

“Determinants of bank profitability in Bangladesh: The role of Basel III disclosure, bank-specific factors, and macroeconomic conditions”

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ARTICLE INFO	Rozina Akter, Md. Shahidul Islam Zahid and Rana Al Mosharrafa (2026). Determinants of bank profitability in Bangladesh: The role of Basel III disclosure, bank-specific factors, and macroeconomic conditions. <i>Investment Management and Financial Innovations</i> , 23(3), 533–548. doi: 10.21511/imfi.23(3).2026.36
DOI	http://dx.doi.org/10.21511/imfi.23(3).2026.36
RELEASED ON	Friday, 18 September 2026
RECEIVED ON	Monday, 15 December 2025
ACCEPTED ON	Monday, 20 July 2026
LICENSE	 This work is licensed under a Creative Commons Attribution 4.0 International License
JOURNAL	"Investment Management and Financial Innovations"
ISSN PRINT	1810-4967
ISSN ONLINE	1812-9358
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

34



NUMBER OF FIGURES

0



NUMBER OF TABLES

7

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BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine
www.businessperspectives.org

Type of the article: Research Article

Received on: 15th of December, 2025
Accepted on: 20th of July, 2026
Published on: 18th of September, 2026

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Conflict of interest statement:
Author(s) reported no conflict of interest

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DETERMINANTS OF BANK PROFITABILITY IN BANGLADESH: THE ROLE OF BASEL III DISCLOSURE, BANK-SPECIFIC FACTORS, AND MACROECONOMIC CONDITIONS

Abstract

This study investigates the determinants of profitability for commercial banks in Bangladesh by evaluating the influence of bank-specific factors, Basel III disclosure, and macroeconomic conditions. Bank profitability is measured using three widely accepted indicators: Return on Assets (ROA), Return on Equity (ROE), Net Interest Margin (NIM). This study uses an unbalanced panel dataset of 42 commercial banks for the period 2004–2024. The empirical analysis is conducted using Pooled Ordinary Least Squares to examine the effects of Loan Growth Rate, Liquidity Ratio, Loan-to-Deposit Ratio, Basel III Disclosure Index, Bank size, Call Money Rate, and inflation on bank profitability. Findings indicate that the Liquidity Ratio is the most consistent and significant determinant of profitability, positively influencing ROA, ROE, and NIM. In contrast, the Loan-to-Deposit Ratio is negatively associated with ROA and ROE, demonstrating that excessive lending relative to deposits reduces financial performance. There is a statistically significant negative relationship between bank size and all profitability measures, indicating that more assets do not automatically mean bigger profits. There is a positive and significant relationship between inflation and profitability, implying that banks can adjust their pricing strategies and improve earnings during inflationary periods. The Basel III Disclosure Index is negatively associated with profitability and is statistically significant only for NIM. The derived models explain between 19.8% and 27.3% of the variation in profitability, and all models are jointly significant. The findings provide important insights for bank managers, regulators, and policy-makers seeking to strengthen profitability, resilience, and long-term sustainability of commercial banks in Bangladesh.

Keywords

profitability, efficiency, CIR, ROA, HHI, Basel disclosure

JEL Classification

G21, G28, E44

INTRODUCTION

The banking sector is a vital part of an economy's financial system, as it facilitates surplus and deficit units in both businesses and productive activities (Alkhazaleh & Almsafir, 2014). Since capital markets are often less developed and banks remain the main source of external finance for firms and economic activities, the role of banks is considered important for developing economies. As a result, the financial outcome of banks is very important not only to individual institutions but also to the broader financial landscape. Especially when it comes to the question of depositors' trust, the availability of financial stability, credit, and economic activity, it is crucial to know whether they can generate sustainable and stable profits

Profitability is considered one of the important sources of the banking sector's stability. Commercial banks that maintain adequate and stable profits are typically better able to manage financial risks, build capital, absorb unexpected losses, and continue lending during economic downturns. The way banks mobilize deposits and allocate resources has a direct effect on their financial performance, since lending and investment are considered the core of banks' financial intermediation activities (Mosharrafa & Islam, 2021). Moreover, profitability can be influenced by external factors not connected to banks' internal operations. Market competition, technological changes, regulatory requirements, and developments in the broader economy are some factors that can affect banks' performance as they operate in a competitive and regulated environment.

After the global financial crisis, banks are required to give more attention to capital adequacy, liquidity, risk management, and disclosure practices under the Basel III framework. Since disclosure requirements under Basel III provide information about banks' capital strength, financial condition, risk exposure, and resilience to regulators and market participants, it is important and relevant to bank performance. Therefore, the regulatory environment and financial fundamentals within which they function are strongly associated with understanding the determinants of sustainable bank profitability.

As banks in Bangladesh continue to play a leading role in fund mobilization and allocation while facing a range of continuing challenges, the issue is particularly important for the country. Operational inefficiencies, high levels of non-performing loans, weaknesses in risk management, and operational funding pressures can affect banks' ability to generate stable returns. In addition, bank performance may vary considerably depending on their size, capital position, liquidity, lending activities, leverage, and the influence of competitive and macroeconomic conditions. These differences suggest that profit-generating capacity may fluctuate significantly across banks and that its determinants need to be assessed within the institutional and economic context of Bangladesh.

The persistently low profitability of Bangladesh's banking sector further underscores the importance of this issue. Statistics show that return on assets reduced from 0.52 percent in 2022 to 0.43 percent by mid-2023. Concerns have been raised about banks' ability to strengthen their capital positions, absorb financial shocks, and maintain sustainable credit growth at such low profitability. The findings point to an unresolved research question: why does bank profitability vary across commercial banks in Bangladesh, and to what extent are these differences explained by bank-specific financial conditions, Basel III disclosure, market competition, and macroeconomic factors? To investigate this issue, it is vital to understand both individual banks' financial performance and the resilience and stability of Bangladesh's banking sector.

1. LITERATURE REVIEW AND HYPOTHESES

Bank profitability is widely regarded as a fundamental indicator of financial stability, operational efficiency, and long-term viability in the banking sector. Prior research suggests that profitability is influenced by a combination of internal bank characteristics, industry structure, and macroeconomic conditions, although the magnitude and direction of these effects differ across countries and institutional settings. A significant strand of literature emphasizes internal financial factors, particularly capital adequacy

and cost efficiency. Banks with stronger capital positions are generally more resilient to financial distress, benefit from lower funding costs, and can better sustain profitability (Petria et al., 2015; Athanasoglou et al., 2008). Similarly, operational efficiency plays a crucial role, as higher operating costs relative to income tend to weaken profitability. Empirical evidence consistently demonstrates a negative relationship between cost-to-income ratios and profitability indicators such as ROA and ROE (Athanasoglou et al., 2008). These findings highlight the importance of both financial strength and efficient management practices in driving bank performance.

