

“Determinants of Profitability in Private Commercial Banks of Bangladesh: A Panel Data Analysis of Bank Specific Factors”



**An Internship Report submitted in partial fulfillment of the requirements for the
Degree of Master of Business Administration (MBA)**

SUBMITTED TO

Ferdous Jahan

Assistant Professor

Department of Finance and Banking

Faculty of Business Studies

Comilla University, Cumilla

SUBMITTED BY

Munira Akter

ID: 22317034

Registration No: 22317034

Session: 2022-23

Program: MBA

Department of Finance & Banking

Comilla University, Cumilla

DATE OF SUBMISSION

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**Department of Finance and Banking
Comilla University, Cumilla.**

Letter of Transmittal

May 26, 2025

Ferdous Jahan

Assistant Professor

Department of Finance & Banking

Comilla University

Subject: Submission of Internship Report on "**Determinants of Profitability in Private Commercial Banks of Bangladesh: A Panel Data Analysis of Bank Specific Factors**"

Honorable Madam,

It is an absolute pleasure for me to submit the internship report titled " **Determinants of Profitability in Private Commercial Banks of Bangladesh: A Panel Data Analysis of Bank Specific Factors** " which has been done as a partial fulfillment of the requirements for the degree of Master of Business Administration (MBA) under Department of Finance & Banking, Faculty of Business Studies, Comilla University. Your guideline has been followed in every aspect of preparing this report. I have really enjoyed working on this report and I have tried my level best to make an effective report. This report focuses on both theoretical and practical knowledge. Within the title limit, I have made this report as comprehensive as possible. But there may be some mistakes due to various limitations.

So, I beg your kind consideration in this regard. I hope that my work would meet the level of your expectation. Any query on this report is appreciated

Sincerely yours,

Munira Akter

ID: 22317034

Department of Finance & Banking

Comilla University

Student Declaration

I, Munira Akter, hereby declare that the internship report title "**Determinants of Profitability in Private Commercial Banks of Bangladesh: A Panel Data Analysis of Bank Specific Factors**" individually prepared by me after completing the 90 days internship at City Bank PLC and prepared a report where analyze the bank specific factors that affect the profitability of ten private commercial banks of Bangladesh based on the bank's past ten years annual report.

I would like also to declare that the report is prepared exclusively for academic purposes and not for any other reason.

Munira Akter

ID: 22317034

Session: 2022-23

Master of Business Administration

Department Of Finance and Banking

Comilla University

Supervisor Forwarding

The Internship Research Report entitled “**Determinants of Profitability in Private Commercial Banks of Bangladesh: A Panel Data Analysis of Bank Specific Factors**” has been submitted in partial fulfillment of the requirements for the degree of Master of Business Administration (MBA) under the Department of Finance & Banking, Faculty of Business Studies, Comilla University, on 26th May, 2025 by Munira Akter, ID:22317034.

The report has been accepted and presented to the Internship Defense Committee for evaluation.

(Signature of Internship Supervisor)

Ferdous Jahan

Assistant Professor

Department of Finance and Banking

Faculty of Business Studies

Comilla University

Acknowledgment

At the very beginning, I would like to express my deepest gratitude to Almighty Allah for giving me the strength and aptitude to finish the report within the time.

I feel honored to lay my sincerest gratitude to my honorable supervisor, Ferdous Jahan, Assistant Professor, Department of Finance and Banking, Comilla University for her help, encouragement, guidance, and valuable suggestions throughout the period of this study without which it would not have been possible to submit this report on time.

It was a great opportunity for me to complete my internship program at **City Bank PLC, Halishahar Branch**. I am also very grateful to my Branch manager, Mohammad Abu Bakar Siddiqui (Mamun) for his great support and patience.

I am fortunate for the aid and encouragement I have received from my parents, teachers and friends and students of Comilla University.

Munira Akter

ID: 22317034

Session: 2022-23

Department of Finance and Banking

Comilla University

Experience Certificate



City Bank PLC

Halishahar Branch, Chattogram

Date: 23.05.2025

To Whom It May Concern

This is to certify that Ms. Munira Akter (ID No: 22317034), a student of Master of Business Administration (MBA) program in Finance and Banking department under Faculty of Business Studies of Comilla University has completed her three months long internship program from 16th March 2025 to 18th May 2025 for our branch. During her tenure of the internship, she has got the opportunity to work almost all aspects of our bank and we found her punctual, hardworking and responsible in projection with her assignment. She gathered practical knowledge which will help her to cope with real-world business environment.

We wish her all success in life.

A handwritten signature in black ink, appearing to read "Mamun".

Mohammad Abu Bakar Siddiqui (Mamun)

Head of Branch

Halishahar Branch

CK Tower, House No. 2 & 4, Road 3, Lane 3, Block K, Halishahar H/E, Chattogram.

Call: 16234, +880 2 8331040. E-mail: halishahar@thecitybank.com.

www.citybankplc.com

Executive Summary

This study investigates the internal determinants of profitability among private commercial banks in Bangladesh, with a particular focus on Return on Assets (ROA) and Return on Equity (ROE) as key performance indicators. Given the critical role these banks play in channeling financial resources and supporting economic development, understanding the factors that drive their profitability is essential for ensuring financial system stability in a developing economy like Bangladesh. By analyzing various financial ratios and internal bank-specific factors, the study aims to identify how internal management decisions and financial structures influence profitability.

Using panel data analysis covering multiple fiscal years and a representative sample of private commercial banks, the study explores how differences in internal financial strategies and resource allocations impact profitability. The findings suggest that capital adequacy and operational efficiency play a crucial role in enhancing bank profitability. Specifically, banks with a stronger capital base and more efficient use of their operating resources tend to achieve better returns on equity. In contrast, higher levels of equity capital relative to total assets and an increased burden of non-performing loans are found to negatively impact equity profitability, reflecting the detrimental effects of excessive funding costs and poor asset quality.

Regarding asset-based returns, the study highlights the significant influence of loan loss provisions, which negatively affect profitability by indicating credit risk and loan quality issues. Operational efficiency again emerges as a strong positive determinant, reinforcing the importance of cost-effective management. The loan-to-deposit ratio also shows a positive impact on ROA, suggesting effective fund utilization, while a higher cost-to-income ratio exerts a negative influence, indicating that banks with high operating costs relative to income tend to underperform. Overall, the study provides valuable insights for bank managers and policymakers. It emphasizes the importance of strengthening capital adequacy, managing credit risk, improving operational efficiency, and optimizing cost structures to sustain profitability in a competitive banking environment. These findings contribute to a deeper understanding of bank performance dynamics within the context of a developing economy like Bangladesh.

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Chapter - 1

Introduction

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1.1 Introduction

The profitability of private commercial banks is a crucial indicator of financial system stability and economic progress in developing economies like Bangladesh. As these institutions serve as key intermediaries in channeling funds from savers to investors, their efficient performance is essential for ensuring the effective allocation of financial resources. In this context, understanding the internal drivers that shape bank profitability has become increasingly important, particularly as the banking sector continues to expand and face evolving regulatory and competitive challenges. The study focuses on the factors that influence the financial performance which is largely determined by the profitability of the banks.

Bank-specific factors, including those related to lending practices, capital strength, operational efficiency, and asset quality, play a significant role in determining financial performance. Variations in how banks manage their loans, control operating costs, maintain capital adequacy, and respond to credit risk can result in substantial differences in profitability outcomes. A deeper exploration of these internal dynamics is important to disclose the underlying mechanisms that contribute to superior financial performance and institutional strength.

In recent years, growing competition, shifting rules and shifting economic condition all have an impact on Bangladesh's dynamic banking sector. While external macroeconomic factors such as inflation or GDP growth influence bank outcomes, this study emphasizes internal, management-driven variables that are within the control of banking institutions. By focusing on these controllable factors, this research aims to provide practical insights for bank managers, investors, and policymakers seeking to enhance the efficiency and sustainability of private commercial banks in Bangladesh.

Using panel data analysis across a sample of private commercial banks over multiple years, this study investigates how variations in internal financial decisions and resource allocations influence key profitability indicators, namely Return on Assets (ROA) and Return on Equity (ROE). These two metrics offer comprehensive measures of how effectively banks utilize their assets and equity to generate earnings. The findings of this study are expected to contribute to the growing body of literature on bank performance in emerging markets and offer evidence-based guidance for improving strategic financial management within the banking sector of Bangladesh.

1.2 Background of the Study

In recent decades, Bangladesh has experienced significant progress in its financial sector, driven largely by the expansion and increased competitiveness of private commercial banks (PCBs). These institutions have emerged as key players in mobilizing savings, financing investments, and facilitating economic transactions throughout the country. In the context of a growing economy, where financial inclusion, technological adoption, and regulatory reforms are reshaping the banking landscape, the profitability of these banks has become an essential measure of institutional strength, efficiency, and sustainability.

Profitability is not only critical for the survival and growth of individual banks but also for the overall stability of the financial system. Profitable banks are better positioned to absorb shocks, expand credit, invest in innovation, and contribute to national development. Two of the most commonly used indicators to measure bank profitability are Return on Assets (ROA) and Return on Equity (ROE). ROA indicates how efficiently a bank uses its assets to generate profit, while ROE reflects the returns generated on shareholders' equity. The ability of a bank to maintain healthy levels of ROA and ROE is often influenced by various internal, bank-specific factors that are within managerial control.

These internal factors include aspects such as the quality and proportion of loans in the asset portfolio, operational efficiency, cost management, capital adequacy, and risk management strategies. Similarly, the adequacy of capital can influence both risk-taking behavior and regulatory compliance, thereby affecting profitability. Operational costs and income generation capacity also play a critical role, as excessive overheads can dilute earnings, while a favorable cost-to-income ratio can enhance performance. Therefore, understanding the influence of such factors is crucial for strategic financial planning and policy formulation.

Although the banking sector in Bangladesh has grown in size and complexity, not all private commercial banks exhibit uniform profitability trends. Some banks consistently perform well, while others struggle to maintain stable returns. This inconsistency, despite operating under the same macroeconomic and regulatory environment, suggests that internal operational and financial management practices significantly shape profitability outcomes. Thus, a focused analysis on these bank-specific determinants becomes imperative to identify the key levers of financial performance.

1.3 Problem Statement

The profitability of private commercial banks is a vital indicator of financial soundness and operational efficiency, influencing not only the individual institutions but also the broader stability of the financial system in Bangladesh. Despite operating in a shared economic, political, and regulatory environment, the performance of private commercial banks varies significantly. Some banks have shown consistent growth in returns, while others have experienced stagnation or even financial distress. This inconsistency raises important concerns about the internal dynamics that drive bank performance.

In the context of Bangladesh, prior studies have predominantly emphasized the role of macroeconomic variables such as inflation, interest rate, and GDP growth in determining bank profitability. However, such external factors are beyond the direct control of bank management. There is a noticeable lack of empirical research that focuses specifically on bank-specific, internal determinants of profitability—such as loan quality, capital adequacy, operating efficiency, and cost control—which are critical for day-to-day decision-making within the banks. Furthermore, studies that adopt robust quantitative techniques, such as panel data analysis, to account for both time-series and cross-sectional variations, are scarce.

Without a comprehensive understanding of how internal financial and managerial factors affect profitability, bank managers may struggle to identify performance gaps and formulate effective strategies for improvement. This gap in the literature and practice presents a pressing problem: What are the key internal factors that determine profitability in private commercial banks in Bangladesh, and how can they be empirically measured and analyzed over time? Addressing this question is essential for enhancing the strategic management of financial institutions and ensuring the sustainable growth of the banking sector in Bangladesh.

1.4 Significance of the Study

This study is significant for bank management, investors, policymakers, and academic researchers. It identifies key internal determinants—such as asset allocation, credit quality, operational efficiency, and capital structure—that influence the profitability of private commercial banks. These insights support managers in making informed decisions to enhance financial performance. For investors and shareholders, the study clarifies how internal variables affect indicators like ROA and ROE, aiding in risk assessment and investment decisions. Policymakers can also benefit, as the findings contribute to strategies aimed at ensuring financial stability and sound resource management in the banking sector.

