

*An Internship Report on
“Analysis of Internal and External Determinants on the Profitability of
Commercial Banks in Bangladesh” for the Degree of Master of Business
Administration (MBA)*



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**Department of Finance and Banking
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Internship Report

“Analysis of Internal and External Determinants on the Profitability of Commercial Banks in Bangladesh”



Letter of Transmittal

26th May, 2025

Md. Al-Amin

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Comilla University

Subject: Submission of internship report on “**Analysis of Internal and External Determinants on the profitability of commercial banks in Bangladesh**”

Respected Sir,

With due respect, I would like to state that it is a matter of great pleasure and honor for me to submit my internship report on “**Analysis of Internal and External Determinants on the Profitability of Commercial Banks in Bangladesh**”. The aim of this report is to analyze the current circumstances and position, as well as the influence of both internal and external factors on profitability in Bangladesh. Completing this report is a necessary step to fulfill the requirements of our MBA Program. Working under your guidance has been both a rewarding and challenging experience for me, and I cannot adequately express my gratitude to you. It has been an uplifting and positive journey, during which I have gained invaluable insights that would not have been possible otherwise. The final report is derived from information sourced from various outlets, supported by relevant findings. To enhance clarity, I have included some graphs and tabular data. I have made every effort to incorporate all pertinent information to ensure that the internship report is both informative and thorough.

Lastly, I would like to express my sincere appreciation and thanks to your help while preparing the report. I am more than willing to address any questions you might have regarding this matter.

Sincerely yours,

Norunehar Akter

ID No: 22317032

Session: 2022-2023

Department of Finance & Banking,

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Supervisor's Declaration

26th May, 2025

This certifies that Norunehar Akter, ID number 22317032, registration number 22317032, completed the internship report on "**Analysis of internal and external determinants on the profitability of commercial banks in Bangladesh**" during the 2022–2023 session. This work is part of the requirements for the Master of Business Administration (MBA) degree from the Department of Finance and Banking, Faculty of Business Studies, Comilla University, Cumilla.

Following my instructions, this internship report was created and documents the successful completion of real work.

.....

Md. Al-Amin

Assistant Professor

Department of Finance & Banking,

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Comilla University

Student Declaration

My internship report, "**Analysis of internal and external determinants on the profitability of commercial banks in Bangladesh,**" was written entirely by me under the supervision of Md. Al-Amin, an assistant professor in the Comilla University Department of Finance and Banking. This report has never before been submitted in part or in whole to any other university, college, institution, or organization for any kind of academic certificate, degree, or diploma. I have not violated any copyrights with this work, and no part of this report has been lifted verbatim from any previous work of any kind. In the text and references, information from other people's published and unpublished works has been acknowledged.

I further commit to indemnifying the department for any losses or damages resulting from any violation of the aforementioned duty.

.....

Norunehar Akter

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Acknowledgement

I would like to start by sincerely thanking God for providing me with the courage and poise to complete the task. An important component of the MBA program is the internship report. I would like to take this opportunity to thank my esteemed academic supervisor, Md. Al-Amin of Comilla University's Department of Finance and Banking, for allowing and assisting me in the preparation of my internship report, which is titled **"Analysis of internal and external determinants on the profitability of commercial banks in Bangladesh."**

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TO WHOM IT MAY CONCERN

THIS IS TO CERTIFY THAT NORUNEHAR AKTER, CLASS ID- 22317032, REG NO- 22317032 STUDENT OF COMILLA UNIVERSITY, DEPARTMENT OF FINANCE & BANKING UNDER MBA PROGRAM IS CONTINUING HER THREE MONTHS LONG INTERNSHIP IN SONALI BANK PLC. WAPDA BUILDING BRANCH, CUMILLA.

DURING HER ONGOING INTERNSHIP PERIOD SHE UNDERGOES A THOROUGH INTERNSHIP PROGRAM ON "ANALYSIS OF INTERNAL AND EXTERNAL DETERMINENTS ON THE PROFITABILITY OF COMMERCIAL BANKS IN BANGLADESH". SHE MAINTAINED ALL THE RULES & PROVIDED THE SERVICES AS AN EMPLOYEE OF THE ORGANIZATION.

ON THE WAY OF ACCOMPLISHING THE TASK WE FOUND HER VERY SINCERE, HARD WORKING AND CURIOUS TO ACQUIRE BANKING KNOWLEDGE. SHE DEVOTED HERSELF FULLY IN WORK AREA AND PERFORMED ALL THE DUTIES & RESPONSIBILITIES ACCORDINGLY. SHE ALWAYS ENGAGED HERSELF IN WORK INSTRUCTED BY THE PERSONNEL OF THE BRANCH.

WE WISH EVERY SUCCESS IN HER LIFE.

(S. M. SAJJAD ALI KHAN)
SENIOR PRINCIPAL OFFICER & BRANCH MANAGER
SONALI BANK LIMITED
WAPDA BUILDING BRANCH
CUMILLA.

Executive Summary

Using Return on Assets (ROA), this study looks at how economic and company-specific factors affect the profitability of 15 commercial banks in Bangladesh. A key measure of banking performance, profitability is influenced by both macroeconomic variables like GDP growth and internal factors like bank size, operating expense to total assets ratio, capital adequacy ratio, and total loans to total assets ratio.

The study employs econometric techniques such as Pooled OLS, Fixed Effects, and Random Effects to ensure accurate estimation and address diagnostic concerns like heteroskedasticity, autocorrelation, and cross-sectional dependence using panel data spanning the years 2009–2023. Based on empirical evidence, bank profitability is significantly influenced by both internal and external factors.

Internal elements such as total loan to total assets, Operating Expense Ratios significantly affect ROA, emphasizing that operational inefficiencies are a crucial factor in diminished profitability. Macroeconomic factors such as GDP growth affect profitability, indicating the vital role of external economic stability in bank performance.

The research indicates that profitability within the banking industry results from a combination of operational effectiveness and overall economic stability. Regulatory bodies and bank executives ought to prioritize improving internal efficiencies, tackling non-performing loans, and utilizing positive economic circumstances to boost profitability. These findings contribute to the existing body of knowledge by bridging the gap between more general economic factors and bank-specific elements, offering practical insights for long-term financial progress.

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Chapter One

1.Introduction

The banking industry in Bangladesh has continuously served an essential function in economic growth by enabling resource mobilization and the effective distribution of capital. The profitability of commercial banks has attracted global and national interest because of its vital significance in maintaining stability and building trust in the financial system. Traditionally, Bangladesh's banking sector has experienced considerable changes, including the growth of private and Islamic banking, reforms in regulatory frameworks, and the adoption of technological innovations. Nonetheless, issues like increasing non-performing loans (NPLs), variable interest rate spreads, and global economic fluctuations have impacted profitability patterns.

As of 2023, the banking sector in Bangladesh comprises 62 banks, which include state-owned, private, and foreign institutions. The total assets of this industry have reached around \$220 billion, with private commercial banks as the foremost players. Despite experiencing growth, profitability indicators such as ROE and ROA have demonstrated varied trends, with several banks facing difficulties due to rising non-performing loans (NPLs), operational inefficiencies, and economic uncertainty. Data from Bangladesh Bank indicates that the banking sector's profitability in Bangladesh ranks the lowest in South Asia due to the high incidence of non-performing loans, reduced efficiency, and a heightened cost of funds. The return on assets (ROA), a key measure of profitability, stood at 0.52 percent in Bangladesh in 2022, declining to 0.43 percent by June 2023. Understanding the factor's influencing profitability is crucial for developing effective policies and strategies to tackle these issues.

The main goal of this study is to investigate the connection between firm-specific factors (such as capital adequacy, asset quality, operational efficiency) and macroeconomic indicators (like GDP growth) in relation to bank profitability. In particular, the research seeks to measure the effect of these variables on ROA, thus offering practical insights for improving bank performance.