Besides, the structure of banks' balance sheets, including leverage and liquidity, also contributes to profitability outcomes. While leverage can enhance returns by increasing the volume of income-generating assets, it may simultaneously raise financial risk (Goddard et al., 2004). Liquidity management presents a trade-off, as maintaining adequate liquidity reduces risk exposure, whereas excessive liquidity can limit profitability by restricting investment opportunities. Consequently, the relationship between liquidity and profitability remains inconclusive in the literature.

Market structure is another key determinant of bank profitability. The Structure-Conduct-Performance (SCP) hypothesis suggests that higher market concentration allows banks to exercise greater pricing power, thereby increasing profitability (Cetorelli, 2004). In contrast, the efficient structure hypothesis argues that more efficient banks naturally gain larger market shares, leading to higher concentration without necessarily reducing competition. Empirical findings remain mixed, with some studies supporting the positive role of concentration (Cetorelli, 2004), while others emphasize the efficiency-enhancing effects of competition (Jiménez et al., 2013).

Evidence from emerging economies also highlights substantial cross-bank variation in Basel disclosure practices. Examining Brazilian banks, de Jesus Santos et al. (2014) observe that compliance with Pillar 3 disclosure requirements remains relatively limited, with fewer than half of the sampled institutions publishing comprehensive risk management reports. Their analysis identifies bank size, the Basel disclosure index, and capital structure as significant determinants of disclosure quality, whereas ownership nationality and voting concentration do not appear to exert a meaningful influence. These findings suggest that institutional characteristics and regulatory considerations play a more prominent role in shaping disclosure practices than ownership structure.

Similar evidence is reported for the Indian banking sector. Samanta and Dugal (2016) find that banks place greater emphasis on disclosing information related to credit risk and capital adequacy, while operational risk receives comparatively limited attention. They also document consider-

able heterogeneity in the volume of information disclosed across institutions, indicating uneven implementation of Basel reporting requirements. Furthermore, the study shows that larger and more profitable banks tend to disclose more comprehensive information, although the variation in disclosure among these banks is relatively small, reflecting more consistent reporting practices. The comparatively limited disclosure of operational risk highlights an area where greater transparency could further strengthen market discipline under the Basel framework.

Macroeconomic conditions further influence bank performance. Economic growth tends to stimulate lending activity and improve profitability, whereas inflation and interest rate fluctuations may have varying effects depending on banks' ability to adjust pricing strategies (Athanasoglou et al., 2008; Liu & Wilson, 2010). These findings indicate that profitability is shaped not only by internal bank-specific factors but also by broader economic conditions.

In emerging economies such as Bangladesh, additional structural challenges have been identified. Evidence indicates that capital adequacy and interest margins positively influence profitability, while high operating costs, non-performing loans, and macroeconomic instability hinder performance (Akther et al., 2023; Mondol & Wadud, 2022). Moreover, the effects of competition and bank size remain ambiguous, reflecting the importance of institutional quality and regulatory frameworks.

A substantial body of literature has further examined the role of capital adequacy within Basel regulatory frameworks. Datta and Al Mahmud (2018) found that capital adequacy positively affects bank profitability under Basel II. Extending this, Yamin et al. (2025) showed that Basel III implementation enhances both financial performance and stability in Bangladesh's banking sector, while Akter et al. (2019) highlighted the progress and challenges associated with Basel III adoption in the country. In a comparative context, Nguyen (2020) observed that capital adequacy improves profitability for small banks but has no significant effect on large banks in Vietnam, suggesting that bank size may moderate this relationship.

Furthermore, Chowdhury et al. (2025) identified Basel III regulations and macroeconomic factors as key determinants of banking inefficiency in Bangladesh. Supporting structural arguments, Siddik et al. (2017) concluded that capital structure negatively affects bank performance in developing economies. From a market perspective, Mia (2023) found that increased competition reduces the cost of financial intermediation, whereas higher regulatory capital increases it, indicating a trade-off between efficiency and stability. Additionally, Naoaj (2023) identified leverage as negatively related and liquidity risk positively related to capital adequacy. Strengthening these findings, Al Mamun et al. (2022) confirmed a significant relationship between capital adequacy and bank performance, while Humta et al. (2024) demonstrated that macroeconomic variables moderate the relationship between capital adequacy and profitability.

The existing literature shows that bank profitability is determined by a combination of internal bank characteristics, industry dynamics, and macroeconomic factors. Although the positive contributions of capital adequacy and operational efficiency to profitability are widely supported, empirical evidence regarding the effects of liquidity, leverage, competition, and bank size remains inconsistent across different contexts. These divergent findings, coupled with the ongoing implementation of Basel III and the limited empirical evidence available for Bangladesh, suggest the need for a comprehensive examination of the factors influencing bank profitability in the Bangladeshi banking sector.

This study proposes hypotheses to investigate the effects of bank-specific factors, Basel III disclosure, and macroeconomic variables on the profitability of commercial banks in Bangladesh:

- H1: *The Loan Growth Rate (LGR) has a significant effect on bank profitability.*
- H2: *The Liquidity Ratio (LiqR) has a significant positive effect on bank profitability.*
- H3: *The Loan-to-Deposit Ratio (LDR) has a significant effect on bank profitability.*
- H4: *The Basel III Disclosure Index (BaselD) has a significant effect on bank profitability.*

H5: *Bank size (log_TA) has a significant effect on bank profitability.*

H6: *The Call Money Rate (CMR) has a significant effect on bank profitability.*

H7: *Inflation has a significant effect on bank profitability.*

Bank profitability has been measured using three indicators: Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM).

2. METHODOLOGY

2.1. Research design

This study applies a quantitative research approach to investigate the influence of bank-specific characteristics, Basel III disclosure, and macroeconomic factors on the profitability of commercial banks in Bangladesh. A panel data framework has been adopted as it integrates both cross-sectional and time-series observations, allowing the analysis to account for differences among banks and changes over time. This approach contributes to the robustness, consistency, and efficiency of the estimated relationships.

