An Internship Report on "Determinants of Non-Performing Loans: A Panel Data Analysis of Commercial Banks"

An Internship Report submitted in partial fulfillment of the requirements for the Degree of Bachelor of Business Administration (BBA).

SUBMITTED TO

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SUBMITTED BY

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Class ID: 12117016

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Session: 2020-21

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DATE OF SUBMISSION

20 April 2026

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Letter of Transmittal

20 April, 2026

Dr. Md. Amdadul Hoque

Associate Professor & Head of The Department

Department of Finance & Banking,

Comilla University.

Subject: Submission of an internship report on "**Determinants of Non-Performing Loans: A Panel Data Analysis of Commercial Banks"**

Honorable Sir,

It is my pleasure to submit my research report titled "**Determinants of Non-Performing Loans: A Panel Data Analysis of Commercial Banks**" prepared as a fulfillment of my degree requirements. In this study, I have aimed to provide a comprehensive analysis of the relationship between the loan portfolio structure and the level of non-performing loans (NPL) at Commercial banks. My objective has been to shed light on how specific loan characteristics may influence the bank's financial stability. Working on this report has given me the opportunity to apply theoretical knowledge in a practical setting, deepening my understanding of loan portfolio management and its implications for financial performance.

I would like to express my sincere gratitude to you for your invaluable guidance and support throughout the preparation of this report. I hope that my efforts meet your expectations, and I would be grateful if you kindly approve this submission.

Sincerely yours,

Shuhanur Rahman

ID:12117016

Session: 2020-2021

Department of Finance & Banking Comilla University.

Supervisor’s Declaration

This is to certify the research report on “**Determinants of Non-Performing Loans: A Panel Data Analysis of Commercial Banks**” has been completed by Shuhanur Rahman, ID No: 12117016, Reg No: 12117016, Session: 2020-2021, as partial fulfillment of the requirements for the Bachelor of Business Administration (BBA) degree from the Department of Finance and Banking, Faculty of Business Studies, Comilla University.

This report has been prepared under my supervision and reflects authentic work completed successfully.

……………………

Dr. Md. Amdadul Hoque

Associate Professor & Head of The Department,

Department of Finance and Banking

Faculty of Business Studies

Comilla University.

Student Declaration

I, Shuhanur Rahman, a student of the Department of Finance and Banking, BBA 8th Batch, bearing ID: 12117016, hereby declare that the research report titled "**Determinants of Non-Performing Loans: A Panel Data Analysis of Commercial Banks**" represents the result of my own work, conducted under the supervision of Dr. Md. Amdadul Hoque, Associate Professor & Head of the Department, Department of Finance and Banking, Comilla University. I further declare that this report has been prepared for academic purposes as part of the BBA program, and I have used current data and the organization's situation in this study.

……………………

Shuhanur Rahman

ID: 12117016

Session: 2020-2021

BBA 8th Batch

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Internship Certificate

JANATA BANK PLC

Janata Bank PLC

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Ref: HRDD/Internship/Certificate/2026/89

Date: 14/01/2026

TO WHOME IT MAY CONCERN

This is to certify that **Shuhanur Rahman**, Student of BBA under the Department of Finance and Banking, **Comilla University**, Cumilla, has been conducting a three months internship with us since 14/01/2026. His student id is -12117016. He maintained steaming enthusiasm all through. His diligence delighted us. This hand on experience will sure have sweet fruition in his professional life later.

We wish him every success in life.

Sincerely Yours,

Mohammed Abu Yusuf
Assistant General Manager

Acknowledgment

First and foremost, I want to express my deepest gratitude to the Almighty for giving me the strength and perseverance to complete this research. This research report is an essential part of the BBA program, and it has been a valuable opportunity to analyze "**Determinants of Non-Performing Loans: A Panel Data Analysis of Commercial Banks**."

I am sincerely grateful to my academic supervisor, Dr. Md. Amdadul Hoque, Associate Professor & Head of the Department of Finance and Banking at Comilla University, for his invaluable guidance, encouragement, and support throughout the preparation of this report. His insights and expertise have been instrumental in helping me successfully complete this study.

I am also grateful to Mohammed Abu Yusuf, (AGM at Janata Bank PLC., Sarulia Corporate Branch), who played a vital role in my internship experience. He provided invaluable guidance, helping me understand and resolve real-world business situations, which would have been difficult to grasp at this early stage without his support.

Finally, I sincerely thank everyone who reads this term paper and those who may benefit from it now or in the future. My heartfelt gratitude also goes to all the faculty members of the Department of Finance & Banking at Comilla University, who have believed in me and continue to motivate me to pursue excellence in my career.

Executive Summary

Chapter 1: Introduction This study investigates the determinants of credit risk within the Bangladeshi banking sector, with particular emphasis on the increasing volume of Non-Performing Loans (NPLs). Employing a longitudinal panel design, the analysis comprises 100 observations from 20 commercial banks spanning 2020 to 2024. The research explores the interaction between internal bank-specific variables, including Capital Adequacy Ratios, Return on Assets, and Bank Size, and macroeconomic factors such as interest rates in shaping challenge quality. The study addresses the challenge of balancing loan growth with risk mitigation to support the goal of offering evidence-based recommendations for strengthening governments, such as the once-and-recovery frameworks in institutions like Janata Bank PLC.

Chapter 2: Literature Review The literature review demonstrates that NPLs serve as a key indicator of asset quality and pose a significant threat to financial stability. Existing scholarship classifies the determinants of NPLs into internal factors, such as deficiencies in credit analysis, loan management practices, and bank scale, as well as external macroeconomic pressures, including interest rate volatility and unemployment. The review underscores a theoretical transition from growth-oriented approaches to risk-adjusted frameworks, emphasizing that institutional stability depends on modernized administrative systems, digital transformation, and efficient judicial processes for debt recovery.

Chapter 3: Organization Profile This chapter presents an overview of Janata Bank PLC, the second-largest state-owned commercial bank in Bangladesh, which is committed to advancing socio-economic development through corporate, retail, SME, and agricultural banking services. The bank's mission emphasizes resource mobilization, robust governance, and professionalism. The profile details the bank's diverse product portfolio, including deposit schemes, credit facilities, and digital banking services, and describes its structured approach to loan classification, provisioning, and recovery, which incorporates specialized local debt collection units and legal proceedings through Money Loan Courts.

Chapter 4: Methodology The research utilizes a quantitative approach, employing a balanced panel dataset comprising 100 observations from 20 commercial banks. The methodology includes Ordinary Least Squares (OLS) regression, Variance Inflation Factor (VIF) analysis to assess multicollinearity, and the Hausman specification test to determine the appropriateness of random-effects models. Qualitative insights from professional internship experiences at Janata Bank PLC supplement secondary data from audited annual reports and central bank publications, contributing to a comprehensive analysis of credit risk determinants.

Chapter 5: Analysis The analysis reveals that the NPL ratio in the sample averages 9.303%. Regression results consistently identify "Bank Size" as a statistically significant positive determinant of NPLs, indicating that larger banks face higher credit risk, while Return on Assets (ROA) shows a significant negative correlation with NPL levels. Diagnostic tests confirm the model's integrity, and although the model is statistically significant overall, the findings indicate that NPL levels are influenced by complex, latent factors beyond the selected financial ratios.

Chapter 6: Findings, Recommendations, and Limitations The study concludes that persistent NPLs are driven by both quantitative financial metrics and operational constraints such as inadequate documentation and technological limitations. Recommendations include transitioning to a risk-adjusted growth strategy, standardizing documentation to ensure legal enforceability, and accelerating digital transformation to improve loan monitoring. Key limitations include reliance on publicly disclosed secondary data, a relatively short five-year timeframe, and unexplained variance in the regression model, suggesting that further research into non-financial and governance factors is warranted.

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CHAPTER - 1

INTRODUCTION

1.1 Introduction

The banking sector in Bangladesh serves as a critical foundation for the nation's socio-economic development, with institutions such as Janata Bank PLC playing a central role in facilitating financial activities across corporate, retail, SME, and agricultural domains. Effective credit risk management is fundamental to the operational success and stability of these institutions, as the emergence of Non-Performing Loans (NPLs) is a key indicator of asset quality and overall financial health. The proliferation of NPLs presents significant operational challenges, often resulting from complex interactions between internal bank-specific variables, including Capital Adequacy Ratios (CAR), Return on Assets (ROA), loan growth, and bank size, as well as external macroeconomic factors such as prevailing interest rates. Understanding the determinants of NPLs is therefore essential for ensuring regulatory compliance, maintaining financial stability, and implementing effective recovery mechanisms. This study examines the factors influencing credit risk in the Bangladeshi banking industry using a quantitative approach with a longitudinal panel data design. The research is based on a balanced panel dataset of 100 observations from the audited annual reports and financial statements of 20 commercial banks for the period 2020 to 2024. By integrating secondary data with institutional insights obtained through professional exposure to internal credit approval and recovery processes, the study employs rigorous econometric methods, including descriptive statistics, correlation analysis, and multiple linear regression, to assess the relationship between bank-specific characteristics and non-performing loans. The application of these diagnostic tests and model estimations provides a comprehensive analysis of the drivers of credit risk, offering findings that support stronger governance and enhanced risk management frameworks within the banking sector.