To accomplish these goals, the research utilizes a panel data econometric framework, examining data from 15 commercial banks in Bangladesh, comprising both state-owned and private conventional banks (Sonali Bank PLC, Janata Bank PLC, Rupali Bank PLC, Pubali Bank PLC, Dhaka Bank PLC, City Bank PLC, Standard Chartered Bank, Dutch Bangla Bank, National Bank PLC, Mercantile Bank, Southeast Bank, NCC Bank, Prime Bank, Eastern Bank PLC, Uttara Bank PLC) over a 15-year span

(from 2009 to 2023). The independent variables encompass firm-specific elements such as the capital adequacy ratio (CAR), total loans-to-deposit ratio, operating expense-to-assets ratio, bank size (calculated as the log of total assets), and the total loans to total assets ratio. Macroeconomic factors consist of GDP growth.

The profitability measure, ROA, serves as the dependent variable, indicating the effectiveness of asset use and returns for shareholders, correspondingly. To evaluate the data, econometric models like fixed effects and pooled ordinary least squares (OLS) are employed. These models are especially appropriate for dynamic panel studies as they consider the distinct traits of individual banks and the temporal fluctuations in macroeconomic elements.

The study highlights the significance of recognizing both internal and external elements that affect profitability to maintain ongoing growth and stability within the banking industry. Policymakers, bank executives, and other involved parties can utilize the knowledge acquired from this research to formulate specific strategies aimed at improving operational effectiveness, controlling risks, and capitalizing on macroeconomic prospects. This thorough method of analyzing profitability establishes a meaningful groundwork for upcoming research and practical uses in banking and finance.

1.1 Research Gap

Based on the previously cited literature, the current study identifies the following research gap. Almost every prior study developed its methods by choosing samples from a small number of commercial banks, ignoring state-owned and private conventional banks. This suggests that there is a chance to investigate bank-specific components that affect banks' profitability, such as the capital adequacy ratio (CAR), the total loan to total deposit ratio (TLTDR), the operating expenses to total assets ratio (OETAR), bank size (BS), and the total loan to total asset ratio, in addition to macroeconomic factors like GDP Growth (GDP). In order to close this gap, this study will evaluate the impact of these indicators on profitability in Bangladesh's banking industry.

1.2 Background of the Study

Through direct observation of complexity and the exploration of diverse approaches to problem-solving, the internship program aims to expose students to real-world situations. It makes it possible to put the theoretical knowledge they have acquired throughout their education to use. The internship program's goal is to combine the two aspects of theoretical knowledge by providing MBA students with hands-on experience. For the MBA program to complete its practical component, an internship is required. A business student cannot achieve success and efficacy in managing actual business situations by relying solely on theoretical education. Knowledge, no matter how vast, is useless if it cannot be applied in real-world situations.

Therefore, appropriate use is crucial. The demands of a competitive free-market economy are causing the modern world to change quickly. For financial institutions and other organizations to stay competitive, they require leaders with up-to-date knowledge. A bank is a type of financial institution that the government has approved. Lending and borrowing are at the heart of its operations. The range of financial activities that were permitted expanded over time. Internship reports are an important part of the MBA program. **"Analysis of Internal and External Determinants on the Profitability of Commercial Banks in Bangladesh"** is the suggested topic. "Md. Al-Amin, Assistant Professor, Dept. of Finance and Banking, Comilla University. Establishing an appropriate workforce framework is essential for central and commercial banks to sustain their competitive standing within the banking sector.

1.3 Problem Statement

The profitability of commercial banks is crucial for the stability and growth of a nation's financial system. In Bangladesh, the banking industry has undergone notable changes in recent decades, shaped by internal elements such as asset management, capital adequacy, and operational efficiency, alongside external influences like macroeconomic conditions, regulatory frameworks, and market competition. Even though the sector is essential for economic advancement, ongoing issues like high nonperforming loans, insufficient risk management, and economic fluctuations persistently hinder bank profitability.

Although numerous studies have examined profitability within the international and regional banking landscapes, there is a deficiency of in-depth analysis specifically aimed at the distinct economic, regulatory, and institutional framework of Bangladesh. Furthermore, the current body of literature frequently emphasizes either internal or external factors separately, lacking a comprehensive assessment of how these two aspects interact to affect bank performance. This segmented perspective hinders policymakers, regulators, and bank executives from developing focused strategies to improve profitability and resilience within the industry.

Hence, it is crucial to methodically examine the joint impact of internal and external factors on the profitability of commercial banks in Bangladesh. This examination is vital for pinpointing the primary influences on financial performance, filling the current knowledge void, and aiding evidence-based decision-making in banking practices and policy development.

1.4 Significance of the study

Throughout our one year as MBA students, we might have to apply our theoretical understanding in real-world situations. Numerous theoretical elements were presented to us. Conversely, our knowledge is opaque. We will address our limitations regarding scope with this report. We are compiling this report by observing bank staff in their roles. The objective of the internship initiative is to merge the two components of academic learning by providing MBA students the opportunity to gain practical experience. During our MBA journey, we may encounter numerous terms. We will now have a clearer understanding of how these terms are applied in daily situations. In the end, this study will help us bridge the knowledge gap.

Furthermore, the profitability of commercial banks is an essential element in maintaining financial stability, fostering economic growth, and promoting the overall advancement of a nation's financial sector. In the case of Bangladesh, where the banking sector is vital in facilitating trade, investment, and economic progress, grasping the factors influencing bank profitability is of great importance. This research adds to the current knowledge by examining internal elements (including capital sufficiency, asset caliber, management effectiveness, profitability, and liquidity) along with external elements (like macroeconomic metrics such as GDP expansion, inflation, interest rates, and regulatory frameworks) that affect the profitability of commercial banks in Bangladesh.

The results of this study will be important for various interested parties:

1. **Bank Management:** Findings from this research will assist bank executives in recognizing crucial internal elements that they can manage and refine to boost profitability.
2. **Policy Makers & Regulators:** Comprehending the influence of external factors will assist regulators and policymakers, including the Bangladesh Bank, in formulating efficient monetary and fiscal strategies to bolster the banking sector's performance.
3. **Investors & Shareholders:** By understanding the elements that influence profitability, investors are able to make educated choices about their investments in the banking industry.
4. **Academicians & Researchers:** This research will offer empirical data and a basis for subsequent investigations into the performance of the banking sector in developing countries such as Bangladesh.
5. **Economic Development:** A successful and steady banking industry enhances the

availability of credit, which consequently promotes economic growth, job creation, and poverty alleviation in Bangladesh.

Consequently, this research holds both scholarly and practical importance, providing strategic guidance for enhancing the financial stability and sustainability of commercial banks in

Bangladesh.

1.5 Scope of the Study

This research intends to explore the different internal and external factors that affect the profitability of commercial banks functioning in Bangladesh. The range includes both quantitative and qualitative evaluations of chosen financial and economic metrics to assess their influence on banking performance. The internal elements to be examined comprise factors like capital sufficiency, quality of assets, management effectiveness, profitability potential, and liquidity. External elements will encompass macroeconomic indicators such as GDP expansion, inflation levels, interest rates, exchange rate fluctuations, and regulatory modifications.

The study will concentrate mainly on scheduled commercial banks functioning under the regulatory oversight of the Bangladesh Bank, encompassing both private and public enterprises. A duration of 15 years will be taken into account for examining trends and making inferences based on secondary data gathered from annual reports, publications from Bangladesh Bank, and pertinent financial databases.

This research will not explore the micro-level operational elements of specific banks, nor will it encompass non-banking financial entities (NBFIs), Islamic banks with distinct operational frameworks, or international banks that are not considerably engaged with the Bangladeshi market. Furthermore, although the study will pinpoint connections and impacts, it does not seek to prove causal links beyond statistical interpretation.

By identifying and constraining the scope to these parameters, the research aims to provide a concentrated, evidence-based, and policy-relevant examination that adds to scholarly literature and practical financial choices in the Bangladeshi banking industry.

1.6 Research Questions

Throughout the study, the researcher will examine the subsequent research inquiries.

1. How do bank-specific factors impact profitability metrics (Return on Assets, or ROA)?
2. How does the capital adequacy ratio impact commercial banks' profits?
3. What effects do the loan-to-deposit and loan-to-total-asset ratios have on profitability?
4. Does a bank's size have a big impact on commercial banks' profitability?
5. What impact does the GDP growth rate have on commercial banks' profitability?