2.2. Data and sample

An unbalanced panel dataset comprising 42 commercial banks operating in Bangladesh during the period 2004–2024 was used for the empirical analysis. Bank-specific information was obtained from the published annual reports of the sampled banks, whereas the macroeconomic variables, namely the Call Money Rate (CMR) and Inflation, were collected from the Bangladesh Bank and other official national statistical publications. After removing observations with missing or incomplete data, the final sample consists of 738 bank-year observations, which form the basis for the regression analysis.

2.3. Variables

The study evaluates bank profitability using three dependent variables: Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin

(NIM). The explanatory variables consist of the Loan Growth Rate (LGR), Liquidity Ratio (LiqR), Loan-to-Deposit Ratio (LDR), Basel III Disclosure Index (BaselD), bank size (log_TA), Call Money Rate (CMR), and Inflation. Bank size is proxied by the natural logarithm of total assets, which is widely used as a measure of the scale of banking operations.

2.4. Model specification

The econometric approach to estimate the model will be in the following linear form:

$$\pi_{its} = \alpha_0 + \sum_{j=1}^J \beta_j X_{jit} + \sum_{l=1}^L \gamma_l X_{lit} + \sum_{m=1}^M \delta_m X_{mit} + \varepsilon_{its}. \quad (1)$$

The empirical models can be written as follows:

Model1:

$$ROA_{it} = \beta_0 + \beta_1 LGR_{it} + \beta_2 LiqR_{it} + \beta_3 LDR_{it} + \beta_4 BaselD_{it} + \beta_5 \log_TA_{it} + \beta_6 CMR_t + \beta_7 Inflation_t + \varepsilon_{it}, \quad (2)$$

Model 2:

$$ROE_{it} = \beta_0 + \beta_1 LGR_{it} + \beta_2 LiqR_{it} + \beta_3 LDR_{it} + \beta_4 BaselD_{it} + \beta_5 \log_TA_{it} + \beta_6 CMR_t + \beta_7 Inflation_t + \varepsilon_{it}, \quad (3)$$

Model 3:

$$NIM_{it} = \beta_0 + \beta_1 LGR_{it} + \beta_2 LiqR_{it} + \beta_3 LDR_{it} + \beta_4 BaselD_{it} + \beta_5 \log_TA_{it} + \beta_6 CMR_t + \beta_7 Inflation_t + \varepsilon_{it}, \quad (4)$$

Table 1. Variables

Variable	Type	Measurement/description
Return on Assets (ROA)	Dependent Variable	Return on Assets (ROA) measures a bank's ability to generate profits from its total assets. It is calculated by dividing net income by total assets and indicates how efficiently management utilizes the bank's asset base to produce earnings
Return on Equity (ROE)	Dependent Variable	Return on Equity (ROE) measures the return earned on shareholders' invested capital. It is calculated as net income divided by total shareholders' equity and reflects the bank's effectiveness in creating value for its shareholders
Net Interest Margin (NIM)	Dependent Variable	Net Interest Margin (NIM) measures the profitability of a bank's core intermediation activities. It is calculated as the difference between interest income and interest expense divided by average earning assets, indicating how effectively the bank earns income from its interest-bearing assets
Loan Growth Rate (LGR)	Independent Variable	Loan Growth Rate (LGR) measures the annual expansion of a bank's lending portfolio. It is calculated as the percentage change in total loans from the previous year and reflects the bank's lending strategy and credit expansion over time
Liquidity Ratio (LiqR)	Independent Variable	The Liquidity Ratio (LiqR) measures the proportion of liquid assets maintained by a bank to meet its short-term financial obligations. A higher ratio indicates stronger liquidity management and a greater capacity to absorb unexpected funding needs
Loan-to-Deposit Ratio (LDR)	Independent Variable	The Loan-to-Deposit Ratio (LDR) measures the extent to which customer deposits are used to finance loans. It is calculated by dividing total loans by total deposits and indicates the bank's lending intensity and funding efficiency
Basel III Disclosure Index (BaselD)	Independent Variable	The Basel III Disclosure Index (BaselD) measures a bank's level of compliance with the disclosure requirements prescribed under the Basel III framework. The index is developed based on the proportion of mandatory disclosure items reported in annual reports, where higher values indicate greater transparency and stronger regulatory compliance
Bank Size (log_TA)	Independent Variable	Bank size is measured as the natural logarithm of total assets (log_TA). This transformation reduces data skewness and captures differences in the scale of banking operations while controlling for size-related effects on profitability
Call Money Rate (CMR)	Independent Variable	The Call Money Rate (CMR) represents the short-term interest rate at which banks lend and borrow funds in the interbank market. It is used as a proxy for funding costs and overall liquidity conditions in the banking sector
Inflation	Independent Variable	Inflation is measured by the annual percentage change in the general price level. It captures the macroeconomic environment in which banks operate and reflects how changes in purchasing power and operating costs may influence bank profitability

where ROA_{it} = Return on Assets of bank i in year t ; ROE_{it} = Return on Equity of bank i in year t ; NIM_{it} = Net Interest Margin of bank i in year t ; LGR_{it} = Loan Growth Rate; $LiqR_{it}$ = Liquidity Ratio; LDR_{it} = Loan-to-Deposit Ratio; $BaselD_{it}$ = Basel III Disclosure Index; $\log_TA_{it}$ = Natural logarithm of total assets (proxy for bank size); CMR_t = Call Money Rate; $Inflation_t$ = Annual inflation rate; β_0 = Constant (intercept), β_1 - β_7 = Estimated coefficients of the explanatory variables; ε_{it} = Error term.

2.5. Variable description

This study investigates the determinants of bank profitability by employing three profitability indicators as dependent variables and a set of bank-specific and macroeconomic factors as explanatory variables. The definitions and measurements of the variables used in the analysis are summarized below.

2.6. Data sources and empirical outcome

We have collected bank-level data from the annual reports of commercial banks operating in Bangladesh. Macroeconomic data, including the inflation rate and the call money rate, were collected from the Bangladesh Bank and the Bangladesh Bureau of Statistics. STATA statistical software has been used to estimate econometric models. Table 2 presents descriptive statistics for all variables employed in the analysis. Specifically, Table 2 presents the summary statistics of both dependent and independent variables for the 42 commercial banks over the period 2004–2024.