1.2 Literature Review

The management of Non-Performing Loans (NPLs) and the broader spectrum of credit risk constitute a central pillar of financial stability in the banking sector, both globally and specifically in Bangladesh. As financial institutions, including state-owned entities like Janata Bank PLC, act as critical conduits for economic development by mobilizing domestic savings and facilitating trade, their operational health is intrinsically linked to the quality of their loan portfolios. Scholarly literature consistently identifies NPLs as the primary indicator of asset quality, where their escalation directly correlates with capital shortfalls and restricted credit availability. (Akhter, 2023) The determinants of these defaults are often categorized into internal bank-specific variables and external macroeconomic factors, creating a complex ecosystem that governs institutional sustainability.

Internal factors commonly identified in the literature include Capital Adequacy Ratios (CAR), Return on Assets (ROA), loan growth, and bank size. Research indicates that weaknesses in credit analysis, inadequate loan portfolio management, and insufficient transparency during loan origination significantly increase the likelihood of default. (An Empirical research on evaluating banks' credit assessment of corporate customers, 2016) The literature also notes that while commercial banks often pursue aggressive loan growth, failure to implement strong asset quality controls can heighten credit risk. (Loan growth and quality over the credit cycle, 2024) Large institutions, in particular, encounter challenges in managing extensive portfolios, which may result in higher NPL levels if not supported by effective internal governance and monitoring systems. (Bhuiyan, 2023). Macroeconomic factors represent the second dimension of credit risk determinants. Studies emphasize that changes in national interest rates, economic volatility, and increasing unemployment reduce borrowers' repayment capacity, making traditional recovery mechanisms such as rescheduling or collateral liquidation less effective. (Hossain et al.2023, pp.45-67) Additionally, the literature highlights that Operational constraints, including outdated data management systems and inadequate documentation standards, significantly hinder a bank's ability to pursue legal enforcement, thereby increasing the challenges of debt recovery in Money Loan Courts. (Dankwah, 2025). Theoretical models in banking research generally support a multi-dimensional approach to risk management, combining econometric analysis with qualitative institutional insights. (Artificial Intelligence in Banking Risk Management: A Bibliometric Analysis, 2026) Current discourse indicates an urgent need to shift from growth-oriented strategies to risk-adjusted frameworks, where profitability metrics such as ROA are used to assess portfolio health. (Karim et al., 2023)

Recent studies in Bangladesh highlight that, while statistical models are crucial for identifying risk factors, they must be integrated with practical recovery strategies, including proactive local debt collection and digital transformation, to mitigate the contagion risks associated with persistent NPLs. (Akhter, 2023) The literature concludes that long-term stability depends on both rigorous regulatory compliance and the modernization of internal administrative and technological systems. (Doshi, 2024)

1.3 Background of the Study

The banking sector in Bangladesh is a vital cornerstone of the nation's socio-economic development, mobilizing domestic savings, facilitating trade and commerce, and generating employment opportunities. By channeling funds from surplus units to those requiring capital, commercial banks, including state-owned institutions such as Janata Bank PLC, promote industrial expansion, infrastructure development, and financial inclusion. However, the sector faces persistent structural challenges that threaten its stability, most notably the accumulation of Non-Performing Loans (NPLs).

The prevalence of NPLs is a critical concern, as these loans directly erode asset quality and can result in capital shortfalls and restricted credit flows. Elevated NPL ratios often arise from a complex interplay of internal and external factors. Institutionally, deficiencies such as inadequate credit analysis, poor loan portfolio management, insufficient borrower transparency, and lenient credit terms significantly heighten default risks. Macroeconomic variables, including high interest rates, rising unemployment, and economic volatility, further reduce borrowers' capacity to meet repayment obligations.

Understanding these determinants is crucial for maintaining the health of the banking system, as persistent NPLs can generate contagion risks that extend instability beyond individual institutions to the broader financial market. Regulatory bodies and banks must therefore implement rigorous monitoring, robust internal controls, and proactive recovery mechanisms to mitigate credit risk. This study examines these dynamics by analyzing the factors influencing credit risk in the Bangladeshi banking sector, with a focus on the relationship between financial indicators such as bank size, capital adequacy, and return on assets and the level of non-performing loans. Through quantitative analysis, the research aims to inform more effective governance and risk management frameworks that support the sustainable growth of the banking sector.

1.4 Problem Statement

The banking sector in Bangladesh is experiencing a significant escalation in credit risk, primarily reflected in the persistent and increasing volume of Non-Performing Loans (NPLs) that threaten the structural stability of commercial banks such as Janata Bank PLC. Despite the adoption of various regulatory frameworks and internal recovery strategies, management practices often struggle to balance aggressive loan growth targets with the need to maintain stringent asset quality, resulting in a disconnect between financial expansion and risk mitigation. This challenge is compounded by operational constraints, including difficulties in securing consistent, high-quality borrowers, outdated data management systems that impede accurate loan monitoring, and inadequate documentation standards that undermine legal follow-up processes. Additionally, external macroeconomic pressures, such as fluctuating interest rates and global economic shifts, further complicate borrowers' ability to meet debt obligations, reducing the effectiveness of traditional recovery methods such as rescheduling or collateral liquidation. There is therefore an urgent need to investigate how internal bank-specific variables, including capital adequacy, profitability, and loan growth, interact with these challenges. Without a comprehensive understanding of these determinants, commercial banks will continue to face obstacles to sustainable growth, as non-performing assets restrict future lending capacity and adversely affect long-term profitability.

1.5 Significance of the Study

The significance of this study lies in its provision of a comprehension. This study is significant in providing a comprehensive empirical framework to enhance credit risk governance and operational stability within the Bangladeshi banking sector. By rigorously analyzing the determinants of Non-Performing Loans (NPLs) using a longitudinal panel dataset from 2020 to 2024, the research delivers actionable insights for regulatory bodies and bank management to refine credit approval processes and implement more proactive loan recovery mechanisms. The study bridges theoretical econometric modeling with the practical realities encountered by credit officers, enabling institutions such as Janata Bank PLC to identify internal vulnerabilities, including capital adequacy and profitability gaps, that directly affect asset quality. By assessing the influence of diverse macroeconomic and bank-specific factors on long-term financial health, the research supports the development of more robust institutional strategies, fostering a resilient banking environment capable of sustaining growth and managing economic volatility. Systematizing these findings, the study contributes to academic discourse on credit risk management and empowers practitioners to make evidence-based decisions that protect capital, improve liquidity management, and ensure the long-term sustainability of the banking industry.

1.6 Scope of the Study

The scope of this study encompasses a quantitative assessment of the credit risk management practices within the Bangladeshi banking sector, specifically focusing on the determinants of Non-Performing Loans (NPLs) across 20 selected commercial banks. By utilizing a longitudinal panel dataset spanning the five-year period from 2020 to 2024, the research captures the impact of both internal bank-specific indicators such as the Loan Growth Rate (LGR), Capital Adequacy Ratio (CAR), Return on Assets (ROA), Bank Size, and the Loan-to-Deposit Ratio (LDR) and external macroeconomic influences like national interest rates on institutional asset quality. The investigation adopts a rigorous econometric methodology, employing Ordinary Least Squares (OLS) regression, VIF analysis for multicollinearity, and Hausman specification tests to ensure statistical reliability, while simultaneously incorporating qualitative institutional insights regarding credit approval and recovery processes gathered through professional exposure. Furthermore, the study explores the practical challenges of loan administration, including issues related to borrower quality, documentation standards, and technological limitations, thereby providing a comprehensive view of the multifaceted factors contributing to credit risk. By concentrating on a balanced panel of 100 observations, the research establishes a robust foundation for evaluating how these variables interact to shape the credit landscape, ultimately aiming to inform more effective governance frameworks and sustainable risk management policies for commercial entities such as Janata Bank PLC.