1.7 Objectives of the Report

This paper aims to investigate and quantify the relationship between macroeconomic indicators and company-specific factors related to the profitability of commercial banks in Bangladesh.

Main Objective:

To identify and assess the key elements affecting the profitability of Bangladesh's commercial banks.

Specific Objectives:

1. To ascertain how operating efficiency, or operating costs as a percentage of total assets, affects commercial banks' bottom lines.
2. To investigate the effect of GDP growth, a macroeconomic variable, on Bangladeshi commercial banks' profitability.
3. To evaluate how commercial banks' profitability is affected by the capital adequacy ratio.
4. To investigate the relationship between bank size and commercial bank's profitability.
5. To investigate how commercial banks' profitability is affected by loan concentration.

Chapter Two

2. Literature Review

A number of factors, including credit risk, capital adequacy, liquidity, cost efficiency, bank size, GDP growth, inflation rates, real interest rates, and stock market activity, have a significant impact on profitability metrics like return on assets (ROA), return on equity (ROE), and net interest margin (NIM). Additionally, Nishat Rumaly examines the profitability of Bangladeshi commercial banks using return on equity (ROE) as a lens. He does this by considering macroeconomic factors like inflation as well as bank-specific factors like asset size, earnings per share (EPS), and capital adequacy ratio. He then evaluates the overall impact of these factors on banking performance from 2011 to 2022 (Rumaly, 2023). Notwithstanding these findings, cost effectiveness is essential to raising bank profitability in Bangladesh; nevertheless, ROE is adversely impacted by both overhead costs and liquidity conditions. ROA is positively correlated with the loan-to-deposit ratio, and banks with adequate capital are skilled at controlling credit risk. The need for efficient cost management is highlighted by the negative impact that the bank's size has on all profitability metrics (Islam, 2021). Although capital adequacy, bank size, and inflation all have a positive impact on profitability, credit risk and cost efficiency have a negative impact (Noman et al.), making ROA the most dependable measure of profitability. in 2015. Similar to this, Lalon (2022) and Chowdhury and Salman (2021) have observed that capital adequacy has a positive impact on both return on equity (ROE) and return on assets (ROA). Following that, Foisal et al. (2016) evaluated profitability between 2007 and 2014, expanding the study to include commercial banks owned by the state. They discovered that while inflation and nonperforming loans (NPL) had a negative impact on profitability, the capital adequacy ratio (CAR) and GDP growth rate had a positive impact. Additionally, nonperforming loans (NPLs) had a detrimental impact on profitability due to rising operating costs, according to Abedin and Dawan (2016).

A company's ability to use its resources to generate revenue that exceeds its costs is referred to as profitability. This indicates the firm's potential to turn a profit from its operations. (Hosen, 2020) They also added that successful commercial banks sought to maintain a suitable level of liquid assets in order to improve asset quality, reduce operating costs, and strengthen their capital foundation. Given that (Gazi et al. 2021), there have been significant changes in the banking industry in Bangladesh in terms of growth

and development in terms of profitability over the past 50 years. Additionally, they looked into the statistically significant effects of macroeconomic factors and firm-specific variables (equity to asset ratios, deposits to asset ratios, debt to equity ratios, and loan to deposit ratios) on profitability. Hossain and Ahamed (2021) conducted a thorough analysis of bank profitability in Bangladesh using panel data from 23 financial institutions. The study made use of a number of independent variables, including market share, capital ratio, and non-interest income. It showed that while inflation and exchange rates had a negative impact on profitability, non-interest income, capital adequacy, and GDP growth had a positive association with return on assets (ROA). The relationship between macroeconomic and bank-specific elements was highlighted by this study, which also highlights the importance of economic development and efficient capital management in raising profitability. According to Shahriar et al. (2021), the capital structure or leverage of commercial banks is significantly impacted by return on assets, earnings per share, asset growth, asset structure, investment structure, cost per loan asset, and loan loss provisioning. The capital structure of the banking industry in Bangladesh, on the other hand, does not appear to be significantly influenced by bank size, liquidity, capital adequacy, or the ratio of non-performing loans. The study's findings indicate that the main elements influencing capital structure are return on assets, earnings per share, asset structure, and cost per loan asset. Furthermore, the capital structure of the banking sector is less significantly influenced by loan loss provisioning, asset growth, and investment structure.

Lalon (2022), focusing on 11 traditional banks between 2012 and 2021, determined the macroeconomic and bank-specific elements that affect Bangladesh's commercial banks' profitability. These results show that while debt ratios have a favorable impact on profitability metrics like NIM, operating expenses, the non-performing loan (NPL) ratio, and the cost-to-income ratio have a negative impact on ROE. The significance of cost effectiveness and credit risk management in raising bank profitability was emphasized by this study. According to (Abdullah et al., 2014), addressing problems within the banking industry also requires an understanding of the factors influencing the sector's profitability. The banking industry has been the primary focus of the majority of the government's financial structure changes. To improve banking performance, a number of adjustments have been made in the areas of ownership, market concentration, regulations, and policies.

Rahman et al. (2015) looked at a number of variables that could affect the profitability of banks in Bangladesh, including capital, risk, size, ownership structure, non-interest income in relation to total assets, the cost-to-income ratio, off-balance sheet items in relation to total assets, total liabilities in relation

to total debt, GDP growth rate, and inflation. They also discovered that loan intensity and capital strength—both equity and regulatory capital—have a favorable and significant impact on profitability. The findings also show that off-balance sheet operations and cost effectiveness have a negative and substantial impact on bank profitability. Other factors have varying effects on different profitability metrics. GDP, credit risk, and non-interest income are found to be important factors that influence NIM. ROA is positively and significantly impacted by size. Finally, both ROA and ROE are significantly impacted negatively by inflation. Although the impact varies by location, macroeconomic factors have a major impact on banks' profitability. According to a number of studies supporting the use of advanced forecasting techniques to predict future inflation patterns, inflation (IF) has a significant and beneficial impact on bank profitability among various macroeconomic factors. On the other hand, several studies have found that GDP has little to no effect on the success of Bangladesh's commercial banks, indicating that it should not be a major factor in investment strategy. Furthermore, the analysis shows that exchange rates have a significant detrimental impact on profitability, although stock market turnover has a minimal effect (Akther et al., 2023). Furthermore, a study by Gazi et al. (2021) finds that the macroeconomic variable of GDP growth rate and firm-specific factors (such as the equity to asset ratio, deposit to asset ratio, debt to equity ratio, and loan to deposit ratio) have a statistically significant impact on profitability as measured by return on equity (ROE) and return on assets (ROA). Research that looks at both macroeconomic and bank-specific factors is common in many different economies throughout the world. Bhatia, Mahajan & Chander (2012) and Sufian & Noor (2012) in India; Liu & Wilson (2010) in Japan; Shoaib, Wang, Jaleel & Peng (2015) in Pakistan; Sufian & Chong (2008) in the Philippines; Macit (2012), Alper and Anbar (2011), Alp, Ban, Demirgunes & Kilic (2010) in Turkey; Kosmidou, Tanna, and Pasiouras (2005), Sufian (2011) in Korea, Saeed (2014) in the United Kingdom, etc., conducted research on bank-specific factors that have a substantial impact on banks' profitability. Similar studies were conducted by Abdullah, Parvez, and Ayreen (2014) and Dey (2014) from the perspective of Bangladesh. The two main approaches that have shaped the corpus of research on evaluating competition in banks are structural and non-structural approaches. enterprises in the market are more likely to achieve a collective price-output arrangement that approaches the monopolistic ideal when there are fewer enterprises and a more concentrated market framework (Staikouras and Koutsomanoli-Fillipaki 2006, Berger and Hannan 1989). Work by Heggstad and Mingo (1977), Spellman (1981), Rhoades (1982), and Lloyd Williams et al. (1994) are among the earlier studies that support the SCP hypothesis. Samad and Van Horne & Wachowicz Jr. use the financial link as a metric to assess the financial results of businesses. In a similar

