An Internship Report

On

Impact of Credit Risk, Liquidity, and Capital Adequacy on Bank Profitability: Evidence from Bangladesh.

Submitted To

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Letter of Transmittal

Md. Al-Amin

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Subject: Submission of the Internship Report.

Dear Sir,

This is a great chance for me to present my internship report on **"Impact of Credit Risk, Liquidity, and Capital Adequacy Ratio on Bank Profitability: Evidence from Bangladesh".** It is a great opportunity to present my internship report under your supervision.

The purpose of this report is to examine how different financial factors affect bank profitability. In this report, **Return on Assets (ROA)** has been used as dependent variable, while **Loan-to-Deposit Ratio (LDR), Capital Adequacy Ratio (CAR), Non- Performing Loans (NPL), and Bank Size** have been considered as explanatory variables. The analysis focuses on understanding the influence of credit risk, Liquidity management, and capital strength on overall banking performance. The study is based on secondary data collected from the annual reports of banks over the period **(2015-2024)**. Appropriate statistical and econometric methods have been applied to ensure the accuracy and consistency of the results.

I tried to put my best effort for the preparation of this report. Yet if any limitations or flaws arise, it will be my pleasure to answer any clarification and recommendation regarding this report.

I am sincerely grateful for your guidance and support throughout the completion of this report.

Yours sincerely,

Faiza Ahmed

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Acknowledgement

Every single work needs backing and direction for the fruitful accomplishment of its points and goals. This report works also had support from many hands and above all the blessings of the Almighty Allah.

I would like to convey my heartfelt appreciation to my respected supervisor, Md. Al- Amin, Assistant Professor, Department of Finance and Banking, Comilla University, for his valuable guidance, continuous support, and constructive suggestions throughout the preparation of this report.

I also appreciate the cooperation of the management and staff of Pubali Bank Limited, who provide the necessary data and information required for this study. I am especially grateful to my internship supervisor and all the officers of the bank who generously shared their knowledge, experiences and necessary information, which helped me to understand the practical aspects of banking operations.

This report is set up by me, however it is outlandish without the assistance and help of the above people so indeed I might want to express appreciation to all, Thank you.

Executive Summary

This report analyzes the impact of credit risk, liquidity, and capital adequacy on bank profitability. The study focuses on evaluating how key financial indicators influence the performance of banks, where profitability is measured by Return on Assets (ROA0. The independent variables used in this analysis include Loan-to-Deposit Ratio (LDR) as a proxy for liquidity, Capital Adequacy ratio (CAR) as a measure of capital strength, Non- Performing Loans (NPL) as an indicator of credit risk, and bank size as a control variable.

The study is based on secondary data collected from the annual reports of banks over the period 2015-2024. To ensure a comprehensive analysis, several statistical and econometric techniques have been applied. These include descriptive statistics to summarize the data, correlation analysis to examine the relationship among variables, regression analysis to measure the impact of independent variables on profitability, and the variance Inflation Factor (VIF) test to identify multicollinearity issues. Furthermore, the Hausman test has been conducted to determine the most appropriate model between Fixed Effects and random Effects.

Based on the Hausman test results, the Fixed Effects model has been selected as the suitable method for this study. The findings of the regression analysis indicate that liquidity (LDR) and Capital Adequacy Ratio (CAR) have a statistically significant impact on bank profitability. On the other hand, Credit Risk (NPL) and Bank Size do not show a significant influence on ROA during the study period.

Overall, the study provides useful insights into the key determinants of bank profitability and offers practical implications for bank management and policymakers. Effective management of liquidity and capital can improve financial stability and operational efficiency, ultimately contributing to better performance in the banking sector.

In conclusion, this report emphasizes the need for sound financial management practices in banks to ensure sustainable profitability and long-term growth.

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Chapter One

Introduction

1. Introduction

Bangladesh is a developing country where the banking sector plays a vital role in accelerating economic growth and ensuring financial stability. An efficient and well- structured banking system is essential for mobilizing savings, facilitating investment, and promoting sustainable development. Over the past few decades, the banking industry in Bangladesh has experienced significant changes due to financial reforms, technological advancements, globalization, and increased competition. These changes have improved the accessibility and quality of banking services; however, they have also introduced new challenges related to risk management, operational efficiency and profitability.

Since bank performance reflects the general stability and health of the financial system, it is a major concern for both financial institution and policymakers. Bank performance is generally measured through various financial indicators, among which profitability in one of the most important. Because it gauges how well a bank uses its assets to produce profits, return on assets (ROA) is frequently cited as a trust worthy indicator of profitability. Stronger financial success and improved management effectiveness are indicated by a greater ROA.

The profitability of banks is influenced by a number of internal and external factors. Credit risk, liquidity, and capital adequacy are thought to be the most important factors. When borrowers don't fulfil their repayment commitments, credit risk develops and has a direct impact on banks financial soundness. Non-performing loans (NPL), which highlight the issue of loans that aren't making money, are frequently used to gauge it. A greater percentage of non-performing loans (NPLs) indicates low asset quality and raises the possibility of financial losses.

Another important component that influences a banks capacity to fulfil its immediate obligations and efficiently run its daily operations is liquidity. The Loan-to-Deposit Ratio is widely used as a measure of liquidity, as it shows the proportion of loans given out of total deposits. While a higher LDR may indicate better utilization of funds, it can also increase liquidity risk if not properly managed.

Capital Adequacy is equally important in ensuring the long-term stability and solvency of banks. By comparing a bank's capital to its risk-weighted assets, the capital adequacy ratio (CAR) makes

sure the bank has enough cash on hand to cover possible losses. A robust capital base contributes to the overall stability of the banking system and boosts investor and depositor trust.

In addition to these factors, bank size often included as a control variable in financial analysis. The performance of larger banks may be enhanced by economies of scale, improved resource access, and diverse operations. However, size may also create challenges in management and operational efficiency.

In recent years, the banking sector in Bangladesh has faced several challenges, including rising non-performing loans, liquidity constraints and the need to maintain adequate capital levels. These issues have raised concerns about the overall performance and stability of banks. Therefore, it is essential to examine how these key factors influence bank profitability in order to ensure effective financial management and policy formulation.

The purpose of this research is to examine how bank profitability is affected by credit risk, liquidity, and capital sufficiency. In particular, it looks into the connection between return on assets (ROA) and its factors, such as Bank size, Loan-to-deposit ratio, Capital adequacy ratio (CAR) and Non-performing loans (NPL). The research is predicted on secondary data gathered from banks annual reports during a predetermined time frame. To choose the right model, a number of statistical and economic methods have been used, such as regression analysis, correlation analysis, variance inflation test, Hausman test, and descriptive statistics.

The findings of this study are expected to provide valuable insights into the key determinants of bank profitability and contribute to a better understanding of the financial performance of banks. The results may also assist bank management, regulators and policymakers in making informed decisions to improve efficiency, reduce risks and enhance the overall stability of the banking sector in Bangladesh.

1.2 Background of the Study

Bangladesh's banking industry has been under more and more pressure in recent years to provide steady profitability while preserving financial stability. The rapid expansion of baking activities, along with growing competition and regulatory requirements, has made it essential for banks to manage their financial resources efficiently. Among various challenges, managing credit risk, maintaining adequate liquidity and ensuring sufficient capital have become critical for banks.

Non- performing loans have been rising in many banks, which weakens assets quality and reduces income-generating capacity. At the same time, maintaining an appropriate balance between loans and deposits is necessary to avoid liquidity shortages. In order to protect against any losses, regulatory bodies also mandate that banks keep a certain amount of capital. These elements have a big impact on how well bank perform and are strongly linked to their financial well-being.

Given these circumstances, it is important to examine how these financial indicators behave over time and how they influence bank profitability. This study focuses on analyzing key variables such as Non- performing Loans (NPL), Loan-to-Deposit (LDR), Capital adequacy Ratio (CAR), and Bank Size to better understand their role in shaping bank performance.

