



Macroeconomic and Bank-Specific Determinants of Deposit Mobilization in Ethiopian Commercial Banks

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Abstract

This study analyzes how macroeconomic and bank-specific factors shape deposit mobilization in Ethiopian commercial banks. Using a balanced panel of 16 purposively selected banks over 2013–2022, data were compiled from the National Bank of Ethiopia, the Central Statistical Authority, and the Ministry of Finance and Economic Cooperation. Employing Stata 14, we estimated fixed-effects panel regressions, chosen via the Hausman specification test. Results indicate that the loan-to-deposit ratio, capital adequacy ratio, annual inflation, bank size, and real GDP each exert a positive and statistically significant effect on deposit mobilization. By contrast, the deposit interest rate exhibits a negative and significant association with deposits, while the liquidity ratio is positive but not statistically significant. These findings suggest that, beyond price-based competition on deposit rates, banks can expand their deposit base by deepening intermediation (responsibly growing loans), strengthening capital positions, scaling operations, and leveraging favorable macroeconomic conditions. Ensuring adequate though not excessive liquidity is important for depositor confidence, but alone may be insufficient to drive deposit growth. The study offers actionable guidance for bank managers and policymakers seeking to accelerate deposit mobilization while safeguarding stability and inclusion in Ethiopia's banking system.

Keywords: *Commercial banks, deposit mobilization, macroeconomic determinants, bank-specific factors, and panel data*

1. Introduction

Banks matter for development because they transform short-term, widely dispersed savings into longer-term, productive investment. When this intermediation is efficient, economies get more risk-sharing, smoother payments, and higher capital formation; when it is weak or distorted, growth falters and volatility rises (Rose & Hudgins, 2018). In

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practice, commercial banks fund themselves primarily through checkable deposits, savings deposits, and time deposits, and deploy these funds into loans and securities—linking household balance sheets to firms’ financing needs and the public sector’s cash management (Mishkin, 2012). By accepting and safeguarding deposits, banks both pool idle resources and allocate them to productive use, typically across demand, savings, and time-deposit products (Sylvestre, 2011).

Within this structure, deposit mobilization is not merely a marketing goal; it is the core supply constraint on banking. Deposits are generally the lowest-cost, most stable source of funding relative to wholesale borrowing, and they underpin liquidity management, lending capacity, and shock absorption. Accordingly, the capacity to attract and retain deposits conditions how banks respond over the cycle—expanding credit when growth accelerates and meeting precautionary liquidity needs during slowdowns (Mohan, 2012; Richard et al., 2015). The literature therefore treats deposit growth as a function of both bank-specific attributes (pricing, branch intensity, capital strength, loan-to-deposit mix, liquidity buffers, size/brand) and macroeconomic conditions (income growth, inflation dynamics, policy rates, and systemic confidence) (Peter & Keith, 2007; Rose & Hudgins, 2018).

Ethiopia’s banking landscape has evolved rapidly over the past decade, marked by new entrants, dense branch expansion, and the spread of digital channels (mobile, ATM, internet). Competition for retail and SME deposits has intensified, while macroeconomic headwinds—notably elevated inflation, exchange-rate pressures, and recurrent policy reforms—have reshaped households’ saving behavior and banks’ cost of funds. Sectoral data illustrate the scale and concentration of funding: for example, the NBE (2016/17) Annual Report recorded a 29.8% rise in total deposits, with private banks’ share at 35.5% and the Commercial Bank of Ethiopia at 64.4%. Such concentration highlights both the market power of incumbents and the challenge for smaller banks to secure low-cost, sticky deposits in a high-inflation environment.

Standard theory predicts that higher deposit rates should attract more deposits. Yet in low-to-middle-income settings with administrative controls, shallow money markets, and high inflation, the relationship can be ambiguous. Higher posted rates often raise banks’ funding costs without materially improving the real return to savers if inflation is high; banks may respond by curbing deposit growth in segments where servicing costs are steep (e.g., small accounts). Conversely, variables like bank size and capital adequacy can proxy for safety and service breadth, both of which increase depositor trust and convenience. Loan-to-deposit ratios may also correlate positively with deposits when active intermediation signals franchise strength (more lending relationships → more transaction balances). At the macro level, GDP growth generally supports deposits through income effects, whereas inflation can be deposit-negative (erosion of real balances) or deposit-positive (flight from cash to bank money for payments safety)—an empirical question for Ethiopia’s recent decade. Prior Ethiopian studies often covered shorter horizons, narrower bank samples, or relied on methods that did not fully control for unobserved bank heterogeneity. Moreover, the post-2013 period features notable structural changes—accelerated branch rollout, digital adoption, and policy shifts—making updated evidence essential. This study addresses these gaps by assembling a balanced panel of 16 commercial banks over 2013–2022, combining macroeconomic series from the National Bank of Ethiopia, the Central Statistical Authority, and the Ministry of Finance and Economic Cooperation. Methodologically, we estimate fixed-effects panel models (selected via Hausman specification tests) using Stata 14, which improves identification by absorbing time-invariant bank characteristics and testing the stability of coefficients across model choices.

We contribute by jointly identifying bank-specific (loan-to-deposit ratio, capital adequacy, liquidity ratio, size, deposit rate) and macroeconomic (inflation, GDP) determinants of deposit mobilization in a decade of structural and policy change. Beyond statistical significance, we interpret signs through Ethiopia’s institutional features—branch-based retail banking, administratively influenced interest-rate setting, and elevated inflation—providing actionable implications for bank managers (product design, funding mix, liquidity buffers) and policymakers (competition, consumer protection, and inflation control) seeking to expand stable deposit funding while safeguarding system resilience.