Academically, the study fills a research gap by focusing on bank-specific profitability factors in Bangladesh using panel data analysis. This approach allows for a deeper, more dynamic understanding of how profitability is influenced over time and across institutions.

1.5 Scope of the Study

The scope of this study is specifically confined to examining the internal, bank-specific determinants of profitability among private commercial banks operating in Bangladesh. It seeks to understand how managerial and financial decisions within banks—such as loan composition, operational cost management, capital structure, and credit risk handling—affect profitability outcomes, particularly measured by ROA and ROE. The study is limited to private commercial banks because they constitute a significant portion of the country's banking sector and operate in a highly competitive, performance-driven environment.

This statistical approach enables the researcher to capture both temporal changes and institutional differences, offering a more dynamic and robust understanding of the determinants of profitability. Moreover, the study utilizes secondary data sourced from the audited financial reports of selected banks, Bangladesh Bank publications, and other relevant financial databases. While the study provides a quantitative analysis of financial variables, it does not explore qualitative aspects such as leadership quality, customer satisfaction, or innovation, which are outside the current research framework.

1.6 Limitations of the Study

- **Limited Bank Sample Size:**

The study focuses on ten private commercial banks, which may not represent the full spectrum of governance practices in the banking sector. Results from a larger dataset collected over a longer period of time may be more thorough and trustworthy.

- **Exclusion of State-Owned and Foreign Banks:**

Governance practices may differ substantially in state-owned or foreign banks, limiting the generalizability of findings across all banking institutions in Bangladesh.

- **Limited Variables:**

Other crucial governance factors such as GDP, DSE index, inflation, foreign remittance were not included due to data constraints. If those variables were added

- **Timeframe Constraints:**

The analysis covers only 10 years (2014–2023), which may be insufficient to capture the long-term impact of governance practices on performance.

- **Reliance on Secondary Data:**

The study uses data extracted from annual reports, which may be subject to inconsistencies in reporting standards or omitted qualitative information.

1.7 Research Questions

This study aims to address the following key research questions:

- What are the major bank-specific factors that influence the profitability of private commercial banks in Bangladesh?
- How do internal variables such as capital adequacy, credit risk, operational efficiency, and asset management affect Return on Assets (ROA) and Return on Equity (ROE)?
- To what extent does bank size impact profitability among private commercial banks in Bangladesh?
- Are there significant differences in the profitability determinants across different private commercial banks over the selected time period?
- Which internal factors are most strongly associated with improvements or declines in bank profitability based on panel data analysis?

1.8 Objectives of the Study

Broad Objective

- ✓ To examine the impact of bank-specific factors on the profitability of private commercial banks in Bangladesh using panel data analysis.

Specific Objectives

- ✓ To identify key internal financial indicators that influence bank profitability (ROA and ROE).
- ✓ To analyze the effect of capital adequacy, credit risk, and cost efficiency on bank performance.
- ✓ To assess the role of bank size and equity structure in determining profitability.
- ✓ To evaluate the relationship between asset utilization and profitability.
- ✓ To provide empirical evidence to support managerial and policy decisions for improving financial performance.

Chapter -2

Literature Review

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2.1 Literature Review

The profitability of private commercial banks has been a subject of significant academic and policy interest, especially in the context of developing economies such as Bangladesh. Recent studies have increasingly emphasized the role of bank-specific factors in shaping profitability metrics such as Return on Assets (ROA) and Return on Equity (ROE).

Biswas (2023) conducted a comprehensive panel data analysis on private banks in Bangladesh and identified that capital adequacy, loan quality, and operational efficiency are critical drivers of bank profitability. Chakraborty (2023) emphasized the strong impact of asset quality, particularly non-performing loans (NPLs), on both ROA and ROE, underscoring the need for effective asset management. In a similar vein, Rumaly (2023) found that capital adequacy ratio, asset quality, and management efficiency significantly affect ROE, while macroeconomic factors like GDP growth are statistically insignificant. This indicates that internal management practices are more influential on profitability than external conditions.

While examining Indian commercial banks, Sarkar and Rakshit (2023) identified factors such as net interest margin, capital adequacy, and operational efficiency as key determinants of profitability. Though based on India, their findings especially regarding lagged profitability and macroeconomic stability have relevance for Bangladeshi banks. Similarly, Rubaiyath and Lalon (2023) showed that ROA, earnings per share, and capital adequacy significantly influence stock prices in Bangladesh, linking profitability directly to investor confidence.

Ramij (2022) also found that cost-to-income ratio and loan loss provisions have a negative impact on profitability, while total loans and capital adequacy ratio (CAR) are positively associated. Hosen (2022) confirmed through panel regression analysis that internal efficiency and credit risk management are pivotal to improving ROA and ROE. High NPLs and operating expenses reduce profitability, while strong equity capital and a favorable loan-to-deposit ratio enhance it.

Hosen (2022) adopted a panel regression model and reaffirmed the influence of internal efficiency and credit risk management on ROA and ROE. This study found that non-performing loans (NPLs) and high operating expenses substantially reduce profitability, whereas sound equity capital and a favorable loan-to-deposit ratio enhance it. Chowdhury and Salman (2021) added further insight by demonstrating that profitability varies across banks depending on their

internal policies and financial structure. They emphasized that higher cost efficiency and lower credit risk correlate with improved ROA and ROE among Bangladeshi banks.

Chowdhury and Salman (2021) noted variations in profitability across banks due to internal policies and financial structures. Their study showed that higher cost efficiency and lower credit risk are linked to better financial performance. Islam (2021) found that internal variables such as loan-to-asset ratio, equity-to-asset ratio, and cost-to-income ratio are the most significant determinants of profitability, while inflation and interest rates were less consistently influential.

Mahmud (2020) focused on conventional private commercial banks listed on the Dhaka Stock Exchange from 2010 to 2019. The study identified non-performing loan ratio, equity multiplier, cost to income ratio, net interest margin, and non-interest income to total asset ratio as significant bank-specific variables affecting profitability. Among macroeconomic variables, real interest rate and economic growth were significant determinants, emphasizing the multifaceted nature of factors influencing bank performance. In a study on state-owned banks, Ullah et al. (2020) observed that asset management efficiency and loan quality positively impact profitability, whereas operational inefficiencies and poor capital structure have a detrimental effect. Miah et al. (2019) focused on private commercial banks and reported that operational efficiency, risk management, and income diversification improve both profitability and financial stability.

While studying Ethiopian banks, Assfaw (2018) found that capital adequacy, asset quality, management efficiency, and earnings significantly influence profitability—findings that align closely with those from Bangladesh. Ahmed and Uddin (2018) emphasized that bank-level factors like CAR, credit quality, and asset utilization play a more substantial role than macroeconomic variables in determining profitability.

Mohiuddin (2017) highlighted that non-performing loans, interest income, and management quality are crucial internal determinants of bank profitability in Bangladesh. The study also noted that while moderate growth in bank size improves performance, excessive expansion leads to inefficiencies. Likewise, Islam and Rana (2017) presented empirical evidence that total assets, bank size, and equity-to-assets ratio have significant explanatory power over profitability variations in commercial banks.

Mahmud et al. (2016), who also stressed the benefits of good cost management and low default ratios. Mahmud et al. (2016) analyzed bank-specific factors affecting the profitability of 15 commercial banks in Bangladesh from 2003 to 2013. They identified size, operating expense,

gearing ratio, and capital as significant variables influencing bank profitability. While capital showed a positive relationship with profitability, the other three variables had negative relationships, emphasizing the need for efficient expense management and optimal sizing.

Kaisher (2016), in a focused study on Dhaka Bank Ltd. and other private banks, identified capital strength, loan-deposit ratio, and operating income as significant profitability drivers, while cautioning against overreliance on interest-based income due to risk concerns. Hossain and Ahamed (2015) explored the determinants of bank profitability by analyzing 15 conventional private commercial banks in Bangladesh from 2012 to 2016. Their study found that earnings variables, asset quality, management efficiency, capital strength, industry impact, and asset structure significantly influenced ROA. For ROE, earnings indicators, capital strength, and industry impact had positive relationships, while NPLs negatively affected profitability.

In addition, multiple studies have stressed the detrimental effect of inefficiencies in operating expenses and rising NPL ratios. For example, Hosen (2022) and Biswas (2023) both noted that higher provisioning requirements and elevated non-performing loan levels are among the key obstacles to profitability in the banking sector. These inefficiencies not only weaken banks' ability to generate returns but also erode stakeholder confidence.

Overall, the literature consistently supports the hypothesis that bank-specific factors such as capital structure, loan allocation efficiency, operating costs, and credit risk management play a decisive role in determining the profitability of private commercial banks in Bangladesh. As the sector evolves, understanding these determinants becomes crucial for banks aiming to maintain competitiveness and financial sustainability in an increasingly complex financial environment.

2.2 Research Gap

Despite the growing body of literature analyzing the determinants of bank profitability in Bangladesh, a significant research gap remains concerning the comprehensive evaluation of bank-specific factors. Many existing studies (e.g., Islam and Rana, 2017; Mahmud et al., 2016) focus on selected internal indicators of financial performance but often overlook the interrelated effects of multiple variables. Additionally, findings across studies tend to be inconsistent, especially concerning the influence of capital adequacy, cost efficiency, and asset quality on profitability.

Based on the cited literature, the current study identifies that most prior research on the financial performance of private commercial banks in Bangladesh deals with general or macro-level factors, leaving limited scope for an in-depth understanding of internal bank-specific determinants. Therefore, there is an opportunity to further explore how specific internal financial indicators affect bank profitability. These include:

- Total Loan to Total Asset Ratio (TLTAR)
- Loan Loss Provision to Total Loan Ratio (LLPTLR)
- Capital Adequacy Ratio (CAR)
- Total Loan to Total Deposit Ratio (TLTDR)
- Operating Expense to Total Assets Ratio (OETAR)
- Size of Bank (SBLN)
- Equity Capital to Total Assets Ratio (ECTAR)
- Cost to Income Ratio (CIR)
- Non-Performing Loan to Total Loan Ratio (NPLTLR)

Most of these indicators have been studied in isolation, and their combined or relative impact on profitability remains underexplored. Moreover, previous research often lacks robust econometric methods to account for endogeneity or cross-sectional differences among banks. To address this gap, the present study aims to investigate the extent to which bank-specific factors influence the profitability of private commercial banks in Bangladesh. By doing so, it will contribute to a more

nuanced understanding of internal performance drivers and provide empirical insights valuable for bank management and policymakers.

2.3 Hypothesis Development

To address the identified research gap regarding bank-specific factors influencing profitability in private commercial banks of Bangladesh, this study formulates the following hypotheses:

- **H1: Total Loan to Total Asset Ratio (TLTAR)** has a significant positive impact on bank profitability.
- **H2: Loan Loss Provision to Total Loan Ratio (LLPTLR)** has a significant negative impact on bank profitability.
- **H3: Capital Adequacy Ratio (CAR)** positively influences bank profitability.
- **H4: Total Loan to Total Deposit Ratio (TLTDR)** has a significant positive effect on profitability.
- **H5: Operating Expense to Total Asset Ratio (OETAR)** negatively affects bank profitability.
- **H6: Bank Size (SBLN)** has a positive impact on profitability.
- **H7: Equity Capital to Total Asset Ratio (ECTAR)** positively influences bank profitability.
- **H8: Cost to Income Ratio (CIR)** has a significant negative impact on profitability.
- **H9: Non-Performing Loan to Total Loan Ratio (NPLTLR)** negatively affects bank profitability.

These hypotheses will be empirically tested to determine how each bank-specific factor contributes to the profitability of private commercial banks in Bangladesh.