1.3 Problem Statement

Even though the banking industry is crucial economic growth, many banks find it difficult to maintain steady and long-term profitability. Rising rates of non- performing loans, inefficient liquidity management, and challenges in maintaining adequate capital have raised concerns about the effectiveness of financial management practices in banks. These issues not only affect individual banks but also pose risks to the overall stability of the financial system.

Although these factors are widely recognized, there is still lack of clear empirical evidence on how they collectively impact bank profitability, particularly in the context of recent data. It remains uncertain which factors have the most significant influence and whether their effects are positive or negative.

Therefore, by examining the connection between credit risk, liquidity, capital adequacy, and bank profitability, this study aims to close this gap. The study intends to pin point the primary factors

influencing profitability and offer a better comprehension of the fundamental problems impacting bank performance by concentrating on return on assets (ROA) as a performance metric.

1.4 Significance of the study

The academic course is not enough to increase the vast knowledge base. It has required a real-world application to increase knowledge. The application of vast amounts of theoretical knowledge to real- world situation makes them valuable. This paper is significant because sheds light on the main variables affecting bank profitability in Bangladesh. By looking at the connection between credit risk, liquidity, capital adequacy and profitability, the study contributes to a better understanding of how banks can improve their financial performance.

The study's conclusions could help bank management create methods that effectively manage risk, maintain liquidity, control capital. It can also assist policymakers and regulatory authorities in designing appropriate policies on strengthen the banking sector. Additionally, this study may serve as a valuable reference for future researchers and students who are interested in banking performance and financial analysis.

1.5 Scope of the Study

The current study is limited to an empirical analysis of the factors that influence bank profitability, with a focus on capital adequacy, credit risk, and liquidity. Loan-to-Deposit (LDR), Capital Adequacy Ratio (CAR), Non-Performing g Loan (NPL), and Bank Size are included as explanatory variables, while return on assets (ROA) is used as a proxy for profitability.

The secondary data used in the analysis comes from selected banks for the period 2015-2024. The scope of the study is limited to the selected variables, sample banks, and the time frame, and therefore does not capture all possible determinants of bank profitability.

1.6 Research Questions

i. How does Non-Performing Loans (NPL), affect bank profitability?
ii. What is the relationship between liquidity, represented as Loan-to-Deposit ratio (LDR), and profitability?
iii. To what extent does Capital Adequacy Rati (CAR) influence the financial performance of banks?

1.7 Objectives of the Study

1.7.1 Main Objective

The study's primary goal is to investigate how bank profitability is affected by credit risk, liquidity and capital sufficiency.

1.7.2 Specific Objectives

i. To examine how bank profitability is impacted by non-performing loans (NPL).
ii. To investigate the connection between profitability and the loan-to-deposit ratio (LDR).
iii. To assess how the capital adequacy ratio (CAR) affects the performance of banks.

Chapter Two

Literature Review

2. Literature Review

A number of financial and risk-related factors bank profitability; credit risk, liquidity, capital adequacy, and bank size are among the most important. Indicators such as Return on Assets (ROA) and Net Interest Margin are commonly used to evaluate how effectively banks utilize their resources to generate earnings. In both developed and developing economies, the performance of banks largely depends on how efficiently these key factors are managed.

Credit risk, commonly measured be Non- Performing Loans (NPL), is one of the most critical factors affecting bank profitability. Numerous researchers have discovered a negative correlation between profitability and NPL. Yulyanti et al. (2023) reported that higher NPL significantly reduces ROA due to increased loan loss provisions and declining interest income. Similarly, Rani (2025) discovered that NPL has a detrimental impact on profitability, highlighting how crucial efficient credit risk management is to preserving financial stability. Berger and DeYoung (1997) highlighted that poor asset quality significantly reduces bank efficiency and profitability. Similarly, Louzis, Vouldis, and Metaxas (2012) discovered a significant inverse link between NPL and profitability, suggesting that higher problem loan levels result in lower profits. In the context of developing countries, Kwan and Eisenbeis (1997) also emphasizes that inadequate credit risk management can severely impact bank performance. In addition, Podpiera and Weili (2008) confirmed that increased loan defaults significantly reduce bank efficiency.

Liquidity is another important determinant of bank profitability and is often represented by Loan -to-Deposit ratio (LDR). Bourke (1989) found that banks with higher liquidity tend to achieve better performance due to efficient fund utilization. However, Molyneux and Thornton (1992) claimed that excessive lending in comparison to deposits could lower profitability and raise liquidity risk. Additionally, Boadi, Li, and Lartey (2016) suggested that while moderate liquidity enhances profitability, excessive liquidity can limit income-generating opportunities, highlighting the need for an optimal balance. Sari and Fauzan (2023) found that LDR significantly influences profitability, as increased lending can enhance income generation. Vodova (2011) found that liquidity has a significant impact on bank performance, especially in transitional economies. Likewise, Pradigdo et al. (2024) concluded that LDR plays a significant part in calculating ROA, albeit the impacts of direction may change based on the banking climate.

Capital adequacy, measured by the Capital Adequacy Ratio (CAR), plays a significant role in ensuring financial stability and improving profitability. Empirical evidence generally supports a positive relationship between CAR and bank performance. Jarwani et al. (2023) found that CAR has a significant positive impact on ROA, suggesting that banks with adequate capital are more resilient and financially stable. Athanasoglou, Brissimis, and Delis (2008) discovered a favorable correlation between bank performance and capital adequacy, suggesting that well capitalized banks more resilient and profitable. Similarly, Dietrich and Wanzenried (2011) reported that higher capital ratios improve bank profitability be reducing financial risk and increasing investors confidences. In addition, Berger (1995) argued that strong capital positions enhance operational efficiency and long- term sustainability. Furthermore, Demirgüç-Kunt and Huizinga (1999) concluded that strong capital positions contribute significantly to bank profitability across countries. Similarly, Rani (2025) confirmed that CAR positively effects profitability, highlighting its role in ensuring long-term sustainability.

Studies on profitability frequently use bank size as a control variable. Larger banks often benefit from economies of scale, better diversification, and improved access to financial resources. Wijayanti and Prasetya (2024) found that bank size contributes positively to financial performance when combined with key financial ratios such as CAR, NPL, and LDR. Goddard, Molyneux, and Wilson (2004) found that larger bank profit from economies of scale, which can favorably influence profitability. However, Athanasoglou et al. (2008) suggested that beyond a certain level, increased size may lead to managerial inefficiencies and reduced performance. Sufian and Habibullah (2009), in their study of Asian banks, also found mixed results about the connection between size and profitability, showing that the impact of size is contingent upon banks operational effectiveness.

In addition, broader empirical reviews support the importance of these financial indicators in explaining bank performance. Mukhtar (2024) conducted a comprehensive review and found that NPL, LDR, and CAR are consistently used as core determinants of profitability across different countries and banking systems. Pradigdo et al. (2024), who found that internal financial ratios are still crucial in explaining changes in ROA, further corroborate these findings.

Regrading developing economies, research like studies such as those by Rahman (2015) and Islam and Nishiyama (2016) have examined bank profitability in Bangladesh and similar markets. These

studies generally found that profitability is positively impacted by capital adequacy but negatively impacted by credit risk. But the impact of liquidity and bank size varies depending on the economic environment and regulatory framework. Moreover, Flamini, McDonald, and Schumacher (2009) found that bank-specific factors, including capital strength and asset quality, are major determinants of profitability in Sub-Saharan Africa.

Overall, the existing literature suggests that credit risk, liquidity, bank size and capital sufficiency are important factors that determine bank profitability. While most studies agree on the negative impact of non-performing loans and positive role of capital adequacy, the effects of liquidity and size remain inconclusive. Therefore, further empirical investigation is necessary, particularly in the context of Bangladesh, to better understand these relationships using recent data and appropriate economic techniques.