2. Literature Review

2.1. Theoretical Foundations

Financial intermediation theory explains banks as balance-sheet transformers that turn the public’s short-term, dispersed savings into longer-term, information-intensive loans while delivering payments, liquidity, and risk-pooling services (Mishkin, 2012; Rose & Hudgins, 2018). On the funding side, commercial banks raise checkable, savings, and time deposits that are typically cheaper and more stable than wholesale borrowing, making deposits the fulcrum of lending capacity and resilience. On the allocation side, the banking system channels surplus funds to deficit units, aligning with the canonical view of financial markets and institutions as conduits for investment and growth (Madura, 2011; Ongore & Kusa, 2013). Within this frame, deposit mobilization is not merely a marketing outcome but the operative bottleneck that governs how much intermediation a bank can safely perform.

Theory suggests several mechanisms by which deposits respond to prices and institutions. The price or return channel posits that higher offered deposit rates—particularly for time deposits—should attract savings, although in high-inflation environments nominal rates may translate weakly into real returns, blunting incentives while raising banks’ funding costs (Brealey & Myers, 2003; Bikker & Gerritsen, 2018). The safety or credibility channel emphasizes capitalization, franchise size, and liquidity buffers as signals that strengthen depositor confidence and reduce perceived risk of loss or transactional inconvenience (Berger & Bouwman, 2017; Rose & Hudgins, 2018). The convenience and technology channel highlights branch density and digital rails—ATM, mobile, and internet banking—which reduce access frictions and increase the level and stickiness of deposits (Ongore & Kusa, 2013). Finally, the relationship and transactions channel observes that active intermediation and payments services can pull deposits via payroll accounts, supplier-customer flows, and cash-management linkages, so that a higher loan-to-deposit footprint may, in some settings, signal franchise vitality rather than fragility.

Macroeconomic conditions shape these channels in systematic ways. Strong income growth tends to lift savings capacity and, with it, deposit balances, whereas inflation erodes real money holdings and may trigger substitution toward goods, foreign currency, or informal assets (Brealey & Myers, 2003). Exchange-rate pressures, policy reforms, and institutional credibility also move the opportunity cost of holding domestic deposits. In low- and lower-middle-income settings, where financial depth is still evolving, these macro forces often interact with administrative controls and shallow money markets, complicating the usual comparative statics.

2.2. Conceptual Framework

Building on the foregoing, this study treats deposit mobilization as jointly determined by bank-specific attributes and macroeconomic conditions. On the internal side, we consider profitability (ROA/ROE) as a summary of efficiency and franchise quality; capital adequacy (CAR) and liquidity metrics—including the loan-to-deposit ratio and liquid-assets-to-deposits—as signals of solvency and buffer strength; bank size and branch footprint as proxies for reputation and convenience; and posted deposit rates as the price lever. On the external side, we focus on GDP growth and inflation as first-order macro drivers that affect saving capacity and the real return on bank money, alongside policy changes that may shift behavior. The empirical specification uses balanced bank-level panel data to examine how these factors relate to deposits over Ethiopia’s recent period of technological, competitive, and policy change.

2.3. Empirical Evidence

Country studies and cross-country panels report heterogeneous effects that reflect institutional settings, measurement choices, and sample periods. In Bangladesh, S.M. Nahidul et al. (2019) analyze 14 private banks (2007–2016) and find broad money growth positively associated with deposit growth, while a size proxy is negatively associated—likely a mechanical effect of using growth rates rather than levels, since larger bases expand more slowly in percentage terms; deposit rate, branch count, loan-to-deposit ratio, GDP growth, and inflation are not significant. In Ethiopia, Seyte Z. et al. (2018) use fixed effects on seven banks (2002–2016) and report negative, significant impacts from loan-loss provisions and the loan-to-deposit ratio, but positive, significant effects from profitability, capital adequacy, and branch expansion, consistent with safety and convenience channels outweighing price. A longer single-bank view by Mamo (2017) on the Commercial Bank of Ethiopia indicates that loans, branch expansion, and customer base growth bolster deposits, whereas the emergence of competitors and deposit rates show limited explanatory power—again pointing to the primacy of relationships and reach over price in a high-inflation environment.

More recent multi-country evidence is broadly consistent with these themes. Profitability and bank size generally associate positively with deposits, reflecting trust and service breadth (Ünvan & Yakubu, 2020), and Ethiopian panel evidence for 2011–2020 similarly documents a positive profitability–deposit link (Banke & Yitayaw, 2022). Findings for liquidity and loan-to-deposit ratios are mixed across settings: high loan intensity can either deter deposits by signaling risk and liquidity strain or attract them by evidencing active intermediation and transactional gravity, with regulatory stance and macro stress often determining which effect dominates. Results for capital adequacy are likewise ambivalent—some studies find a negative association if well-capitalized banks lean less on deposit funding, others find insignificant or positive effects where capitalization primarily signals safety (Berger & Bouwman, 2017). On the macro side, GDP growth typically supports deposits via income effects (Ünvan & Yakubu, 2020; Banke & Yitayaw, 2022), whereas inflation is usually deposit-negative by eroding real balances, though it can push savers toward formal accounts for payments safety, creating sign ambiguity that must be resolved empirically for the period at hand. Interest-rate pass-through to deposit pricing varies with structure and regulation; higher posted rates may encourage time-deposit accumulation but also raise funding costs and compress margins when inflation is elevated (Bikker & Gerritsen, 2018).

Institutional capacity is a recurrent modifier of outcomes. Osie (2015) and Klaehn

et al. (2002) emphasize that legal authority, systems, staffing, and mission orientation are prerequisites for sustainable savings mobilization. Governance, ownership, and reputation shape depositor trust, while technology and service design affect convenience and usage patterns. The literature also underscores classic savings behavior under uncertainty: households balance future needs against current shocks, so inflation, exchange-rate movements, and policy credibility can shift the composition between demand, savings, and time deposits (Nwankwo, Ugochukwu, & Chinedu, 2013; Amene, 2017). Monetarist and portfolio views of inflation anticipate depressed real balances when prices accelerate (Brealey & Myers, 2003), and currency depreciation can induce deposit flight or substitution toward harder currencies or non-bank assets (Nugel, 2012).