Table 2. Summary statistics of dependent and independent variables

Variables	(1)	(2)	(3)	(4)	(5)
	N	mean	sd	min	max
ROA	749	0.00992	0.00859	-0.0452	0.0312
LGR	740	0.191	0.183	-0.125	2.152
LiqR	749	0.256	0.0622	0.0450	0.452
LDR	749	0.802	0.0783	0.312	1.125
BaselD	749	0.796	0.222	0.400	1
CMR	861	0.0661	0.0291	0.0246	0.128
Inflation	861	0.0701	0.0156	0.0542	0.114
log_TA	749	9.634	1.239	6.363	12.55
Number of b_id	43	43	43	43	43

The average Return on Assets (ROA) is 0.992%, indicating that, over that study period, the sampled banks generated a modest return from their total assets. The standard deviation of 0.859% suggests relatively constrained variation in profitability across banks and over time. ROA ranges from -4.52% to 3.12%, indicating that although some banks experienced substantial losses in certain years, others achieved comparatively strong financial performance.

The average Loan Growth Rate (LGR) is 19.1%, indicating that the sampled commercial banks extended their loan portfolios by nearly one-fifth per year over the study period. Nevertheless, the relatively high standard deviation of 18.3% suggests significant differences in lending growth across the banks and years. Loan growth ranges from -12.5% to 215.2%, indicating that some banks experienced a decline in lending, while others recorded exceptionally accelerated credit creation.

The average Liquidity Ratio (LiqR) is 25.6%, with a standard deviation of 6.22 percentage points, suggesting moderate variation in the level of liquid assets held by banks. As the ratio varies between 4.5% and 45.2%, it suggests significant differences in liquidity management across the banking sector.

The average Loan-to-Deposit Ratio (LDR) is 80.2%, suggesting that banks, on average, converted about four-fifths of their deposits into loans. The relatively small standard deviation of 7.83 percentage points suggests that credit policies were reasonably consistent across the sample. LDR values range from 31.2% to 112.5%, indicating differences in banks' funding structure and lending strategies. Although lower values suggest a more conservative lending approach, values above 100% indicate that some banks relied on funding sources beyond customer deposits to support loan growth.

The average value of the Basel Disclosure Index (BaselD) is 0.796, indicating that the sampled banks assembled approximately 79.6% of the Basel III disclosure requirements. The standard deviation of 0.222 points suggests moderate variation in disclosure practices. This indicates that although some banks disclosed only part of the required information, others achieved full compliance with the disclosure framework.

The average Call Money Rate (CMR) is 6.61%, with a standard deviation of 2.91 percentage points, suggesting variations in short-term interbank borrowing costs over the sample period. The rate ranges from 2.46% to 12.8%, indicating changes in liquidity conditions within the money market.

The average inflation rate for the period under study is 7.01%, with a standard deviation of 1.56 percentage points, suggesting reasonable variation in the macroeconomic environment. Inflation ranges from 5.42% to 11.4%, reflecting periods of relatively stable prices and episodes of relatively higher inflation.

The average logarithm of total assets (log_TA) is 9.634, with a standard deviation of 1.239, suggesting substantial variations in bank size across the sample. The values range from 6.363 to 12.55, highlighting significant variation in the total asset base of commercial banks operating in Bangladesh.

Based on the sample distribution, this study used 749 bank-year observations for most bank-specific variables and 861 observations for the macroeconomic variables (CMR and Inflation), comprising 42 commercial banks. The empirical variance across both bank-specific and macroeconomic variables provides a suitable basis for panel data analysis and validates the examination of factors influencing Basel III disclosure practices.

Table 3 presents the correlation matrix, which depicts the strength and direction of the relationships between the independent and dependent variables included in the regression analysis. The results indicate typically low correlations among the independent variables, reflecting minimal multicollinearity. The matrix below is generated

from STATA and aligns with the abbreviated variable definitions in Table 1.

Table 3 indicates the Pearson correlation matrix for all variables included in the analysis. The correlation coefficients quantify the strength and direction of linear associations between paired variables, whereas statistical significance is reported by the corresponding significance levels.

Return on Assets (ROA) is positively and significantly correlated with the Loan Growth Rate (LGR) ($r = 0.166$, $p < 0.01$), Liquidity Ratio (LiqR) ($r = 0.441$, $p < 0.01$), bank size (log_TA) ($r = 0.183$, $p < 0.01$), and the Call Money Rate (CMR) ($r = 0.103$, $p < 0.01$). These relationships demonstrate that more profitable banks tend to accelerate lending, tend to retain elevated liquidity reserves, and possess larger asset bases. On the other hand, ROA is negatively associated with the Loan-to-Deposit Ratio (LDR) ($r = -0.443$, $p < 0.01$) and the Basel Disclosure Index (BaselD) ($r = -0.131$, $p < 0.01$), suggesting that banks with higher lending intensity and higher disclosure levels are correlated with lower profitability. While ROA has a positive association with Inflation ($r = 0.053$), its impact on ROA is not statistically significant.

Loan Growth Rate (LGR) demonstrates significant negative correlations with the Loan-to-Deposit Ratio (LDR) ($r = -0.208$, $p < 0.01$), Basel Disclosure Index (BaselD) ($r = -0.108$, $p < 0.01$), and Bank size (log_TA) ($r = -0.315$, $p < 0.01$). This indicates that larger banks and those with greater lending intensity and higher disclosure typically witness decelerated loan growth. There is no statistically significant relationship between LGR and the Liquidity Ratio (LiqR), Call Money Rate (CMR), or Inflation.

Table 3. Pairwise correlation

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) ROA	1.000							
(2) LGR	0.166***	1.000						
(3) LiqR	0.441***	-0.037	1.000					
(4) LDR	-0.443***	-0.208***	-0.612***	1.000				
(5) BaselD	-0.131***	-0.108***	0.369***	0.272***	1.000			
(6) log_TA	0.183***	-0.315***	0.580***	0.131***	0.641***	1.000		
(7) CMR	0.103***	0.051	-0.182***	-0.228***	-0.624***	-0.388***	1.000	
(8) Inflation	0.053	0.037	-0.158***	0.002	-0.335***	-0.101***	0.498***	1.000

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Liquidity Ratio (LiqR) is positively associated with the Basel Disclosure Index (BaselD) ($r = 0.369$, $p < 0.01$) and bank size ($\log_TA$) ($r = 0.580$, $p < 0.01$), indicating that larger banks and those with robust disclosure practices are prone to maintain higher liquidity buffers. In contrast, LiqR is negatively correlated with the Loan-to-Deposit Ratio (LDR) ($r = -0.612$, $p < 0.01$), the Call Money Rate (CMR) ($r = -0.182$, $p < 0.01$), and Inflation ($r = -0.158$, $p < 0.01$), indicating that higher lending activity and macroeconomic downturns are accompanied by lower liquidity levels.