vein, Pandey claims that it is the best way to compare the organization's current financial ratio with past data in order to ascertain if the financial outcome has improved, decreased, or remained constant over time (Pandey, 2004). earnings from shareholders that the Bank receives. The Bank stays profitable if the benefit and related risks are skillfully managed. According to Mujeri & Younus's study findings, the need for regulatory reserves, financing costs, inflation rates, share of the deposit market, and classified loans and lending charges all have a significant impact on the interest rate differential (Mujeri & Younus, 2009). In their evaluation of the financial performance of the banking industry in Bangladesh, Chowdhury & Ahmed note a steady rise in branches, employees, deposits, loans, advances, net earnings, and EPS between 2002 and 2006. The SCP hypothesis has been supported by recent studies on emerging banking markets, such as Katib (2004) on Malaysia, Al-Muharrami and Mathews (2009) on the Arab Gulf Cooperation Council (GCC), Bhatti and Hussain (2010) on Pakistan, and Sharma and Bal (2010) on India. Mauricio Jara-Bertin, Jose Arias Moya, and Arturo Rodriguez Perales (2014) examined panel data from 78 commercial banks in Argentina, Brazil, Chile, Colombia, Mexico, Paraguay, Peru, and Venezuela between 1995 and 2010 and found a positive relationship between capital adequacy and profitability. According to empirical data presented by Demircuc-Kunt and Huizinga (1999), banks that have a higher equity ratio in relation to their assets typically perform better. Dietrich & Wanzenried (2009), Garcia-Herrero et al. (2009), Obamuyi (2013), Pasiouras and Kosmidou (2006), and Ben Naceur and Goaied (2008) all support this claim. Using data from the top 15 commercial banks in Pakistan between 2005 and 2009, Gul, Irshad, and Zaman (2011) used the pooled Ordinary Least Square (POLS) technique to investigate the relationship between macroeconomic and bank-specific factors regarding bank profitability. They discovered that all three profitability metrics—ROA, ROE, and NIM—benefit from assets, loans, equity, and deposits. Hassan & Bashir (2003) have observed that indicators of bank performance typically respond favorably to more capital. Alp, Ban said that Turkish banks become less profitable as their operating costs increase. Kilic and Demirgunes (2010). Additionally, they acknowledged that there is no statistically significant correlation between the profitability metrics and the ratio of total loans and receivables to total assets. Many scholars have examined the profitability of commercial banks, concentrating on either particular company components or more general economic issues. Sufian and Habibullah (2009) used data from 1997 to 2004 to examine the factors affecting bank profitability in Bangladesh. Their study's key finding was that profitability was adversely affected by both bank size and inflation. Using Least Squares and Fixed Effect models, they found that larger banks were more negatively impacted by inflation, highlighting the significance of macroeconomic issues on

profitability. This conclusion on bank size was supported by later research, such as Chowdhury and Salman (2021), who also noted that larger banks in Bangladesh were inefficient since their cost-to-income ratios had a negative impact on profitability. According to Dey (2014), the cost-to-income ratio, capital adequacy, and credit risk are important firm-specific characteristics that have a big impact on Bangladeshi commercial banks' profitability. Regression models were used by Sufian and Habibullah (2009) in their investigation, and the results were similar in showing that non-conducting loans had a negative effect on profitability while improved capital adequacy and effective cost control increased profitability.

According to Foisale et al. (2016), their findings supported those of Sufian and Habibullah (2009), who also found that non-performing loans had a negative impact on state-owned commercial banks' profitability. Credit risk is still a persistent problem in a number of studies. In a more comprehensive regional analysis in Bangladesh, Islam and Nishiyama (2016) found that inflation and interest rates had a major impact on profitability, especially during recessions when higher credit risks resulted in lower profitability. Larger banks are adversely affected by inflation, according to Sufian and Habibullah (2009), highlighting the significance of macroeconomic factors like inflation and interest rates in a number of studies. Bangladesh's banking sector is vital to the country's overall economic growth, but it faces many obstacles, such as low capital, non-performing loans, inefficiencies, and liquidity problems, according to research by "Tamanna Yesmine, Md. Emran Hossain, and Md. Akhtaruzzaman Khan." Thus, the purpose of this study was to evaluate the efficacy and efficiency of scheduled banks—state-owned, privately held, foreign-owned, and specialty banks—that are active in Bangladesh. The CAMELS grading system was used to assess bank performance, and Data Envelopment Analysis (DEA) techniques were used to gauge efficiency. This report offers policymakers suggestions that may result in better methods for raising the banking industry's level of efficiency and productivity.

Using data from publicly listed scheduled commercial banks, "Md. Shah Naoaj and Mir Md. Moyazzem Hosen" found a substantial negative empirical association between the cost of equity and the degree of capital maintenance of banks. The study also shows that the relationship between these two variables is significantly influenced by the quality of capital, especially Tier 1 capital.

CONCEPTUAL FRAMEWORK

Dependent Variable	Independent Variables
Return on Assets (ROA)	Capital Adequacy Ratio
	Total Loan to Total Assets Ratio (TLTAR)
	Total Loan to Total Deposit Ratio (TLTDR)
	Size of Bank
	Operating Expense to Total Assets Ratio (OPTAR)
	GDP Growth Rate

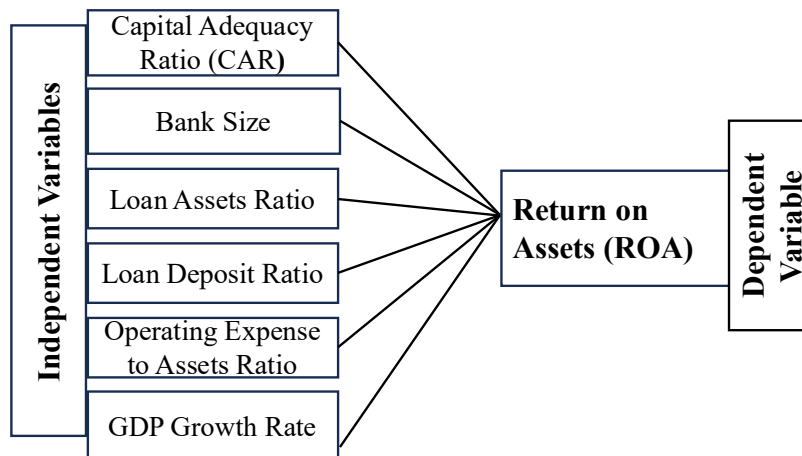


Figure: Anticipated connection between internal and external factors on profitability

Chapter Three

3. Methods and Hypothesis Development

3.1 Sample Selection and Data Resources

By examining whether macroeconomic and bank-specific factors significantly affect the profitability of commercial banks in Bangladesh, as measured by ROA since 2010, this analytical study demonstrates the relationship between these factors and profitability. CAR, the ratio of total loans to total deposits, the ratio of operating expenses to total assets, the logarithm of total assets used to determine bank size, the ratio of total loans to total assets, and macroeconomic indicators like GDP growth are among the internal metrics that will be examined in this study. Both qualitative and quantitative methods will be used in the investigation.

The chosen variables and their expected impacts on the dependent variable are presented in Table 1 for multiple regression analysis in the observational literature.

The creation of this research paper only necessitates secondary data collected through convenience sampling and a non-probabilistic method from fifteen commercial banks that have been operating in Bangladesh for 15 years, starting in 2009. Consequently, this is now panel data comprising a sample of 225.

3.2 Variable Description

Previous authors (A. N. M. Minhajul Haque Chowdhury, Ayesha Siddiqua, Jannatul Ferdous (November Mahmud (2020) r 2019; Shahnaz Parvin, Islam, 2021; Abdullah et al. 2014; Saeed Sazzad Jeris 2021; Mohammad Ahsan Uddin Lalon & Morshada, 2020; Mohammad Rokibul Hossain, September 2024;

The return on assets was used by Chowdhury et al. (2019) and Foisalet al. (2016) to evaluate the profitability of banks. The macroeconomic variable is the GDP growth rate, while the internal factors taken into account are the CAR, the ratio of total loans to total deposits, the ratio of operating expenses to total assets, the size of the bank as determined by the logarithm of total assets, and the ratio of total

loans to total assets. Table 1 lists the selected variables together with their anticipated effects on the dependent variable.