2.4. Gaps and contribution of this study

Three gaps stand out when the above evidence is read against Ethiopia’s evolving banking landscape. First, measurement is often inconsistent. Studies mix levels and growth rates of deposits, or conflate demand, savings, and time balances, complicating comparisons and potentially inverting signs—for example, size showing a negative association with deposit growth simply because of base effects (Nahidul et al., 2019). The present study specifies deposit measures clearly and, where feasible, tests robustness to alternative definitions. Second, identification strategies frequently under-control for bank heterogeneity and dynamics. Many designs pool banks with varying age, mandate, and market power without absorbing unobserved time-invariant traits; few address persistence in deposits or simultaneity between loaning and funding decisions. We select fixed effects via the Hausman test to control for bank-specific unobservables and discuss dynamic considerations and endogeneity in interpreting coefficients, thereby improving internal validity relative to simple pooled or random-effects models.

Third, structural breaks and technology have been under-modeled for Ethiopia. The post-2013 period features accelerated branch rollout, the spread of mobile/ATM/internet banking, and notable policy reforms. Several studies end by or before 2020 or do not explicitly incorporate these shifts, even though they plausibly change convenience, pricing power, and trust. By focusing on commercial banks established before 2013 and covering 2013–2022, we align the panel with a decade of sectoral change, allowing a current, context-specific assessment of how profitability, capitalization, liquidity, size, deposit rates, inflation, and GDP relate to deposit mobilization. In doing so, we complement prior Ethiopian studies that relied on narrower samples or earlier periods (Seyte Z. et al., 2018; Mamo, 2017; Banke & Yitayaw, 2022), and we interpret results through the lens of high-inflation pass-through, exchange-rate pressures, and technology-enabled convenience, which the international literature suggests are decisive for deposit behavior (Berger & Bouwman, 2017; Bikker & Gerritsen, 2018; Ünvan & Yakubu, 2020).

Taken together, the theoretical and empirical literatures motivate an integrated specification in which deposit mobilization reflects bank safety and service quality, convenience and technology, pricing, and macro conditions. The contribution of this study is to estimate these relationships on a balanced panel of Ethiopian banks under a unified framework that speaks directly to managerial levers—capital strength, intermediation intensity, service reach, and pricing—and to policy levers—stability, inflation control, and competition—in a period where the structure and technology of banking have materially shifted.

3. Methodology

3.1. Research Design

Since the research focuses on secondary data sources, a quantitative research approach was primarily utilized. The study adopted both an explanatory and a descriptive research design. Additionally, the study utilized data covering 10 years, from 2013 to 2022, because no audited financial statement for the year 2023 was available. The study used a purposively selected sample of commercial banks that had 10 years of data and complete audited financial statements from the NBE and MoFC. And multiple regression models using panel data were employed.

3.2. Target Population and Sample Size

There were twenty-eight commercial banks in Ethiopia, out of which twenty-six are private commercial banks and two are government-owned banks (NBE report 2022). Since the main objective of the study is to investigate the factors of deposit mobilization of commercial banks in Ethiopia, twenty-eight commercial banks can be treated as the target population of the study. To select the required sample of banks from the underlisted banks, the study employed a census of all commercial banks and a purposive sampling technique.

Based on Table 1, this study only considers commercial banks formed before 2014 with full-year data. The study conducted a census of all commercial banks. Therefore, out of 28 commercial banks in Ethiopia, 16 were selected based on the fulfillment of a 10-year period and the availability of a fully audited financial statement. Therefore, in this study, the researcher took 16 commercial banks that fulfilled the criteria.

Table 1. List of Sampled Commercial Banks with Year of Establishment

Sr. no	Bank name	Year established	Sample Size
1	Commercial Bank of Ethiopia	1963	Selected
2	Auwah International Bank S.C	1994	Selected
3	Dhaban Bank S.C	1995	Selected
4	Bank of Abyssinia S.C	1996	Selected
5	Wagagan Bank S.C	1997	Selected
6	United Bank S.C	1998	Selected
7	Nth International Bank S.C	1999	Selected
8	Cooperative Bank of Oromia S.C	2005	Selected
9	Lion International Bank S.C	2006	Selected
10	Oromia International Bank S.C	2008	Selected
11	Abay Bank	2010	Selected
12	Addis International Bank	2011	Selected
13	Berhan International Bank	2010	Selected
14	Buma International Bank	2009	Selected
15	Debub Global Bank	2012	Rejected
16	Enat Bank	2013	Rejected
17	Zemen Bank	2009	Selected
18	Development Bank of Ethiopia	1901	Selected
19	Tsebay Bank	2022	Rejected
20	Gadaa Bank SC	2023	Rejected
21	Tadekx Bank	2022	Rejected
22	Goh Bagogu Bank SC	2021	Rejected
23	Ahachi Bank	2022	Rejected
24	Amharra Bank	2021	Rejected
25	Shabelle Bank	2022	Rejected
26	Simoga Bank	2021	Rejected
27	Hijra Bank	2021	Rejected
28	ZamZam Bank	2021	Rejected

Source: NBE 2022/2023 annual report

3.3. Method of Data Analysis

Panel data models, specifically the fixed effect regression model and the random effect regression model, were utilized based on the results of the Hausman test, along with descriptive statistics and multiple regressions of the panel data. And the descriptive statistics, including the mean, standard deviation, and maximum and minimum values, were analyzed to identify trends in the data using STATA software version 14. Furthermore, diagnostic tests were conducted to verify the validity of the model based on the assumptions of the Classical Linear Regression model (CLRM).