The Loan-to-Deposit Ratio (LDR) is positively associated with the Basel Disclosure Index (BaselD) ($r = 0.272$, $p < 0.01$) and bank size ($\log_TA$) ($r = 0.131$, $p < 0.01$), indicating that larger banks and those with greater disclosure levels are prone to expand more loans compared to their deposit base. In contrast, LDR is negatively correlated with the Call Money Rate (CMR) ($r = -0.228$, $p < 0.01$), whereas inflation is not statistically significant with LDR.

A strong positive association is observed between the Basel Disclosure Index (BaselD) and bank size ($\log_TA$) ($r = 0.641$, $p < 0.01$), suggesting that larger banks generally report greater compliance with Basel III disclosure requirements. BaselD is, however, negatively associated with both the Call Money Rate (CMR) ($r = -0.624$, $p < 0.01$) and Inflation ($r = -0.335$, $p < 0.01$), indicating that stringent money market conditions and greater inflation synchronize with lower disclosure levels.

Among the independent controls, the highest positive association is found between BaselD and $\log_TA$ ($r = 0.641$), whereas the strongest negative association exists between LiqR and LDR ($r = -0.612$). Crucially, all pairwise correlation coefficients remain well below the standard threshold of 0.80, validating that multicollinearity is insignificant and unlikely to distort the subsequent regression outputs

In short, the correlation metrics indicate notable, moderate relationships exist among the study variables. The empirical findings are broadly consistent with the predicted correlations and provide preliminary insights that validate the empirical model, while also confirming that the independent variables are sufficiently discrete to be included in the panel data estimations.

2.7. Test of multicollinearity (VIF)

The empirical results of the multicollinearity diagnosis exhibit no evidence of acute collinearity among the explanatory variables. In Table 4, VIF values range from 1.21 to 6.55, with a mean VIF of 3.20, each score presenting well under the standard threshold of 10. Similarly, tolerance values vary between 0.153 and 0.825, exceeding the recommended minimum threshold of 0.10. These findings indicate that multicollinearity is not a significant concern in the model and is unlikely to distort the estimated regression coefficients. Accordingly, all explanatory variables were retained for the subsequent regression analysis.

Table 4. Using VIF to test the multicollinearity of the variables

Variables	VIF value	Tolerance value
LiqR	6.55	0.152586
LDR	4.35	0.229869
$\log_TA$	3.96	0.252572
BaselD	2.93	0.340761
CMR	1.97	0.507358
Inflation	1.41	0.711703
LGR	1.21	0.825311
Mean VIF	3.2	

2.8. Hausman test

The model specification procedure was applied consistently across all three profitability measures (ROA, ROE, and NIM). Since the same panel structure, sample, explanatory variables, and estimation framework were used for each specification, the reported Hausman test was intended to justify the general preference for the Fixed Effects estimator in this study.

Table 5. Hausman test

Dependent Variable	Chi-square (χ^2)	Prob > χ^2	Decision
ROA	18.96	0.0020	Fixed Effect
ROE	26.38	0.0001	Fixed Effect
NIM	18.48	0.0024	Fixed Effect

In Table 5, Chi-square statistic of ROA, ROE, and NIM are 18.96 (0.0020), 26.38 (0.0001), and 18.48 (0.0024), respectively, which are highly significant in all cases. This means the differences between FE and RE coefficients are systematic, so RE is

not consistent. We should go for the Fixed Effects model. FE accounts for time-invariant heterogeneity across banks, making the analysis more reliable. To account for potential heteroskedasticity and autocorrelation, we used Driscoll and Kraay standard errors, a non-parametric covariance matrix estimator that is robust to general forms of spatial and temporal dependence. These standard errors are particularly suitable when regression residuals exhibit cross-sectional dependence.

Table 6. Results of the fixed-effects model for bank profitability determinants in Bangladesh from 2004 to 2024

Variables	(1) ROA	(2) ROE	(3) NIM
LGR	0.00138 (0.00119)	0.0172 (0.0158)	-0.000755 (0.00151)
LiqR	0.0466*** (0.00879)	0.550*** (0.117)	0.0686*** (0.0112)
LDR	-0.0207** (0.00634)	-0.302*** (0.0844)	-0.00352 (0.00807)
BaselD	-0.00242 (0.00163)	-0.0356 (0.0217)	-0.00414* (0.00208)
log_TA	-0.00175*** (0.000419)	-0.0252*** (0.00557)	-0.00277*** (0.000533)
CMR (Call Money Rate)	-0.0113 (0.00748)	-0.198* (0.0995)	-0.00343 (0.00952)
Inflation	0.0349** (0.0122)	0.434** (0.163)	0.0407** (0.0156)
_cons	0.0317*** (0.00485)	0.482*** (0.0646)	0.0416*** (0.00617)
N	738	738	738
R ²	0.252	0.273	0.198
Adj. R ²	0.199	0.221	0.141
F	33.09	36.92	24.32

Note: Standard errors in parentheses. + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

3. RESULTS AND DISCUSSION

This section reports the results of the panel regression analysis examining the determinants of profitability in Bangladeshi commercial banks. Bank profitability is measured using Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM). The explanatory variables include the Cost-to-Income Ratio (CIR), Capital Adequacy Ratio (CAR), leverage, market concentration (HHI), inflation, and the call money rate. Beyond presenting coefficient estimates, the discussion interprets the findings in the Bangladeshi institutional and regulatory context.