1.7 Research Question

The primary research question guiding this study is the extent to which specific internal bank characteristics namely the Loan Growth Rate, Capital Adequacy Ratio, Return on Assets, Bank Size, and Loan-to-Deposit Ratio alongside macroeconomic variables such as interest rates, significantly influence the levels of Non-Performing Loans (NPLs) within the Bangladeshi commercial banking sector. The study aims to determine the nature and statistical significance of the relationships between these independent variables and credit risk, specifically examining whether metrics such as profitability and bank scale are reliable predictors of asset quality deterioration over the five-year period from 2020 to 2024. Additionally, the research investigates whether a comprehensive econometric analysis, accounting for institutional differences between state-owned and private commercial banks, can yield actionable insights to mitigate default risks, and identifies which financial determinants are most critical for maintaining the structural stability and long-term performance of banks such as Janata Bank PLC amid ongoing economic volatility.

1.8 Objectives of the Study

1.8.1 Broad Objectives

The broad objectives of this study is to conduct a comprehensive quantitative evaluation of the determinants of credit risk in the Bangladeshi commercial banking sector, with a focus on identifying the internal and macroeconomic factors that significantly influence the accumulation of Non-Performing Loans (NPLs) within the industry from 2020 to 2024.

1.8.2 Specific Objectives

1. To empirically measure the impact of bank-specific financial indicators, including the Loan Growth Rate (LGR), Capital Adequacy Ratio (CAR), Return on Assets (ROA), Bank Size, and the Loan-to-Deposit Ratio (LDR), on the level of Non-Performing Loans.
2. To analyze the influence of macroeconomic variables, specifically national interest rates, on the credit risk profiles of the selected commercial banks.
3. To assess the relationship between bank size and NPL levels, examining whether larger commercial institutions exhibit distinct asset quality trends compared to their smaller counterparts.
4. To evaluate the efficacy of current loan recovery methods and internal credit management policies at Janata Bank PLC through a synthesis of quantitative financial data and qualitative professional insights.
5. To provide evidence-based recommendations that can assist regulatory bodies and bank management in formulating more robust risk management frameworks and governance strategies to mitigate future defaults.

CHAPTER - 2

ORGANIZATION PROFILE

2.1 Vision of Janata Bank

Janata Bank PLC envisions being the bank of choice in Bangladesh, combining credit and commerce for sustainable growth while supporting socio-economic progress. With a commitment to responsive service, innovation, and teamwork, JBL aims to become Bangladesh's leading commercial bank and a key player in South Asia. Upholding ethical lending practices and social responsibility, JBL seeks to build customer loyalty, foster professionalism, and contribute actively to a prosperous Bangladesh.

2.2 Mission of Janata Bank

Janata Bank PLC is dedicated to creating opportunities for clients by providing tailored services and fostering strong relationships. The bank mobilizes financial resources locally and internationally to support agriculture, industry, and socio-economic development across Bangladesh. With a commitment to trade, commerce, and industry, JBL also plays a catalytic role in developing the country’s capital markets. Engaging actively in foreign exchange and international trade, JBL offers competitive rates and a range of foreign exchange services, from letters of credit to export documentation. With a strong focus on good governance, Janata Bank aims to deliver exceptional services at minimal costs, making banking convenient and accessible. Driven by professionalism and ethical standards, the bank aligns with globally accepted banking and accounting principles. Each Janata Bank professional is committed to excellence, continuous learning, and a drive to exceed set goals. By walking the extra mile for customers, JBL professionals ensure clients’ success, fostering loyalty and solidifying the bank’s role as a dependable, strong financial institution that contributes to a prosperous and developed Bangladesh.

2.3 Core Values of Janata Bank

1. For Clients: Make customer service a top priority by providing polite, effective, and respectful service across all banking activities, consistently attending to client demands with professionalism and dependability.
2. For Workers: Establish a welcoming workplace that prioritizes the professional development and well-being of its employees.
3. For shareholders: Maintain a solid capital basis and sustainable profitability to guarantee a just return on investment.

4. For Community: Act as a socially conscious business, supporting economic and social advancement in accordance with national goals and policies.
5. For Professionalism and Integrity: Maintain the highest moral standards in all facets of service, emphasizing ongoing development and prudent financial management.

2.4 Strategic Goals

1. Nationwide Service Accessibility: To guarantee that financial solutions are available to all areas and communities by offering complete banking services to citizens throughout the entire nation.
2. Cost-Effective Service Delivery: To provide banking services at the most reasonable and competitive prices while upholding excellent standards of quality and efficiency across the board.
3. Operational Efficiency: To ensure that the bank achieves its objectives in a timely and economical manner by improving operational effectiveness through streamlined procedures and ongoing improvement.
4. Strong Governance: To uphold a robust framework for internal and external governance, led by a cooperative and accountable board of directors, guaranteeing accountability and transparency in every facet of the bank's activities.

2.5 Corporate Profile

Particulars	**Values**
Name	Janata Bank PLC
Genesis	Janata Bank PLC, the 2nd largest State-Owned Commercial Bank (SCB) in Bangladesh, is playing pivotal role in overall financial activities of the country. The Bank emerged as ‘Janata Bank’ by combining the erstwhile United Bank Limited and Union Bank Limited under the Banks Nationalization Order (President’s Order- 26) of 1972 and was restructured as a limited company in November, 2007. Since inception in 1972 the Bank has commendably contributed to the socio-economic development

	of Bangladesh and helped structuring solid financial ground of the country as well.
Registered Address	Janata Bhaban, 110, Motijheel Commercial Area Dhaka - 1000, Bangladesh.
Legal Status	Public Limited Company
Chairman	M. Fazlur Rahman
CEO & Managing Director	Md. Abdul Jabbar
Company Secretary	Mansur-Ul Haque Md. Jahangir
Date of Incorporation	9 May 2007
Authorized Capital	BDT 30,000 million
Paid up Capital	BDT 23,140 million
Face value per share	BDT 100 per share
Shareholding pattern	100% Share owned by the Government of Bangladesh
Number of employees	12,619
Banking license obtained from Bangladesh Bank	31 November, 2007
Phone	+88 02-223380029, +88 02-223380042, +88 02-223385042, +88 02 223386142, +88 02-223350193
Slogan	Your commitment partner in progress
Number of branches	922
Fax	88-02-9554460, 9553329, 9552078
Total Customer Deposit	1,103,260.62.
SWIFT	JANBBDDH
Website	www.jb.com.bd/

2.6 Service Offered by Janata Bank PLC

1. Janata Bank PLC focuses on offering financial services in a variety of industries and works in various important business domains. These are its primary business sectors:
2. Corporate banking: Providing a variety of services to big businesses, such as project

financing, trade financing, working capital loans, and more.

3. Retail banking is the provision of services to individual clients, such as current and savings accounts, debit and credit cards, personal loans, and remittance services.
4. SME Banking: Providing specialized financial solutions to small and medium-sized businesses, including cash management, working capital financing, and business loans.
5. Agricultural banking is the provision of credit facilities and other financial services to the agricultural industry, assisting farmers and agribusinesses with investments in agriculture-related projects and seasonal financing.
6. Islamic banking: Serving clients seeking interest-free banking solutions by providing Shariah-compliant financial products and services.
7. Foreign Trade and Remittances: Using trade financing, foreign currency transactions, and letters of credit to facilitate international trade. For Bangladeshi expatriates, the bank also provides remittance services.
8. Investment and Treasury Operations: Managing the bank's asset-liability and preserving liquidity through money market operations, foreign exchange transactions, and investments in corporate and governmental securities.

2.7 Product Offered by Janata Bank

Particulars	**Elements**
Deposit Products	Savings Accounts Current Accounts Fixed Deposit Receipts Special Deposit Schemes
Loan and Credit Products	Personal Loans Agricultural Loans SME Loans Corporate Loans Export and Import Financing Retail Loans

Islamic Banking Products	Mudaraba Savings Account Mudaraba Term Deposit Bai-Muajjal and Ijara Financing Shariah-Compliant Investment Schemes
Digital Banking Services	Mobile Banking Online Banking (Internet Banking) ATM Services
Treasury and Investment Products	Treasury Bills and Bonds Corporate Bonds Money Market Instruments
Special Products	Special NRB Products Special Deposit Products

2.8 Service Offered by Janata Bank PLC

Particulars	**Elements**
Card Services	Debit Cards Credit Cards Prepaid Cards
Digital Banking Services	Mobile Banking Online Banking (Internet Banking) ATM Services
Foreign Trade Services	Letters of Credit (LC) for Imports and Exports Foreign Currency Accounts Trade Finance Solutions
Remittance Services	Domestic and International Remittance Services.