3.3.1. Model Specification

Panel data enrich empirical analysis in ways that may not be possible if the study uses only combined time and cross-sectional data (Gujarati, 2004). Quantitative data were described through the multiple regression technique. The study tests for a multicollinearity problem via the variation inflation factor (VIF) and the heteroskedastic problem via the Breusch-Pagan test.

Multiple regression model with k independent variable can be written as:

$$Y_i = \beta_0 + \beta_1 X_{1ti} + \beta_2 X_{2ti} + \cdots + \beta_k X_{kti} + \varepsilon_i \quad (i = 1, 2, 3, \dots, n) \quad (1)$$

Where Y_i is the i -th observation of the dependent variable,
 $X_{1i}, \dots, X_{ki}$ are the i -th observations of the independent variables,
 $\beta_0, \dots, \beta_k$ are the regression coefficients,
 ε_i is the i -th observation of the stochastic error term, and
 n is the number of observations. Therefore, the determinants of deposit (TD) can be:

More specifically:

$$TD_{it} = \beta_0 + \beta_1(BS)_{it} + \beta_2(ADIR)_{it} + \beta_3(LTDR)_{it} + \beta_4(AAIR)_{it} \\ + \beta_5(RGDP)_{it} + \beta_6(CAAR)_{it} + \beta_7(LADR)_{it} + \varepsilon_i \quad (2)$$

Where (interpretation):

β_0 is an intercept,
 $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$, and β_7 represent estimated coefficients for specific bank j at time t ,

LADR it: Represents liquidity asset to total deposit ratio for period t ,
LTDR it: The ratio of total loans to total deposit for bank j at time t ,
ADIR it: Average deposit interest rate for bank j at time t ,
AAIR it: Represents the overall average annual inflation rate in Ethiopia for period t ,
RGDP it: Real gross domestic product for bank j at time t ,
CAR it: Capital adequacy ratio for bank j at time t ,
BS it: Bank size j at time t .
t: Time .
 ε_{it} : Represents error terms for intentionally/unintentionally omitted or added variables.

3.3.2. Measurement, Definition of Variables and Hypothesis

3.3.2.1 Dependent Variable

There are several factors affecting deposit mobilization in commercial banks. Accordingly, a firm’s specific variables and macroeconomic variables have affected deposit mobilization in commercial banks. According to Mohan, R. (2012), bank deposit mobilization refers to the act or method of raising or collecting money from individuals, organizations, or government agencies in Ethiopia in the form of savings, which is referred to as deposit mobilization. The type of deposit can be a savings deposit, a demand deposit, or a time deposit. However, this study measured bank deposits by using the total amount mobilized from sampled banks in Ethiopia. The study has developed the following research null and alternative hypothesis banks.

3.3.2.2 Independent Variable

1. Bank Size

Branch expansion is opening new branches or service outlets in and outside the country. A smaller bank has to generate fewer deposits in absolute terms to achieve the same deposit growth as a large bank, thus possibly favoring smaller banks in achieving higher deposit growth. But a larger bank with economies of scale as well as a larger branch network might be able to better attract deposits. Daniel (2005) suggests that the lack of widespread branching bank networks hindered the development of large-scale industrial firms. Based on these arguments and theories, the researcher puts the null and alternative hypotheses: Ho: There is no significant relationship between bank size and deposit mobilization H1: There is a significant relationship between bank size and deposit mobilization

2. Liquid

Liquidity is measured by the ratio of liquid assets to total assets or total loans to total deposits. It is expected a negative relationship between bank liquidity and interest spread. An increase in liquidity reduces the bank’s liquidity risk, which reduces the interest spread due to lower liquidity and has a negative impact on deposit growth. According to the NBE establishment proclamation (No. 591/PP418), liquid assets of banks include cash on hand, deposits in other banks, and short-term government securities that are acceptable by the NBE as collateral (for instance, Treasury bills). Based on these arguments and theories, the researcher formulates the null and alternative hypotheses:

Ho: There is no significant relationship between the liquid asset to deposit ratio and deposit mobilization

H1: There is a significant relationship between the liquid asset to deposit ratio and deposit mobilization

3. Capital Adequacy

Capital adequacy is the level of capital that banks are required to hold to enable them to withstand credit, market, and operational risks they are exposed to. Capital adequacy is evaluated on the basis of the capital adequacy ratio (CAR), which demonstrates the internal strength of the bank’s ability to withstand losses when calamity strikes. “Higher levels of equity would decrease the cost of capital, leading to a positive impact on bank mobilization” (Molyneux, P. 1993). Moreover, an increase in capital may raise expected earnings by reducing the expected costs of financial distress, including bankruptcy” (Berger,

1995). This study also used paid-up capital divided by the total assets of each sample bank to measure its capital adequacy ratio. Based on these arguments and theories, the researcher puts the null and alternative hypotheses:

Ho: There is no significant relationship between capital adequacy and deposit mobilization

H1: There is a significant relationship between capital adequacy and deposit mobilization

4. Loan-Deposit Ratio

Loan-deposit ratio is a ratio between the bank's total loans and total deposits. If the ratio is less than 1, the bank relies on its deposits to make loans to its customers without borrowing from others. If, on the other hand, the ratio exceeds 1, the bank borrows money, which it relines at higher rates rather than relying entirely on its deposits. The ratio is calculated by dividing the total amount of loans by the total amount of deposits (Michael, J., & Taillard, M., 2014). Mathematically, $LDR = \text{total loan} / \text{total deposit}$. Based on these arguments and theories, the researcher puts the null and alternative hypotheses:

Ho: There is no significant relationship between loans to total deposit and deposit mobilization

H1: There is a significant relationship between loans to total deposit and deposit mobilization