Chapter Three

Methodology of the Study

3.1. Research Design

The study used a panel data methodology- based quantitative research strategy. This design is suitable because it allows for the investigation of various banks across a number of years by combining cross-sectional and time series data by incorporating unique bank characteristics and time-specific impacts, panel data improves the results dependability. To choose the best model, the study uses a number of statistical and economic techniques, such as regression analysis, correlation analysis, descriptive statistics, the Hausman test, and the variance inflation factor (VIF) test.

3.2 Description of Data

The study's panel data dataset is made up of observations from eight commercial banks during a ten-year period from2015-2024. The data has been collected from publicly available financial statements, such as income statements and balance sheets. Both dependent and independent variables are present in the dataset required for empirical analysis. The panel nature of the data allows for a comprehensive examination of variations across banks and over time.

Financial indicators make up the quantitative data used in this study that measures profitability, liquidity, capital adequacy, and bank size. Return on Asset (ROA) is used as the dependent variable to represent bank performance, while Loan-to-Deposit Ratio (LDR), Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), and Bank Size (SIZE) are considered as independent variables.

The data are structured in a panel format, where multiple banks are observed over multiple years, enhancing the reliability and robustness of the analysis. Overall, the dataset provides a comprehensive foundation for examining the determinants of bank profitability and ensures consistency, reliability, and suitability for econometric analysis.

3.2.1 Variables of the Study

Variable	Description	Measure
Dependent Variables		
Return on Assets (ROA)	Return on asset measures the overall profitability of a bank by indicating how efficiently it makes use of all of its asset to produce net income.	ROA= Net Profit ÷ Total Assets
Independent Variables		
Non- Performing Loan Ratio (NPL)	Non-Performing Loan represents the portion of loans that are not generating income due to borrowers' failure to meet repayment obligations.	NPL= Non- Performing Loans÷ Total Loans
Loan -to-Deposit Ratio (LDR)	Loan-to-Deposit measures the proportion of a banks total loans to its total deposits, reflecting its lending capacity and liquidity position.	LDR= Total Loans ÷ Total Deposits
Capital Adequacy Ratio (CAR)	By comparing a banks capital to risk-weighted assets, the Capital Adequacy Ratio shows how strong its finances are.	CAR= Capital÷ Risk-weighted assets
Control Variables		
Bank Size (SIZE)	Bank size refers to the overall scale of a bank's operation, typically measured by the natural logarithm of total assets.	Bank Size= Natural Logarithm of Total Asset

3.3. Source of Data

- ✓ Data has been taken for 10 years started from 2015-2024.
- ✓ The data has been collected from annual reports of commercial banks and publications from Bangladesh bank.

3.4. Data collection Procedure

This section describes the process of data collection, including the population, sample unit and sample size considered for the study.

3.4.1. Population

The study's population consists of all Bangladeshi commercial banks, these institutions are important to the financial system and offer the information needed to examine how credit risk, liquidity, capital adequacy, and profitability are related.

3.4.2. Sample Size

The sample size is made from of eight selected commercial banks in Bangladesh. The study covers a ten-year period from 2015-2024, resulting in a total 80 observations (8 banks × 10 years). The selection of these banks is based on the availability and consistency of financial data required for analysis.

3.5 Sampling Technique

Purposive sampling, a non-probability sampling technique, is used in the study, for selecting the sample banks. This technique has been chosen as the selection is based on specific criteria relevant to the objective of the study. The sample banks were chosen based on their availability, consistency, and accessibility of financial data from 2015 to 2024. Only banks with comprehensive and trust worthy annual reports covering the whole-time frame were taken into account.

For this study, purposive sampling is useful since it enables the selection of banks that provide sufficient data for conducting panel data analysis. This method ensures that the sample is suitable for examining the relationship between credit risk, liquidity, capital adequacy, and profitability.

3.6. Research Instruments

The study employs the following research instruments to analyze the data and achieve the research objectives.

Instruments used for analysis:

- ✓ Ratio and Trend Analysis
- ✓ Statistical Analysis

3.6.1. Ratio and Trend Analysis

Ratio analysis is utilized to assess the state and financial performance of particular institutions. The ratio I have used are:

i. Profitability Ratio (ROA)
ii. Liquidity Ratio (LDR)
iii. Credit Risk Ratio (NPL)
iv. Capital Adequacy Ratio (CAR)
v. Control Variable (Bank size)

In addition, Trend analysis is conducted to observe the changes and patterns of these ratios over the study period (2015-2024), providing insights into the movement of profitability, credit risk, liquidity, and capital strength over time.

3.6.2 Statistical Analysis

Statistical analysis is applied to examine the relationship between variables included in the study. The tools below have been used to study the data. Such as:

i. Descriptive Statistics
ii. Correlation matrix

iii. Panel Data Regression Analysis
iv. Variance Inflation Factor (VIF) Test
v. Heteroskedasticity Test
vi. Hausman Test

3.7. Conceptual Framework of the Study

Financial metrics like Return on assets (ROA), which shows how well a bank uses its resources to produce profit, are frequently used to assess bank performance. Non-performing loans, liquidity situation, and capital adequacy are some of the major aspects that determine bank performance. Because greater default rates lower income and raise financial risk, the quality of a banks loan portfolio in particular directly affects its profitability.

In recent years, the banking sector has become a crucial pillar for economic stability and growth, particularly in developing countries like Bangladesh. A sound and efficient baking system is essential for mobilizing savings, facilitating investment, and ensuring smooth functioning of financial markets. However, the performance of banks is increasingly challenged by issues such as rising credit risk, inefficient liquidity management, and the need to maintain adequate capital in compliance with regulatory requirements.

In this context, the conceptual framework of the study presents the connection between the independent and dependent variables utilized to investigate bank profitability. Return on Assets (ROA) is considered as the dependent variable, representing the overall financial performance of banks.

The independent variables include Non-Performing Loans (NPL), Loan-to-Deposit Ratio (LDR), and Capital Adequacy Ratio (CAR), which represents credit risk, liquidity, and capital strength respectively. In addition, bank size is included as a control variable to account for the effect of scale on profitability.

3.7.1. Effect on Profitability

The framework makes the assumption that these factors directly affect bank profitability. Credit risk, measured by NPL, is expected to have a negative impact on ROA, as higher levels of non-

performing loans reduce income. Liquidity, represented by LDR, may have either a positive or negative effect depending on how efficiently funds are utilized. Capital adequacy (CAR) is generally expected to positively influence profitability, as well-capitalized banks are more stable and capable of absorbing risks. Bank size may also influence profitability through economies of scale and operational efficiency.