2.9 Types of loan

Janata Bank PLC offers four different kinds of loans. They are:

1. Constant Loan

2. Long-Term Loan

3. Demand Loan

4. Loan under a Special Scheme

Constant Loan: Overdrafts and cash credits are examples of short-term, renewable credit facilities for working capital needs.

Term Loan: A fixed-repayment long-term loan for infrastructure or equipment investments.

Demand Loan: A flexible loan that can be repaid on demand and is frequently given for special or urgent financial requirements.

Loan for Special Schemes: Targeted loans with preferential terms that are intended for particular uses, such as housing, education, or small business help.

2.10 Loan classification

Loan Type	**Substandard**	**Doubtful**	**Bad/Loss**
Continuous Loan	Due for 3 months less than 9 months	Due for 9 months less than 12 months	Due for 12 months or more
Demand Loan	Due for 3 months less than 9 months	Due for 9 months less than 12 months	Due for 12 months or more
Term Loan	Due for 9 months less than 15 months	Due for 15 months less than 18 months	Due for 18 months or more
Micro Credit	Due for 12 months less than 36 months	Due for 36 months less than 60 months	Due for 60 months or more

2.11 Loan Provisioning:

Loan Type	Unclassified	Substandard	Doubtful	Bad/Loss
Continuous Loan	1%	20%	50%	100%
Demand Loan	1%	20%	50%	100%
Term Loan	1%	20%	50%	100%
Micro Credit	1%	5%	5%	100%

2.12 Loan Classification and Its Impact on Non-Performing Loans

An essential technique for assessing the caliber of a bank's loan portfolio and figuring out its financial stability is loan classification. It guarantees adherence to legal requirements and assists in identifying loans with different default risks. In this study, we examine Janata Bank's classified and unclassified loans with an emphasis on how they affect non-performing loans (NPLs).

2.13 Janata Bank Loan recover method

1. **First Contact with Borrowers:** In order to explore repayment choices and determine the likelihood of successful collection, the recovery process starts with contacting borrowers.
2. **Primary Recovery Techniques Cash Payment Collection:** The bank makes an effort to collect past-due sums in cash.
3. **Rescheduling in accordance with Bangladesh Bank Guidelines**: The bank may reschedule the loan in accordance with central bank policy, giving the borrower a new repayment schedule.
4. **Exit Strategy and Write-Off:** The bank may take formal legal action, such as filing lawsuits with Money Loan Courts for official involvement, or reduce outstanding debt through write-offs for loans that are judged irrecoverable.
5. **Enhanced Recovery Actions:** To help encourage repayment, the bank may get in touch with the borrower's relatives, neighbors, or esteemed community members.
6. **Sending Recovery Notices:** As a reminder of unpaid debt, the borrower receives an official recovery letter.
7. **Issuing Final Legal Notice:** The bank issues a formal legal notice if its earlier efforts are unsuccessful.

8. **Creating a Local Debt Collection Unit:** At local branches, specialized teams are assembled to concentrate on loan collection.
9. **Regular Quarterly Visits:** To keep an eye on and assist with the recovery process, bank officials visit the borrower's place of business or property on a quarterly basis.
10. **Establishing a Head Office Task Force:** A group at the bank's main office oversees and assists with recovery initiatives at all branches.
11. **Liquidating Collateral Assets:** If money needs to be recovered, the bank sells collateral.
12. **Appointing Legal Representation:** When legal action is necessary, lawyers are consulted.

2.14 Limitations in Janata Bank's Loan Advancement Section:

1. **Lack of Quality Borrowers:** The bank occasionally has trouble finding trustworthy and consistent borrowers, which lowers loan quality and raises risk.
2. **Inconsistent Borrower Characteristics:** The bank's risk is increased when borrowers don't display the ideal traits for prompt repayment and responsible loan utilization.
3. **Incapacity to Guarantee Borrower Commitment:** Some borrowers don't follow through on their commitments, which causes delays in payments and more follow-up work.
4. **Limited Variety in Loan Schemes:** There is a lack of diversity in the bank's loan offerings, and some of the current loan schemes might not be as successful in satisfying the needs of contemporary borrowers.
5. **Overdue Payments on Older Loans:** The bank's capacity to provide new loans is hampered by a backlog of outstanding older loans.
6. **Inadequate Information on Past Loans:** It can be challenging to manage and pursue default situations when there are gaps in data and records regarding previous loans.
7. **Inadequate Documentation Standards:** Inadequate documentation procedures result in incomplete loan records, which undermine legal follow-ups and make debt recovery more difficult.
8. **Competitive Loan Interest Rates:** The bank's profitability is impacted by the fiercely competitive interest rate environment, which also limits its power to modify rates.
9. **Limited Technological Resources:** The bank's ability to process loans and manage data efficiently is hampered by antiquated technology.
10. **Low Promotion of Loan goods:** Inadequate marketing and promotional efforts for loan goods limit potential borrower outreach and lower public knowledge.

2.15 JBL’s Corporate Social Responsibilities

Since Bangladesh Bank publicly adopted CSR in 2008, the country's banking sector has placed a great deal of emphasis on it. However, long before this formalization, Janata Bank PLC (JBL) has been involved in community-focused activities. With more than 40 years of experience, JBL works to fulfill its social obligations through active involvement in CSR initiatives as well as policy-driven initiatives.

In order to satisfy its economic, environmental, and ethical obligations across its activities, JBL seeks to enhance stakeholder participation in its CSR initiatives in accordance with Bangladesh Bank's rules. JBL committed over 1.89 crore BDT to CSR initiatives in 2017, focusing on important sectors that complemented its objectives. According to JBL, corporate social responsibility (CSR) is a commitment to enhancing societal well-being, especially for impoverished populations that lack access to basic essentials like food, healthcare, and education. Since Bangladesh suffers particular difficulties due to climate change, environmental issues, cultural heritage, and disaster relief are important considerations.

CHAPTET - 3

METHODOLOGY OF THE STUDY

3.1 Research Design

The research methodology for this study follows a quantitative approach using a longitudinal panel data design to analyze 100 observations from 20 commercial banks over the period 2020–2024. Utilizing secondary data extracted from audited annual reports and central bank publications, the study evaluates the impact of bank-specific factors including Loan Growth Rate, Capital Adequacy Ratio, Return on Assets, Bank Size (measured as the natural log of total assets), and Loan-to-Deposit Ratio. Alongside the macroeconomic variable of Interest Rates on the dependent variable, Non-Performing Loans (NPL). The econometric analysis is conducted via Stata, initiating with descriptive statistics and a correlation matrix to detect multicollinearity, followed by the Hausman test to select the most appropriate estimation technique between Fixed Effects and Random Effects models. Finally, diagnostic tests for heteroscedasticity and serial correlation are applied to ensure the statistical reliability and integrity of the regression coefficients.

3.2 Description of Data

The dataset for this study consists of a balanced panel of 100 observations, constructed by tracking 20 commercial banks over a five-year period from 2020 to 2024. The data is secondary in nature, primarily sourced from the audited financial statements and annual reports of the selected banks to ensure the accuracy of bank-specific variables such as Non-Performing Loans (NPL), Capital Adequacy Ratio (CAR), Return on Assets (ROA), and the Loan-to-Deposit Ratio (LDR). To account for macroeconomic influences, national interest rate data is integrated into the panel. For the purpose of regression analysis, "Bank Size" is treated as the natural logarithm of total assets to normalize the scale of financial figures. This panel structure is specifically designed to capture both the individual characteristics of the banks and the temporal changes within the banking sector over the specified half-decade, providing a comprehensive view of the factors driving credit risk.

3.3 Primary Sources

Primary sources for this study involve the insights and practical knowledge gained during a professional internship at a commercial bank. This firsthand experience provided the necessary context to interpret the secondary data, allowing for a deeper understanding of internal credit approval processes, loan recovery mechanisms, and the qualitative factors that contribute to the rise of non-performing loans within the banking sector.

3.4 Secondary Sources

The **secondary sources** form the core of the quantitative analysis, consisting of a balanced panel dataset of 100 observations. These were meticulously compiled from the audited annual reports and financial statements of 20 commercial banks covering the period from 2020 to 2024. Additional secondary data, such as the prevailing interest rates and industry-wide benchmarks, were retrieved from official central bank publications, the World Bank database, and national economic surveys.

3.5 Data Collection Procedure

3.5.1 Population

The population for this study encompasses all commercial banks operating within the banking sector. This includes state-owned commercial banks, private commercial banks, and foreign commercial banks. By considering the entire commercial banking industry, the study establishes the broad context within which credit risk and loan portfolio qualities are managed across varying institutional structures.