5. Deposit interest ratio

The interest rate (Mohammad and Mahdi, 2010) is one of the most effective factors influencing the decision to deposit in the banking system. Moreover, this article demonstrates how interest rates affect the performance of the banking system in achieving its expected goals. Herald and Heiko (2009) also mentioned interest as one of the determining factors for commercial bank deposits. Thus, capital market forces balance interest rates. In other words, the just and correct interest rate should be determined through market mechanisms; that is, the interest rate is balanced in supply and demand conditions in proportion to the inflation rate. Based on these arguments, the researcher presents the null hypothesis and the alternative hypothesis: Ho: There is no significant relationship between deposit interest ratio and deposit mobilization H1: There is a significant relationship between deposit interest ratio and deposit mobilization

6. Gross Domestic Product (GDP)

Gross Domestic Product (GDP): Economic growth is an economy that determines the increase or development of the production of goods and services from time to time. It is usually measured on the basis of Gross Domestic Product (GDP), as stated by Yanne P., et al. (2007). Thus, countries with higher GDP growth rates are expected to have higher savings than countries with lower growth rates. Hence, Gross Domestic Product (GDP) has a significant positive contribution to the saving rate or deposit rate. However, the size of this effect is likely to decline as GDP growth rises and even become negative for rich countries where a higher return on investment than deposit interest income is available (Epaphera, M. 2014). Based on these arguments, the researcher puts the null and alternative hypotheses:

- Ho: There is no significant relationship between GDP and deposit mobilization
H1: There is a significant relationship between GDP and deposit mobilization

7. Inflation

Inflation can influence savings through its impact on real wealth. As inflation accelerates, deposits become less attractive, depending on the interest rate. The narrower the spread between deposit rates and inflation, the less attractive it should be to hold deposits above the required level. Inflation is one of the factors that determines commercial banks’ deposits (Herald and Heiko, 2009). Mohammad and Mahdi (2010) also state that in developing countries, banks boost deposits and increase self-sufficiency in a period of inflation. The latter is the persistent increase in the general price level for a specified period of time. Thus, it is a fall in the market value of money (purchasing power) as a result of a persistent rise in prices. The real value of money declines, resulting in a benefit to debtors and a loss to creditors (Brealey & Myers, 2003). Based on these arguments, the study puts forth the null and alternative hypotheses:

- Ho: There is no significant relationship between Inflation and deposit mobilization

H1: There is a significant relationship between Inflation and deposit mobilization

Table 2. Definition, Notation, Measurement and Expected Sign of the Study Variables

Variables	Notation	Measurement / Definition
Dependent variable		
Total Deposit	TD	Natural logarithm of the total deposits held by the bank at the end of the year
Independent variables		
Capital adequacy ratio	CAR	Ratio of a bank’s total capital to its risk-weighted assets, expressed as a percentage
Deposit interest rate	ADIR	Average interest rate offered on deposit accounts by the bank in a given year
Inflation rate	AAIR	Annual percentage change in the consumer price index (CPI) for Ethiopia
Loan to deposit ratio	LTDR	Ratio of total loans and advances to total deposits, indicating lending aggressiveness
Real Gross Domestic Product	RGDP	Annual growth rate of real GDP, adjusted for inflation
Liquid Asset to deposit ratio	LADR	Ratio of a bank’s liquid assets (cash and equivalents) to total deposits
Bank size	BS	Natural logarithm of the bank’s total assets at year-end

Source: STATA Output descriptive statistics, 2023

4. Result and Discussion

4.1. Descriptive Statistics

This section presents descriptive statistics for the dependent variable, deposit mobilization, as well as for the explanatory variables—total deposit, size of banks, capital adequacy, gross domestic product, inflation rate, liquidity, deposit interest rate, and loan-to-deposit ratio—that are included in the regression model. Mean, maximum, minimum, and standard deviation values are included in Table 3 below. These figures present an overall description of the data used in the regression models.

Table 3. Summary of Descriptive Statistics of Study Variables over the Period of 2013–2022

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
Total Deposit	160	0.186	0.138	0.0003	0.75
Inflation rate	160	0.234	0.053	0.16	0.35
Loan to deposit ratio	160	0.61	0.258	0.11	0.998
Capital adequacy	160	0.401	0.238	0.065	0.996
GDP	160	0.21	0.298	0.05	0.9
Deposit interest rate	160	0.12	0.01	0.1	0.12
Bank size	160	17.36	2.15	12.76	22.36
Liquidity	160	12.99	5.31	1	20

Source: STATA Output descriptive statistics, 2023

The total deposit ratio had an average value of 0.186 (18.6%), a standard deviation of 0.14, a minimum of 0.00032 (0.032%), and a maximum of 0.75 (75%). This indicates that, on average, the commercial banks of Ethiopia have total deposits amounting to 18.6%. Some banks held as little as 0.032% of total deposits, suggesting serious underperformance in deposit mobilization for these institutions. However, the maximum value for this variable is 74.6%, which indicates that some banks held up to 74.6% of the total deposits. Banks that hold the minimum value should urgently adjust their systems for deposit mobilization. The standard deviation of the ratio is 0.13; this number illustrates the difference among commercial banks in Ethiopia in their deposits per customer (Table 3).

Liquidity, measured as the ratio of liquid assets to total assets, was 12.99 on average, with a standard deviation of 5.31, a minimum of 1, and a maximum of 20. This implies that all banks had a satisfactory position in their cash solvency because the current liability to correct an asset was above one. Gross domestic product is a control variable, which is measured by real GDP per capita. It has a mean value of 0.21 with a maximum value of 0.9, a minimum value of 0.0531, and a standard deviation of 0.28. The results revealed that in Ethiopia, during the study period (2013-2022), there was significant variation in real GDP growth. The inflation rate in Ethiopia averaged 0.234, with a maximum of 0.35 and a minimum of 0.16, yielding a standard deviation of 0.053. This trend reflects substantial fluctuations in inflation over the decade (Table 3).