Chapter – 3

Theoretical Aspects

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3.1 Overview of Profitability in Private Commercial Banks of Bangladesh

The profitability of private commercial banks (PCBs) in Bangladesh is a critical indicator of the overall health and stability of the banking sector and the broader economy. These banks play a significant role in financial intermediation, credit disbursement, and mobilization of savings. The private commercial banking sector in Bangladesh has become a vital pillar of the country's financial system. Since the liberalization of the banking industry in the 1980s, private commercial banks (PCBs) have steadily increased their market share, assets, and customer base. Profitability in these banks reflects not only their individual financial health but also the overall soundness of the banking industry. Private commercial banks' profitability is generally determined by a combination of factors, including internal operational efficiency, external economic conditions, and regulatory environment. Internal factors like non-performing loans (NPLs), cost-to-income ratios, and loan-to-deposit ratios can significantly impact profitability, while external factors such as macroeconomic conditions and regulatory policies can also play a role.

3.2 Profitability Indicators of Private Commercial Banks in Bangladesh

Profitability indicators are fundamental tools for assessing the financial health and operational performance of private commercial banks in Bangladesh. These indicators reflect how efficiently a bank is managing its resources, how well it is generating income from its core activities, and the extent to which it is creating value for its shareholders. Among the various measures used, Return on Assets (ROA), Return on Equity (ROE), Net Interest Margin (NIM), and Operating Profit are the most widely applied in evaluating banking profitability.

3.2.1 Return on Assets

Return on Assets (ROA) indicates how effectively a bank is using its total assets to generate net profit. It reveals the efficiency of management in converting assets into earnings. A higher ROA reflects better utilization of the bank's assets and suggests that the bank is capable of operating profitably even with limited resources. In Bangladesh, the average ROA for well-performing private commercial banks typically ranges from 0.9% to 1.5%, which, though moderate by

global standards, is considered satisfactory in the context of a developing economy with structural challenges.

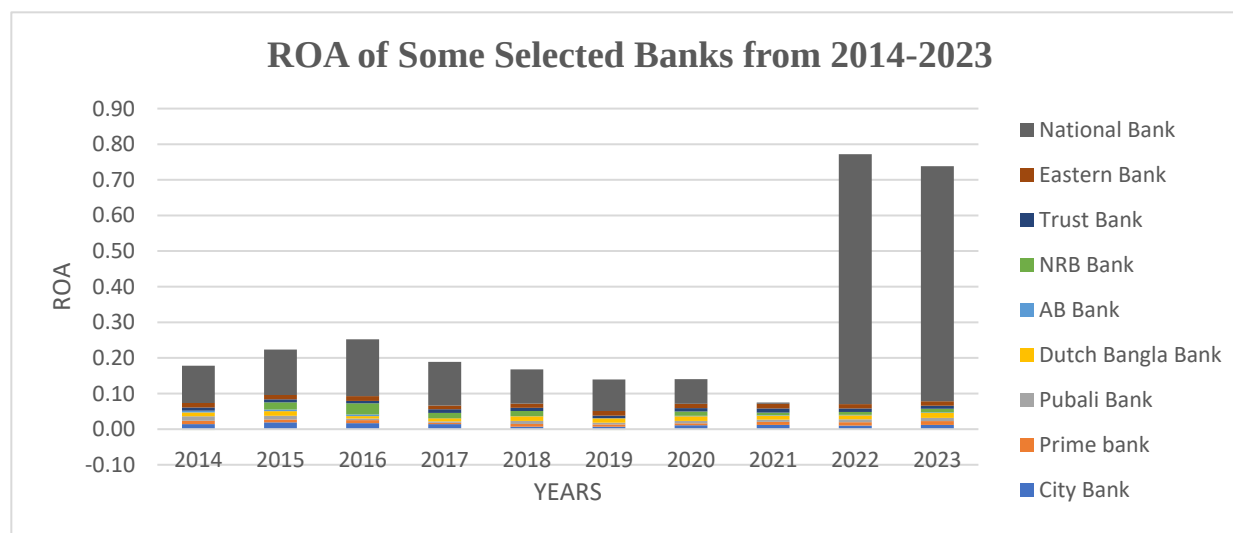


Figure 3.1: ROA fluctuation of ten banks from 2014-2023

The Return on Assets (ROA) trends from 2014 to 2023 for the ten selected banks reveal notable differences in how efficiently these institutions have utilized their assets to generate profits. Among them, City Bank and Pubali Bank stood out with comparatively stronger ROA figures in recent years. City Bank, in particular, showed a rising trend from 2020 onwards, suggesting improved asset efficiency and profitability. Pubali Bank also maintained a relatively consistent ROA after 2018, reflecting stable operational performance. In contrast, banks like Dhaka Bank and Trust Bank experienced more fluctuation. Their ROA values were moderate but lacked a consistent upward trajectory, which may point to operational challenges or changes in asset quality over time. Prime Bank, AB Bank, and NRB Bank generally displayed weaker ROA throughout the period, with little to no significant improvement. This indicates potential inefficiencies in asset management or persistent issues with loan quality and returns.

Dutch-Bangla Bank, Eastern Bank, and National Bank exhibited mixed results. In some years, these banks recorded slightly improved ROA, while in others they dipped, reflecting volatility likely driven by changes in macroeconomic conditions or internal restructuring. The overall ROA trend across most banks dipped around 2020, which aligns with the economic disruptions

caused by the COVID-19 pandemic, but some banks showed signs of recovery in the years following.

3.2.2 Return on Equity

Return on Equity (ROE), on the other hand, measures the return generated on shareholders' equity. This indicator is particularly important from the perspective of investors and stakeholders, as it reflects how well the bank is using the funds invested by shareholders to produce net income. A higher ROE is a sign of strong financial performance, as it means that the bank is effectively managing its equity base to maximize returns. In Bangladesh, ROE figures for private commercial banks generally range between 10% and 18%, depending on a variety of factors such as asset quality, capital adequacy, and income diversification. Banks with better governance and low levels of non-performing loans often show consistently strong ROE.

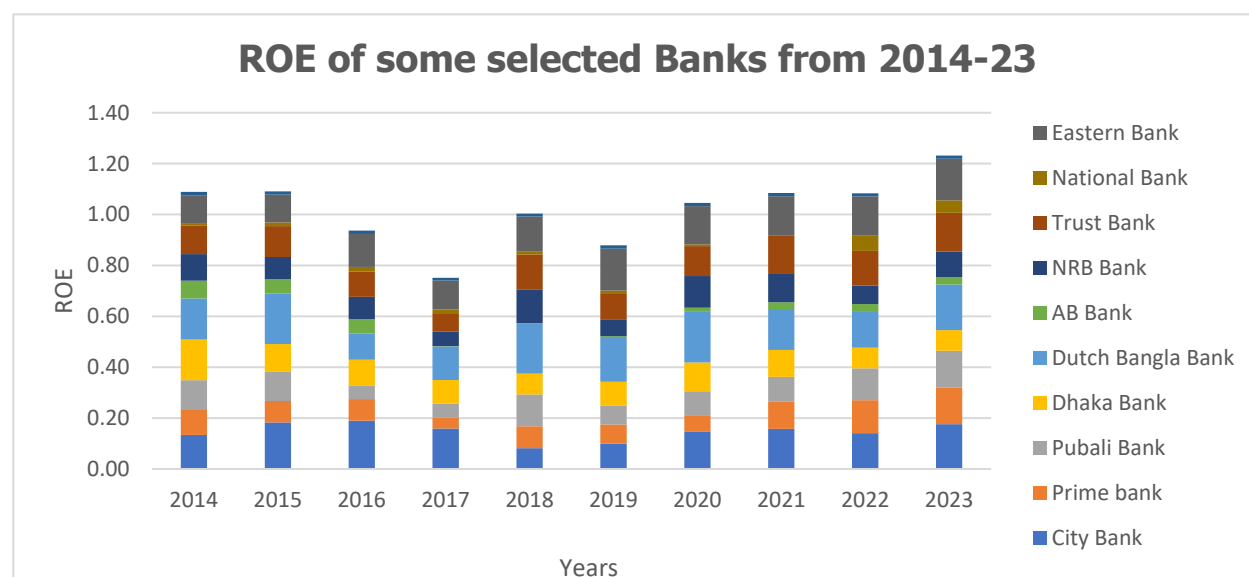


Figure 3.2: ROE fluctuation of ten banks from 2014 to 2023

The Return on Equity (ROE) data across the same timeline paints a clearer picture of how effectively these banks used their shareholders' equity to generate earnings. City Bank again emerges as a high performer, particularly after 2020, where its ROE saw significant improvement. This suggests not only operational efficiency but also strategic use of capital to

drive profit growth. Similarly, Pubali Bank demonstrated a steadily rising ROE trend from 2019 to 2022, indicating that it successfully enhanced shareholder value during this period. Eastern Bank and Trust Bank showed moderate ROE performance, with some upward movement over the years. This may reflect gradual improvement in profitability and equity management. On the other hand, Dhaka Bank and Prime Bank presented a mixed performance—though not

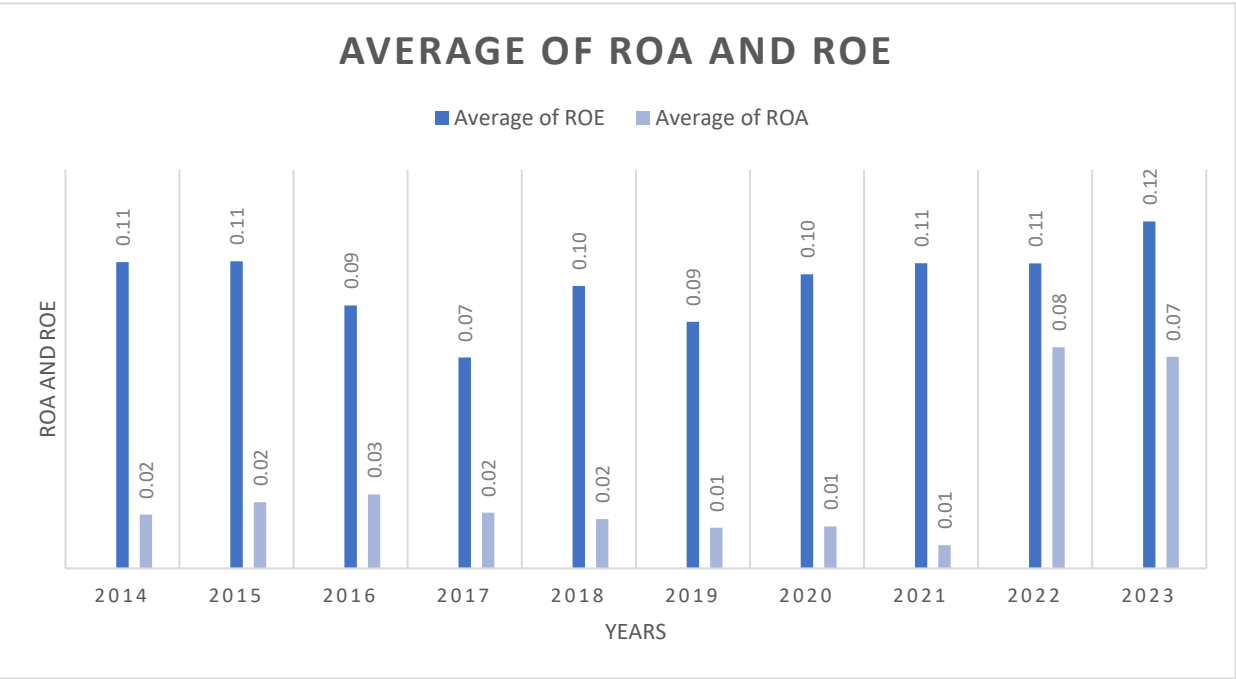


Figure 3.3: Average of ROA and ROE of the selected banks

alarming, their ROE figures lacked sustained growth, possibly due to challenges in maintaining profitability or higher equity bases diluting returns. Alarmingly, National Bank and AB Bank showed very low or even negative ROE in some years, a red flag indicating significant profitability issues or capital erosion. Such trends might be due to large non-performing loan portfolios or operational inefficiencies. NRB Bank also had low ROE throughout, suggesting it struggled to generate adequate returns for its investors. Dutch-Bangla Bank remained relatively flat, indicating stable but unremarkable performance. Overall, the ROE graph reveals that only a few banks have managed to consistently deliver strong returns to shareholders over the decade. The disparity among banks reflects differing strategic directions, risk management effectiveness, and responses to external economic pressures such as the pandemic and inflationary trends.