3.7.2 Description of the variables

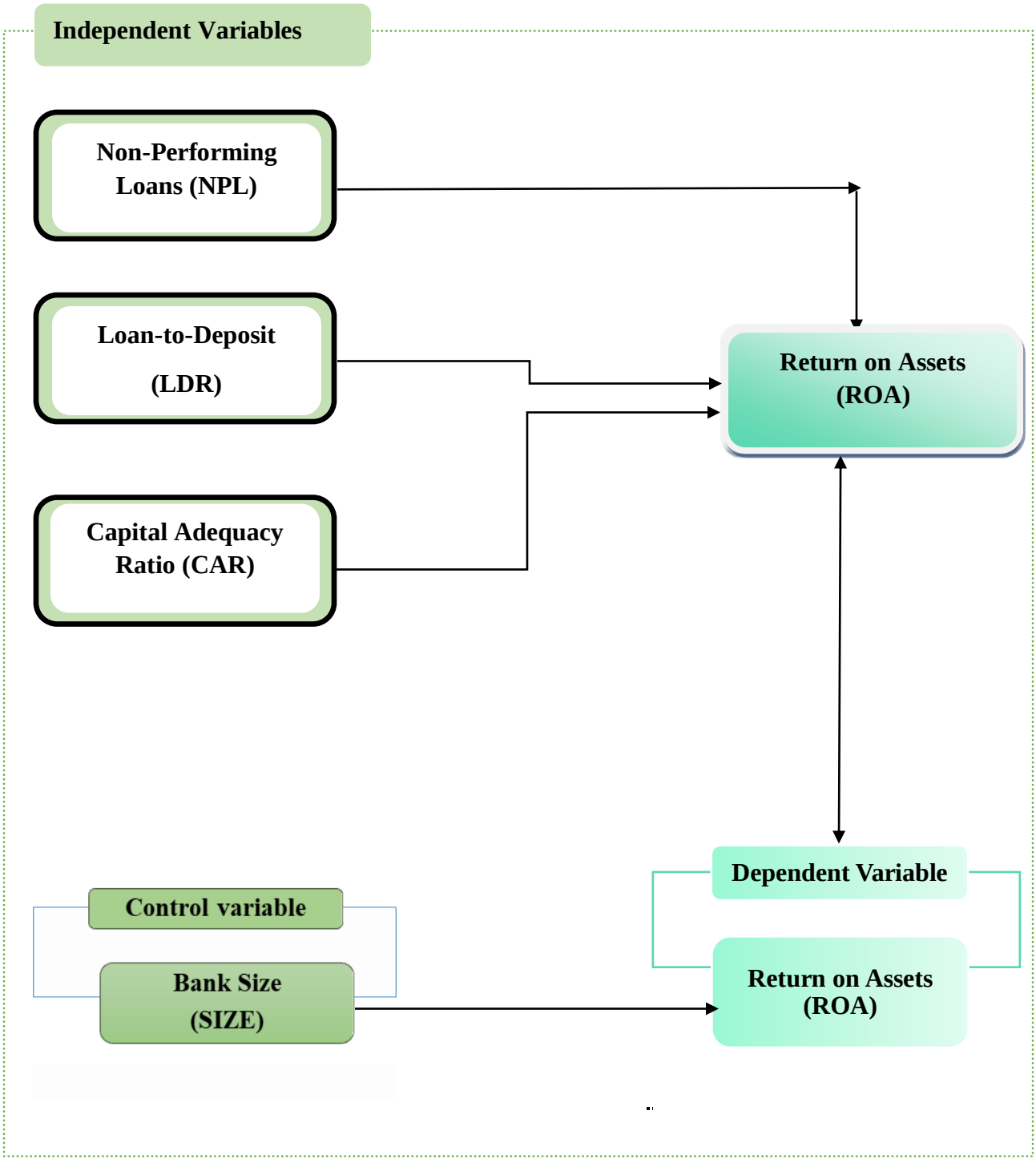
This framework illustrates the relationship between the dependent and independent variables considered in this study. It provides a clear understanding of how credit risk, liquidity, capital adequacy, and bank size influence bank profitability.

The framework is comprised of three distinct variables:

1. **Independent Variables**
   - Non-Performing Loans (NPL): It indicates the proportion of loans that are not being repaid as scheduled. A higher NPL ratio reflects poor asset quality and increased financial risk.
   - Loan-to-Deposit Ratio (LDR): It shows the percentage of total deposit that are used for lending activities. It reflects the banks' ability to manage liquidity while maintaining profitability.
   - Capital Adequacy Ratio (CAR): Represents the bank's capital strength and it measures the financial banks capital in relation to its risk-weighted assets and indicates its ability to absorb potential losses.
2. **Dependent Variables**
   - Return on Assets (ROA): Measures how profitably the bank utilizes its total assets tp generate income.

3. **Control Variables**
   - Bank Size: to account for the scale, it is calculated using the natural log of total asset. It captures the effect of scale, operational efficiency, and resource utilization on profitability.

Conceptual Framework of the study



Interpretation of the conceptual Framework

The conceptual framework illustrates the relationship between selected financial risk indicators and bank profitability. In this study, Non- Performing Loans (NPL), Loan-to-Deposit Ratio (LDR), and Capital Adequacy Ratio (CAR) are treated as independent variables, while Return on Assets (ROA) represents the dependent variable. Additionally, Bank Size (SIZE) is incorporated as a control variable to account for variations in the scale of operations among banks.

The Framework suggest that changes in credit risk, liquidity position, and capital strength significantly influence the profitability of banks. Specifically, a higher level of non- performing loans is expected to negatively affect profitability, as it reflects poor asset quality and increased credit risk. The loan-to-deposit ratio indicated the banks liquidity management efficiency, where an optimal level may enhance profitability, but excessive lending could increase risk exposure. Similarly, the capital adequacy ratio reflects the financial stability and risk-bearing capacity of a bank, which may have either a positive or negative impact on profitability depending on how efficiently capital is utilized.

Bank size in included as a control variable because larger banks may benefit from economies of scale, better diversification, and stronger market position, which can influence profitability independently of other factors. Therefore, controlling for size helps to isolate the true effect of the independent variables on ROA.

Overall, the framework assumes that all independent variables, along with the control variable, have a direct impact on bank profitability. This relationship is empirically tested in the study using statistical techniques to determine the nature and significance of these effects.

Chapter Four
Analysis and Findings

4.1 Introduction

The empirical conclusion drawn from the gathered data are presented and analyzed in this chapter, the relationship between financial risk indicators and bank profitability. To achieve the objectives of the study, various statistical techniques have been employed, including descriptive statistics, correlation analysis, regression analysis, and diagnostic tests such as multicollinearity (VIF), heteroskedasticity, and the Hausman test. These methods are applied to examine the validity of the model and to assess the impact of non-performing loans, liquidity, and capital adequacy on bank profitability.

In addition, ratio and trend analyses are conducted to observe the behavior and movement of key variables over the study period. The results obtained from these analyses provide a comprehensive understanding of how different financial factors influence the performance of selected banks

4.2. Hypothesis of the study

4.2.1. Joint Hypothesis

Null hypothesis (H_0)	There is no significant joint impact of Non-Performing Loans (NPL), Loan-to-Deposit Ratio (LDR), Capital Adequacy Ratio (CAR), and Bank Size (SIZE) on bank profitability (ROA).
Alternative Hypothesis (H_1)	There is a significant joint impact of Non-Performing Loans (NPL), Loan-to-Deposit Ratio (LDR), Capital Adequacy Ratio (CAR), and Bank Size (SIZE) on bank profitability (ROA).

4.2.2. Individual Hypothesis

1.	$\boldsymbol{H_{01}}$	There is no significant effect of Non-Performing Loans (NPL) on Return on Assets (ROA).
	$\boldsymbol{H_{11}}$	There is a significant effect of Non-Performing Loans (NPL) on Return on Assets (ROA).
2.	$\boldsymbol{H_{02}}$	There is no significant effect of Loan-to-Deposit Ratio (LDR) on Return on Assets (ROA).
	$\boldsymbol{H_{12}}$	There is a significant effect of Loan-to-Deposit Ratio (LDR) on Return on Assets (ROA).
3.	$\boldsymbol{H_{03}}$	There is no significant effect of Capital Adequacy Ratio (CAR) on Return on Assets (ROA).
	$\boldsymbol{H_{13}}$	There is a significant effect of Capital Adequacy Ratio (CAR) on Return on Assets (ROA).
4.	$\boldsymbol{H_{04}}$	There is no significant effect of Bank Size (SIZE) on Return on Assets (ROA).
	$\boldsymbol{H_{14}}$	There is a significant effect of Bank Size (SIZE) on Return on Assets (ROA).

Decision Criteria

- If the value of significance is more than 0.05, we will accept the Null Hypothesis
- If the value of significance is less than 0.05, we will reject the Null Hypothesis

4.3. Model Specification and Econometrics Framework

This study investigates the impact of credit risk, liquidity, and capital adequacy on profitability of selected banks. Bank performance is measured employing ROA or return on assets, as the dependent variable. Non-Performing Loans (NPL), Capital Adequacy Ratio (CAR), Loan-to

Deposit Ratio (LDR) are the independent variables, while Bank Size (SIZE) is incorporated as control variable to account for variations in the scale of banking operations.

To examine the relationship among the variables, panel data analysis is employed, as the dataset consists of multiple banks observed over a specific time period. The study applies both Fixed Effects and Random Effects regression models, and the appropriate model is selected based on the results of the Hausman Test. Furthermore, several diagnostic tests, including multicollinearity (variance Inflation Factor), heteroskedasticity, and autocorrelation tests, are conducted to ensure the robustness and reliability of the estimated model.