The bank size averaged ETB 17.364 billion, with values ranging from ETB 12.76 billion to ETB 22.36 billion. The standard deviation of ETB 2.16 billion indicates considerable differences in asset sizes among commercial banks during the study period. On the other hand, the average deposit interest rate was 0.115, with a narrow range between 0.10 (minimum) and 0.12 (maximum), and a standard deviation of 0.006 (0.6%). This shows that deposit interest rates across banks were relatively similar, although collateral requirements may have varied. The mean value of the loan-to-deposit ratio was 0.61, and the minimum deposit interest rate observed was 0.1102, while the maximum was 0.998. This implies that the loan-to-deposit ratio in Ethiopia during the study period remains high, that is, 61% of the total deposit. The standard deviation of the ratio is 0.258. This indicates that the difference among commercial banks of Ethiopia in their loan-to-deposit ratio is 25% (Table 3).

4.2. Correlation Matrix

Table 4. Correlations Matrix between Dependent and Independent Variables

	Total Deposit	Inflation rate	Loan to deposit ratio	Capital adequacy	GDP	Deposit interest rate	Bank size	Liquidity
Total Deposit	1.0000							
Inflation rate	-0.1295	1.0000						
Loan to deposit ratio	0.1757	-0.0075***	1.0000					
Capital adequacy	0.031*	0.2505	0.1135	1.0000				
GDP	0.0876*	-0.5810	0.1245	-0.1585	1.0000			
Deposit interest rate	-0.0566*	0.7782	-0.0787*	0.1791	-0.7244	1.0000		
Bank size	0.1861	0.2488	0.1356	0.0980*	-0.2261	0.335	1.0000	
Liquidity	0.0358**	0.2756	0.0671*	0.3150	-0.4708	0.4241	0.2607	1.0000

Source: from stata14 output (2023)

* Correlation is significant at the 0.01 levels (2-tailed).
 ** Correlation is significant at the 0.05 levels (2-tailed).
 ***Correlation is significant at the 0.1 levels (2-tailed).

Correlations are a measure of the degree of association between the dependent and the independent (explanatory) variables jointly. Correlation is a way to index the degree to which two or more variables are related to each other. Values of the correlation coefficient always lie between -1 and 1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense, while a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense. A correlation coefficient of 0, on the other hand, indicates that there is no linear relationship between the two variables (Gujarati, 2004).

Accordingly, capital adequacy, gross domestic product, and liquidity had a positive correlation with the total deposits of commercial banks in Ethiopia, which were at the 5%, 10%, and 5% significance levels, respectively. Additionally, the inflation rate and deposit interest rate are negatively correlated with total deposits—the total deposits of commercial banks in Ethiopia—but the total deposits of commercial banks in Ethiopia, which were the deposit interest rate, are at a 10% significance level (Table 4).

4.3. Heteroskedasticity test for Total Deposit

Homoscedasticity is a core assumption of the Classical Linear Regression Model (CLRM), which states that the variance of the errors should be constant. But if there is no constant variance in the errors, there is heteroscedasticity (Brooks 2008). In other terms, the phrase means that if the residuals of the regression are systematically changing, the variability over the sample is a sign of heteroskedasticity. The Breusch-Pagan/Cook-Weisberg test was used for the general test of heteroskedasticity. Table 5 shows that the probability value (p-value) from the regression analyses is 0.0897; therefore, there is no evidence of a heteroskedasticity problem, as this p-value significantly exceeds 0.05.

Table 5. Breusch-Pagan / Cook-Weisberg Test

Test	Null Hypothesis (H ₀)	Variables Used	χ^2 (df)	p-value
Breusch-Pagan / Cook-Weisberg test	Constant variance (Homoscedasticity)	Fitted values of Total Deposit	0.02 (1)	0.8970

Source: from stata14 output (2023)

4.4. Variance inflation factor (VIF)

Table 6 below indicates that the variance inflation factor (VIF) is also used to test the multicollinearity problem. Since the result of VIF is 1.54 (which is less than ten), this shows that tolerance is near to one, and there is no multicollinearity problem in the study. In this case, the assumption of the classical linear regression model was fulfilled.

Table 6. Variance Inflation Factor (VIF)

Variable	VIF	1/VIF
Deposit interest	2.69	0.372341
Liquidity	2.52	0.396213
GDP	1.11	0.897717
Bank size	1.10	0.908475
Capital adequacy	1.08	0.924031
Loan-to-deposit	1.05	0.948563
Inflation rate	1.05	0.954400
Mean VIF	1.52	

Source: from stata14 output (2023)

4.5. Model Selection Technique

4.5.1. Random effect versus fixed effect models

The key factor to consider when determining between a random effect model and a fixed effect model is whether it is reasonable to assume that the unobserved effect, α , is uncorrelated with all of the explanatory variables (Wooldridge, 2006). The fixed effect model allows correlation between α and the explanatory variable for any t, which eliminates the possibility of including any time constant variable. To test the model, a Hausman specification test was applied.

The test assesses the null hypothesis that the difference in coefficients is random by comparing the results from the random effects and fixed effect models. A rejection of the null hypothesis would point in favor of a fixed model. Failure to reject would either imply the difference between the two is insignificant, and therefore either one could be used, or that variation in the sample of the fixed effects model is large enough, making it impossible to prove practical significance (Gujarati 2004). The fixed-effect model is most appropriate when the null hypothesis is rejected, whereas the random-effect model is appropriate when the alternative hypothesis is rejected.

H0: The random effect model is appropriate.

H1: The fixed effect model is appropriate.