3.5.2 Sample Unit

The sample unit is defined as an individual commercial bank (including Janata bank plc). Each unit represents a distinct financial entity with its own specific internal management policies, capital structures, and loan portfolio compositions. For this research, the units are selected based on the availability of audited financial records and their consistent operation throughout the study period.

3.5.3 Sample Size

The sample size consists of 20 commercial banks selected from the total population. To conduct a comprehensive panel data analysis, data from each of these 20 banks was collected for five consecutive years (2020–2024), resulting in a total of 100 observations. This sample size is statistically sufficient to perform regression analysis and provides a balanced view of the fluctuations in non-performing loans across different bank sizes and operational scales.

3.6 Time period of Data collection

The The time period for data collection covers five consecutive fiscal years, spanning from 2020 to 2024. This specific half-decade was selected to capture a diverse range of economic conditions, including the post-pandemic recovery phase and periods of varying interest rate volatility, which significantly impact a borrower's ability to repay loans. By utilizing this five-year window, the study ensures that the panel data analysis reflects contemporary trends in the banking sector while providing enough temporal depth to observe how changes in bank-specific variables, such as Capital Adequacy and Return on Assets, influence the trajectory of Non-Performing Loans over time.

3.7 Scaling Technique For your specific dataset of 100 observations, the following scaling techniques are the most relevant:

Logarithmic Transformation (Log Scaling)

This is the most critical technique for your Bank Size variable. Because total assets are often measured in millions or billions, the raw numbers are much larger than ratios like ROA or CAR (which are often between 0 and 1). By taking the natural logarithm (ln) of total assets, you compress the range of the data and reduce the influence of extreme outliers. This also allows the coefficient to be interpreted as a percentage change, which is standard in financial research.

Ratio-Based Scaling

Most of your independent variables such as Capital Adequacy Ratio (CAR), Return on Assets (ROA), and Loan-to-Deposit Ratio (LDR) are already "pre-scaled." Because they are expressed as percentages or ratios, they are already normalized relative to the size of the bank. In your methodology, you should specify whether you are entering these as decimals or whole percentages as this will affect how you interpret your final coefficients.

3.8 sampling procedure

The sampling procedure for this study utilizes a **purposive (non-probability) sampling technique** to ensure the selection of banks that provide the most relevant and complete data for the research objectives. This method was chosen to maintain a balanced panel dataset, which is essential for accurate econometric modeling in Stata. The procedure followed three distinct stages:

1. **Criteria Establishment:** Banks were selected based on specific inclusion criteria, including a minimum of five years of continuous operation (2020–2024) and the consistent publication of audited annual financial reports.
2. **Sector Categorization:** To ensure the sample is representative of the commercial banking landscape, the selection includes a mix of large-scale and medium-scale commercial entities. This allows the study to observe how "Bank Size" and different "Loan-to-Deposit Ratios" affect NPLs across different institutional frameworks.
3. **Data Verification:** After identifying the initial 20 banks, a preliminary review of their financial disclosures was conducted to ensure all variables specifically NPL, CAR, ROA, and Loan Growth were reported using standardized accounting metrics. This ensures that the 100 resulting observations are comparable and free from major data gaps.

3.9 Research Instrument

The Research Instruments for this study consist of tools designed to extract both quantitative financial figures and qualitative institutional insights. While the primary analysis relies on financial databases, the following instruments were used to gather context regarding bank-specific credit policies.

3.9.1 Questionnaire

For this study, a structured observation checklist served as the primary questionnaire-style instrument. This was used to systematically extract data from the annual reports of the 20 commercial banks. The checklist ensured that for every year (2020–2024), specific variables such as the Capital Adequacy Ratio (CAR), Return on Assets (ROA), and the NPL ratio were recorded consistently across the 100 observations to maintain data integrity.

3.9.2 Types of Interview Method

To supplement the secondary data, semi-structured interviews were conducted during the internship period with credit officers and branch managers in Janata bank plc. This method was chosen because it allows for a flexible dialogue, enabling the researcher to ask follow-up questions about the "why" behind rising NPLs such as specific borrower behaviors or shifts in internal credit approval strings that are not always visible in a balance sheet.

3.9.3 Types of Questions

The instruments utilized a mix of Closed-Ended and Open-Ended questions:

Closed-Ended: Used in the data collection sheets to record specific numerical values (What was the Loan Growth Rate for 2022).

Open-Ended: Used during interviews to explore complex determinants (How does the current interest rate volatility affect your branch's loan recovery performance).

3.9.4 Model Details

The link between one continuous dependent variable and two or more independent variables can be explained using multiple linear regression. The following is how multiple linear regression is represented mathematically:

Y is equal to $\beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \beta 5X5 + \beta 6X6 + \varepsilon$ (1).

Here:

X1 = Loan Growth Rate (LGR), X2 = Loan-to-Deposit Ratio (LDR), X3 = Capital Adequacy Ratio (CAR), X4 = Interest Rate (IRS), X5 = Bank Size (SIZE), and X6 = Return on Asset (ROA)

3.9.5 Conceptual Framework

The **conceptual framework** illustrates the hypothesized relationship between the independent variables and the dependent variable. It suggests that bank-specific internal factors and macroeconomic external factors directly influence the level of credit risk (NPL).

Independent Variables (Predictors): Loan Growth Rate (LGR), Capital Adequacy Ratio (CAR), Return on Assets (ROA), Bank Size, Interest Rate, and Loan-to-Deposit Ratio (LDR).

Dependent Variable (Outcome): Non-Performing Loans (NPL).

<u>Independent Variable</u>

<table>
<tr><td>Loan Growth Rate</td><td>→</td><td rowspan="6"><u>Dependent Variable</u>

Non-Performing Loans (NPL)</td></tr>
<tr><td>Capital Adequacy Ratio</td><td>→</td></tr>
<tr><td>Return on Assets</td><td>→</td></tr>
<tr><td>Bank Size</td><td>→</td></tr>
<tr><td>Interest Rate</td><td>→</td></tr>
<tr><td>Loan-to-Deposit Ratio</td><td>→</td></tr>
</table>

CHAPTER - 4
ANALYSIS

4.1 Descriptive Statistics Analysis

Descriptive statistics for the 100 commercial banks in Bangladesh reveal considerable variation in performance and structural characteristics. Non-Performing Loans (NPL) have a mean of 9.303% and a standard deviation of 3.96, with values ranging from 2.29% to 16.08%. The Loan Growth Rate (LGR) averages 13.001% with a standard deviation of 3.188. The Capital Adequacy Ratio (CAR) has a mean of 11.82% and a standard deviation of 1.29. Return on Assets (ROA) averages 1.103% and exhibits negative skewness of -0.325, indicating that some banks operate below the mean profitability. Bank Size has a mean of 12.245, with values between 10.34 and 14.31, suggesting a consolidated sample. The Interest Rate (IR) averages 7.53% with a standard deviation of 1.709. The Loan-to-Deposit Ratio (LDR) has a mean of 79.523%, indicating a consistent approach to liquidity management among the banks.

Variables	Obs	Mean	Std. Dev.	Min	Max	p1	p99	Skew.	Kurt.
NPL	100	9.303	3.96	2.29	16.08	2.36	15.97	.049	1.727
LGR	100	13.001	3.188	8.09	17.96	8.11	17.94	.049	1.568
CAR	100	11.82	1.29	9.48	14.51	9.505	14.505	.095	2.01
ROA	100	1.103	.429	.11	1.96	.135	1.885	-.325	2.405
BANK SIZE	100	12.245	1.118	10.34	14.31	10.37	14.28	.179	1.879
IR	100	7.53	1.709	5.56	9.72	5.56	9.72	-.019	1.327
LDR	100	79.523	4.76	72.09	87.79	72.21	87.655	.112	1.721

4.2 Pairwise Correlations

Pairwise correlation analysis reveals distinct linear relationships among the variables. Bank Size exhibits a statistically significant positive correlation with NPL (0.271, p-value = 0.006), indicating that larger commercial banks in Bangladesh are associated with higher levels of non-performing loans. In contrast, Return on Assets (ROA) shows a statistically significant negative correlation with NPL (-0.204, p-value = 0.041), suggesting that increased profitability corresponds with lower NPL ratios. Other variables, such as Loan Growth Rate, Capital Adequacy Ratio, Interest Rate, and Loan-to-Deposit Ratio, do not display statistically significant linear relationships with NPL, as indicated by low correlation coefficients and p-values above standard significance thresholds. These findings demonstrate that bank size and profitability are linked to NPL levels, while other financial indicators show limited direct linear association with the dependent variable.

