3.5. Model Specification

The estimated model is:

$$LIQ_{i,t} = \alpha_i + \beta1(CAR_{i,t}) + \beta2(ROA_{i,t}) + \beta3(SIZE_{i,t}) + \beta4(LG_{i,t}) + \beta5(IRM_t) + \beta6\ (DEPO_{i,t}) + \beta7\ (BILL_{i,t}) + \beta8(INFL_t) + \beta9(MONS_t) + \beta10(GDP_t) + \varepsilon_{i,t}$$

Where i stands for bank and t stands for the year. The dependent variable is bank liquidity while the independent variables denote bank characteristics, regulations, and macroeconomic variables. The paper uses the random effects generalized least squares technique to estimate the model. The suitability of the random effects specification is proven by Hausman tests in the final version of the study.

4. Results

4.1. Model Fit

The stated random effect model comprises 110 observations. The R squared for the model is 0.672, which shows that the explanatory variables in the model account for about 67.2% of the total variation in the liquidity indicator. The value of the Wald chi-square is 178.751 and its p-value is below 0.001.

4.2. Diagnostic Tests

The chi-square value is 0.56 and the p-value is 0.4546 for the Breusch-Pagan/Cook-Weisberg test. Thus, the hypothesis of constant variance cannot be rejected at the 5% significance level. There is no information about heteroskedasticity from the results obtained for the given model. According to Jarque-Bera test, the statistic value is 1.511 and p-value is 0.4698. Thus, the null hypothesis of normality cannot be rejected. The p-value of skewness-kurtosis test is 0.8086. For the Breusch- Godfrey test, the chi-square value is 1.723 and the pvalue is 0.189. Therefore, the null hypothesis of no serial correlation cannot be rejected at the 5% significance level.

4.3. Regression Results

Variable	Coefficient	Standard error	p-value	Interpretation
Capital adequacy	0.914	0.404	0.024	Positive and significant
Profitability	0.153	1.242	0.902	Positive but insignificant
Bank size	-0.021	0.017	0.212	Negative but insignificant
Loan growth	-0.158	0.053	0.003	Negative and significant
Interest-rate margin	-1.641	1.555	0.291	Negative but insignificant
Deposit mobilization	0.187	0.060	0.002	Positive and significant
NBE-bill holdings	-0.003	0.016	0.848	Negative but insignificant
Inflation	-0.002	0.003	0.607	Negative but insignificant
Money supply	-0.086	0.023	< 0.001	Negative and significant
GDP growth	-0.020	0.010	0.046	Negative and significant
Constant	2.151	0.344	< 0.001	Significant

4.4. Capital Adequacy and Liquidity

The coefficient of the variable capital adequacy is 0.914 with a p-value of 0.024. This indicates that the relationship is statistically significant at the 5% level. Higher capital adequacy implies higher bank liquidity, ceteris paribus.

Such a finding provides evidence for the risk absorption theory, where capital-adequate banks have the ability to absorb any unexpected losses and remain liquid (Allen & Gale, 2004; Repullo, 2004). It is also consistent with the positive relationship reported in several studies of bank liquidity (Tseganesh, 2012; Belete, 2015). Therefore, H1 is supported.

4.5. Profitability and Liquidity

The profitability variable has a positive coefficient value of 0.153, while the p-value is 0.902. This makes the correlation statistically insignificant. Although the coefficient value is positive, there is no strong evidence to indicate that profitability influences bank liquidity.

The insignificant result may indicate that profitable banks use their earnings for different purposes, including loan expansion, dividend payments, investment, or capital accumulation. The result does not support the hypothesized negative relationship.

Therefore, **H2 is not supported**.

4.6. Bank Size and Liquidity

The coefficient of Size of the bank is -0.021 and p-value is 0.212. The coefficient is negative but the relation is statistically insignificant. It indicates that the banks having higher size may have lower liquidity ratio but there is no significant evidence to prove the existence of any systematic relation between the two variables. The negative coefficient is consistent with the theory that the larger banks have sources for funds and hence less liquid assets. Hence, hypothesis H3 is rejected.

4.7. Loan Growth and Liquidity

The coefficient on loan growth is -0.158 and its p-value is 0.003. There exists an inverse relationship which is statistically significant at 1%. This means that an increase in loan growth leads to low bank liquidity.

The result is consistent with the maturity-transformation function of banks. As banks expand lending, a larger share of their assets is invested in relatively illiquid loans, reducing the proportion of resources immediately available to meet withdrawals and other obligations (Diamond & Rajan, 2005; Pilbeam, 2005). Therefore, H4 is supported.

4.8. Interest Rate Margin and Liquidity

Interest rate margin carries a coefficient of -1.641 and a p-value of 0.291. Even though the negative sign agrees with the hypothesis that higher interest rate margin might foster lending and reduce liquidity, the correlation is not statistically significant.

This finding contrasts with those of other researchers who found a significant link between interest-rate margin and bank liquidity (Tseganesh, 2012; Abdu, 2019). The difference in the period of study, interest rate environment, and definition of margin could account for the difference. Thus, hypothesis H5 is not supported.

4.9. Deposit Mobilization and Liquidity

The coefficient for deposit mobilization is 0.187, with a p-value of 0.002. There is a positive and significant relationship between the variables. This implies that higher levels of deposit mobilization lead to better bank liquidity.

Through deposits, banks are able to access a fairly constant source of financing while at the same time maintaining their liquidity when lending. This finding proves that having a wider deposit base improves the bank’s capacity to fulfill its payments (Kashyap et al., 2002). Hence, H6 is confirmed.

4.10. NBE-Bill Holdings and Liquidity

NBE-bill holdings have a coefficient of -0.003 and a p-value of 0.848. The negative coefficient is consistent with the expectation that bill purchases may reduce immediately available liquid funds, but the relationship is statistically insignificant.