Table 1: Explanation of variables incorporated in the models

Variables	Definition	Calculation procedure	Prior studies
Dependent Variable			
ROA (Return on Asset)	Return on assets (ROA) is a financial metric that shows how profitable a company is in relation to its total assets.	Net income / Total Assets	Rumaly, 2023
Independent Variables			
Capital Adequacy Ratio (CAR)	The Capital Adequacy Ratio (CAR) is an essential indicator that assesses a bank's financial stability by evaluating its capital in relation to its risk-weighted assets.	Regulatory Capital / Risk Adjusted Assets	Lalon (2022)
Total Loans to Total Deposit Ratio (TLTD)	The loan-to-deposit ratio (LDR) is a financial measure that assesses the total loans of a bank in relation to its total deposits, presented as a percentage. It serves as an essential indicator of a bank's liquidity and lending approach.	Loans and Advances / Overall Deposits	Chowdhury and Salman (2021)
Operating Expense to Total Assets Ratio (OPETA)	The ratio of operating expenses to total assets, referred to as the operating cost to assets ratio or expense	Operating expenses / Total Assets	Hossain and Ahamed (2021)
	ratio, assesses a company's or fund's operating costs in relation to its total assets.		

Size of Bank	The size of a bank, broadly speaking, denotes the total assets held by the bank, commonly serving as an indicator of its overall magnitude and economic impact.	Log of Total Assets	Abdullah et al., 2014
Total Loan to Total Asset Ratio (TLTA)	The total debt-to-total assets ratio is a financial metric that indicates the proportion of a company's assets that is supported by debt.	Loan and Advances/ Total Assets	Shahriar et al., 2021
GDP Growth Rate	GDP growth rate is a gauge of how swiftly a nation's economy is generating goods and services.	GDP growth rate from one year to the next.	Gazi et al., 2021

3.3 Hypothesis Development

To find out how various bank-related factors affect banks' profitability, the following hypothesis has been developed:

Ho: There is no significant relationship between profitability (ROA) and various bank specific factors and macroeconomic variables

H1: There is significant relationship between profitability (ROA) and various bank specific factors and macroeconomic variables

3.4 Data Analysis Methods

Following the findings of the Hausman test and the Breusch and Pagan Lagrangian multiplier test, the random effects model of panel data analysis is used for this investigation. Relevant diagnostic tests, including the multi-collinearity, autocorrelation, and normality tests, were also carried out prior to selecting the random effect model (Wooldridge, 2004). For this investigation, the regression that follows was created.

$$ROA_{i,t} = \beta_0 + \beta_1 TLTA_{i,t} + \beta_2 TLTD_{i,t} + \beta_3 CAR_{i,t} + \beta_4 OPETA_{i,t} + \beta_5 BS_{i,t} + \beta_6 GDP_{i,t} + \varepsilon_{it}$$

Where, ROA represents return on assets. The acronyms TLTA (total loan to total assets ratio), TLTD (total loan to total deposit ratio), CAR (capital adequacy ratio), OPETA (operating costs to total assets ratio), BS (bank size), and GDP (gross domestic product growth rate). *i* indicates banks, *t* represents time (year), and ε is the error term.

Chapter Four

Organizational Profile

4.1 Background of Sonali Bank Limited

4.2 Corporate Profile

4.3 Vision, Mission, Motto & Corporate Structure of Sonali Bank

4.4 Strategic Objectives

4.5 Ethical Principles

4.6 Core Values of Sonali Bank limited

4.7 Board of Directors of Sonali Bank Limited (SBL)

4.1 Background of Sonali Bank Limited

Sonali Bank Limited is Bangladesh's largest state-owned commercial bank. It was founded by purchasing the branches of the National Bank of Pakistan, Bank of Bhawalpur, and Premier Bank, all of which functioned in East Pakistan until 1971, and was nationalized under the (Nationalisation) Order 1972. On June 3, 2007, the bank became a public limited company with total government ownership and began operations as Sonali Bank Limited (SBL), assuming all of Sonali Bank's assets, liabilities, and business operations. Following corporatisation, the bank's management was given the required authority to improve its competitiveness and run operations more efficiently.

The foundation of a subsidiary, "Sonali Investment Limited," intends to widen the banking sector and stimulate public investment, and Merchant Banking has been operational since September 14, 2009, contributing to Bangladesh's economic progress. Sonali Bank Limited demonstrates its corporate social responsibility by overseeing the establishment of the "Sonali Foundation."

Sonali Bank Limited now has 1224 branches, with 1222 in the country and two outside. Out of the 1226 domestic branches, 701 are located in rural areas, while the remaining 523 are in cities. Sonali Bank Limited conducts international trade operations through 45 branches (authorized dealers or AD branches). The bank has two international branches in West Bengal, India: one in Kolkata and another in Siliguri. Sonali Bank Limited has 11 General Manager's Offices, 46 Principal Offices, and 16 Regional Offices that handle its administrative and operational operations. Sonali Bank Limited manages its whole banking activities through 47 divisions at its headquarters. The bank has around 1.25 crore different types of client accounts in Bangladesh. Training facilities have been established to improve the skills and expertise of its officers and staff in banking operations.

4.2 Corporate Profile

Chairman	Mohammad Muslim Chowdhury
Managing Director and CEO	Md. Shawkat Ali Khan
Company Secretary	Mr. Tauhidul Islam
Legal Status	Public Limited Company
Genesis	Emerged as a Nationalized Commercial Bank in 1972
Date of Incorporation	03 June 2007
Date of Commencement	03 June 2007
Registered Office	35-42,44 Motijheel Commercial Area, Dhaka, Bangladesh
Accounting Year-end	December 31
Authorized Capital	Tk. 6000 Crore
Paid-up capital	Tk. 4530 Crore
Branches	1224
Number of Employees	21839
Credit Rating Company	Credit Rating Information and Services Limited (CRISL)
SWIFT Code	BSONBDDH
E-mail:	info@sonalibank.com.bd.
Website	www.sonalibank.com.bd

4.3 Vision, Mission, Motto & Corporate Culture of Sonali Bank Limited:

Vision:

Sonali Bank wants to be a socially responsible leading banking company with an international presence. footprint. At Sonali Bank, we find inspiration in the distant stars. Our objective is to assure that Quality that elevates each banking transaction to a delightful experience.

Our mission is to provide you with outstanding service by providing precision, dependability, fast delivery, sophisticated technology, and customized solutions for your business needs, as well as a global presence in trade and commerce and the best returns on your investments.

Sonali Bank aspires to be a socially responsible, leading banking company with an international presence. At Sonali Bank, we find inspiration in the distant stars. Our objective is to ensure excellence that turns each banking transaction into a pleasant experience.

Our mission is to provide you with outstanding service by providing precision, dependability, fast delivery, sophisticated technology, and customized solutions for your business needs, as well as a global presence in trade and commerce and the best returns on your investments.

Mission:

Committed to providing a comprehensive array of quality products that cater to the varied requirements of individuals striving to enhance their lives. Generating value for stakeholders and aiding in the socioeconomic advancement of the nation.

Slogan: Your reliable ally in advanced banking.

Corporate Culture: Employees of Sonali Bank Limited possess shared values that assist Sonali Bank Limited in upholding a corporate culture-

- ✓ Providing service to the maximum number of clients in Bangladesh
- ✓ Professional excellence is one of the top priorities
- ✓ Ability to quick decision making
- ✓ Encouraging creativity
- ✓ Flexible in response

4.4 Strategic Objectives:

- Their objective and vision prioritize transparent and high-quality commercial activities led by market forces, while conforming to legal and social frameworks.
- Their major priority is to provide our clients with effective, innovative, and high-quality products, as well as an amazing delivery system.
- Their guiding philosophy is to generate profit through quality business operations as a growing and sustainable firm while giving fair returns to our investors.
- As part of our corporate social responsibility, we are committed to supporting our community.
- Their staff is our foundation. We improve their well-being with attractive remuneration packages and promote employee morale through training, growth, and career advancement.
- Their aim to fulfill our obligations to the government by paying all applicable taxes and duties and adhering to other regulations.
- They are committed to environmental awareness and climate change, and we are dedicated to transforming our homeland into a sustainable and pristine space.