Econometric Model Formulation

$$\mathbf{ROA_{it} = \beta_0 + \beta_1\ NPL_{it} + \beta_2 LDR_{it} + \beta_3 CAR_{it} + \beta_4 SIZE_{it} + \varepsilon_{it}}$$

Where:

ROA_{it}= Return on Assets of bank i at time t

NPL_{it}= Non-Performing Loan Ratio

LDR_{it}= Loan-to-Deposit Ratio

CAR_{it}= Capital Adequacy Ratio

$SIZE_{it}$= Bank Size

β_0= Intercept

β_1- β_4= Coefficient of explanatory variables

ε_{it}= Error term

i = Individual bank

t = Time period (2015-2024)

4.4 Ratio Analysis

One technique to use numbers to assess a company's success is through ratio analysis. Ration analysis has been employed in this study to illustrate the variables trend. The following table displays the ratios trend over the previous ten years.

Table 4.4.1: Average Ratio Analysis of Selected Banks (2015-2024)

Bank Name	Avg ROA	Avg LDR	Avg CAR	Avg NPL
Pubali Bank Limited	0.61%	79.94%	12.60%	5.02%
Prime Bank Limited	0.91%	98.40%	15.88%	4.56%
City Bank Limited	1.26%	104.00%	14.57%	5.08%
Dhaka Bank Limited	0.56%	91.50%	12.39%	4.43%
Mutual Trust PLC	0.76%	97.50%	13.32%	4.82%
Sonali Bank PLC	0.31%	43.70%	10.12%	2.13%
Southeast Bank Limited	0.55%	88.00%	12.44%	6.47%
Eastern Bank Limited	1.23%	89.00%	14.44%	2.98%

Note: Values are expressed in percentage terms

Interpretation:

The table shows the average performance of selected banks based on ROA, LDR, CAR, and NPL over the period 2015-2024. In terms of profitability, City Bank Limited and Eastern Bank Limited demonstrate higher ROA, while Sonali Bank PLC shows the lowest profitability.

Regarding liquidity, City Bank limited has the highest LDR, indicating more aggressive lending, whereas Sonali Bank PLC maintains a lower Ratio. In terms of Capital Adequacy, Prime Bank Limited records highest CAR, reflecting strong financial stability.

For credit risk, Southeast Bank Limited exhibits the higher NPL ratio, suggesting higher loan default risk, while Eastern Bank Limited maintains a comparatively lower NPL, indicating better assets quality. Overall, the results reveal variations in financial performance among the selected banks.

4.5 Trend Analysis of Selected Banks

To examine the changes in financial performance over time, trend analysis has been conducted using average values of selected financial ratios 2015 to 2024.

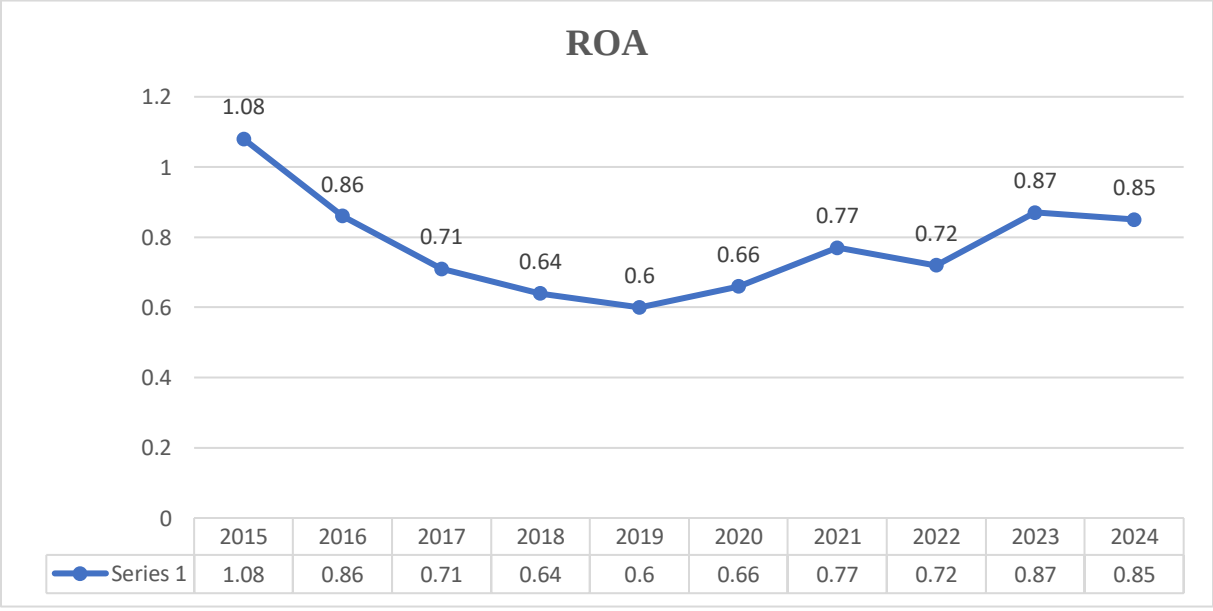
Table 4.5.1: Trend Analysis of Financial Ratios (2015-2024)

Year	Avg ROA (%)	Avg LDR (%)	Avg CAR (%)	Avg NPL (%)
2015	1.08%	77.38%	11.84%	7.49%
2016	0.86%	83.14%	12.30%	7.57%
2017	0.71%	86.53%	12.71%	9.17%
2018	0.64%	90.61%	13.02%	7.69%
2019	0.60%	90.48%	13.86%	6.66%
2020	0.66%	88.21%	14.30%	5.41%
2021	0.77%	90.89%	14.13%	6.19%
2022	0.72%	94.98%	13.78%	5.59%
2023	0.87%	91.14%	12.60%	5.81%
2024	0.85%	85.00%	13.69%	6.75%

Note: Values are expressed in percentage terms

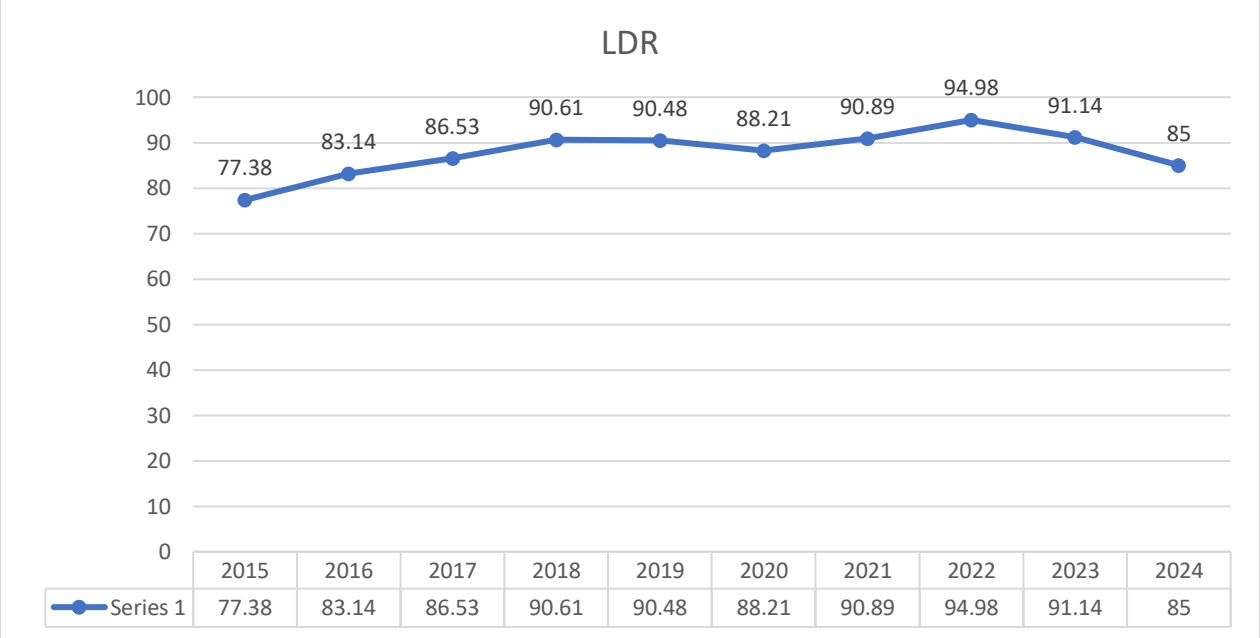
The table presents the year-wise average trend of ROA, LDR, CAR, and NPL of the selected banks over the period 2015–2024.