3.1. Model 1 (ROA)

Table 6 presents the fixed effects estimation results for Return on Assets (ROA). The Liquidity Ratio (LiqR) has a positive and statistically significant effect on ROA ($\beta = 0.0466$, $p < 0.01$), suggesting that banks that have stronger liquidity positions tend to generate higher returns on their assets. On the other hand, the Loan-to-Deposit Ratio (LDR) ($\beta = -0.0207$, $p < 0.05$) and Bank size ($\log_TA$) ($\beta = -0.00175$, $p < 0.01$) are negatively correlated with profitability, indicating that greater lending intensity and larger bank size are linked to lower ROA. A statistically significant positive relationship exists between Inflation and ROA ($\beta = 0.0349$, $p < 0.05$), whereas the effects of Loan Growth Rate (LGR), the Basel Disclosure Index (BaselD), and the Call Money Rate (CMR) are not statistically significant. The model explains 25.2% of the variation in ROA ($R^2 = 0.252$), and the F-statistic confirms its overall significance. Dietrich and Wanzenried (2014) indicated that Loan intensity and funding structure significantly affect ROA. Athanasoglou et al. (2008) also agreed that LDR is an important determinant of profitability. Additionally, Jokipii and Danton (2024) suggested that Return on Assets (ROA) exhibits different sensitivities to market interest rate levels and highlighted the non-linear effect of compressed liability margins on NIM. Additionally, initial bank characteristics affect falling interest rates and profitability. In contrast, Akber and Dey (2020) found a strong positive relation between ROA and LDR.

3.2. Model 2 (ROE)

Similar patterns are observed for Return on Equity (ROE). LiqR remains positively associated with profitability ($\beta = 0.550$, $p < 0.01$), while LDR ($\beta = -0.302$, $p < 0.01$) and $\log_TA$ ($\beta = -0.0252$, $p < 0.01$) have significant negative effects. The Call Money Rate (CMR) is negatively related to ROE at the 10% significance level ($\beta = -0.198$, $p < 0.10$), whereas Inflation has a positive effect ($\beta = 0.434$, $p < 0.05$). Neither LGR nor BaselD significantly influences ROE. The model explains 27.3% of the variation in ROE ($R^2 = 0.273$), and the F-statistic indicates that the model is jointly significant. Zheng et al. (2017) found that higher bank regulatory capital ratios reduce the cost of financial intermediation and increase bank profitability, whereas Akber and Dey

(2020) identified a strong positive correlation between ROE and Cash deposit ratio. On the other hand, Parvin et al. (2019) found that liquidity and bank size did not significantly influence bank profitability.

3.3. Model 3 (NIM)

For Net Interest Margin (NIM), LiqR continues to have a positive and highly significant effect ($\beta = 0.0686, p < 0.01$). BaselD shows a weak negative association with NIM ($\beta = -0.00414, p < 0.10$), while bank size ($\log_TA$) remains negatively related to profitability ($\beta = -0.00277, p < 0.01$). Inflation is positively associated with NIM ($\beta = 0.0407, p < 0.05$). In contrast, LGR, LDR, and CMR do not have statistically significant effects. The model explains 19.8% of the variation in NIM ($R^2 = 0.198$), and the F-statistic confirms the overall significance of the regression. Shahria and Jahan (2026) found that the liquidity coverage ratio negatively affects Net Interest Income (NII). Dietrich and Wanzenried (2014) found that profitability determinants vary widely across various income levels in terms of significance, sign, and effect size.

Across the three models, the Liquidity Ratio emerges as the most consistent positive determinant of bank profitability. By contrast, Bank size is negatively associated with all three profitability measures, indicating that larger banks tend to generate lower returns. Inflation is positively related to ROA, ROE, and NIM, while the Loan-to-Deposit Ratio negatively affects ROA and ROE. Loan Growth Rate does not significantly influence any profitability measure, whereas the Basel Disclosure Index is significant only in the NIM model. Overall, the empirical findings provide support for six of the seven proposed hypotheses, while one hypothesis is not supported by the empirical evidence.

Empirical results suggest that banks' profit performance in Bangladesh is influenced more strongly by credit structure, liquidity management, bank size, and macroeconomic factors than by the extent of Basel III disclosure or loan growth. An important characteristic of the findings is that the impacts are not the same across ROA, ROE, and NIM. This indicates that a single dimension is not enough to assess a bank's financial performance.

The same bank feature may affect interest margin and accounting returns through various channels. This result is compatible with evidence from the wider international context and Wanzenried (2014), who identified that the magnitude and trend of financial outcome factors vary considerably across national contexts and income groups.

3.4. Loan growth and bank profitability

All three financial performance models showed that the result of loan growth is substantively small. Thus, hypothesis H1 is not supported by the obtained estimates due to a lack of sufficient evidence. Since credit provision is generally considered one of the primary sources of income of commercial banks, this outcome is significant. Nevertheless, financial performance might not be positively affected solely by an increase in credit provision. The quality of those loans, funding costs, interest margin earned, provisioning requirements, and the level of associated credit risk are the determinants of the profitability generated from additional loans.

The insignificant association found in this study is not essentially incompatible with the broader empirical literature. Foos et al. (2010), who used more than 16,000 banks across 16 countries, found that accelerated loan growth was related to greater loan loss provisions, weaker capital ratios, and lower relative interest income. The results indicate that growing the loan portfolio can heighten risk that mitigate the additional revenue arising from expanded credit provision. From the perspective of Bangladesh, Sufian and Habibullah (2009) found a positive and notable association between bank performance and loan intensity, which differs from the current result.

This difference may reflect changes in market conditions faced by banks in Bangladesh during the period under review. Previous evidence was grounded in 1997–2004, while the current study covers a considerably later period in which banks have witnessed liquidity pressures, greater regulatory requirements, asset-quality issues, and variations in competitive conditions. Therefore, the current result indicates that simply accelerating loans is no longer enough to enhance profitability. Lending quality and pricing conditions are more important than just the scale of lending expansion.

3.5. Liquidity and bank profitability

Liquidity generates the most consistent result in the study. The liquidity ratio is positive and statistically significant in all three profitability measures. The coefficient is 0.0466 for ROA, 0.550 for ROE, and 0.0686 for NIM, all significant at the 1% level. H2 is thus much favored.

At first glance, this result might appear to contradict the common view that holding liquid assets entails opportunity costs, since such assets (e.g., cash) typically yield lower returns than other income-generating assets, such as loans. But the positive coefficient implies that sufficient liquidity in the banking system could be beneficial, despite this opportunity cost, in Bangladesh. A more liquid bank is more likely to accommodate customer demand for withdrawals, continue loans, limit access to costly emergency funding, and take advantage of profitable investment opportunities without being forced to either curb its lending activity or borrow at high interest rates. Recent evidence is available in Bangladesh that supports this interpretation. Shahria and Jahan (2026) found that there is a significant positive relationship between the Basel III Liquidity Coverage Ratio and ROA for 25 banks from 2018 to 2024. They also conclude that liquidity conditions are negatively related to non-performing assets. The congruence between their conclusions and the present findings is especially interesting because both studies consider the post-Basel III regulatory framework in Bangladesh. This finding also has significant implications for the understanding of Basel III. The cost of complying with liquidity regulation should not be considered solely as a compliance cost. If liquidity is managed well, it can boost a bank's ability to withstand short-term shocks and continue with its routine intermediation business. The results thus indicate that liquidity management may be used to achieve both regulatory and profitability goals.