4.5 Ethical Principles:

- They adhere to the laws and regulations of our nation.
- They reject bribery and corruption.
- They steer clear of gifts and entertainment that may be compromised.
- They will raise our voices if we have any suspicion of current, intended, or possible actions that could violate any laws and regulations.
- They adhere to Anti Money Laundering standards and other regulatory requirements set forth by our supervisory authorities.
- They address customer grievances promptly and justly.
- They uphold the privacy and loyalty of our clients.
- They engage with our coworkers with equity and esteem; collaborate with a strong sense of motivation and camaraderie.

4.6 Fundamental Principles of Sonali Bank Limited:

The principal value proposition of Sonali Bank Limited comprises the following essential components, which will aid the bank in enabling its employees to collaborate as a cohesive unit in fulfilling assigned tasks and responsibilities to attain the intended goals. The core value encompasses:

Ethics:

All individuals are required to uphold the ethical standards of banking.

Objectivity:

Every individual will possess a clear goal while performing their duties.

Integrity

The protection and preservation of national and customer interests are essential components for establishing societal trust.

Accountability

All staff members are accountable for their actions and will continue to be answerable to their appropriate supervisor for their performance.

Commitment

All employees are dedicated to performing at the anticipated standard to guarantee the contentment of esteemed clients.

4.7 Board of Directors of Sonali Bank Limited (SBL)

The Board of Directors grants authority to the Executive Committee to authorize credit facilities to clients as proposed by the branch and the Management Credit Committee. The Board supervises the actions of the Executive Committee and the Bank's Management. The Board convenes once a month. It serves as the supreme body for approving any credit facilities for which authority has not been transferred.

Current Board of Directors of Sonali Bank Limited (SBL) includes the following:

Name	Position
Mohammad Muslim Chowdhury	Chairman
A. B. M. Ruhul Azad	Director
A. K. M. Kamrul Islam	Director
Ishtiaque Ahmed Chowdhury	Director
Daulatunnaher Khanam	Director
Molla Abdul Wadud	Director
Mohammad Kaykobad	Director
Md. Matiur Rahman	Director
Abul Kalam Azad	Director
Md. Shawkat Ali Khan	Chief Executive Officer and Managing Director

Chapter: Five

5. Data Analysis

This segment details the extent of the major influence of various bank-specific models in clarifying the variations in bank profitability. To evaluate the profitability of different banks, an in-depth multiple regression analysis utilizing various statistical models has been performed. Ultimately, it determines the most effective approach to elucidate the findings and carries out multiple diagnostic evaluations for the models.

The subsequent Table 1; outlines the statistics for every variable in the previously mentioned models:

5.1 Descriptive Analysis

Table: 5.1 Descriptive statistics

	Mean	Std. Dev.	min	max	Median	skewne ss	kurtosis
ROA	2.287	3.83	-0.100	17.55	.92	2.634	9.079
LoanAssetRatio	59.892	24.957	0.742	96	68.9	-1.528	4.34
CapitalAdequacyRatio	40.071	139.423	4.920	849	13.6	5.131	27.754
LoanDepositRatio	68.922	35.676	0.677	111.526	85.994	-1.172	2.759
OperatingExpenseAs~o	1.822	1.326	0.015	8.97	1.789	2.483	13.308
BankSize	12.032	1.532	8.453	15.3	12.059	-.4	3.242
GDP	6.454	1.247	3.450	7.88	6.94	-1.416	4.2

The subsequent Table 5.1 summarizes data for all variables in the aforementioned models:

Table 5.1 offers descriptive statistics for all eight independent variables that influence bank profitability variations in Bangladesh. The Return on Assets (ROA) ranges from -.001 to.1755, with a mean of 0.0228702 and a standard deviation of 0.0382972. Both the return on assets and the return on equity indicate that value changes are not very large, implying that banks can maintain the stability of their asset returns over time due to the success of their bank-specific variables. Except for two independent variables: capital adequacy ratio (CAR) and total loan to total deposit ratio, the summary statistics of the independent variables appear to be consistent, with low standard deviation values and minor differences between

variable ranges, as indicated by the minimum and maximum values. The Capital Adequacy Ratio has a considerable impact on bank profitability, with a minimum of 0.0492 and a high of 8.49; the average value is 0.4007084, and the standard deviation is 1.394233. This result implies that the banks' market growth is substantially more volatile, which has an impact on their profitability. The other variable, Total Loan to Total Deposit Ratio, has a standard deviation of 0.3567568, an average value of 0.6892163, and a data range of 0.0067696–1.115257. This data implies that banks' total loan-to-deposit ratios are unstable.

5.2 Correlation Analysis:

Correlation analysis is a statistical approach that measures the degree of linear relationship between two variables. The symbol r clearly defines this relationship, which is commonly stated as a unitless value between -1 and 1. A strong correlation shows a strong link between two variables, whereas a weak correlation indicates no significant relationship between them.

Table 5.2: Correlation Analysis

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) ROA	1.000						
(2) LoanAssetRatio	0.116	1.000					
(3) CapitalAdequacyRatio	-0.114	-0.077	1.000				
(4) LoanDepositRatio	0.161	0.615	-0.057	1.000			
(5) OperatingExpenseToAssets	0.083	0.509	0.003	0.422	1.000		
(6) BankSize	-0.687	0.206	-0.062	-0.064	-0.090	1.000	
(7) GDP	-0.030	0.001	0.051	-0.021	-0.018	0.028	1.000

The capital adequacy ratio, bank size, and GDP all have an inverse relationship with ROA. In this context, the equation shows that when capital adequacy ratio, bank size, and GDP increase, ROA decreases, and vice versa. In contrast, the total loan to total asset proportion, the loan to total deposit proportion, and the operating expense to total asset percentage all have a positive relationship with ROA. The formula states that changes in independent variables such as capital adequacy ratio, bank size, GDP, total loans to total

assets ratio, loans to total deposits ratio, and operating expenses to total assets ratio cause the dependent variable ROA to change by 0.116, -0.114, 0.161, 0.083, -0.687, and -0.030, respectively, while other variables remain constant.

5.3 Model Specification Test

This section will outline the optimal models via specific tests to illustrate how bank-specific elements influence variations in profitability.

Table 5.3: Random Effect FS Fixed Effect (Hausman Test)

	FE	RE	Difference	S. E.
TLTAR	.1524822	.0625667	.0899155	.0360972
CAR	.0008018	-.0021914	.0029932	.
TLTDR	.0213638	-.007907	.0292707	.0305655
OETAR	-.1629473	-.381459	.2185116	.
BS	-.0264399	-.0200149	-.006425	.0027324
GDP	-.054763	-.0477654	-.0069976	.
Spread	.1519827	.281757	- .1297743	.0943644
GFR	.0077705	.008525	- .0007545	.

Hausman (1978) specification test

	Coef.
Chi-square test value	13.31
P-value	.1018

The Hausman test was used to identify which of the two panel analysis methods to use (Fixed Effects Model or Random Effects Model). This test runs under two conditions: stringent homogeneity of the error term and constant variances of unobserved effects and idiosyncratic mistakes. The hypotheses for this test

are as follows: H0: The coefficient difference is not systematic, implying that the Random Effects Model surpasses the Fixed Effects Model; H1: The Fixed Effects Model is superior.

The Model is superior to the Random Effects Model. The P-value of 0.1018 for ROA, greater than 5%, indicates that the Null Hypothesis cannot be rejected.

The Random Effects Model is preferred over the Fixed Effects Model.

5.4 Random Effect VS Pooled OLS (Breusch and Pagan Lagrangian Multiplier Test)

The BPLM test is used to assess both Random Effect and Pooled OLS models. The null hypothesis states that there is no discernible difference between units since the variance between estimates is zero. The table below shows that the study has a P-value of 0.0000, which is statistically significant enough to reject the null hypothesis. This indicates that there is a considerable disparity between units, and the Pooled OLS method cannot generate better estimates than the Random Effect method.