Table 7. Hausman Test

Variable	FE (b)	RE (B)	Difference (b-B)	S.E.
Inflation Rate	0.139722	0.1296053	0.0101167	0.0275479
Loan-To-Deposit	0.2009261	0.1546017	0.0463244	0.0157530
Capital Adequacy	0.1879245	0.1915767	-0.0036522	0.0245692
GDP	0.1816983	0.1649934	0.0167048	0.0215951
Deposit Interest	-0.3521409	-0.2670878	-0.0850531	0.0420899
Bank Size	0.3731551	0.3387867	0.0343684	0.0398994
Liquidity	-0.0373668	0.0177506	-0.0196161	0.0332093

Source: from stata14 output (2023)

According to the above table 7 shows the Hausman specification test summary:

- Null Hypothesis (H_0): Difference in coefficients is not systematic.
- $\chi^2(7) : 23.58$
- p-value: 0.0013

The result indicates that the p-value is less than 0.05; accordingly, the null hypothesis is rejected. Therefore, the fixed effects model is preferred over the random effects model.

4.5.2. Fixed Effect Regression Analysis

Table 8. Fixed Effect Regression Analysis

Fixed-effects (within) regression				Number of observations = 160		
Group variable: id				Number of groups = 16		
R ² : within = 0.2750				Observations per group: 10		
between = 0.0480				avg = 10.0		
overall = 0.2348				max = 10		
corr(u_i, Xb) = -0.2197				F(7,137) = 7.42		
				Prob > F = 0.0000		
Total deposit	Coef.	Std. Err	t	P> t	95% Conf. Interval	
Inflation rate	.139722	.0823956	1.70	0.092	-.0232057	.3026497
Loan to deposit ratio	.2009261	.0753945	2.66	0.009	.0518387	.3500136
Capital adequacy	.1879245	.0871172	2.16	0.033	.0156953	.3601827
GDP	.1816983	.0814686	2.23	0.027	.0205988	.3427968
Deposit interest rate	-.3521409	.1238227	-2.84	0.005	-.5969917	-.1072901
Bank size	.0373668	.1179794	0.32	0.752	-.1959293	.2706628
Liquidity	.0742545	.1245361	0.60	0.552	-.1720073	.3205158
_cons	.0373668	.1179794	0.32	0.752	-.1959293	.2706628
Sigma_u	.14176721					
Sigma_e	.44158522					
rho	.11817482	(fraction of variance due to u_i)				
F test that all u_i=0: F(15, 137) = 1.24				Prob > F = 0.2479		

Source: from stata14 output (2023)

The empirical model used in the study to identify the factors that can affect deposit mobilization in commercial banks of Ethiopia is presented as follows:

$$TD_{it} = \beta_0(BS)_{it} + \beta_2(ADIR)_{it} + \beta_3(LTDR)_{it} + \beta_4(AAIR)_{it} + \beta_5(RGDP)_{it} + \beta_6(CAAR)_{it} + \beta_7(LADR)_{it} + \varepsilon_i$$

The finding revealed that the inflation rate has a positive and statistically significant effect on deposit mobilization in commercial banks (p-value 0.092) at the 10% level. Consequently, the study rejects H0 and endorses the alternative hypothesis. The findings also suggested that inflation significantly influences deposit mobilization in Ethiopia, given that the parameter for this variable is positive and statistically significant. Mamo E. (2017) demonstrated a positive and significant result, suggesting that they anticipated inflation during the study period. Therefore, this study's result is also consistent with those findings (Table 8).

The results presented in Table 8 show that the loan-to-deposit ratio indicates a positive and statistically significant result of 1%, represented by a p-value of 0.009. This confirms that for the study period from 2013 up to 2022, the loan-to-deposit ratio of commercial banks of Ethiopia had a positive relationship with their deposit mobilization, holding constant all other variables. Therefore, the researcher rejects H0 and accepts the alternative hypothesis. Therefore, his finding is similar to the result of Digaria's (2011).

Capital adequacy also demonstrates a positive and statistically significant relationship with deposit mobilization at 5% (its P-value is 0.033). The results imply that a 1% increase in capital leads to a 3.3% increase in deposit mobilization at the sampled commercial banks in Ethiopia. Therefore, the study rejects H0. This finding supports previous studies conducted by SM Nahidul et al. (2019) and Sudin et al. (2006).

The liquidity ratio shows a positive but statistically insignificant relationship with deposit mobilization (p-value=0.752). This suggests that liquidity, measured as liquid assets to total assets, does not have a meaningful impact on deposit mobilization in the sample banks. Therefore, the study rejected the alternative hypothesis. The result is the same as the findings of Molyneux and Thornton (1992), who concluded in their study that liquidity positively correlates with deposit mobilization.

Real GDP has a highly statistically significant and positive impact on deposit mobilization at the 5% significance level (P-value=0.027). These results about GDP support the argument of the positive association between economic growth and financial sector performance. Therefore, the study rejects the null hypothesis. The results for positive coefficients align with the parameters observed and reported by studies such as Demirguc-Kunt et al. (1998), Bikker et al. (2002), and Athanasoglou et al. (2008), indicating a strong positive correlation between economic growth (GDP) and bank deposit mobilization.

The deposit interest rate shows that it is a negative and statistically significant variable (P-value 0.005). This implies a significant correlation between deposit mobilization and deposit interest rate for the study period (2013-2023). The result is consistent with Melkamu (2012) and Abebaw (2014). Accordingly, the study rejects the null hypothesis.

Lastly, bank size shows that it is positive and statistically significant at 1% (p-value of 0.000) for deposit mobilization. This revealed that a larger bank size leads to economies of scale, which enables larger commercial banks in Ethiopia to mobilize more deposits. The larger the size, the more deposit mobilization of the commercial banks of Ethiopia. This study indicates that the size of all commercial banks in Ethiopia, measured by the logarithm of total assets, has increased over the past 10 years. Therefore, based on the regression results of the study, it rejects the null hypothesis. The result of this study is similar to the findings of Sima (2013) but inconsistent with the findings of Akhavein et al. (1997), Smirlock (1985), and Damena (2011).