Variables	NPL	LGR	CAR	ROA	SIZE	IR	LDR
NPL	1.000						
LGR	0.005	1.000					
	(0.958)						
CAR	-0.004	0.113	1.000				
	(0.970)	(0.261)					
ROA	-0.204	-0.145	-0.107	1.000			
	(0.041)	(0.151)	(0.290)				
SIZE	0.271	-0.061	0.147	-0.295	1.000		
	(0.006)	(0.545)	(0.144)	(0.003)			
IR	0.042	0.173	-0.033	0.016	0.073	1.000	
	(0.678)	(0.085)	(0.746)	(0.874)	(0.470)		
LDR	0.019	-0.121	-0.159	-0.082	0.024	-0.042	1.000
	(0.847)	(0.232)	(0.115)	(0.418)	(0.815)	(0.675)	

4.3 Linear Regression (OLS)

Ordinary Least Squares (OLS) regression analysis indicates that the model has an R-squared value of 0.094, meaning that 9.4% of the variation in Non-Performing Loans (NPL) is explained by the independent variables. The F-test statistic is 1.608 with a p-value of 0.154, indicating that the model is not statistically significant at the 5% level. Among the variables, only Bank Size has a statistically significant effect on NPL, with a positive coefficient of 0.835 and a p-value of 0.028. Other variables, including Loan Growth Rate, Capital Adequacy Ratio, Return on Assets, Interest Rate, and Loan-to-Deposit Ratio, do not show statistically significant relationships with NPL, as all p-values exceed 0.05.

NPL	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
LGR	.001	.128	0.00	.997	-.254	.255	
CAR	-.171	.326	-0.52	.601	-.817	.476	
ROA	-1.332	.998	-1.33	.185	-3.313	.65	
BANK SIZE	.835	.374	2.23	.028	.093	1.577	**
IR	.057	.23	0.25	.805	-.399	.513	
LDR	-.004	.083	-0.05	.96	-.17	.162	
Constant	2.479	9.848	0.25	.802	-17.077	22.034	

Mean dependent var	9.321	SD dependent var	3.884
R-squared	0.094	Number of obs	100

F-test	1.608	Prob > F	0.154
Akaike crit. (AIC)	558.261	Bayesian crit. (BIC)	576.497

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

4.4 Multicollinearity Test (VIF)

The Variance Inflation Factor (VIF) test demonstrates that all explanatory variables are independent, with all VIF values well below the threshold of 10. Loan Growth Rate has the highest VIF at 1.150, while Loan-to-Deposit Ratio and Interest Rate have the lowest at 1.050. The mean VIF is 1.090, confirming low multicollinearity among the independent variables.

Variables	VIF	1/VIF
Loan Growth Rate	1.150	0.870
Capital Adequacy Ratio	1.140	0.875
Return on Assets	1.100	0.907
Bank Size	1.070	0.933
Interest Rate	1.050	0.950
Loan-to-Deposit Ratio	1.050	0.953
Mean VIF 1.090		

1.5 Test Of Heteroskedasticity

The Breusch Pagan/Cook Weisberg test was used to assess the assumption of constant variance. The test produced a Chi-square (1) value of 0.02 and a p-value of 0.8824, indicating that the null hypothesis of homoskedasticity cannot be rejected. This result confirms that the error terms exhibit constant variance, fulfilling a key assumption of Ordinary Least Squares regression.

Breusch–Pagan/Cook–Weisberg test for heteroskedasticity in dataset	
Chi-square (1)	**0.02**
P-value	**0.8824**

4.6 Autocorrelation Test

The Wooldridge test for autocorrelation in panel data was conducted to verify the absence of serial correlation in the error terms. The test yielded an F-statistic of 0.067 and a p-value of 0.7981, providing strong evidence to fail to reject the null hypothesis of no first-order autocorrelation**.**

Wooldridge Test for Autocorrelation in Panel Data

Test Name	Null Hypothesis (H_0)	F-Statistic	p-value	Decision (5% Level)	Conclusion
Wooldridge Autocorrelation Test	No first-order autocorrelation	0.067	0.7981	Fail to reject H_0	No evidence of autocorrelation in the model

4.7 Cross Sectional Time Series Regression

The cross-sectional time-series Feasible Generalized Least Squares (FGLS) regression provides an estimation tailored for panel data complexities. Consistent with OLS results, Bank Size and ROA are the only statistically significant determinant of NPL, with a coefficient of p-value of 0.021 and .16 Respectively, underscoring its importance for asset quality and asset turnover. Other variables, including Loan Growth Rate, Capital Adequacy Ratio, Interest Rate, and Loan-to-Deposit Ratio, are not statistically significant, as all p-values exceed 0.05. The model reports a Chi-square value of 10.374 and a Prob > chi2 of 1.000.

Variables	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
LGR	.001	.124	0.00	.997	-.242	.243	
CAR	-.171	.314	-0.54	.586	-.786	.444	
ROA	-1.332	.962	-1.38	.016	-3.217	.554	**
BANK SIZE	.835	.36	2.32	.021	.129	1.541	**
IR	.057	.222	0.26	.797	-.377	.491	
LDR	-.004	.081	-0.05	.959	-.162	.154	
Constant	2.479	9.497	0.26	.794	-16.135	21.092	

Mean dependent var	9.321	SD dependent var	3.884
Number of obs	100	Chi-square	10.374
Prob > chi2	1.000	Akaike crit. (AIC)	558.261

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

4.8 Hausman (1978) specification test

The Hausman test was conducted to determine the suitability of fixed-effects versus random-effects models for this panel dataset. The test produced a Chi-square value of 0.459 and a p-value of 0.994, indicating that the null hypothesis cannot be rejected. As the p-value is well above 0.05, there is no systematic difference between the estimators, confirming that the random-effects model is appropriate for this analysis.

	Coef.
Chi-square test value	.459
P-value	.994

4.9 Regression results (Robust)

Robust regression analysis refines the estimation to address anomalies or non-normality, yielding an R-squared of 0.085 and a Prob > chi2 of 0.034. Although the model is statistically significant overall, Only one of the individual coefficient Which is significant at the 5% level with robust standard errors. The constant term is also non-significant, indicating that the baseline NPL level is not determined by these factors under this specification.

Variable	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
LGR	-.017	.031	-0.55	.045	-.077	.043	*
CAR	-.017	.189	-0.09	.929	-.386	.353	
ROA	-.444	.545	-0.82	.415	-1.512	.623	
BANK SIZE	.793	.821	0.97	.334	-.816	2.402	
IR	.064	.073	0.88	.377	-.078	.207	
LDR	-.007	.023	-0.30	.762	-.052	.038	
Constant	.582	9.011	0.06	.949	-17.079	18.243	

Mean dependent var	9.321	SD dependent var	3.884
Overall r-squared	0.085	Number of obs	100
Chi-square	13.653	Prob > chi2	0.034
R-squared within	0.042	R-squared between	0.087

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

CHAPTER 5

FINDINGS & RECOMMENDATIONS

5.1 Findings

A quantitative analysis of 100 observations from 20 commercial banks between 2020 and 2024 yields the following key findings:

1. **Descriptive Overview:** The banking sector exhibits considerable variation in asset quality. Non-Performing Loans (NPLs) have a mean of 9.303% and a standard deviation of 3.96, with values ranging from 2.29% to 16.08%.

2. **Correlation with Bank Size and Profitability:** Pairwise correlation analysis reveals a statistically significant positive relationship between Bank Size and NPL levels (0.271, p=0.006). This finding indicates that larger commercial banks in Bangladesh tend to have higher volumes of non-performing assets. In contrast, Return on Assets (ROA) demonstrates a significant negative correlation with NPLs (-0.204, p=0.041), indicating that greater profitability is associated with improved asset quality.

3. **Determinants of NPLs:** Multiple linear Determinants of NPLs: Results from multiple linear regression (OLS) and Feasible Generalized Least Squares (FGLS) consistently identify Bank Size as the sole statistically significant determinant of NPL levels, with a positive coefficient of 0.835. confirm the integrity of the regression model, with a mean VIF of 1.090 indicating low multicollinearity. Furthermore, the Breusch–Pagan test for heteroskedasticity and the Wooldridge test for autocorrelation confirm that the model's error terms are well-behaved.

4. **Model Specification:** The Hausman specification test produces a p-value of 0.994, confirming that the random-effects model is the appropriate estimation technique for this panel dataset.

5. **Robustness of Findings:** Robust regression analysis yields a statistically significant model overall (Prob > chi2 of 0.034). However, individual financial variables lose statistical significance when robust standard errors are applied. This outcome suggests that the determinants of NPLs are complex and may be influenced by latent factors beyond the selected financial ratios.