Breusch and Pagan Lagrangian multiplier test for random effects:

	Var sd = sqrt (Var)
ROA	.0014667 .0382972
e	.0003363
u	.0183397
	.0000282
Chi-square test value	.0053092
P-value	187.11
	0.0000

5.5 Results of Regression Analysis

Table 5.5: Regression analysis

Variable	Pooled_OLS	FE	RE
LoanAssetR~o	.06104331***	.15946773***	.08746033***
CapitalAde~o	-.00374515**	0.001	-0.000
LoanDeposi~o	-0.008	0.012	-0.013
OperatingE~o	-.46261889**	-0.187	-.33312415**
BankSize	-1.9910922***	-2.8122787***	-2.4583808***
GDP	-0.018	-0.033	-0.004
_cons	24.250949***	26.238966***	28.160278***
Adj-R ²	0.543	0.3913	0.5796
No. of Observations	225	225	225

legend: * p<0.05; ** p<0.01; *** p<0.00

To assess the effect on bank profitability, random effect panel regression is employed. The coefficient for Loan Asset Ratio is positive and statistically significant at the 1% level for all models (Pooled OLS: 0.061, FE: 0.159, RE: 0.087). This indicates that an increase in the Loan Asset Ratio correlates with a rise in the dependent variable (e.g., profitability or bank performance measure). The size of the effect is greatest under the Fixed Effects model, highlighting the significance of considering unobserved heterogeneity. In the case of Pooled OLS, the coefficient is negative and significant at the 5% level (0.0037), suggesting that enhanced capital adequacy is related to a reduction in the dependent variable. However, the coefficients in both FE and RE models are nearly zero and statistically insignificant, indicating that the effect vanishes when accounting for fixed or random effects. This variable does not exhibit any significant correlation with the dependent variable in any of the models, as shown by small coefficients and lack of significance. This suggests that changes in the loan-to-deposit ratio do not have a statistically meaningful impact on the dependent variable within the examined sample. Operating efficiency shows a negative and significant influence in Pooled OLS (-0.4626) and RE (-0.3331) models

at the 1% significance level. However, the coefficient becomes insignificant in the FE model. This implies that increased operational inefficiencies (probably indicated by cost ratios) adversely affect the dependent variable, but this association may be affected by firm-specific factors. Bank size is removed from the Pooled OLS and FE models but included in the RE model, where it has a positive and significant effect (RE: 2.4583, $p < 1\%$). This suggests that larger banks perform better on the dependent variable, albeit this impact is only seen in the RE specification. The GDP coefficient is negative across all models but lacks statistical significance, implying that macroeconomic conditions (as measured by GDP growth) have no discernible effect on the dependent variable in this research. The constant term is positive and statistically significant at the 1% level in all models. While this largely depicts the dependent variable's baseline level when all independent variables are zero, it has little economic interpretation. The study underlines that Loan Asset Ratio and Operating Efficiency are important factors impacting the dependent variable, with considerable effects reported across multiple specifications. The influence of capital adequacy and bank size varies depending on the model, indicating sensitivity to estimating methodologies.

Adjusted R Square:

The adjusted R-squared values are 0.3913 for FE, 0.5796 for RE, and 0.543 for Pooled OLS. These numbers suggest that the independent variables in the Pooled OLS model can explain approximately 54.3% of the variation in ROA, while the FE and RE models can explain approximately 39.1% and 57.96% of the variation, respectively. The random effect model's relatively high adjusted R-squared suggests that it fits the data quite well.

Diagnostic Tests for ROA

5.6 Test of Heteroskedasticity

Breusch-Pagan / Cook-Weisberg examination for heteroskedasticity

Ho: Constant variance $\chi^2(1) = 0.18$

Prob > $\chi^2 = 0.6723$

The heteroskedasticity assessment investigates if the variance of errors remains consistent. The null hypothesis presupposes a constant error variance. The findings are outlined below: Chi-square statistic: 0.18, P-value:0.6723. Given that the P-value is not statistically significant, the null hypothesis cannot be dismissed, suggesting that the model does not experience issues with non-constant error variance.

5.7 Assessment of Multicollinearity

Table 5.6: Vif

Variable	VIF	1/VIF
LoanAssetR~o	2.11	0.474074
LoanDeposi~o	1.73	0.576713
OperatingE~o	1.45	0.690713
BankSize	1.16	0.860538
CapitalAde~o	1.01	0.986600
GDP	1.00	0.995783
Mean VIF	1.41	

The variance inflation factor (VIF) is employed to evaluate multicollinearity among the independent variables. A high VIF signifies a considerable level of collinearity. When the VIF value for a variable surpasses 5, it indicates a potential multicollinearity concern. Table analysis shows: Mean VIF: 1.41. Since the mean VIF is below 5, the model does not experience significant multicollinearity issues.

5.8 Test of Unit-root

Table 5.7: Unit root test

Variable	Adjusted t	P-value	Stationary
ROA	-4.7475	0.0000	Yes
TLTAR	-5.8630	0.0000	Yes
CAR	-3.6659	0.0001	Yes
TLTDR	-3.7416	0.0001	Yes
OETAR	- 5.2887	0.0000	Yes
BS	-1.8917	0.0293	Yes
GDP	-13.7743	0.0000	Yes

The Levin-Lin-Chu unit-root examination is carried out to assess if the panel data exhibits stationarity.

H_0 The panel includes a Unit Root or is non-stationary.

H_1 The panel remains fixed.

When the specific variable's P-value falls below the significance level, suggesting that the variable is stationary, the null hypothesis H_0 will be rejected. When the P value exceeds or equals the significance criterion, H_0 will not be rejected.

According to the null hypothesis (H_0), the panel is non-stationary and has a unit root. According to the test results, ROA, the dependent variable: The null hypothesis is rejected, indicating that the panel data for ROA is stationary (adjusted t^* value = -4.7475; P-value = 0.0000 < 0.05). Total loan to total asset ratio, capital adequacy ratio, total loan to total deposit ratio, operating expense to total asset ratio, bank size, and GDP are significant at the 5% level and indicate the presence of a unit root for this variable.

Chapter Six

Findings and Conclusion

6.1 Summary of Findings

The study's findings are arranged in accordance with its primary objectives, offering insights into the relationship between macroeconomic variables, bank-specific characteristics, and the profitability of Bangladesh's commercial banks.

- Aspects Associated with Banks and Profitability Measures (ROA)

The analysis revealed significant relationships between a number of bank-related variables and the profitability metric (ROA). ROA was positively impacted by the ratio of operating expenses to total assets, which suggested that the banks were operating inefficiently. Profitability and bank size were positively connected, underscoring the advantages of better resource allocation and economies of scale.

- Important Factors Affecting Profitability

The operating expense ratio and bank size are two important determinants of profitability identified in this study. These results provide useful tactics for bank executives and legislators, emphasizing the significance of improved risk management, efficient cost control, and taking advantage of economic growth.

- Econometric Analysis

A robust econometric model was employed in the study to ensure the validity of the results. While Pooled OLS was suitable for analyzing ROA, the Random Effects model offered the most correct explanation for variations in ROA. The soundness and dependability of the chosen models were confirmed by tests like the Hausman test and the Breusch-Pagan Lagrangian multiplier assessment. The findings demonstrate the dual importance of favorable macroeconomic conditions and efficient internal operations in increasing bank profitability.

6.2 Conclusion

This study looks closely at how macroeconomic and firm-specific factors affect Bangladeshi commercial banks' profitability as measured by ROA. The study emphasizes crucial factors including capital adequacy, operational efficiency, and bank size by using a robust econometric methodology. These results provide a thorough understanding of the factors influencing profitability by highlighting the complex interrelationship between internal banking operations and broader economic concerns. Addressing these problems with targeted legislative actions and operational adjustments is essential to creating a stronger and more efficient banking industry. By filling in the gaps in our understanding of the elements that affect profitability, this study contributes to the body of knowledge already in existence. It also offers valuable insights for bank executives, decision-makers, and future researchers who aim to improve the stability and sustainability of Bangladesh's financial system.