3.2.3 Net Interest Margin:

Net Interest Margin (NIM) is another crucial indicator that reflects the bank's core profitability derived from interest-bearing assets. It is calculated by taking the difference between interest income and interest expense and expressing it as a percentage of the bank's average earning assets. A higher NIM indicates that the bank is efficiently managing its lending and borrowing activities, earning more from interest than it is paying out to depositors. However, in Bangladesh, the profitability from interest income has been somewhat restricted by regulatory caps on interest rates, such as the 9% ceiling on lending rates imposed in recent years. Despite these limitations, several banks have managed to maintain a NIM between 2.5% and 4%, primarily by focusing on retail and SME lending, where interest spreads are typically wider.

3.2.4 Operating Profit:

Operating Profit represents the earnings generated from the core banking operations before accounting for provisions against bad loans, taxes, or extraordinary gains or losses. It includes income from interest, service charges, commissions, and foreign exchange dealings, minus the operating costs associated with staff salaries, administrative expenses, and branch operations. Operating profit is a strong reflection of the bank's ability to run its day-to-day business efficiently. In the Bangladeshi context, banks that have invested in digital banking infrastructure, streamlined their operations, and expanded into new market segments have shown impressive growth in operating profits. Institutions like Brac Bank, Eastern Bank, and City Bank have demonstrated strong operating performance through effective cost control and diversification of income sources.

Overall, these profitability indicators provide a multidimensional view of the financial performance of private commercial banks in Bangladesh. They highlight both the strengths and challenges within the sector and serve as essential benchmarks for comparing banks, guiding investors, and informing policy decisions. A consistent focus on improving these indicators is necessary to ensure the long-term sustainability and competitiveness of the country's banking industry.

3.3 Key Drivers of Profitability

3.3.1 Total Loan to Total Asset Ratio

This ratio indicates how actively banks use their assets for lending purposes. Banks like City Bank, Dutch-Bangla Bank, and Prime Bank typically maintain a high ratio, reflecting an aggressive lending approach and reliance on interest income. In contrast, banks with relatively lower ratios, such as NRB Bank or AB Bank in recent years, may be adopting a more conservative lending strategy or diversifying their asset base.

3.3.2 Loan Loss Provision to Total Loan Ratio

This ratio highlights how much banks are setting aside to cover potential loan losses. Institutions like Dutch-Bangla Bank and Eastern Bank generally maintain adequate provisions, showing prudent risk management. However, banks like National Bank and AB Bank, due to higher levels of non-performing loans, have had to allocate larger provisions, which can eat into their profits.

3.3.3 Capital Adequacy Ratio (CAR)

CAR reflects a bank's capital strength. Banks such as City Bank and Eastern Bank consistently show strong capital buffers, maintaining CAR well above the regulatory minimum. This suggests better financial resilience. Meanwhile, banks like AB Bank have struggled to maintain high CAR, indicating weaker capital strength and greater vulnerability to credit shocks.

3.3.4 Total Loan to Total Deposit Ratio

This measures how effectively deposits are being used for lending. A high ratio, such as that of Dhaka Bank and Prime Bank, suggests aggressive use of deposit funds, which can boost earnings but also raise liquidity concerns. On the other hand, banks like Pubali Bank and NRB Bank maintain more conservative ratios, prioritizing liquidity and risk mitigation.

3.3.5 Operating Expense to Total Asset Ratio

This reflects how efficiently a bank is managing its operating costs relative to its assets. Banks such as Eastern Bank and Trust Bank show operational efficiency with lower expense ratios. Conversely, banks with broader networks or legacy systems, like National Bank or AB Bank, face higher operating costs, which can reduce profitability.

3.3.6 Size of Bank (Natural Log of Total Assets)

Larger banks like Dutch-Bangla Bank and Pubali Bank, by asset size, benefit from economies of scale and broader customer bases. These banks can spread their fixed costs over a larger revenue base. Smaller banks like NRB Bank and Trust Bank are more agile but may face challenges in competing on price, coverage, or technology investments.

3.3.7 Equity Capital to Total Asset Ratio

This ratio indicates the financial leverage of a bank. Banks such as Prime Bank and Pubali Bank maintain higher equity ratios, reflecting strong capital positions and lower reliance on debt. Meanwhile, banks like AB Bank and National Bank operate with thinner equity buffers, making them more susceptible to financial instability during downturns.

3.3.8 Cost to Income Ratio

A lower cost to income ratio, as seen in Eastern Bank and Dutch-Bangla Bank, reflects better management of operational efficiency and income generation. In contrast, banks like AB Bank and National Bank face higher ratios, implying a need to improve cost control and revenue strategies.

3.3.9 Non-Performing Loan (NPL) to Total Loan Ratio

This is a key indicator of asset quality. City Bank, Prime Bank, and Eastern Bank maintain relatively low NPL ratios, suggesting effective credit risk management. On the other hand, National Bank and AB Bank show higher NPL ratios, pointing to deteriorating loan quality and potential challenges in profitability and capital adequacy.

3.4 Organizational Overview

3.4.1 Organizational Profile of City Bank PLC

City Bank PLC is one of the oldest and most prominent private commercial banks in Bangladesh, headquartered in Dhaka. Established on 28 March 1983 by 12 visionary local businessmen, the bank began its journey with a capital of BDT 34 million, which has grown to BDT 3.3 billion in capital and reserve today. The bank offers a wide range of financial services, including retail banking, SME and corporate finance, digital banking, asset management, equity brokerage, and Islamic banking. City Bank is a licensed issuer of Visa, MasterCard, and is the exclusive issuer of American Express cards in Bangladesh.



With a strong nationwide presence through 134 branches and 47 sub-branches, City Bank operates as a real-time online bank. Internationally, it has expanded with offices in Malaysia and Hong Kong. It also made history by becoming the first bank in Bangladesh to collect foreign currency deposits through offshore banking services, accumulating nearly US\$21 million shortly after the 2024 law change.

The bank is listed on both the Dhaka and Chittagong Stock Exchanges and has attracted international investment, including a 5% stake purchased by the International Finance Corporation (IFC). Under the leadership of Mashrur Arefin, the current Managing Director and CEO, City Bank continues to innovate and expand in both local and global markets.

3.4.2 Vision of City Bank PLC

"The Financial Supermarket with a Winning Culture Offering Enjoyable Experiences."

City Bank envisions becoming a one-stop financial service provider that delivers outstanding customer experiences through innovation, efficiency, and a high-performance culture.

3.4.3 Mission of City Bank PLC

- ✓ To offer a wide array of products and services that differentiate and excite all customer segments.
- ✓ To become the employer of choice by providing an environment where people grow and leaders are created.
- ✓ To continuously challenge and improve processes and platforms to enhance effectiveness and efficiency.
- ✓ To promote innovation and automation to ensure service excellence.
- ✓ To maintain respect for the community, ensure good governance, and uphold compliance in all activities.

3.4.4 Core Values of City Bank PLC

- ✓ Result Driven – Committed to achieving targets with a strong performance focus.
- ✓ Accountable & Transparent – Acting with responsibility and openness.
- ✓ Courageous & Respectful – Taking bold steps while valuing others.
- ✓ Engaged & Inspired – Passionate and motivated to give the best.
- ✓ Focused on Customer Delight – Always aiming to exceed customer expectations.

3.4.5 Corporate Profile

Attribute	Details
Legal Name	City Bank PLC
Former Name	The City Bank Limited (renamed in December 2023)
Founded	March 28, 1983
Founders	Monowar Ali, Ibrahim Mia (Late), Abdul Hadi (Late), M.A. Hashem (Late), Anwar Hossain, Abdul Barik Choudhury (Late), Deen Mohammad, A.B.M. Feroz, Md. Ali Hossain, Azizul Haque Chowdhury, N.A. Chowdhury (Late)
Headquarters	City Bank Center, 28 Gulshan Avenue, Gulshan-1, Dhaka 1212, Bangladesh

Chairman	Aziz Al Kaiser
Managing Director & CEO	Mashrur Arefin
Industry	Banking and Financial Services
Stock Exchange Listing	Dhaka Stock Exchange (Ticker: CITYBANK)
Authorized Capital	BDT 20,000 million
Paid-up Capital	BDT 13,521.97 million
Total Assets	BDT 506.84 billion (as of 2022)
Net Profit After Tax	BDT 6,384.66 million (2023)
Credit Rating	AA1 (Long Term), ST-1 (Short Term) by CRAB; B2 by Moody's
Employees	Over 7,689 (as of February 2025)
Branches	134 branches, 52 sub-branches, 485 agent points
ATMs	458 ATMs and Remote ATMs
Customers	Over 2.6 million
Cards Issued	Over 711,621
Products & Services	Retail Banking, Corporate Banking, SME Banking, Investment Banking, Islamic Banking, Priority Banking (Citygem), Agent Banking, Digital Banking (Citytouch), Credit & Debit Cards (Visa, MasterCard, American Express)
Subsidiaries	
Digital Platforms	Citytouch (mobile banking), CityRemit (remittance app), City Alo (women banking), City Islamic Banking
Notable Achievements	Sole franchisee of American Express® in Bangladesh - First bank in Bangladesh to issue Dual Currency Credit Card

3.4.6 Products and Services of City Bank Limited

The principal activities of the Bank are to provide all kinds of commercial banking, consumer banking trade services, custody and clearing to its customers through its branches in Bangladesh. City Bank is among the very few local banks which do not follow the traditional, decentralized, geographically managed, branch based business or profit model. Instead the bank manages its business and operation vertically from the head office through 4 distinct business divisions namely-

1. **Corporate & Investment Banking;**
2. **Retail Banking (including Cards);**
3. **Treasury & Market Risks;**
4. **SME Banking.**



1. Retail Banking:

Retail banking includes the tasks for the following purposes-

- | | |
|-------------------|--------------------|
| ✓ DEPOSITS | ✓ City Shomridhhi |
| ✓ Current Account | ✓ City Projonmo |
| ✓ Savings Account | ✓ City Ichchapurun |
| ✓ City Onayash | ✓ FDR |

2. LOANS

- | | |
|-----------------|----------------|
| ✓ City Drive | ✓ City Double |
| ✓ City Solution | ✓ City Scholar |
| ✓ City Express | |