3.6. Loan-to-deposit ratio and bank profitability

It is interesting to note what the figures say regarding the loan-to-deposit ratio (LDR). Giving out more loans than deposits does not clearly move the interest margins (NIM) but does negatively affect overall earnings (ROA and ROE).

So, hypothesis H3 gains support in the case of total returns, but it does not hold for the interest spread. The bottom line is that it is easy to understand that loans can be a source of cash, but that doesn't mean it is a good idea to lend aggressively. When a bank runs out of its deposit cushion to pump out credit, it begins to sweat for liquidity. If you are pushing the loan without a thorough quality control system, any additional interest you make will only be lost due to increased borrower costs, safety measures, and bad debt management. This is contradictory to the previous studies conducted in Bangladesh. Previous studies indicated that increasing lending had a positive effect or, at best, did not adversely affect the bottom line (for example, Sufian & Habibullah, 2009, or Islam & Rana, 2017). The negative numbers now indicate a real change in the market; the additional juice from new loans is no longer worth the squeeze. On the surface, there is no problem with interest margins, but the hidden risks and clean-up costs come back to haunt net returns.

3.7. Basel III disclosure and bank profitability

Basel III disclosure index is not statistically significant with ROA and ROE. The coefficient is negative and weakly significant in the NIM model ($\beta = -0.00414$, $p < 0.10$). This means that H4 is supported, but not quite. This result is to be interpreted with caution. Basel III disclosure is primarily meant to enhance transparency and market discipline and is not a means to promote accounting profitability. Pillar 3 of the Basel Committee is designed to allow banks to be more transparent and comparable in their risk exposures and regulatory information to the market. In this sense, it does not seem fair to simply argue that more disclosure equals higher ROA or ROE. It's not like transparency about Basel III will increase profits. The disclosure score is not really connected to ROA or ROE and just slightly bites into interest margins, providing little support for hypothesis H4. This news shouldn't surprise anyone. Reporting rules were established to ensure banks are honest, transparent, and stable, rather than reporting record earnings. It is hard to see how a checklist for risks and compliance would get a bank any fat on its bones.

3.8. Bank size and bank profitability

There is a stable, negative, and statistically significant relationship between bank size and all three profitability measures. The coefficient is -0.00175 for ROA, -0.0252 for ROE, and -0.00277 for NIM, all significant at the 1% level. H5 is thus highly recommended. This indicates that bigger size may not be an advantage for profitability for the Bangladeshi banks. While large banks may have scale and more customers and access to funding, the disadvantages are organizational complexity, cost of operations, bureaucratic structures, and problems in coping with larger loan portfolios. This finding is especially significant in comparison with previously available evidence from Bangladesh. Sufian and Habibullah (2009) concluded that the impact of size was not equal; size was negatively related to ROAE but positively related to ROAA and NIM. This study, with more recent data available and three profitability measures, confirms this negative relationship. This contrast can reflect a diminishing over time of the advantages of scale, or a growing importance of the disadvantages of complexity. The outcome also underlines the importance of not relying solely on asset growth as a measure of bank performance. A bank could grow larger without being more efficient or profitable. For Bangladeshi banks, thus, it looks like the quality of expansion is more crucial than the increase of assets only.

3.9. Call money rate and bank profitability

The call money rate does not significantly impact ROA and NIM, as the same rate has a significant negative impact on ROE. H6 is thus only available for ROE. The negative ROE coefficient implies that lower short-term funding costs could lead to lower returns for the bank's equity holders. When the call money rate goes up, it will further increase the short-term funding costs for banks, and it will strain the spread between the short-term loan and funding rates. This impact could become apparent specifically in ROE since fluctuations in funding costs can affect earnings generated from the equity base. Not all short-term market differences affect bank profitability to a similar extent, as shown by the lack of a significant effect on ROA and NIM. Banks can adjust their lending rates, de-

posit rates, position in the call money market, and funding structures to some extent if there is any change in the call money market. Consequently, the net impact on profitability will depend on the ability of each bank to reflect those changes in funding costs in its asset and liability pricing. This finding corroborates the findings of Dietrich and Wanzenried (2014) that the factors that influence bank profitability are very context-specific. From a Bangladesh perspective, the results indicate that ROE has responded strongly to the short-term interest-rate conditions, while ROA and NIM have responded to the short-term interest-rate conditions in a rather insignificant way, suggesting that the effects of changes in short-term interest-rate conditions can be more clearly seen in shareholder returns than in the interest margin.

3.10. Inflation and bank profitability

Inflation has a positive and statistically significant relationship with ROA, ROE, and NIM. Therefore, H7 is supported across all three profitability measures. The results seem considerably consistent, as inflation can affect banks through several competing channels. If inflation increases at a moderate level, banks will be able to follow up with lending rate adjustments and earnings asset repricing, which can boost their nominal interest income and, in the end, help the profitability of the banks. It may also increase the nominal value of banking transactions and credit demand. These effects can generate a positive association between inflation and bank profitability when banks are able to adjust lending rates sufficiently quickly.

However, the actual conclusion differs from earlier data from Bangladesh. Sufian and Habibullah (2009) found a negative relationship between inflation and bank profitability, while Rahman et al. (2015) also reported a negative effect of inflation on ROA and ROE. This distinction is important because it indicates that the impact of inflation does not necessarily remain stable over time..

One explanation is that banks' ability to adjust lending and deposit rates may have changed over time. The positive relationship observed in the present sample may indicate that banks have been able to transfer at least part of the inflationary

increase in costs and funding requirements into lending rates and interest income. It may also reflect differences in the inflationary environment and monetary-policy conditions between the earlier sample periods and the more recent period examined in this study.

3.11. General interpretation of the obtained results

Taken together, the results provide a more specific picture of profitability determinants in Bangladesh than would be obtained from considering the individual coefficients separately. Liquidity emerges as the most stable positive determinant, while bank size is consistently negative. Inflation is also consistently positive. By contrast, the effects of lending-related variables are more conditional: loan growth itself does not significantly affect profitability, whereas a higher loan-to-deposit ratio reduces ROA and ROE.