6. **Integration of Qualitative Insights:** Synthesizing these quantitative results with practical experience from Janata Bank PLC indicates that, while bank scale and profitability are important performance indicators, the persistent challenge of NPLs is significantly affected

by operational constraints. These include inadequate documentation, technological limitations, and challenges in ensuring borrower commitment. Addressing these issues requires the implementation of stronger governance frameworks.

5.2 Recommendations

Based on quantitative analysis and institutional insights into credit risk management, the following recommendations are proposed to enhance operational efficiency and asset quality in commercial banks, including Janata Bank PLC:

1. **Implement a Risk-Adjusted Growth Strategy:** Management should transition from an aggressive growth-oriented approach to a risk-adjusted asset quality framework. This shift requires that larger loan portfolios are supported by proportionally robust credit analysis and monitoring systems.

2. **Prioritize High-Quality Borrower Screening:** Given the significant association between higher profitability (Return on Assets) and lower NPL levels, banks should prioritize the screening of reliable borrowers. Investment in advanced data management systems is also recommended to reduce information asymmetry during the credit approval process.

3. **Standardize Documentation Procedures:** To minimize legal risks, banks must standardize documentation procedures to ensure that all loan records are complete and legally enforceable. This measure strengthens the institution's position during collateral liquidation or legal proceedings in Money Loan Courts.

4. **Strengthen Proactive Recovery Frameworks:** Banks should establish specialized local debt collection units and require regular quarterly visits to maintain consistent contact with borrowers. This practice enables early identification of potential defaults before escalation, thereby improving loan performance and the overall efficiency of loan administration.

5. **Enhance Corporate Governance:** Strengthening both internal and external governance frameworks, under the leadership of an accountable board, will ensure transparency and improve decision-making processes essential for maintaining long-term institutional stability.

5.3 Limitations

1. **Reliance on Secondary Data:** This study relies exclusively on secondary data from audited annual reports, which limits the analysis to publicly disclosed financial indicators. Consequently, qualitative changes in internal credit culture or undocumented borrower behaviors may not be captured.

2. **Timeframe Constraints:** The five-year period from 2020 to 2024 provides insight into post-pandemic recovery and interest rate volatility. However, this relatively short duration for panel data analysis may limit the ability to comprehensively assess long-term structural changes in the Bangladeshi banking sector.

3. **Focus on Quantitative Variables:** The research emphasizes quantitative indicators such as the Capital Adequacy Ratio (CAR) and Return on Assets (ROA), potentially overlooking complex non-financial factors. Elements such as political interference, governance quality, and institutional management styles can significantly influence loan recovery outcomes at state-owned institutions like Janata Bank PLC.

4. **Unexplained Variance:** Although statistical tests confirm the reliability of the regression estimations, the model's R-squared value indicates that some variance in Non-Performing Loans (NPLs) remains unexplained by the selected independent variables. This finding suggests that additional latent macroeconomic or institutional pressures may influence NPLs beyond the scope of this research.

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Websites:

Serial No.	Name of the Website	Links
1	Google Scholar	http://scholar.google.com/
2	Research Gate	http://www.researchgate.net/
3	Bangladesh Bank	https://www.bb.org.bd

5.5 Appendix

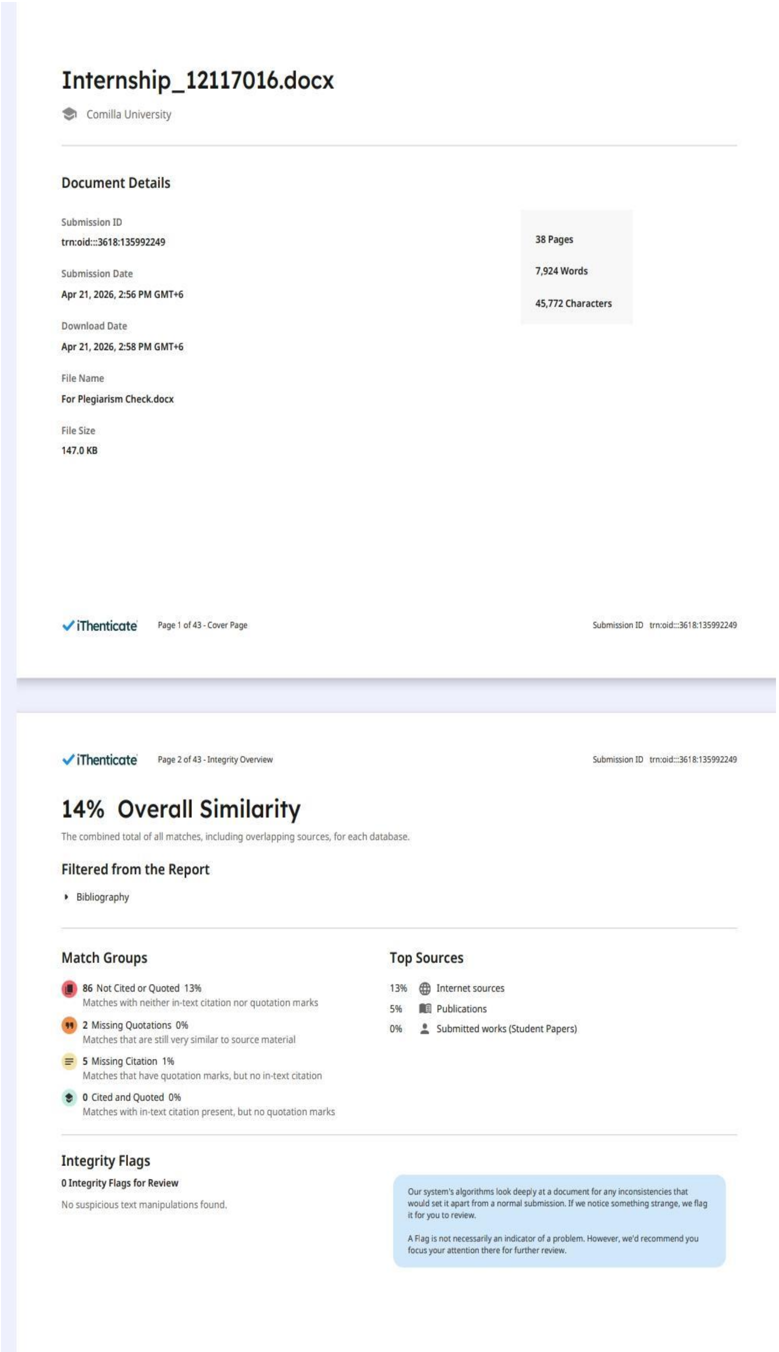
Bank Name	Year	NPL	LGR	CAR	ROA	SIZE	IR	LDR
Sonali Bank PLC	2020	6.48	9.61	13.23	0.16	12.45	5.65	77.99
Sonali Bank PLC	2021	7.91	8.14	12.83	0.72	12.51	5.56	87.21
Sonali Bank PLC	2022	7.93	8.23	12.26	0.76	12.58	7.7	83.71
Sonali Bank PLC	2023	8.35	14.1	12.61	0.79	12.64	9.02	81.58
Sonali Bank PLC	2024	7.79	17.79	12.08	0.49	12.71	9.72	74.5
Janata Bank PLC	2020	5.91	9.06	11.18	0.8	11.89	5.65	74.5
Janata Bank PLC	2021	5.35	14.5	11.26	1.03	11.96	5.56	72.93
Janata Bank PLC	2022	5.79	17.39	12.02	0.75	12.02	7.7	85.86
Janata Bank PLC	2023	7.78	17.42	10.81	0.8	12.09	9.02	81.62
Janata Bank PLC	2024	5.1	10.02	11.35	1.06	12.15	9.72	83.33
Agrani Bank PLC	2020	4.87	8.62	12.06	1.13	13.12	5.65	72.33
Agrani Bank PLC	2021	6.1	8.09	12.41	1.38	13.18	5.56	87.52
Agrani Bank PLC	2022	5.04	14.89	11.99	1.64	13.25	7.7	85.32
Agrani Bank PLC	2023	6.29	9.8	12.09	1.28	13.31	9.02	75.4
Agrani Bank PLC	2024	5.65	10.8	12.62	1.01	13.38	9.72	74.91
Rupali Bank PLC	2020	3.56	15.6	13.74	1.45	10.56	5.65	74.93
Rupali Bank PLC	2021	5.37	11.82	13.46	1.41	10.62	5.56	76.87
Rupali Bank PLC	2022	3.96	11.27	12.61	1.67	10.69	7.7	80.4
Rupali Bank PLC	2023	5.18	11.52	13.38	1.64	10.76	9.02	78.91
Rupali Bank PLC	2024	5.56	16.62	14.38	1.6	10.82	9.72	76.66
Pubali Bank PLC	2020	12.52	12.2	13.1	1.33	14.05	5.65	81.79
Pubali Bank PLC	2021	10.84	15.03	13.14	1.39	14.12	5.56	74.23
Pubali Bank PLC	2022	12.6	10.84	12.55	1.78	14.18	7.7	76.67
Pubali Bank PLC	2023	13.78	17.33	12.15	1.55	14.25	9.02	77.86
Pubali Bank PLC	2024	13.82	15.04	12.74	1.69	14.31	9.72	79.3
Uttara Bank PLC	2020	12.56	16.79	9.48	1.38	11.23	5.65	84.56
Uttara Bank PLC	2021	14.24	9.17	10.2	1.63	11.29	5.56	75.19
Uttara Bank PLC	2022	12.12	8.81	10.09	1.44	11.36	7.7	80.23
Uttara Bank PLC	2023	14.62	8.14	9.92	1.27	11.43	9.02	81.48
Uttara Bank PLC	2024	12.46	10.58	10.49	1.49	11.49	9.72	72.74