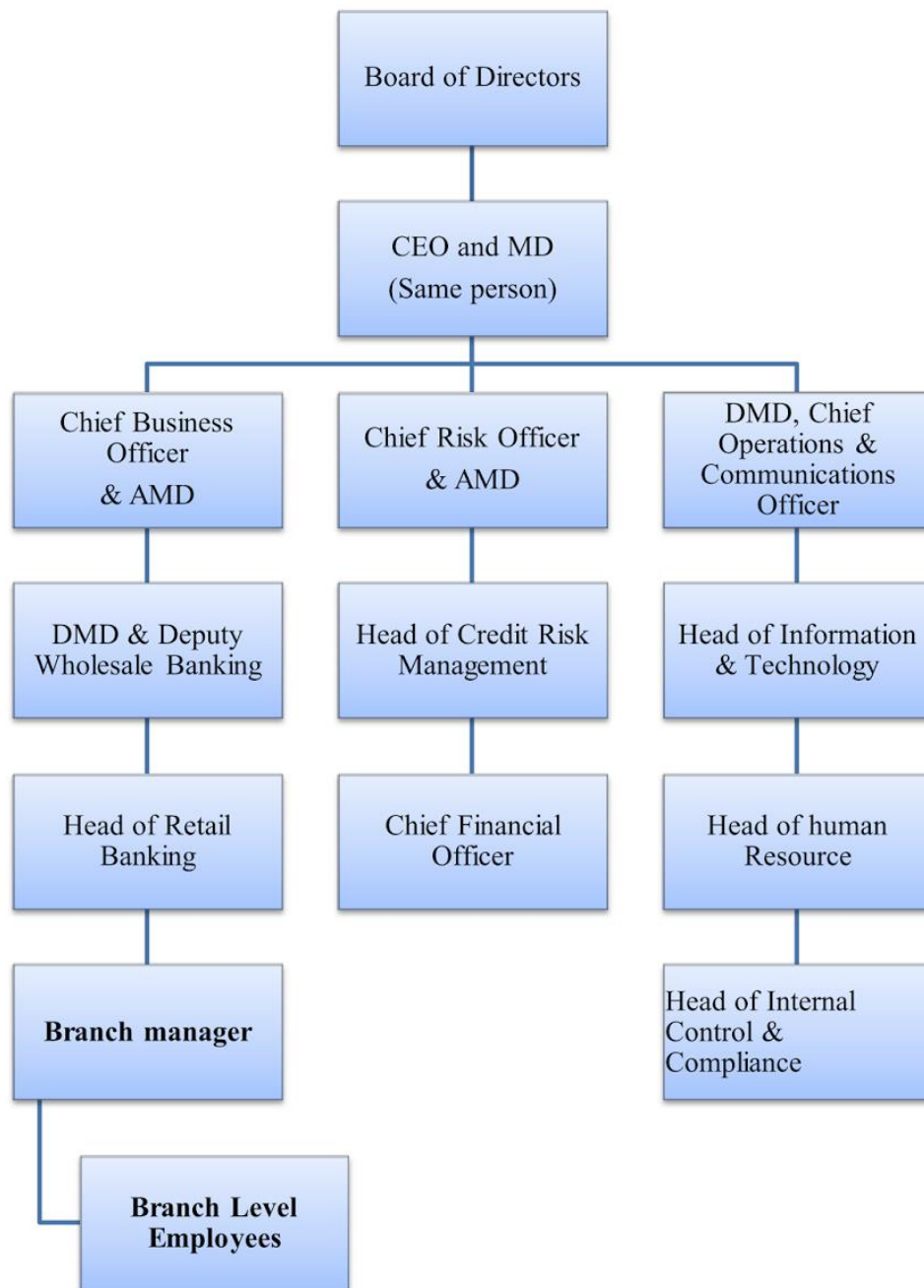
3. CARDS- DEBIT CARD, CREDIT CARD ETC.

- | | |
|---------------------|--------------------|
| ✓ Visa Debit Card | ✓ Amex Credit Card |
| ✓ Master Debit Card | ✓ Visa Credit Card |

4. NRB- FOREIGN REMITTANCE

- | | |
|----------------|--------------|
| ✓ Medical File | ✓ Remittance |
| ✓ Student File | |

3.4.7 Organizational Structure



3.4.8 Financial Performance

In 2023, City Bank PLC reported a net profit of BDT 638 crore, marking a 33% growth from the previous year. The bank's total assets stood at BDT 506.84 billion, reflecting its robust financial position in the industry. To estimate the growth data of a decade has been added as follows:

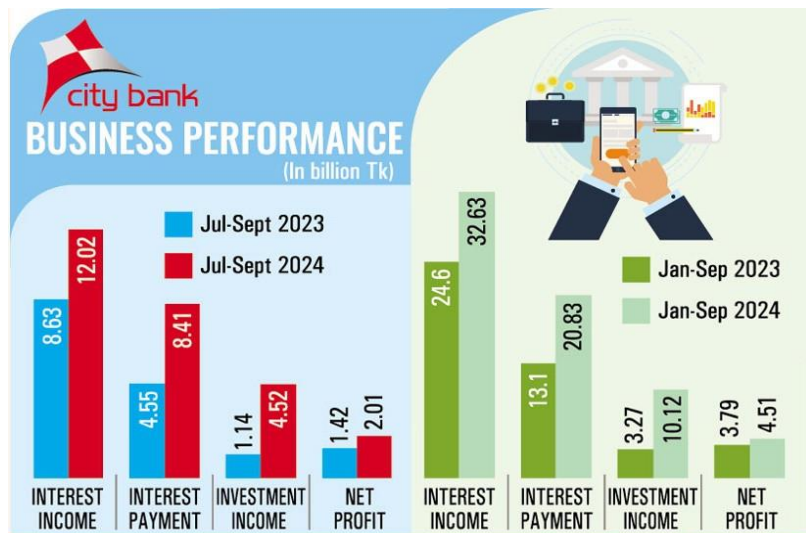


Figure 3.4: Business Performance of City Bank

From 2014-2023 the bank experienced a robust change in the profitability. To estimate the growth data of a decade has been added as follows:

Year	Net Profit (Tk crore)	ROA	ROE	NIM (%)	Cost to Income (%)	NPL (%)
2014	2,800	1.40%	10.60%	4.20%	55%	6.5%
2015	3,578	1.80%	14.70%	4.30%	52%	5.2%
2016	3,934	0.62%	7.14%	3.90%	60%	5.8%
2017	4,500	0.47%	4.46%	3.50%	63%	5.1%
2018	4,800	0.88%	9.06%	4.00%	58%	4.8%
2019	5,000	0.37%	4.46%	3.60%	61%	4.5%
2020	5,200	1.17%	16.15%	4.25%	50%	3.8%
2021	5,498.8	1.35%	17.65%	4.30%	48%	3.2%
2022	4,778.4	1.02%	14.36%	4.10%	52%	3.0%
2023	6,380	1.18%	17.65%	4.35%	47%	2.2%

Figure 3.5: Profitability growth prospects of City Bank PLC

Over the ten-year period from 2014 to 2023, City Bank demonstrated notable progress in terms of profitability, despite facing occasional fluctuations due to internal challenges and external economic conditions.

➤ **Net Profit After Tax**

City Bank's net profit showed a generally increasing trend over the years. Starting from around Tk 2,800 crore in 2014, it reached Tk 6,380 crore in 2023. The upward trend reflects the bank's ability to grow its business, manage risks, and optimize operations. However, there was a slight dip in 2022, primarily due to a decrease in foreign exchange income. The strong recovery in 2023 indicates effective strategic adjustments and a resilient business model.

➤ **Return on Assets (ROA)**

Return on Assets measures how efficiently the bank uses its total assets to generate profit. The ROA figures ranged from a low of 0.37% in 2019 to a high of 1.80% in 2015. ROA remained above 1% from 2020 onwards, which signals improved efficiency and better utilization of the bank's resources in recent years.

➤ **Return on Equity (ROE)**

ROE reflects the bank's ability to generate profits from shareholders' equity. The ROE figures also fluctuated during the decade. It reached a low of 4.46% in 2017 and peaked at 17.65% in 2021 and again in 2023. This indicates a strong return for shareholders in the later years, which may be attributed to improved asset quality and revenue growth.

➤ **Net Interest Margin (NIM)**

Net Interest Margin remained relatively stable throughout the years, hovering around 4%. This consistency reflects the bank's effective management of interest income and expenses. A healthy NIM indicates that City Bank maintained a sound lending and deposit pricing strategy, ensuring stable income from core banking operations.

➤ **Cost to Income Ratio**

The cost to income ratio measures the bank's operating efficiency. A lower ratio indicates better efficiency. City Bank improved significantly in this area, reducing its cost to income ratio from a high of 63% in 2017 to just 47% in 2023. This improvement demonstrates the bank's focus on cost control, automation, and productivity enhancement over the years.

➤ **Non-Performing Loan (NPL) Ratio**

The NPL ratio is a key indicator of asset quality. City Bank successfully reduced its NPL ratio from 6.5% in 2014 to just 2.2% in 2023. This significant reduction highlights better credit risk management, strong recovery efforts, and cautious lending practices. Lower NPLs also reduce the need for provisioning, thereby positively impacting net profit.

Overall, City Bank has shown consistent progress in terms of profitability, particularly in recent years. The bank's strong recovery after 2020, improving efficiency, stable interest margins, and enhanced asset quality have all contributed to its financial strength. The bank's focus on digital transformation, diversification of income, and prudent risk management has played a vital role in this success.

3.4.9 Commitment to Sustainable Investment

City Bank PLC is dedicated to promoting sustainable economic growth through responsible investment practices:

- **Infrastructure Financing:** The bank participates in financing infrastructure projects that contribute to the country's development, such as clean energy and energy efficiency initiatives.
- **Environmental and Social Governance (ESG):** City Bank integrates ESG considerations into its investment decisions, aiming to minimize environmental impact and promote social responsibility.

City Bank PLC's asset management approach reflects its commitment to financial excellence, client satisfaction, and sustainable development. By balancing internal asset optimization with client-centric investment services, the bank continues to strengthen its position in Bangladesh's financial sector.

3.4.10 Job Description

As an intern I have a great opportunity to work some work in bank directly. Since it is true bank is not always allows me everything but some of work I have done confidently and help to my supervisor to execute them. Among of them given in below:

- Account opening
- Account Close
- Form Fill Up
- Account Active
- Dealing with customer
- Card Delivery
- Cheque Book Delivery
- Distributing ATM Card
- Check KYC Form

3.4.11 Outcome from Internship

I've learned a lot about the new duties that banks are performing. I gained knowledge about how to work under pressure and fit in with the corporate world from this point on. When I first started as an intern, I found that the officers approached every task with care and method. The lessons 1 took away from this internship are discussed in the sections that follow.

- Reducing errors at work;
- Keeping good relations with other banks;
- Observing how each bank handles its customers;
- Developing a strong network in the marketplace;
- Assessing gaps in specific tasks and determining appropriate solutions;
- Learning how to cope with stress and pressure;
- Reporting to head office on time

Chapter - 4

Methodology

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4.1 Research Design

This study aims to evaluate the efficiency of the “**Determinants of Profitability in Private Commercial Banks of Bangladesh: A Panel Data Analysis of Bank Specific Factors**” initiative. The study employs a quantitative research design with a deductive approach, aiming to empirically examine the impact of selected bank-specific factors on the profitability of private commercial banks in Bangladesh. The study is causal in nature, intending to identify and measure the influence of multiple independent variables (bank-specific factors) on a dependent variable (bank profitability), typically represented by Return on Assets (ROA) and/or Return on Equity (ROE). A panel data analysis approach is used to ensure robust statistical outcomes over time and across multiple entities.

4.2 Data and Sources

The data used in this study is secondary in nature, drawn from:

- Annual reports of listed Bangladeshi private commercial banks (2014–2023)
- Bangladesh Bank publications
- Bangladesh Bureau of Statistics (BBS)
- World Bank open data
- Ministry of Finance reports
- Bangladesh Economic Review
- Reports from financial research portals and databases

4.3 Procedure and Timeline of Data Collection

Data were collected for a period of 10 years (2014–2023) from 10 selected private commercial banks in Bangladesh. The data collection process involved:

- Listing all private commercial banks operating during the study period.
- Selecting banks based on data availability and continuity.
- Downloading and compiling annual report data for each year.
- Extracting relevant variables (e.g., ROA, ROE, TLTR, LLPTLR, etc.) using MS Excel.

4.3.1 Population

The population of the study comprises all private commercial banks operating in Bangladesh. As per the latest information from the Bangladesh Bank, there are currently 43 private commercial banks in Bangladesh. These include both conventional and Islamic banks operating under private ownership.