Figure-01: Last ten years Avg Return on Asset Ratio at a glance



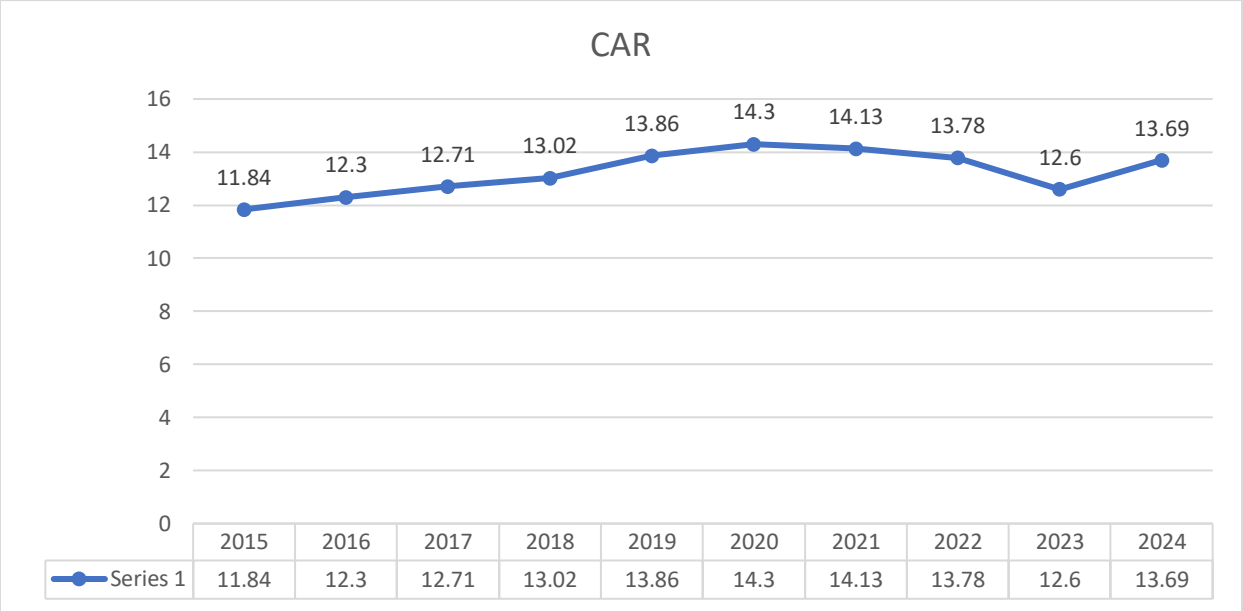
The trend of Return on Assets (ROA) demonstrates noticeable fluctuations throughout the study period, reflecting variations in the profitability of the selected banks. Initially, ROA shows a declining pattern from 2015 to 2019, indicating a reduction in operational efficiency and profit generation during these years. However, from 2020 onwards, an upward trend is observed, suggesting a gradual recovery in bank performance. Although minor fluctuations persist in the later years, the overall improvement highlights better management efficiency and enhanced profitability in recent periods.

Figure-02: Last ten years Avg Loan-to-Deposit Ratio at a glance



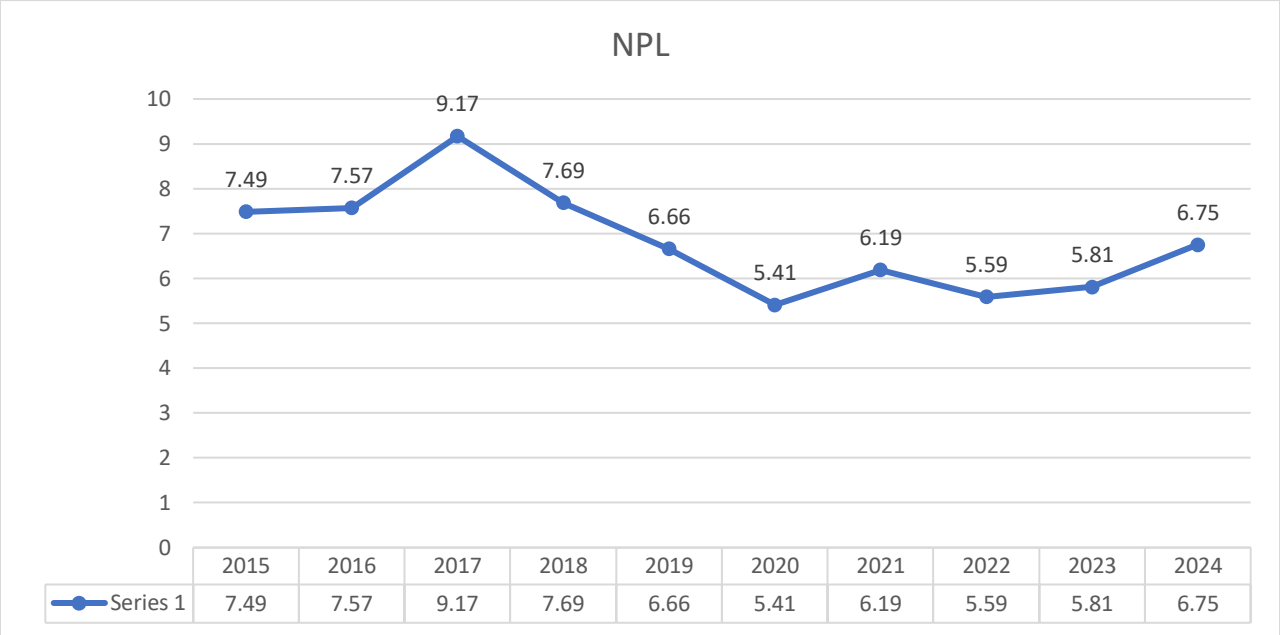
The trend of the loan-to-Deposit Ratio (LDR) exhibits moderate fluctuations over the study period, reflecting changes in the lending and liquidity management practices of the selected banks. Initially, LDR shows a steady increase from 2015 to 2018, indicating a higher proportion of loans, relative to deposits and more aggressive lending behavior. However, a slight decline is observed in 2019 and 2020, suggesting a cautious approach in lending. The ratio rises again in the following years, reaching a peak in 2022, before declining towards 2024. Overall, the trend indicates that banks maintained a relatively balanced liquidity position, with periodic adjustments in response to economic conditions and risk management strategies.

Figure-03: Last ten years Avg Capital Adequacy Ratio at a glance



The Capital Adequacy Ratio (CAR) exhibits a generally steady trend throughout the study period, reflecting the ability of the selected banks to maintain sufficient capital against potential risks. The ratio shows a gradual upward movement from 2015 to 2020, Indicating strengthening capital positions and improved financial stability. In the subsequent years, a slight decline is observed, particularly around 2022 and 2023, which may suggest increased risk exposure or adjustments in assets composition. However, a recovery in noticeable in 2024, demonstrating an effort by banks to reinforce their capital base. Overall, the pattern suggests that banks have consistently maintained acceptable levels of capital adequacy, with only minor variations over time.