The evidence does not support the conclusion that NBE-bill holdings systematically affect bank liquidity in the sample. Therefore, H7 is not supported.

4.11. Inflation and Liquidity

The value of the coefficient of inflation is -0.002, and its p-value is 0.607. The negative coefficient indicates that there may be less liquidity in high inflation periods; however, the correlation is statistically insignificant.

Although inflation might boost loan demand and withdrawals, it could also lead to the holding of liquid assets by banks. Such conflicting results may account for the insignificant relationship found above. Thus, H8 is not supported.

4.12. Money Supply and Liquidity

Money supply shows a negative correlation with a coefficient value of -0.086 and p-value less than 0.001. The finding implies that an increase in money supply is related to low bank liquidity. One possible explanation is that monetary expansion stimulates lending and investment, causing banks to shift funds from liquid assets into less-liquid assets. Thus, increased system-wide liquidity does not necessarily result in higher bank-level liquidity ratios. Therefore, H9 is supported.

4.13. GDP Growth and Liquidity

The GDP growth variable has a coefficient of -0.020 and a p-value of 0.046. There is a negative relationship, and it is statistically significant at the 5% significance level. It implies that the level of bank liquidity decreases when there is high economic growth. In economic booms, banks are able to offer more loans and investments since the demand for borrowing goes up and the credit risk is lower. Hence, H10 is supported.

5. Discussion

From the findings, bank liquidity in Ethiopia depends mainly on capital adequacy, loan growth, deposit mobilization, money supply, and GDP growth. The positive impact of capital adequacy indicates that increased capital adequacy leads to better liquidity in the sense of improved loss absorbing capacity of banks. It is supported by the risk absorption theory (Allen & Gale, 2004; Repullo, 2004).

The negative impact of loan growth demonstrates the liquidity trade-off problem of financial intermediation, since loans are much less liquid than cash and marketable securities (Diamond & Rajan, 2005). As a result, fast credit expansion limits the amount of funds needed for liquidity.

Deposits have a positive and significant relation to liquidity. The findings demonstrate the significance of the stability of deposits. Banks that are more successful in raising deposits may have the necessary ability to keep their liquidity. However, banks need to use good asset-liability management because deposits can also be used for financing rapid loan growth.

The inverse relationship between liquidity and money supply and between liquidity and GDP growth indicates that during monetary and economic expansions, banks might tend to lower their liquidity ratios. This could be due to the fact that banks react to good economic performance by borrowing more and holding less-liquid investments. The above findings coincide with the idea that banks can experience low liquidity during economic expansions (Aspachs et al., 2005).

The absence of significance of profitability, bank size, interest margin, NBE bills held, and inflation suggests that the influence of these factors cannot be distinguished from zero with the estimated model. The above-mentioned results do not necessarily imply that the effects of these variables are always irrelevant. Rather, the impacts might depend on some other parameters.

6. Conclusion and Implications for policy

6.1. Conclusion

The present research has analyzed the liquidity determinants in the commercial banking sector of Ethiopia using bank-specific factors and macroeconomic indicators. Based on the results, it can be seen that capital adequacy and deposits have a positive impact on liquidity.

Moreover, there is a negative relationship between loan expansion, money supply, and economic growth on liquidity. However, there is no statistical significance for the impact of profitability, bank size, interest rate margin, NBE bills, and inflation on liquidity. From this study, it can be clearly seen that the level of liquidity is highly dependent on the level of capital, deposits stability, loan expansion, and the general economic environment. The fact that observational panel data was used makes these results not cause-and-effect.

6.2. Policy Implications

- Firstly, commercial banks should keep enough capital buffers. Good capital enhances loss absorbing capability and builds confidence of depositors and other interested parties.
- Secondly, banks should boost deposit mobilization through providing quality services, designing accessible products, adopting online banking services, and widening their client base.
- Thirdly, loan growth should be consistent with funding and liquidity expectations. Liquidity stress test should be performed before engaging in credit expansion programs.
- Fourthly, bank managers should keep an eye on the relationship between economic growth, money supply growth, loan growth, and liquidity. Economic boom periods need more liquidity protection since banks can extend loans excessively.
- Lastly, National Bank of Ethiopia should take into account the combined impacts of capital ratio, credit growth, monetary policy, and policy tools when setting up liquidity policies.

6.3. Limitations

There are various limitations to the study. Firstly, it involves the analysis of selected commercial banks as opposed to the overall banking industry. Secondly, it employs published financial and macroeconomic data that might have varying accounting practices. Thirdly, there is no inclusion of certain variables such as non-performing loans, exchange rates, unemployment, and efficiency of management, ownership and corporate governance. Fourthly, the model simply shows statistical relations and does not give any cause-effect relationship.

6.4. Suggestion for Further Research

Further studies could be conducted using more banks and an extended period. The researchers might conduct a comparison between state-owned and private banks and see if ownership impacts liquidity management. It would be possible to do further research using dynamic panel estimations and adding non-performing loans, exchange rate changes, unemployment, governance, and efficiency of the banks as variables. Other liquidity ratios, such as the loan to deposit ratio, liquid assets to total assets ratio, and liquidity coverage ratio, could also be used.

Declarations

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No funding was provided by any organization for conducting the research and preparing this manuscript. The author has not received any financial assistance for this work i.e. data collection, analysis or other related activities.

Author's Contributions

The only author of this paper conceptualized and designed the study, conducted the data collection and analysis process, interpreted the results and prepared the manuscript.

Competing interests

There are no competing interests for the author to disclose.

Data Availability

The data generated and analyzed for this study are available from the corresponding author upon request.

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