Policy Considerations (Social and Economic Impact)

The research presents practical approaches that aid in achieving larger societal and economic objectives, such as:

Financial Inclusion: By enhancing effectiveness and profitability, financial institutions can broaden their offerings to underrepresented communities, fostering increased financial inclusivity.

Economic Growth: A more stable and lucrative banking industry can improve access to credit for enterprises, fostering economic development and the generation of jobs.

Sustainability Goals: Motivating banks to embrace eco-friendly practices can be in harmony with worldwide sustainability goals while also ensuring profitability.

Consumer Benefits: Reducing costs and enhancing efficiency can result in superior customer service, decreased fees, and more competitive interest rates.

Through these contributions, the study offers a blueprint for establishing a more effective, stable, and inclusive banking industry that bolsters Bangladesh's economic growth.

6.3 Limitations

This study was conducted under particular limitations, which highlights important topics for further investigation and opens the door for more research. For instance, a more thorough analysis of the relationship between bank profitability and non-performing loans (NPLs) might provide specific insights into how effective risk management techniques are. Similarly, it could be very beneficial to look into how capital sufficiency affects financial stability over the long run throughout different economic cycles. To enable a more comprehensive examination, future studies may include more scheduled commercial banks, going beyond those listed on the Dhaka Stock Exchange (DSE).

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Appendix

Descriptive statistics

	Mean	Std. Dev.	min	max	Median	skewne ss	kurtosis
ROA	2.287	3.83	-0.100	17.55	.92	2.634	9.079
LoanAssetRatio	59.892	24.957	0.742	96	68.9	-1.528	4.34
CapitalAdequacyRatio	40.071	139.423	4.920	849	13.6	5.131	27.754
LoanDepositRatio	68.922	35.676	0.677	111.526	85.994	-1.172	2.759
OperatingExpenseAs~o	1.822	1.326	0.015	8.97	1.789	2.483	13.308
BankSize	12.032	1.532	8.453	15.3	12.059	-.4	3.242
GDP	6.454	1.247	3.450	7.88	6.94	-1.416	4.2

Table: Correlation Analysis

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) ROA	1.000						
(2) LoanAssetRatio	0.116	1.000					
(3) CapitalAdequac~o	-0.114	-0.077	1.000				
(4) LoanDepositRatio	0.161	0.615	-0.057	1.000			
(5) OperatingExpen~o	0.083	0.509	0.003	0.422	1.000		
(6) BankSize	-0.687	0.206	-0.062	-0.064	-0.090	1.000	
(7) GDP	-0.030	0.001	0.051	-0.021	-0.018	0.028	1.000

Table: Model Specification

	FE	RE	Difference	S. E.
TLTAR	.1524822	.0625667	.0899155	.0360972
CAR	.0008018	-.0021914	.0029932	.
TLTDR	.0213638	-.007907	.0292707	.0305655
OETAR	-.1629473	-.381459	.2185116	.
BS	-.0264399	-.0200149	-.006425	.0027324
GDP	-.054763	-.0477654	-.0069976	.
Spread	.1519827	.281757	- .1297743	.0943644
GFR	.0077705	.008525	- .0007545	.

Table: BP LM Test

	Var sd = sqrt (Var)
ROA	.0014667 .0382972
c	.0003363 .0183397
u	.0000282 .0053092
Chi-square test value	187.11
P-value	0.0000

Table: Regression Analysis

Variable	Pooled_OLS	FE	RE
LoanAssetR~o	.06104331***	.15946773***	.08746033***
CapitalAde~o	-.00374515**	0.001	-0.000
LoanDeposi~o	-0.008	0.012	-0.013
OperatingE~o	-.46261889**	-0.187	-.33312415**
BankSize	-1.9910922***	-2.8122787***	-2.4583808***
GDP	-0.018	-0.033	-0.004
_cons	24.250949***	26.238966***	28.160278***

Vif

Variable	VIF	1/VIF
LoanAssetR~o	2.11	0.474074
LoanDeposi~o	1.73	0.576713
OperatingE~o	1.45	0.690713
BankSize	1.16	0.860538
CapitalAde~o	1.01	0.986600
GDP	1.00	0.995783
Mean VIF	1.41	

Table: Unit root Test

Variable	Adjusted t	P-value	Stationary
ROA	-4.7475	0.0000	Yes
TLTAR	-5.8630	0.0000	Yes
CAR	-3.6659	0.0001	Yes
TLTDR	-3.7416	0.0001	Yes
OETAR	- 5.2887	0.0000	Yes
BS	-1.8917	0.0293	Yes
GDP	-13.7743	0.0000	Yes

Table: Linear regression

ROA	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
LoanAssetRatio	.061	.01	6.30	0	.042	.08	***
CapitalAdequacy Ratio	-.004	0	-11.73	0	-.004	-.003	***
LoanDepositRatio	-.008	.003	-2.46	.015	-.014	-.002	**
OperatingExpense As~o	-.463	.188	-2.46	.015	-.834	-.092	**
BankSize	-1.991	.206	-9.67	0	-2.397	-1.585	***
GDP	-.018	.1	-0.18	.857	-.215	.179	
Constant	24.251	2.303	10.53	0	19.713	28.789	***
Mean dependent var	2.287		SD dependent var		3.830		
R-squared	0.584		Number of obs		225		
F-test	33.938		Prob > F		0.000		

*** $p < .01$, ** $p < .05$, * $p < .1$

Table: Regression results fixed effect

ROA	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
LoanAssetRatio	.159	.037	4.28	0	.086	.233	***
CapitalAdequacy Ratio	.001	.001	0.92	.357	-.001	.003	
LoanDepositRatio	.012	.029	0.42	.676	-.046	.07	
OperatingExpense As~o	-.187	.126	-1.49	.139	-.435	.061	
BankSize	-2.812	.219	-12.87	0	-3.243	-2.381	***
GDP	-.033	.099	-0.33	.742	-.229	.163	
Constant	26.239	3.319	7.91	0	19.695	32.782	***
Mean dependent var	2.287		SD dependent var		3.830		
R-squared	0.503		Number of obs		225		
F-test	34.378		Prob > F		0.000		
Akaike crit. (AIC)	902.725		Bayesian crit. (BIC ₁)		926.638		

Table: Regression results random effect

ROA	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
LoanAssetRatio	.087	.018	4.83	0	.052	.123	***
CapitalAdequacy Ratio	0	.001	-0.37	.713	-.002	.002	
LoanDepositRatio	-.013	.013	-1.00	.315	-.038	.012	
OperatingExpense As~o	-.333	.127	-2.62	.009	-.582	-.084	***
BankSize	-2.458	.18	-13.68	0	-2.811	-2.106	***
GDP	-.004	.105	-0.04	.968	-.21	.202	
Constant	28.16	2.389	11.79	0	23.478	32.843	***
Mean dependent var		2.287	SD dependent var		3.830		
Overall r-squared		0.560	Number of obs		225		
Chi-square		200.914	Prob > chi2		0.000		
R-squared within		0.479	R-squared between		0.664		
*** $p<.01$, ** $p<.05$, * $p<.1$							

Cross-sectional time-series FGLS regression

ROA	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
LoanAssetRatio	.061	.01	6.37	0	.042	.08	***
CapitalAdequacy Ratio	-.004	.001	-3.15	.002	-.006	-.001	***
LoanDepositRatio	-.008	.006	-1.32	.187	-.02	.004	
OperatingExpense As~o	-.463	.149	-3.10	.002	-.755	-.17	***
BankSize	-1.991	.116	-17.19	0	-2.218	-1.764	***
GDP	-.018	.132	-0.14	.891	-.277	.241	
Constant	24.251	1.632	14.86	0	21.052	27.45	***
Mean dependent var		2.287	SD dependent var		3.830		
Number of obs		225	Chi-square		316.045		
Prob > chi2		0.000	Akaike crit. (AIC)		1058.360		
*** $p<.01$, ** $p<.05$, * $p<.1$							

Table: Ramsay Test

Ramsay RESET test using powers of the fitted values of ROA	
Ho: model has no omitted variables	
F(3, 215) = 220.65	
Prob > F =	0.0000

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