Figure-04: Last ten years Avg Non-Performing Loans Ratio at a glance



The trend of Non-Performing Loans (NPL) over the study period exhibits noticeable fluctuations, reflecting changes in the quality of loan portfolios of the selected banks. Initially, NPL shows a slight increase from 2015 to 2016, followed by a sharp rise in 2017, reaching the highest level during the period. After 2017, the ratio demonstrates a consistent downward trend until 2020, indicating an improvement in credit risk management and loan recovery efforts. Although minor increases are observed in 2021 and 2023, the overall level of NPL remains lower compared to earlier years. However, a slight rise again in 2024 suggests emerging challenges in maintaining asset quality. Overall, the trend indicated that while banks have improved in managing non-performing loans over time, fluctuations still persist, highlighting the need for continuous monitoring and effective credit risk policies.

4.6. Statistical Analysis

4.6.1 Descriptive Statistics

The primary features of the data are summarized and presented in this study using descriptive statistics. They provide a simple overview of the variables and help in understanding their behavior over the study period.

In this research, descriptive statistics tools are used to present quantitative data in an organized and meaningful form, making it easier to interpret trends and variations in bank performance indicators. The analysis relies on three primary categories of descriptive statistics:

1. **Measure of central tendency**

   These metrics show the datasets typical or core value.

   - **Mean:** Displays the average value of the observations.
   - **Median:** The middle value in an ordered set of data.
   - **Mode:** Indicates the most common value in the dataset.

2. **Measure of dispersion**

   These measures show the extent to which the data are spread or dispersed around the central value.

   - **Range:** The distinction between the highest and the lowest value.
   - **Variance:** How widely observations vary
   - **Standard Deviation:** It shows the deviations of all the observations from the average value.

3. **Measure of Normality**

   These measures describe the shape of the data distribution.

   - **Kurtosis:** Determines how flat or peaked the series' distribution is.
   - **Skewness:** Indicates how asymmetrical the series is.

Table 1: Descriptive Statistics of Study Variables

Particulars	ROA	LDR	CAR	NPL	SIZE
Mean	.0076875	.8837125	.1331875	.0642537	12.95075
Max	.015	1.09	.1719	.2032	14.28
Min	.002	.43	.1007	.0269	12.21
SD	.003817	.175188	.0205288	.0482061	.570517
Range	.013	.66	.0712	.1763	2.07
Kurtosis	2.091076	4.090566	2.261478	5.67645	3.22088
Skewness	.3100992	-1.281764	.0646938	1.966206	.9711972
Median	.007	.91	.13405	.0488	12.825

Interpretation:

The descriptive statistics in Table 1 provide an overview of the key variables used in the study. The mean value of ROA is relatively low (0.0077), indicating modest profitability among the selected banks, with limited variations as reflected by a small standard deviation. The Loan-to-Deposit Ratio (LDR) shows a high average of 0.837, suggesting that banks utilize a significant portion of their deposits for lending activities, although the variability is moderate.

The Capital Adequacy Ratio (CAR) has a mean value of 0.1333, indicating that banks generally maintain adequate capital levels above minimum requirements, with relatively low dispersion. In contrast, the Non-Performing Loans (NPL) ratio shows a mean of 0.064, but with higher variability, implying fluctuations in assets quality across the study period.

Bank size exhibit a relatively high mean value (12.95) with moderate variation, suggesting differences in the scale of operations among the banks. The kurtosis and skewness values show that the majority of variables deviate from perfect normality, with some showing asymmetry and peakedness, particularly NPL and LDR.

Overall, the results suggest moderate variability in the data, with some evidence of non- normal distribution, which justifies the use of further econometric analysis in the study.

4.6.2. Correlation Analysis

Correlation analysis is used to examine the strength and direction of relationships among the variables included in the study. It helps to identify whether the independent variables are strongly correlated, which could cause problem with multicollinearity. The Pearson correlation coefficient is applied in this study.

Table 2: Correlation Matrix of Variables

	ROA	LDR	CAR	NPL	SIZE
ROA	1.0000				
LDR	0.4956	1.0000			
	0.0000				
CAR	0.5091	0.7289	1.0000		
	0.0000	0.0000			
NPL	-0.4964	-0.8293	-0.6163	1.0000	
	0.0000	0.0000	0.0000		
SIZE	-0.3968	-0.7240	-0.3649	0.7125	1.0000
	0.0003	0.0000	0.0009	0.0000	

Interpretation:

The Correlation analysis shows the relationships among ROA, LDR, CAR, NPL, SIZE.

ROA is positively correlated with LDR (0.4956) and CAR (0.5091), indicating that higher loan utilization and stronger capital adequacy are associated with better profitability. However, ROA in negatively related to NPL (-0.4964) and size (-0.3968), suggesting that increased non-performing loans and larger bank size may reduce profitability.

Among the independent variables, LDR and CAR have strong positive correlation (0.7289), while LDR is strongly negatively correlated with NPL (-0.8293). Size shows a positive relationship with NPL (0.7125) but a negative association with LDR and CAR.

Although some correlations are relatively high, most values remain below the critical threshold of 0.80, indicating that multicollinearity is not a serious concern. Therefore, the variables are suitable for further regression analysis.

4.6.3 Multicollinearity Test (VIF)

Multicollinearity between the independent variables is examined using the variance inflation factor (VIF) test.

Table 3: VIF Table

Variable	VIF	1/ VIF
LDR	5.45	0.183404
NPL	3.75	0.279793
SIZE	2.66	0.376073
CAR	2.47	0.404306
Mean VIF	3.54	

Interpretation:

The Variance Inflation Factor (VIF) results indicate that all independent variables have VIF values below the critical threshold of 10. Specifically, LDR has the highest VIF value of 5.45, followed by NPL (3.75), SIZE (2.66), and CAR (2.45). Although LDR shows a relatively higher VIF compared to other variables, it is still within the acceptable range.

The mean VIF is 3.45, which is also well within the acceptable limit. These results suggest that there is no serious multicollinearity problem among the independent variables. Therefore, all variables are suitable for inclusion in the regression analysis.

4.6.4. Heteroskedasticity Test

To determine if the variance of the error term in the regression model is constant, the heteroskedasticity test is used. The regression models heteroskedasticity can be found using the Breusch-Pagan test.

Table 4: Heteroskedasticity Test Result

Test	Chi- Square	Prob>$\boldsymbol{chi^2}$
Breusch-Pagan	**7.06**	**0.0079**

Interpretation:

The Breusch-Pagan test is conducted to examine the presence of heteroskedasticity in the model. The result shows that the p-value (0.0079) is less that 0.05, indicating the presence of heteroskedasticity. Therefore, the null hypothesis of constant variance is rejected.

Robust standard errors are used in the regression analysis to solve this problem and provide consistent and dependable outcomes.

4.6.5. Regression Analysis

This study uses panel data analysis to look at how certain financial ratios affect bank profitability between 2015-2024. Panel data integrates time series and cross- sectional dimensions, enabling more accurate and reliable results. In this analysis, Return on Assets (ROA) is used as the dependent variable, while Loan-to- Deposit Ratio (LDR), Non-Performing Loans (NPL), Capital Adequacy Ratio (CAR), and Bank Size (SIZE) are considered as independent variables.

1.Model Specification

The regression model used in this study is expressed as follows:

$$\mathbf{ROA_{it}= \beta_0 + \beta_1\ NPL_{it}+ \beta_2 LDR_{it}+ \beta_3 CAR_{it}+\beta_4 SIZE_{it}+ \varepsilon_{it}}$$

2.Panel Data Analysis

Panel Data analysis is used to control for individual bank-specific effects over time. This study applies both Fixed Effects (FE) and Random Effect (RE) models to examine the relationship between variables.

Table 5: Fixed Effect Model Results

Variable	Coefficient	Std. Error	t- value	p-value
LDR	-0.0153142	0.0043349	-3.53	0.001
CAR	0.0410378	0.024468	1.68	0.098
NPL	-0.0250254	0.0148934	-1.68	0.097
SIZE	-0.0011597	0.0010047	-1.15	0.252

The fixed effect model results indicate that LDR h a negative and statistically significant impact on ROA (β= -0.0153, $p < 0.01$), suggesting that higher loan-to-deposit ratios reduce bank profitability. CAR shows a positive relationship with ROA, but the result is not statistically significant at the 5% level ($p = 0.098$). Similarly, NPL has a negative but insignificant effect on ROA. Bank size also exhibits a negative and insignificant relationship with profitability. Overall, only LDR is found to be significant determination under the fixed effect model.