4.3.2 Sample Unit

The sample unit of this research is an individual private commercial bank. Each bank represents a single observation unit for the analysis of bank-specific determinants of profitability.

4.3.3 Sample Size

The sample size for this study is 10 private commercial banks, selected purposively based on the availability of relevant data for the study period. The selected banks are:

- | | |
|------------------------------|---------------------------|
| 1. The City Bank Limited | 6. AB Bank Limited |
| 2. Prime Bank Limited | 7. NRB Bank Limited |
| 3. Pubali Bank Limited | 8. Trust Bank Limited |
| 4. Dhaka Bank Limited | 9. Eastern Bank Limited |
| 5. Dutch-Bangla Bank Limited | 10. National Bank Limited |

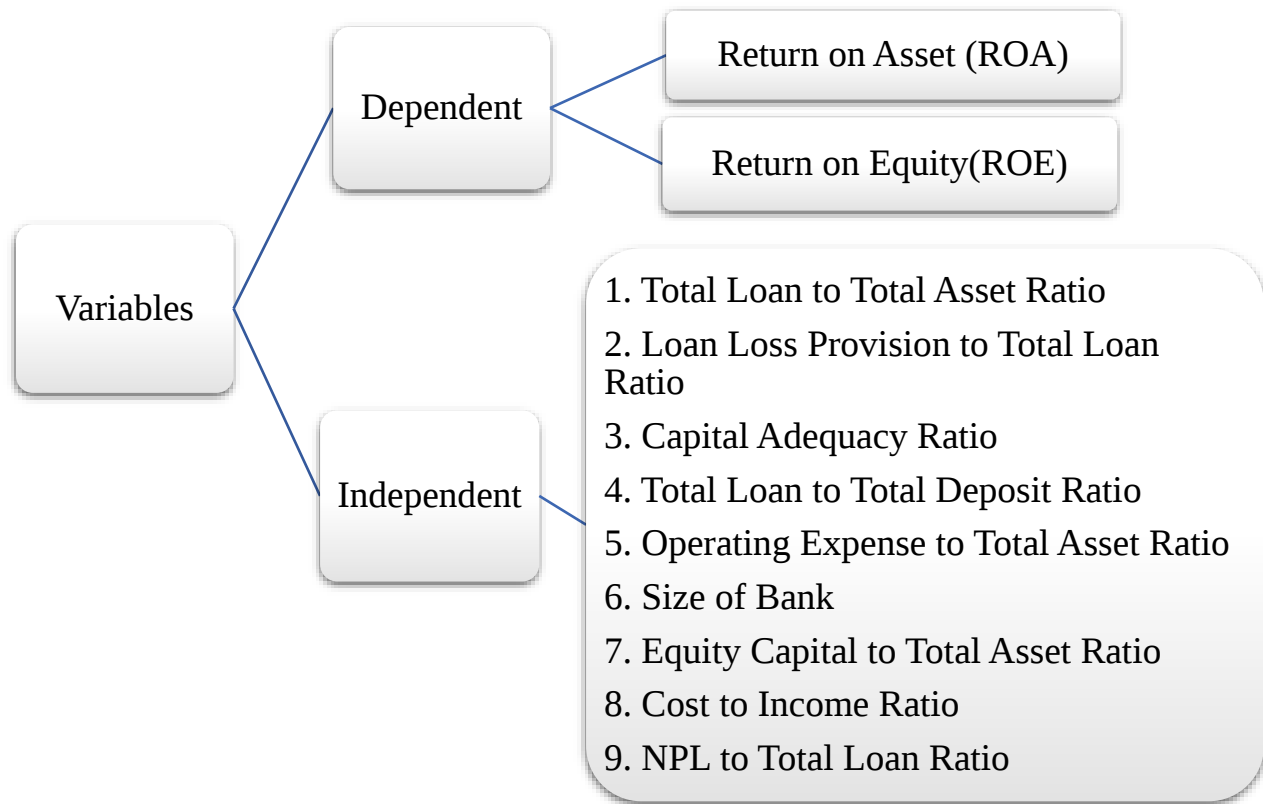
These banks were chosen to ensure variation in bank size, performance, and operational characteristics, and due to the availability of consistent financial data for the selected variables over the study period.

4.4 Tools and Methods of Data Analysis

To examine the determinants of bank profitability, this study employed a series of quantitative analytical tools using secondary data from 10 private commercial banks in Bangladesh. The analysis was conducted using statistical software such as Microsoft Excel and SPSS (or STATA/EViews, as applicable), and included the following methods:

- **Descriptive Analysis:** Descriptive statistics (mean, median, standard deviation, minimum, and maximum) were calculated for all the variables used in the study. This provided a general overview of the data distribution and the nature of the variables.
- **Correlation Analysis:** Pearson correlation coefficients were computed to assess the strength and direction of the linear relationship between bank-specific factors and profitability indicators (ROA and ROE). This helped identify potential multicollinearity and the degree of association between variable.
- **Regression Analysis:** Multiple linear regression models were estimated separately for Return on Assets (ROA) and Return on Equity (ROE) to determine the impact of bank-specific variables on bank profitability. The models tested how each explanatory variable influenced the dependent variables while controlling for the others.
- **Variance Inflation Factor (VIF) Test:** To detect multicollinearity among independent variables, the VIF test was conducted. This ensured the robustness and reliability of the regression estimates by identifying any variables with high collinearity that could distort the model.

4.5 Conceptual Framework



4.6 Model Specification

The study uses multiple regression models to examine the relationship between the selected independent variables and the profitability measures. The general model can be specified as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + u$$

where:

Y = Profitability (ROA/ROE)

β_0 = Constant Term

X₁ = Total Loan to Total Asset Ratio

X₂ = Loan Loss Provision to Total Loan Ratio

X₃ = Capital Adequacy Ratio

X₄ = Total Loan to Total Deposit Ratio

X₅ = Operating Expense to Total Asset Ratio

X₆ = Size of Bank

X₇ = Equity Capital to Total Asset Ratio

X₈ = Cost to Income Ratio (CIR)

X₉ = Non-Performing Loan to Total Loan Ratio

u = Error Term

Table 4.1 Model Summary

Variable Type	Variable Name	Abbreviation	Description	Expected Sign
Dependent	Return on Assets	ROA	Net income after tax divided by total assets.	---
Dependent	Return on Equity	ROE	Net income after tax divided by shareholders' equity.	---
Independent	Total Loan to Total Asset Ratio	TLTAR	Measures the proportion of total loans in total assets.	+
Independent	Loan Loss Provision to Total Loan Ratio	LLPTLR	Indicates the percentage of loan losses provided against total loans.	–
Independent	Capital Adequacy Ratio	CAR	Ratio of bank's capital to its risk-weighted assets.	+
Independent	Total Loan to Total Deposit Ratio	TLTDR	Measures how much of the deposits are used to issue loans.	+ / –
Independent	Operating Expense to Total Asset Ratio	OETAR	Shows the operational cost efficiency relative to total assets.	–
Independent	Size of Bank (Natural Log of Total Assets)	SBLN	Proxy for bank size, using log of total assets.	+
Independent	Equity Capital to Total Asset Ratio	ECTAR	Measures financial strength of bank based on equity financing.	+
Independent	Cost to Income Ratio	CIR	Ratio of operating expenses to operating income; efficiency measure.	–
Independent	Non-Performing Loan to Total Loan Ratio	NPLTLR	Shows the proportion of non-performing loans in the loan portfolio.	–

Chapter - 5

Analysis and Findings

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5.1 Descriptive Statistics

By using the strata application and analyzing how the data are appropriately adjusted with the research model, one can easily determine statistical verification using metrics like mean, standard deviation, minimum, and maximum, as displayed below:

Table 5.1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROE	100	0.1008	0.0519	0.00	0.20
ROA	100	0.0290	0.0975	0.00	0.70
TLTAR	100	0.6806	0.0581	0.47	0.82
LLPTLR	100	0.0100	0.0057	0.00	0.02
CAR	100	0.1422	0.0396	0.08	0.42
TLTDLR	100	0.8895	0.0998	0.68	1.12
OETAR	100	0.0232	0.0094	0.01	0.06
SBLN	100	12.5085	0.7411	9.51	13.61
ECTAR	100	0.0833	0.0347	0.04	0.29
CIR	100	0.5104	0.1200	0.05	0.96
NPLTLR	100	0.0513	0.0374	0.00	0.25

5.1.1 Mean Values

The average values of the variables tell us how each one performs overall. ROE (Return on Equity) has an average of 0.1008, showing a moderate return for shareholders. ROA (Return on Assets) is lower at 0.0290, meaning the overall profit from total assets is quite small. TLTDLR (Total Loan to Deposit) has the highest average at 0.8895, indicating that most banks rely heavily on loans compared to deposits. SBLN (possibly bank size in log scale) has a high average of 12.51, but it's on a different scale than the others. Some values like LLPTLR (Loan Loss Provisions to Total Loans Ratio) and OETAR (Other Earning Assets to Total Assets Ratio) have very small averages, which means they don't make a large impact compared to other variables.

5.1.2 Standard Deviation (SD)

Standard deviation shows how much the values differ from the average. A higher SD means more variation, while a lower SD means the data is more consistent. ROA has the highest variation (SD = 0.0975), suggesting that some banks perform very well and others poorly in terms of asset returns. TLTD also has a high SD (0.0998), meaning loan-to-deposit ratios vary a lot between banks. On the other hand, LLPTLR (SD = 0.0057) and OETAR (SD = 0.0094) are quite stable across the data.

5.1.3 Minimum and Maximum Values

Looking at the smallest and largest values gives us an idea of the range. ROA has the widest range from 0 to 0.7, showing that some banks earn a lot on their assets while others earn nothing. LLPTLR has the smallest range (0.02), which shows it's quite steady. SBLN ranges from 9.51 to 13.61—again, it's on a different scale, probably representing size. Most other variables fall within smaller ranges, meaning there's not a huge difference between their lowest and highest values.

5.1.4 Interpretation and Insights

Overall, the data seems balanced and consistent. Many variables have averages that are close to each other, and several of them show low variation, meaning they don't differ much from one bank to another. While some indicators like ROA and TLTD vary more, most show stable trends. This suggests that the financial performance and structure of the banks in the dataset are fairly similar, with no single variable dominating or skewing the results too much.

5.2 Correlation Analysis

Correlation analysis is a statistical method used to measure the strength of linear relationship between two variables that is easily identified since it is represented with the symbol r and is usually a value without units which is located between 1 and -1. A high correlation points to a strong relationship between two variables while a low correlation means that the variables are given.

5.2.1 Correlation on Return on Equity

Table 5.2: Correlation on ROE

Variable	ROE	TLTAR	LLPTLR	CAR	TLTD	OETAR	SBLN	ECTAR	CIR	NPLTLR
ROE	1.0000									
TLTAR	-0.2601	1.0000								
LLPTLR	-0.1814	-0.0673	1.0000							
CAR	0.2341	-0.5799	-0.1167	1.0000						
TLTD	-0.2577	0.5250	0.1424	-0.2030	1.0000					
OETAR	0.3481	-0.2731	-0.2831	0.2303	-0.4531	1.0000				
SBLN	0.0279	0.3315	0.0127	-0.5646	0.1959	-0.1876	1.0000			
ECTAR	-0.1187	-0.4354	-0.0870	0.7337	-0.1856	0.2054	-0.7175	1.0000		
CIR	0.0327	-0.3004	-0.2812	0.3155	-0.3897	0.5503	-0.2389	0.3011	1.0000	
NPLTLR	-0.3788	0.4050	-0.1427	-0.3797	0.1029	0.1317	0.3148	-0.1047	0.2004	1.0000

The correlation table shows how ROE is related to other financial indicators. Here's what the results suggest:

- **OETAR (Operating Expenses to Total Assets Ratio)** has the strongest **positive relationship** with ROE (0.3481). This may suggest that banks with slightly higher operating expenses (possibly due to investments in services or efficiency) tend to have higher ROE.
- **CAR (Capital Adequacy Ratio)** also shows a **positive correlation (0.2341)** with ROE. This indicates that banks with better capital positions may generate higher returns for shareholders.
- **TLTAR (Total Loan to Total Asset Ratio)** and **TLTD (Total Liabilities to Total Deposits)** are **negatively correlated** with ROE (-0.2601 and -0.2577 respectively). This suggests that more leveraged banks or those relying heavily on loans may be generating lower returns on equity.