Thus, the results indicate balance-sheet expansion matters less than the quality and structure of banking activity. Profitability cannot be ensured only by enhancing loans and total assets. Rather, banks can benefit more if they maintain adequate liquidity and manage the relationship between lending and deposit mobilization carefully.

The Basel III disclosure results can be considered. Since there is an insignificant association between disclosure and ROA or ROE, transparency in the regulatory framework should not be assessed solely regarding short-term profitability. Basel III Pillar 3 disclosure is aimed mainly at strengthening transparency, comparability, and market discipline. The economic benefit of ensuring Pillar 3 can be found through governance, improved risk monitoring, and market discipline rather than through an immediate increase in accounting returns.

Overall, the empirical result supports six of the seven hypotheses, even though two of these – H4 and H6 – receive only measure-specific evidence. H1 is not supported because loan growth is insignificant across all profitability measures. In particular, the results reveal that the factors affecting profitability have changed over time in Bangladesh. Some of the findings contradict previous studies conducted on Bangladesh, especially in the cases of bank sizes and inflation. While the differences should not always be read as an antagonism, they do highlight some shifts in the regulatory, financial, and macro-economic context in which Bangladesh banks operate. Thus, the findings support the importance of examining bank profitability using recent country-specific evidence rather than relationships established in earlier periods that remain unchanged.

CONCLUSION

This study analyzes how bank-specific variables, Basel III disclosure, and macroeconomic conditions influence the profitability of commercial banks in Bangladesh using ROA, ROE, and NIM as proxies of financial performance. Since we incorporate Basel III disclosure into the analysis in addition to conventional profitability determinants, the study extends the existing literature and provides new evidence from an emerging banking market. The results suggest that the most consistent determinant of profitability across all three models is liquidity management. On the other hand, higher loan-to-deposit ratios and larger bank sizes are associated with lower profitability, whereas inflation contributes positively to bank performance. The influence of Basel III disclosure remains limited, with significance observed only for Net Interest Margin, and Loan growth does not have a significant effect on profitability.

These findings indicate that increasing disclosure compliance is less important than strengthening liquidity management, improving operational efficiency, and maintaining balanced lending policies for enhancing bank profitability. The financial benefits may take longer to materialize than those of internal managerial practices, although Basel III disclosure promotes transparency and accountability.

This study has several limitations. It focuses exclusively on commercial banks in Bangladesh and considers a limited set of explanatory variables. Future researchers can incorporate governance characteristics,

ownership structure, market competition, digital banking, or environmental, social, and governance (ESG) factors for extending the analysis. Employing comparative cross-country analyses or alternative panel estimation methods may also provide a deeper understanding of the determinants of bank profitability.

AUTHOR CONTRIBUTIONS

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APPENDIX A

This Appendix provides a list of the 42 commercial banks included in the study sample. For each bank, information is presented on its ownership category (state-owned, private commercial, or foreign commercial bank), year of establishment, and selected descriptive indicators. The Appendix is intended to improve the transparency of the sample selection process and to provide readers with additional context regarding the characteristics of the banking institutions examined in the analysis.

Table A1. Commercial banks of Bangladesh included in the study

S.N.	Bank name	Ownership category	Years covered
1	Brac Bank PLC	Private commercial bank	21 years (2004–2024)
2	Bank Asia Limited	Private commercial bank	20 years (2005–2024)
3	Eastern Bank	Private commercial bank	21 years (2004–2024)
4	DUTCH BANGLA BANK PLC	Private commercial bank	17 years (2008–2024)
5	Premier Bank	Private commercial bank	13 years (2012–2024)
6	Al-Arafah Islami Bank Limited	Private commercial bank	21 years (2004–2024)
7	IFIC Bank PLC	Private commercial bank	15 years (2010–2024)
8	Dhaka Bank PLC	Private commercial bank	19 years (2005–2024)
9	Prime Bank PLC	Private commercial bank	21 years (2004–2024)
10	Agrani Bank PLC	State-owned commercial bank	8 years (2016–2024)
11	Jamuna Bank	Private commercial bank	15 years (2010–2024)
12	Trust Bank	Private commercial bank	21 years (2004–2024)
13	Islami Bank	Private commercial bank	21 years (2004–2024)
14	City Bank	Private commercial bank	15 years (2010–2024)
15	Mutual Trust Bank	Private commercial bank	19 years (2006–2024)
16	Southeast Bank	Private commercial bank	21 years (2004–2024)
17	One Bank	Private commercial bank	21 years (2004–2024)
18	Mercantile Bank PLC.	Private commercial bank	21 years (2004–2024)
19	Exim Bank	Private commercial bank	21 years (2004–2024)
20	Pubali Bank	Private commercial bank	10 years (2015–2024)
21	Uttara Bank PLC	Private commercial bank	21 years (2004–2024)
22	Rupali Bank	State-owned commercial bank	11 years (2014–2024)
23	Social Islami Bank	Private commercial bank	16 years (2009–2024)
24	Bangladesh Development Bank	State-owned commercial bank	15 years (2010–2024)
25	United Commercial Bank	Private commercial bank	21 years (2004–2024)
26	First Security Islami Bank	Private commercial bank	5 years (2015–2019)
27	NCC Bank	Private commercial bank	11 years (2014–2024)
28	Union Bank PLC	Private commercial bank	12 years (2013–2024)
29	National Bank Limited	Private commercial bank	7 years (2015–2021)
30	Standard Chartered Bank	Private commercial bank	13 years (2012–2024)
31	Shahajalal Islami Bank PLC	Private commercial bank	12 years (2011–2023)
32	SBAC Bank	Private commercial bank	12 years (2013–2024)
33	NRB Bank	Private commercial bank	12 years (2013–2024)
34	Padma Bank	Private commercial bank	12 years (2013–2024)
35	MIDLAND Bank	Private commercial bank	12 years (2013–2024)
36	Modhumoti Bank	Private commercial bank	12 years (2013–2024)
37	Community Bank plc	Private commercial bank	6 years (2019–2024)
38	Global Islami Bank PLC	Private commercial bank	12 years (2013–2024)
39	Citizen Bank PLC	Private commercial bank	4 years (2021–2024)
40	Bengal Commercial Bank	Private commercial bank	4 years (2021–2024)
41	BASIC BANK PLC	State-owned commercial bank	21 years (2004–2024)
42	ICB BANK	Private commercial bank	11 years (2013–2023)