Table 6: Random Effect Model Results

Variable	Coefficient	Std. Error	z- value	p-value
LDR	-0.0097367	0.0043259	-2.25	0.024
CAR	0.0589202	0.0247118	2.38	0.017
NPL	-0.0303283	0.0137502	-2.21	0.027
SIZE	-0.0019429	0.0009065	-2.14	0.032

The random effect model results show that LDR has a negative and statistically significant effect on ROA ($\beta = -0.0097$, $p < 0.05$). CAR is positively related to ROA and is statistically significant, indicating that better capital adequacy improves profitability. ROA is severely impacted negatively by NPL. Implying that increased non-performing loan levels hinder bank performance. Bank size also shows a negative and statistically significant relationship with ROA. Overall, all variables are significant under random effect model.

3.Hausman Test

The Hausman specification test was used to select between Fixed Effect and Random Effect models in order to identify the best panel data model. The alternative hypothesis backs the fixed effect model, whereas the null hypothesis presupposes that the random effects model is suitable.

The test result shows a chi-square value of 15.12 with a probability value of 0.0045. Since the p-value is less than 0.05, the null hypothesis is rejected. Therefore, the **Fixed Effects** model is considered more appropriate for this study.

4.Fixed Effect Model Results (Robust Standard Errors)

Based on the Hauman test, the Fixed Effects model is selected as the appropriate model. To ensure more reliable result, the regression is estimated using robust standard errors.

Table 7: Fixed Effect Model Results (Robust)

ROA	Coefficient	Robust Std. Error	t-value	p-value
LDR	-0.0153142	0.0050931	-3.01	0.020
CAR	0.0410378	0.0150496	2.73	0.029
NPL	-0.0250254	0.0161098	-1.55	0.164
SIZE	-0.0011597	0.001515	-0.77	0.469

Interpretation:

The regression results show that LDR has a negative and statistically significant effect on ROA (β= -0.0153, p= 0.020), indicating that higher loan-to-deposit ratios reduce bank profitability.

CAR has a statistically significant and positive relationship with ROA (β= 0.0410, p= 0.029), suggesting that better capital adequacy improves bank performance.

NPL shows negative but statistically insignificant effect on ROA, implying that non-performing loans do not have a strong impact on profitability.

Size also exhibits a negative and insignificant relationship with ROA, suggesting that bank size does not significantly influence profitability.

Overall, the findings highlighted that LDR and CAR are the key determinants of bank performance, while NPL and Size have limited influence.

5.Overall Significance

The R-squared value indicates that independent variables explain a portion of the variation in ROA. The model as a whole is statistically significant as supported by F-statistic. The t-values and p-values confirm that LDR and CAR are statistically significant variables, while NPL and SIZE are not significant.

6.Hypothesis Testing

Hypothesis No.	Hypothesis Statement	Expected Relationship	Result	Decision
H1	LDR has a significant effect on ROA	Negative	Significant	Accepted
H2	CAR has a significant effect on ROA	Positive	Significant	Accepted
H3	NPL has a significant effect on ROA	Negative	Insignificant	Rejected
H4	SIZE has a significant effect on ROA	Negative	Insignificant	Rejected

4.7. Major Findings

The results of the study are obtained through several statistical analyses using panel data techniques. In this study, Return on Assets (ROA) is used as a proxy for bank profitability, while Loan-to-Deposit Ratio (LDR), Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), Bank Size (SIZE) are regarded as explanatory factors. The major findings are outlined as follows:

- The descriptive results show that the profitability of the selected banks remains relatively moderate during the study period, with some fluctuations observed across different years.
- The correlation analysis shows that ROA has a negative relationship with LDR and NPL, meaning that an increase in these variables tends to reduce profitability. In contrast, CAR exhibits a positive relationship with ROA, suggesting that stronger capital positions improve bank performance.
- The results from the multicollinearity test (VIF) confirm that there is no serious multicollinearity problem among the independent variables, ensuring the reliability of the regression estimates.
- The regression results indicate that LDR and CAR have a significant impact on ROA, suggesting that these variables play an important role in determining bank profitability. On the other hand, NPL and SIZE are found to be statistically insignificant, indicating a weaker influence on profitability during the study period.
- The Hausman test supports the use of the fixed effects model, highlighting that individual bank characteristics play a significant part in explaining profitability. The robust regression results further confirm that LDR has a negative and significant effect on ROA, while CAR has a positive and significant effect, reinforcing the consistency of the findings.
- The overall model is statistically meaningful, as indicated by the significance of the regression results. This implies that the selected independent variables, jointly explain variations in bank profitability.

Chapter Five

Conclusion, Recommendation and Limitations

5.1 Conclusion

This study examines the impact of bank-specific factors on profitability, where Return on Assets (ROA) is used as a measure of performance. The findings highlight that quality of loans, capital strength, and lending behavior play an important role in determining the financial performance of banks.

The findings also highlight the role of Loan-to-Deposit Ratio (LDR) in influencing bank profitability. A higher LDR indicates that banks are effectively utilizing their deposits for lending activities, which can enhance interest income. However, excessively high LDR levels may expose banks to liquidity risks, while very low ratios suggest underutilization of available funds.

One of the major insights of this study is the adverse effect of non-performing loans (NPL) on profitability. A higher level of NPL reduces interest income and forces banks to allocate additional provisions for potential losses. This, in turn, lowers overall earnings and weakens financial stability. Banks with high volume of problematic loans tend to face difficulties in maintaining liquidity and expanding their lending activities.

The results also indicate that maintaining adequate capital is essential for improving bank performance. A strong capital base enhances the ability of banks to absorb risks and supports sustainable growth. In contrast, inefficient loan management and excessive lending without proper risk assessment can negatively affect profitability.

Furthermore, the study suggests that internal management practices, such as proper credit evaluation and monitoring, are crucial in controlling loan defaults. Banks that effectively manage their loan portfolios are more likely to achieve stable and consistent returns.

Overall, the findings emphasize the importance of sound risk management, efficient credit policies, and strong financial discipline in the banking sector. Improving these areas will not only enhance the performance of individual banks but also contribute to the stability and development of the overall financial system.

5.2 Recommendations

Banks should take the following steps to improve their performance and ensure better financial stability:

- ✓ Banks should carefully manage their **loan-to-deposit ratio (LDR)**. Excessive lending without proper control may reduce profitability, so a balanced lending policy is necessary.
- ✓ Banks need to maintain a **strong capital base (CAR)**. Adequate capital helps bank absorb risks and improves overall financial performance.
- ✓ Special attention should be given to **non-performing loans (NPL)**. Even though the impact is not significant, banks should reduce bad loans through proper monitoring and recovery strategies.
- ✓ Banks should regularly **review their lending decisions** and avoid approving risky loans without proper evaluation.
- ✓ Proper **risk management policies** should be followed to minimize financial uncertainty and improve operational efficiency.
- ✓ Banks should **monitor their financial activities continuously** and take corrective actions when performance declines.
- ✓ Management should focus on **efficient use of resources,** as increasing size alone does not guarantee higher profitability.
- ✓ Training and development programs should be arranged for employees so that they can handle financial risks and loan management more effectively.
- ✓ Regulatory authorities should ensure that banks follow proper guidelines to maintain stability in the banking sector.

5.3 Limitations

This study has several limitations that should be considered when interpreting the results:

- The study is based on a limited number of banks, which may not fully represent the entire banking sector.
- The time period of the study is restricted, so the results may not capture long-term changes or recent developments in the banking industry.
- Only a few financial variables (LDR, CAR, NPL, and SIZE) are considered, while other important factors such as macroeconomic conditions and management efficiency are not included.
- The study relies on secondary data, which may contain errors or inconsistencies from original sources.
- External factors like economic shocks, inflation, or political conditions are not included, which may influence bank performance.

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