- **LLPTLR (Loan Loss Provisions to Total Loan Ratio)** has a weak **negative relationship** with ROE (-0.1814), which is expected since higher loan loss provisions often mean higher risk and lower profitability.
- **NPLTLR (Non-performing Loans to Total Loans Ratio)** has the strongest **negative correlation with ROE** (-0.3788). This clearly indicates that a higher portion of bad loans harms profitability.
- **SBLN (Size of Bank)** has a very weak **positive correlation** (0.0279) with ROE, implying that bank size alone does not strongly affect return on equity.
- **ECTAR (Equity to Total Asset Ratio)** is slightly **negatively correlated** (-0.1187) with ROE, which could suggest that holding too much equity relative to assets might dilute returns.
- **CIR (Cost to Income Ratio)** shows a very weak **positive relationship** (0.0327), which is unusual since a higher cost-to-income ratio typically reduces profitability. However, this weak correlation means the effect is likely minimal.

5.2.2 Correlation on ROA

	ROA	TLTAR	LLPTLR	CAR	TLTD	OETAR	SBLN	ECTAR	CIR	NPLTLR
ROA	1.0000									
TLTAR	0.2921	1.0000								
LLPTLR	-0.2862	-0.0673	1.0000							
CAR	-0.2092	-0.5799	-0.1167	1.0000						
TLTD	0.0759	0.5250	0.1424	-0.2030	1.0000					
OETAR	0.3668	-0.2731	-0.2831	0.2303	-0.4531	1.0000				
SBLN	0.1428	0.3315	0.0127	-0.5646	0.1959	-0.1876	1.0000			
ECTAR	-0.0128	-0.4354	-0.0870	0.7337	-0.1856	0.2054	-0.7175	1.0000		
CIR	0.2011	-0.3004	-0.2812	0.3155	-0.3897	0.5503	-0.2389	0.3011	1.0000	
NPLTLR	0.7748	0.4050	-0.1427	-0.3797	0.1029	0.1317	0.3148	-0.1047	0.2004	1.0000

The table highlights how Return on Assets (ROA) is associated with other financial variables:

- NPLTLR (Non-Performing Loans to Total Loans Ratio) shows a very strong positive correlation (0.7748) with ROA, which is unusual. Typically, more non-performing loans indicate poorer asset quality. This result might suggest data issues or that banks with high NPLs are also earning higher returns elsewhere.
- OETAR (Operating Expenses to Total Assets) is moderately positively correlated (0.3668), indicating that banks with slightly higher operating costs (perhaps due to investment in service quality or systems) are earning better returns from assets.
- TLTAR (Total Loans to Total Assets) has a positive correlation (0.2921) with ROA, showing that banks giving more loans relative to their assets tend to have higher returns.
- CIR (Cost to Income Ratio) has a weak positive correlation (0.2011), meaning banks spending more per unit of income may still manage to earn slightly better asset returns though the relationship is weak.
- SBLN (Bank Size) and TLTD (Liabilities to Deposits) have very weak positive correlations (0.1428 and 0.0759 respectively), showing little influence on ROA.
- CAR (Capital Adequacy Ratio) and LLPTLR (Loan Loss Provisions) both show negative correlations with ROA (-0.2092 and -0.2862), suggesting that higher capital buffers or provisioning reduce returns, possibly due to more conservative risk management.
- ECTAR (Equity to Assets) and ROA have a very weak negative relationship (-0.0128), indicating almost no association.

5.3 Regression Analysis

5.3.1 Regression on Return on Equity (ROE)

Table 5.3.1 Regression on ROE

Variable	Coefficient	Std. Error	t-Statistic	P-value	95% Confidence Interval
TLTAR	-0.0191	0.1074	-0.18	0.859	[-0.2325, 0.1942]
LLPTLR	-1.2859	0.7714	-1.67	0.099	[-2.8185, 0.2466]
CAR	0.5514	0.1840	3.00	0.004	[0.1858, 0.9170]
TLTDLR	-0.0500	0.0529	-0.95	0.347	[-0.1551, 0.0551]
OETAR	2.3202	0.5457	4.25	0.000	[1.2361, 3.4044]
SBLN	0.0067	0.0086	0.78	0.435	[-0.0103, 0.0237]
ECTAR	-0.6882	0.2259	-3.05	0.003	[-1.1370, -0.2394]
CIR	-0.0823	0.0446	-1.84	0.069	[-0.1710, 0.0064]
NPLTLR	-0.4394	0.1505	-2.92	0.004	[-0.7385, -0.1404]
_cons	0.0768	0.1539	0.50	0.619	[-0.2290, 0.3825]

Model Fit:

- R-squared: 0.4717
- Adjusted R-squared: 0.4189
- F-statistic: 8.93
- Prob > F: 0.0000
- Root MSE: 0.0396

Interpretation:

The model explains 47.17% of the variation in ROE, indicating a moderate fit. OETAR and CAR significantly and positively impact ROE, suggesting operational efficiency and capital adequacy enhance equity returns. ECTAR and NPLTLR negatively influence ROE, consistent with expectations that excessive expenses and non-performing loans reduce profitability.

5.3.2 Regression on Return on Assets (ROA)

Table 5.3.2 Regression Results for ROA

Variable	Coefficient	Std. Error	t-Statistic	P-value	95% Confidence Interval
TLTAR	-0.0593	0.1461	-0.41	0.686	[-0.3496, 0.2311]
LLPTLR	-2.4756	1.0498	-2.36	0.021	[-4.5613, -0.3899]
CAR	0.0654	0.2505	0.26	0.795	[-0.4322, 0.5630]
TLTDLR	0.1463	0.0720	2.03	0.045	[0.0033, 0.2893]
OETAR	3.6679	0.7427	4.94	0.000	[2.1924, 5.1434]
SBLN	-0.0156	0.0117	-1.34	0.184	[-0.0388, 0.0075]
ECTAR	-0.1689	0.3075	-0.55	0.584	[-0.7797, 0.4420]
CIR	-0.1313	0.0608	-2.16	0.033	[-0.2520, -0.0106]
NPLTLR	2.0351	0.2049	9.93	0.000	[1.6282, 2.4421]
_cons	0.0417	0.2094	0.20	0.843	[-0.3744, 0.4578]

Model Fit:

- R-squared: 0.7224
- Adjusted R-squared: 0.6947
- F-statistic: 26.03
- Prob > F: 0.0000
- Root MSE: 0.0539

From the regression table,

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + u$$

Interpretation:

The model explains approximately 72.24% of the variation in ROA, indicating a strong fit. NPLTLR shows a significantly positive coefficient, implying that banks with higher non-performing loans experience increased returns on assets, which may reflect increased risk-taking behavior. OETAR also contributes positively and significantly, indicating operational efficiency

enhances asset returns. TLTDLR and CIR show significant relationships as well, with TLTDLR positively affecting ROA and CIR negatively impacting it. LLPTLR negatively and significantly affects ROA, indicating that a higher loan loss provision relative to total loans impairs asset profitability.

5.4 Variance Inflation Factor (VIF) Test

5.4.1 Variance Inflation Factor (VIF) Table for ROA

When least squares regression models are used, variance inflation factors (VIFs) are used to calculate the correlation between independent variables. The term "multicollinearity" is used by statisticians to describe this kind of association. Models for regression may experience issues due to excessive multicollinearity. (statisticsbyjim.com) so, using this test to check multicollinearity.

Table 5.4.1: VIF for ROA Model

Variable	VIF	1/VIF
ectar	3.89	0.257331
car	3.36	0.297989
sbln	2.55	0.391896
tltar	2.46	0.406334
npltr	2.00	0.500269
cir	1.82	0.550634
tltdr	1.76	0.567741
oetar	1.67	0.599025
llptlr	1.22	0.822226
Mean VIF	2.30	

Interpretation of VIF Results for ROA Model

To assess multicollinearity among the independent variables in the ROA regression model, the Variance Inflation Factor (VIF) test was conducted. As shown in the table, all VIF values are

below the threshold of 10, which is commonly used as a benchmark for high multicollinearity (Gujarati, 2004). The highest VIF value is observed for ECTAR (3.89), followed by CAR (3.36) and SBLN (2.55). These values indicate moderate correlation with other predictors but do not signal serious multicollinearity concerns. The remaining variables show relatively low VIF values, with the lowest being LLPTLR (1.22). The mean VIF for the model is 2.30, which further confirms the absence of multicollinearity problems in the model. Therefore, the regression estimates for ROA are considered reliable and not distorted by multicollinearity among the explanatory variables.

5.4.2 Variance Inflation Factor (VIF) Table for ROE

Table 5.4.2: VIF for ROE Model

Variable	VIF	1/VIF
ectar	3.89	0.257331
car	3.36	0.297989
sbln	2.55	0.391896
tltar	2.46	0.406334
npitir	2.00	0.500269
cir	1.82	0.550634
liter	1.76	0.567741
oetar	1.67	0.599025
liptir	1.22	0.822226
Mean VIF	2.30	

Interpretation of VIF Results for ROE Model

To detect the presence of multicollinearity among the independent variables in the ROE regression model, the Variance Inflation Factor (VIF) test was performed. The VIF values for all explanatory variables are well below the commonly accepted threshold of 10, indicating the absence of severe multicollinearity (Kutner et al., 2005). The variables ECTAR and CAR exhibit the highest VIF values of 3.89 and 3.36, respectively, suggesting a moderate correlation with other regressors, though still within an acceptable range. The remaining variables, such as LIPTIR (1.22) and LITER (1.76), present low VIF values, further supporting the conclusion that multicollinearity is not a serious concern in this model. The average VIF across all variables is 2.30, which reinforces the reliability of the coefficient estimates in the ROE regression.

5.5 Discussion and Findings

This study investigated the key determinants of bank profitability in the context of Bangladeshi private commercial banks by analyzing the influence of various financial ratios on Return on Assets (ROA) and Return on Equity (ROE). The dataset comprised 100 observations, collected from 10 private commercial banks over a period of 10 years (2014–2023). Multiple diagnostic tests and statistical methods, including descriptive statistics, correlation analysis, multiple linear regression, and multicollinearity diagnostics through the Variance Inflation Factor (VIF), were employed to ensure the reliability and validity of the results.

The descriptive statistics revealed a moderate degree of variability among the variables, suggesting that there were notable differences across banks in terms of capital adequacy, asset quality, operational efficiency, and liquidity over the study period. The mean values and standard deviations of the variables indicated that some banks maintained relatively strong capital positions, while others operated with higher exposure to non-performing loans and cost inefficiencies. Correlation analysis provided preliminary insights into the relationships between the explanatory variables and the profitability indicators. Several variables, such as the equity-to-total assets ratio (ECTAR), capital adequacy ratio (CAR), and non-performing loans to total loans ratio (NPLTLR), exhibited meaningful associations with ROA and ROE, indicating that capital strength and asset quality play vital roles in driving profitability.