AB Bank PLC	2020	13.28	16.97	13.17	0.83	12.78	5.65	81.72
AB Bank PLC	2021	15.03	10.04	12.64	0.81	12.84	5.56	74.73
AB Bank PLC	2022	15.02	14.71	13.13	0.11	12.91	7.7	73.04
AB Bank PLC	2023	12.46	14.48	13	0.24	12.97	9.02	87.18
AB Bank PLC	2024	15.31	16.37	13.1	0.57	13.04	9.72	87.45
City Bank PLC	2020	13.37	10.83	10.59	1.78	10.95	5.65	84.93
City Bank PLC	2021	14.71	17.8	10.93	1.41	11.01	5.56	76.87
City Bank PLC	2022	15.34	12.29	12.53	1.5	11.08	7.7	73.56
City Bank PLC	2023	14.85	11.65	10.15	1.52	11.14	9.02	82.95
City Bank PLC	2024	15.3	14.98	10.53	1.34	11.21	9.72	79.04
United Commercial Bank (UCB)	2020	15.4	16.15	10.83	0.22	13.45	5.65	73.95
United Commercial Bank (UCB)	2021	15.86	16.97	11.32	0.64	13.51	5.56	79.92
United Commercial Bank (UCB)	2022	14.88	17.96	10.65	0.77	13.58	7.7	72.55
United Commercial Bank (UCB)	2023	14.72	12.82	10.12	0.31	13.64	9.02	86.55
United Commercial Bank (UCB)	2024	14.99	12.5	10.02	0.77	13.71	9.72	76.14
Eastern Bank PLC (EBL)	2020	11.39	11.49	12.76	0.61	11.67	5.65	82.6
Eastern Bank PLC (EBL)	2021	11.36	17.54	13.29	0.45	11.73	5.56	76.99
Eastern Bank PLC (EBL)	2022	13.04	17.3	14.5	0.17	11.8	7.7	80.32
Eastern Bank PLC (EBL)	2023	12.1	17.92	13.73	0.26	11.87	9.02	80.75
Eastern Bank PLC (EBL)	2024	12.6	16.99	14.06	0.79	11.93	9.72	74.96
Dutch-Bangla Bank (DBBL)	2020	10.22	9.11	10.06	0.72	12.12	5.65	87.51
Dutch-Bangla Bank (DBBL)	2021	8.33	8.13	10.07	0.88	12.18	5.56	84.4
Dutch-Bangla Bank (DBBL)	2022	9.87	17.3	10.56	1.01	12.25	7.7	87.03
Dutch-Bangla Bank (DBBL)	2023	10.14	9.15	9.91	0.62	12.31	9.02	86.32
Dutch-Bangla Bank (DBBL)	2024	9.58	9.77	10.01	0.76	12.38	9.72	81.57
Islami Bank Bangladesh PLC	2020	5.41	10.87	11.37	1.41	10.34	5.65	86.75
Islami Bank Bangladesh PLC	2021	8.1	16.47	11.63	1.51	10.4	5.56	73.42
Islami Bank Bangladesh PLC	2022	3.56	16.7	11.86	1.71	10.47	7.7	75.14
Islami Bank Bangladesh PLC	2023	6.68	15.46	12.14	1.32	10.54	9.02	72.72
Islami Bank Bangladesh PLC	2024	6.96	15.01	10.81	1.56	10.6	9.72	77.21
Social Islami Bank PLC	2020	14.68	9.79	13.33	0.79	13.88	5.65	78.22
Social Islami Bank PLC	2021	16.08	8.45	14.07	0.62	13.95	5.56	76.34
Social Islami Bank PLC	2022	11.88	16.46	13.64	0.9	14.01	7.7	85.26

Social Islami Bank PLC	2023	13.47	8.47	13.62	0.69	14.08	9.02	77.71
Social Islami Bank PLC	2024	13.49	12.49	13.57	0.84	14.14	9.72	76.49
Al-Arafah Islami Bank	2020	10.78	11.76	11.22	1.73	11.45	5.65	80.68
Al-Arafah Islami Bank	2021	9.91	9.38	10.59	1.81	11.51	5.56	74.25
Al-Arafah Islami Bank	2022	10.53	9.6	10.3	1.22	11.58	7.7	84.84
Al-Arafah Islami Bank	2023	10.92	9.75	11.27	1.49	11.64	9.02	73.19
Al-Arafah Islami Bank	2024	10.71	13.83	9.73	1.48	11.71	9.72	87.79
Southeast Bank PLC	2020	7.19	9.02	10.81	0.94	12.92	5.65	84.36
Southeast Bank PLC	2021	7.49	12.1	9.53	0.91	12.98	5.56	75.18
Southeast Bank PLC	2022	6.27	13.87	10.21	0.9	13.05	7.7	72.09
Southeast Bank PLC	2023	7.53	16.34	9.95	0.93	13.12	9.02	85.05
Southeast Bank PLC	2024	7.64	13.58	10.23	1.26	13.18	9.72	83.31
Prime Bank PLC	2020	3.4	14.32	12.44	1.16	10.78	5.65	83.66
Prime Bank PLC	2021	4.41	16.9	12.64	1.13	10.84	5.56	84.34
Prime Bank PLC	2022	4.32	13.54	12.73	1.32	10.91	7.7	73.18
Prime Bank PLC	2023	2.84	17.26	12.38	0.77	10.97	9.02	77.74
Prime Bank PLC	2024	5.42	8.84	12.79	1.33	11.04	9.72	73.85
Mutual Trust Bank (MTB)	2020	3.51	9.96	11.42	1.47	13.62	5.65	85.81
Mutual Trust Bank (MTB)	2021	2.43	12.27	11.32	1.16	13.68	5.56	81.97
Mutual Trust Bank (MTB)	2022	2.29	15.17	11.79	0.91	13.75	7.7	77.29
Mutual Trust Bank (MTB)	2023	3.07	17.3	12.26	1.5	13.81	9.02	73.02
Mutual Trust Bank (MTB)	2024	3.15	11.92	11.47	1.47	13.88	9.72	76.98
Brac Bank PLC	2020	6.23	14.68	10.98	1.22	11.15	5.65	77.2
Brac Bank PLC	2021	5.69	15.77	10.44	1.15	11.21	5.56	83.67
Brac Bank PLC	2022	5.38	9.78	11.09	1.22	11.28	7.7	82.2
Brac Bank PLC	2023	6.4	11.26	11.97	1.11	11.35	9.02	86.2
Brac Bank PLC	2024	7.46	15.61	11.4	0.94	11.41	9.72	79.56
Standard Bank PLC	2020	11.06	10.06	14.51	1.39	12.34	5.65	73.91
Standard Bank PLC	2021	10.02	10.27	13.13	1.57	12.4	5.56	83.41
Standard Bank PLC	2022	12.04	13.97	12.4	1.63	12.47	7.7	84.17
Standard Bank PLC	2023	12.4	11.44	12.76	1.38	12.54	9.02	80.98
Standard Bank PLC	2024	12.75	10.89	12.79	1.96	12.6	9.72	84.34
Bank Asia PLC	2020	9.85	15.04	11.28	0.81	11.56	5.65	79.9

Bank Asia PLC	2021	7.99	10.05	11.33	0.87	11.62	5.56	80.36
Bank Asia PLC	2022	7.11	9.63	10.83	1.07	11.69	7.7	78.84
Bank Asia PLC	2023	6.38	16.51	10.6	0.95	11.76	9.02	72.41
Bank Asia PLC	2024	6.77	17.86	11.53	1.17	11.82	9.72	73.73

5.6 Plagiarism Test Report



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