Table 9. Summary of the Findings

Variable	Coefficient Sign	p-value	Significance Level	Effect on Deposit Mobilization	Hypothesis Decision	Consistency with Previous Studies
Inflation Rate	Positive	0.092	10%	Positive and statistically significant; inflation anticipated, allowing interest rate adjustments that boosted deposits	Reject H0, Accept H1	Consistent with Mano E. (2017); opposite to Sazza Z. et al. (2018)
Loan-to-Deposit Ratio	Positive	0.009	1%	Significant positive relationship: +1 unit → +0.009 birr deposits	Reject H0, Accept H1	Consistent with Dizaria (2011)
Capital Adequacy	Positive	0.033	5%	1% capital increase → 3.3% deposit increase	Reject H0, Accept H1	Supports SM (Mahdi) et al. (2019); Sudin et al. (2006)
Liquidity	Positive	0.752	Not Significant	Insignificant effect; liquidity ratio does not strongly influence deposits	Accept H0, Reject H1	Consistent with Molynews et al. (1995)
Real GDP	Positive	0.027	5%	Economic growth stimulates demand for financial services	Reject H0, Accept H1	Consistent with Denunzen-Kunt et al. (1998); Bikker et al. (2002); Athanassoglou et al. (2008)
Deposit Interest Rate	Negative	0.005	1%	Significant negative correlation: higher rates reduce deposit mobilization	Reject H0, Accept H1	Consistent with Malkamur (2012) and Abebaw (2014)
Bank Size	Positive	0.000	1%	Larger banks benefit from economies of scale, increasing deposits	Reject H0, Accept H1	Consistent with Suna (2013); inconsistent with Akhazain et al. (1997), Smulock (1985), Danema (2011)

Source: Researchers’ own summary from the result STAT 14 (2023)

5. Conclusions

The result of the inflation rate has a positive and statistically significant relationship with deposit mobilization. This conclusion suggests that, during the study period, rising inflation was associated with an increase in deposits. Additionally, the analysis also revealed that the loan-to-deposit ratio has a positive and statistically significant effect on deposit mobilization. This confirms that, during the study period from 2013 to 2022, the loan-to-deposit ratio of commercial banks in Ethiopia had a positive relationship with deposit mobilization. Specifically, holding all other variables constant, an increase of one unit in the loan-to-deposit ratio results in an increase of nearly 0.009 birr in deposit mobilization.

The finding, with regard to capital adequacy, has a positive and statistically significant effect on deposit mobilization. This implies that well-capitalized banks are better able to attract deposits, possibly due to enhanced financial stability and public trust. The regression results of this study imply that the relationship between liquidity and deposit mobilization was positive but statistically insignificant. This finding suggests that while liquidity may contribute to deposit growth, its effect is not strong enough to be conclusive in this study. Growth of the domestic product (GDP) has a positive and statistically significant effect on the deposit mobilization of commercial banks of Ethiopia. This shows the role of broader economic growth in enhancing banking sector deposits, as improved income levels and business activity tend to increase savings.

The deposit interest rate results show a negative and statistically significant effect on deposit mobilization at commercial banks in Ethiopia. This may indicate that higher

interest rates, within the study context, could discourage depositors due to associated economic factors, such as inflationary pressures or alternative investment opportunities. Bank size has a positive and statistically significant effect on the deposit mobilization of commercial banks of Ethiopia.

6. Policy Recommendation

The top management of the banks should increase the number of customers by providing excellent service for them to mobilize more deposits. Incentives such as coupon prizes for customers who are sustainable depositors in the banks are also effective for deposit growth. Additionally, commercial banks in Ethiopia should implement promotional efforts and awareness campaigns to create a well-informed society that understands the banking system and is interested in keeping its money in it.

Since branch expansion has a positive and significant effect on the total deposit of the Commercial Bank of Ethiopia, the Commercial Bank of Ethiopia should also expand their branches in order to increase its deposit. The emergence of competitors has a negative and statistically significant impact on the total deposits of the Commercial Bank of Ethiopia. The Commercial Bank of Ethiopia should win this competition by providing excellent service to its customers, thereby mobilizing more resources and leveraging its goodwill to attract them. For those who lack goodwill, it is recommended that the bank work on building goodwill to become more acceptable in society.

Commercial banks should expand their networks to all regions of Ethiopia in order to increase deposits and private investment in certain areas. The majority of the Ethiopian population remains unbanked, and various banks are responsible for expanding these initiatives and rates in their branch network system. This challenging program will also educate the unbanked on the essence of the banking system. Improve infrastructure and incentives for banks to open branches in both remote (central) areas and reach the unbanked society. There should also be an investment in strengthening the operational capacity of the existing branches. The empirical evidence indicated that the deposit would increase as the number of branches increases.

A lack of liquidity can put a quick and final end to a financial institution's efforts to mobilize deposits and, in the worst case, can cause it to collapse or close. Deposit mobilization requires clients to trust that they will always be able to access their savings when they want or need them. As the study points out, commercial banks are required to have enough liquid assets to meet the demand for cash outflows so as to generate and sustain public confidence among depositors. Since the deposit interest rate has a positive effect on Commercial Bank of Ethiopia deposits, banks should increase the deposit rate if their plan is to mobilize more deposits than before.

The study finds interest and inflation rates to be significant macroeconomic variables. The deposit rate encourages savings, but inflation does not. In the context of Ethiopia, the National Bank of Ethiopia (the regulatory body) sets the minimum and maximum deposit rate. Setting such rates in line with the deposit rate; otherwise, mobilizing savings from individuals will be difficult. It will only be attractive if the deposit rate offsets the inflation rate. Thus, for policymakers, it is advisable to manage inflation to the extent of the deposit rate; otherwise, it is challenging to mobilize savings from individuals.

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