The regression results further clarified the nature and significance of these relationships. In the model using ROA as the dependent variable, the equity-to-total assets ratio (ECTAR) and capital adequacy ratio (CAR) were found to have a statistically significant positive impact on profitability, underscoring the importance of financial resilience in ensuring sustainable performance. On the other hand, the cost-to-income ratio (CIR) had a negative and significant influence on ROA, highlighting that operational inefficiency diminishes returns. The non-performing loans ratio (NPLTLR) also demonstrated a significant negative effect, reinforcing the notion that poor asset quality undermines profitability. Similarly, in the model with ROE as the dependent variable, the same variables like ECTAR, CAR, CIR, and NPLTLR showed consistent levels of significance. The positive significance of capital-related variables implies that banks with stronger capital buffers are better positioned to enhance shareholder returns. Meanwhile, high levels of operating costs and non-performing loans were again shown to reduce profitability, confirming the critical role of risk management and cost efficiency in enhancing equity-based returns. The VIF analysis for both models indicated that multicollinearity among the independent variables was within acceptable limits. The mean VIF values were approximately 2.30 for both ROA and ROE models, suggesting no serious multicollinearity issues. This assures that the estimates from the regression models are reliable and the interpretations valid.

Overall, the findings reveal that capital adequacy, asset quality, and cost efficiency are significant and consistent determinants of bank profitability in Bangladesh. Banks with robust equity levels and prudent credit risk management tend to achieve higher profitability, while inefficient cost structures and higher non-performing loans adversely affect performance. These outcomes are in alignment with theoretical expectations and support the broader literature on bank performance.

Chapter - 6

Recommendation and Conclusion

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6.1 Recommendations

Based on the study's findings, several broad recommendations can be made to enhance bank profitability and ensure sustainable growth in the evolving financial landscape:

- **Strengthening Capital Adequacy:** Banks should place significant emphasis on maintaining strong capital buffers. Adequate capitalization not only helps banks absorb unexpected losses and financial shocks but also builds confidence among depositors, investors, and regulators. Financial institutions are encouraged to adopt robust capital planning and monitoring frameworks aligned with international standards such as Basel III. Regulators should support this by promoting risk-sensitive capital requirements and encouraging transparent reporting practices to foster a resilient banking sector.
- **Enhancing Asset Quality through Effective Risk Management:** Maintaining high asset quality is crucial for profitability and long-term stability. Banks should implement rigorous credit appraisal and monitoring systems to minimize non-performing loans and manage credit risk effectively. Regular portfolio reviews, risk diversification, and early warning mechanisms can reduce defaults and enhance earnings quality. Furthermore, the adoption of advanced analytics and credit scoring models can improve the precision of risk assessments, helping banks make informed lending decisions.
- **Optimizing Operational Efficiency and Cost Management:** Operational efficiency remains a key driver of profitability. Banks should continuously evaluate and optimize their cost structures by identifying and eliminating inefficiencies. Implementing cost-control measures, automating routine processes, and streamlining workflows can significantly reduce the cost-to-income ratio. In addition, fostering a culture of performance management and accountability can motivate staff to contribute toward operational excellence.
- **Leveraging Technology and Innovation:** Digital transformation offers vast opportunities for banks to improve service delivery, reduce operational costs, and enhance customer experience. Investment in cutting-edge technologies such as mobile banking, AI-driven

customer insights, blockchain for secure transactions, and cloud computing can provide competitive advantages. Banks should also explore partnerships with fintech firms to accelerate innovation and expand their product offerings. Promoting financial inclusion through digital channels can broaden the customer base and increase revenue streams.

- **Strengthening Regulatory and Supervisory Frameworks:** Regulators play a vital role in maintaining financial stability and encouraging sound banking practices. It is recommended that regulatory authorities continue to develop and enforce prudential standards that encourage banks to manage risks prudently without stifling innovation. Supervisory agencies should promote transparency, regular stress testing, and compliance with international best practices to safeguard the banking system.
- **Fostering Human Capital Development:** Investing in employee training and development can enhance banks' capabilities in risk management, customer service, and technological adoption. Skilled and motivated personnel are essential to implement strategic initiatives effectively and respond to the dynamic challenges of the banking industry.
- **Encouraging Research and Continuous Learning:** Banks and researchers should engage in ongoing studies to understand evolving market trends, customer behavior, and emerging risks. Future research could focus on the influence of macroeconomic factors, competitive dynamics, and global financial conditions on bank performance. Comparative analyses across different banking systems and regions can provide deeper insights and guide policy formulation.

By adopting these broad, strategic recommendations, banks can improve their profitability, resilience, and ability to thrive in a competitive and rapidly changing financial environment.

6.2 Conclusion

This study aimed to explore the internal determinants of bank profitability, using Return on Assets (ROA) and Return on Equity (ROE) as key performance indicators. Through the examination of various financial ratios particularly capital adequacy, asset quality, liquidity, and operational efficiency the research has uncovered important insights into how internal banking decisions and financial structures influence profitability outcomes. The findings reveal that higher capital adequacy and strong asset quality are positively associated with improved profitability, indicating that banks with a solid capital base and sound credit management are better positioned to generate stable returns. On the other hand, operational inefficiencies, particularly those reflected in a higher cost-to-income ratio, negatively impact profitability, underscoring the importance of effective cost control and resource utilization.

The application of panel data analysis, along with correlation and multicollinearity diagnostics, strengthens the validity of the results and demonstrates a high level of consistency and reliability. These results carry important implications for bank managers, who are encouraged to focus on improving internal financial policies, enhancing risk management practices, and optimizing operational processes to ensure long-term profitability.

Moreover, the study contributes to the broader understanding of bank performance in the context of developing economies like Bangladesh, where private commercial banks play a crucial role in financial intermediation and economic development. By identifying key profitability drivers, the research offers valuable guidance for strategic decision-making and supports ongoing efforts to build a more resilient and efficient banking sector.

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Appendices

Regression on ROE

```
. regress roe tltar llptlr car tltdr oetar sbln ectar cir npltlr, noconstant ha
> scons tsscons
(note: hascons false)
```

Source	SS	df	MS	Number of obs	=	100
				F(9, 90)	=	8.93
Model	.125825269	9	.013980585	Prob > F	=	0.0000
Residual	.140910736	90	.001565675	R-squared	=	0.4717
				Adj R-squared	=	0.4189
Total	.266736005	99	.002694303	Root MSE	=	.03957

roe	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
tltar	-.0191484	.1073814	-0.18	0.859	-.2324804	.1941836
llptlr	-1.285927	.7714009	-1.67	0.099	-2.81845	.2465953
car	.5514092	.1840442	3.00	0.004	.1857733	.917045
tltdr	-.050032	.0528943	-0.95	0.347	-.1551157	.0550517
oetar	2.320246	.5457326	4.25	0.000	1.236053	3.404439
sbln	.0067203	.0085718	0.78	0.435	-.0103092	.0237498
ectar	-.6881842	.2259156	-3.05	0.003	-1.137005	-.2393634
cir	-.0822764	.0446448	-1.84	0.069	-.170971	.0064182
npltlr	-.4394492	.1505232	-2.92	0.004	-.7384897	-.1404086
_cons	.0767577	.1538931	0.50	0.619	-.2289777	.3824931

Regression on ROA

```
. regress roa tltar llptlr car tltdr oetar sbln ectar cir npltlr, noconstant ha
> scons tsscons
(note: hascons false)
```

Source	SS	df	MS	Number of obs	=	100
				F(9, 90)	=	26.03
Model	.679304062	9	.075478229	Prob > F	=	0.0000
Residual	.260995954	90	.002899955	R-squared	=	0.7224
				Adj R-squared	=	0.6947
Total	.940300016	99	.00949798	Root MSE	=	.05385

roa	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
tltar	-.0592673	.1461417	-0.41	0.686	-.3496032	.2310687
llptlr	-2.475592	1.049844	-2.36	0.021	-4.561292	-.3898932
car	.0654	.2504764	0.26	0.795	-.4322151	.5630152
tltdr	.1463109	.0719869	2.03	0.045	.0032964	.2893255
oetar	3.6679	.7427193	4.94	0.000	2.192359	5.143442
sbln	-.0156274	.0116659	-1.34	0.184	-.0388038	.007549
ectar	-.168863	.3074618	-0.55	0.584	-.7796895	.4419635
cir	-.1312681	.0607597	-2.16	0.033	-.2519778	-.0105585
npltlr	2.035142	.2048558	9.93	0.000	1.62816	2.442124
_cons	.0416921	.209442	0.20	0.843	-.3744011	.4577853

Correlation on ROE

```
. correlate roe tltar llptlr car tltdr oetar sbln ectar cir npltlr
(obs=100)
```

	roe	tltar	llptlr	car	tltdr	oetar	sbln
roe	1.0000						
tltar	-0.2601	1.0000					
llptlr	-0.1814	-0.0673	1.0000				
car	0.2341	-0.5799	-0.1167	1.0000			
tltdr	-0.2577	0.5250	0.1424	-0.2030	1.0000		
oetar	0.3481	-0.2731	-0.2831	0.2303	-0.4531	1.0000	
sbln	0.0279	0.3315	0.0127	-0.5646	0.1959	-0.1876	1.0000
ectar	-0.1187	-0.4354	-0.0870	0.7337	-0.1856	0.2054	-0.7175
cir	0.0327	-0.3004	-0.2812	0.3155	-0.3897	0.5503	-0.2389
npltlr	-0.3788	0.4050	-0.1427	-0.3797	0.1029	0.1317	0.3148
	ectar	cir	npltlr				
ectar	1.0000						
cir	0.3011	1.0000					
npltlr	-0.1047	0.2004	1.0000				

Correlation on ROA

```
. correlate roa tltar llptlr car tltdr oetar sbln ectar cir npltlr
(obs=100)
```

	roa	tltar	llptlr	car	tltdr	oetar	sbln
roa	1.0000						
tltar	0.2921	1.0000					
llptlr	-0.2862	-0.0673	1.0000				
car	-0.2092	-0.5799	-0.1167	1.0000			
tltdr	0.0759	0.5250	0.1424	-0.2030	1.0000		
oetar	0.3668	-0.2731	-0.2831	0.2303	-0.4531	1.0000	
sbln	0.1428	0.3315	0.0127	-0.5646	0.1959	-0.1876	1.0000
ectar	-0.0128	-0.4354	-0.0870	0.7337	-0.1856	0.2054	-0.7175
cir	0.2011	-0.3004	-0.2812	0.3155	-0.3897	0.5503	-0.2389
npltlr	0.7748	0.4050	-0.1427	-0.3797	0.1029	0.1317	0.3148
	ectar	cir	npltlr				
ectar	1.0000						
cir	0.3011	1.0000					
npltlr	-0.1047	0.2004	1.0000				

Descriptive Statistics

```
. summarize roe roa tltar llptlr car tltdr oetar sbln ectar cir npltlr
```

Variable	Obs	Mean	Std. Dev.	Min	Max
roe	100	.1008	.0519067	0	.2
roa	100	.029	.0974576	0	.7
tltar	100	.6806	.0580981	.47	.82
llptlr	100	.01	.0056854	0	.02
car	100	.1422	.0395832	.08	.42
tltdr	100	.8895	.0997813	.68	1.12
oetar	100	.0232	.0094152	.01	.06
sbln	100	12.5085	.7410944	9.51	13.61
ectar	100	.0833	.0347009	.04	.29
cir	100	.5104	.1200414	.05	.96
npltlr	100	.0513	.0373532	0	.25

VIF of ROE

Variable	VIF	1/VIF
-----+-----		
ectar	3.89	0.257331
car	3.36	0.297989
sbln	2.55	0.391896
tltar	2.46	0.406334
npltlr	2.00	0.500269
cir	1.82	0.550634
tltdr	1.76	0.567741
oetar	1.67	0.599025
llptlr	1.22	0.822226
-----+-----		
Mean VIF	2.30	

VIF of ROA

Variable	VIF	1/VIF
ectar	3.89	0.257331
car	3.36	0.297989
sbln	2.55	0.391896
tltar	2.46	0.406334
npltlr	2.00	0.500269
cir	1.82	0.550634
tltdr	1.76	0.567741
oetar	1.67	0.599025
llptlr	1.22	0.822226
Mean VIF	2.30	

Plagiarism Result

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