

Internship Report
on
**“Analysing the Impact of Capital Structure on Financial
Performance: An Empirical Study of State-owned
Commercial Banks in Bangladesh”**



Submitted To

Md. Al-Amin
Assistant Professor
Department of Finance & Banking
Comilla University, Cumilla

Submitted By

Sadia Islam
Id- 22317023
Session-2022-23
Department of Finance & Banking
Comilla University, Cumilla.

Date of Submission

26 May, 2025

Letter of Transmittal

26 May, 2025,

Md. Al-Amin,

Assistant Professor,

Department of Finance & Banking,

Comilla University, Cumilla.

Subject: Submission of internship Report on **“Analysing the impact of Capital Structure on Financial Performance: An Empirical Study of State- owned Commercial Banks in Bangladesh”**

Dear Sir,

With due respect, I am honored and pleased to submit my project report titled “Analyzing the Impact of Capital Structure on Financial Performance: An Empirical Study of State-owned Commercial Banks in Bangladesh” as a partial requirement for the completion of my MBA program under the Department of Finance & Banking at Comilla University. I have completed this three-month internship report under your valuable supervision.

Throughout the preparation of this report, I have dedicated my full efforts to make it meaningful and informative. I sincerely thank you for your guidance and support during this process. Kindly consider any errors or shortcomings as a result of human limitations.

I would be grateful if you accept this report and provide your valuable feedback. It would be my great pleasure if you find this report both useful and insightful.

Sincerely yours,

Sadia Islam

ID- 22317023

Session- 2022-23

Department of Finance & Banking

Comilla University, Cumilla

Supervisor's Declaration

This is to certify that the project report titled “**Analysing the Impact of Capital Structure on Financial Performance: An Empirical Study of State-owned Commercial Banks in Bangladesh**” has been completed by Sadia Islam, Session: 2022-23, as a partial fulfillment of the requirements for the Master of Business Administration (MBA) degree from the Department of Finance and Banking, Faculty of Business Studies, Comilla University, Cumilla. This project report has been prepared under my supervision and reflects the authentic and successful work carried out by the student.

.....

Md. Al-Amin

Assistant Professor

Department of Finance & Banking

Comilla University, Cumilla

Student Declaration

I hereby sincerely declare that this internship report on “Analysing the Impact of Capital Structure on Financial Performance: An Empirical Study of State-owned Commercial Banks in Bangladesh” is my original work, completed under the supervision of Md. Al-Amin, Assistant Professor, Department of Finance & Banking, Comilla University.

No part of this report has been submitted previously to any other university, college, institution, or organization for any academic certificate, degree, or diploma. This work is free from any copyright infringement, and no portion has been copied from any previous work submitted for any degree. All information derived from published or unpublished sources has been properly acknowledged in the text and references.

I also undertake full responsibility and agree to indemnify the department against any loss or damage arising from a breach of these obligations, if any.

.....

Sadia Islam

ID- 22317023

Session- 2022-23

Department of Finance & Banking

Comilla University, Cumilla

Acknowledgement

At the very beginning, I would like to express my heartfelt gratitude to the Almighty for granting me the strength and patience to complete this task. The internship report is a vital component of the MBA program, and it is a great honor for me to prepare this report on “Analysing the Impact of Capital Structure on Financial Performance: An Empirical Study of State-Owned Commercial Banks in Bangladesh.”

I am deeply thankful to my respected academic supervisor, Md. Al-Amin, from the Department of Finance and Banking at Comilla University, for his invaluable permission, guidance, and support throughout the preparation of this report.

.....

Sadia Islam

ID- 22317023

Session- 2022-23

Department of Finance & Banking

Comilla University, Cumilla

Executive Summary

This report focuses on the impact of capital structure on the profitability of state-owned commercial banks in Bangladesh. State-owned commercial banks play a vital role in the banking industry by engaging in genuine commercial activities with strong performance. This study analyzes data from the past ten years of these banks to understand how capital structure affects their profitability.

The study is centered on examining the relationship between capital structure and financial performance of state-owned commercial banks.

In Chapter 1, I explain the reasons behind choosing this topic and outline the objectives and scope of the study. Additionally, I discuss the significance of the research and the limitations encountered during the work.

Chapter 2 reviews previous studies related to this topic, identifying gaps in the existing literature.

In Chapter 3, I describe the sample size, the variables included, the types of data used, and the software tools employed for analysis.

Chapter 4 provides an overview of Sonali Bank Limited, detailing its history, vision, mission, origin, and key objectives.

Chapter 5 covers theoretical concepts related to capital structure and profitability.

In Chapter 6, I conduct statistical analyses and offer interpretations of the results.

Finally, in Chapter 7, I present recommendations for the bank to improve profitability and efficiency, followed by the conclusion of the report.

Table of Contents

Chapter			Particulars	Page
Introduction				
Chapter One	1.1		Background of the Study	2
	1.2		Objective of the Study	2
		1.2.1	Main Objectives	2
		1.2.2	Specific Objectives	2
	1.3		Significance of the Study	2
	1.4		Scope of the Study	2
	1.5		Limitation of the Study	3
Chapter Two	Literature Review and Research Gap			5-6
Research Methodology				
Chapter Three	3.1		Sample Design	8
	3.2		Sampling Design	8
	3.3		Data Source and Collection	8
	3.4		Method of Data Analysis	8
	3.5		Model Specification	8
	3.6		Hypothesis Development	10
	3.7		Conceptual Framework	10
Chapter Four			Overview of Sonali Bank Limited	11-14
Theoretical Aspects				
Chapter Five	5.1		Capital structure	17
	5.2		Theories of capital structure	18
		5.2.1	Net Income Approach	19-22
		5.2.2	Traditional Approach	21-22
		5.2.3	Net Operating Income Approach	22-23
		5.2.4	Modigliani-Miller Approach	23-25
		5.2.5	Pecking Order Theory	25
Statistical Analysis				
	6.1		Descriptive Analysis	27
	6.2		Correlation Analysis	28
	6.3		Linear Regression	28-29
	6.4		Linear Regression VC (Robust Test)	30
	6.5		Linear from Fixed Effects	31-32

Chapter Six	6.6		VIF Test	32
	6.7		Normality Test	32
Findings & Conclusion				
Chapter Seven	7.1		Findings of the Report	35
	7.2		Recommends	36-37
	7.3		Conclusion	38
	7.4		References	39-40

Chapter One

Introduction

1.1 Background of the study

The internship experience provided valuable exposure to the corporate environment, which will greatly support my transition into the next stage of my professional journey. This report serves as an essential component of the internship, reflecting the knowledge and insights gained during the period. As I interned in the Finance Department, the financial analysis section was particularly significant. Among the various aspects covered, capital structure analysis played a key role. The analysis presented in this report aims to demonstrate the impact of capital structure on the profitability of State-Owned Commercial Banks (SOCBs) in Bangladesh.

1.2 Objectives of the Study

General Objective of the study

The main objective of this study is to assess the impact of capital structure on the profitability of State-Owned Commercial Banks in Bangladesh.

Specific Objectives of the study

1. To identify the position capital structure in State-owned Commercial bank of Bangladesh.
2. To identify the position of profitability in State-owned Commercial bank of Bangladesh.
3. To identify the significant factors influencing the relationship between capital structure and profitability in State-Owned Commercial Banks in Bangladesh.

1.3 Significance of the Study

This study plays a crucial role in bridging the gap in understanding the impact of capital structure decisions on the profitability of core business operations within State-Owned Commercial Banks (SOCBs) in Bangladesh. It will serve as a valuable resource for financial managers, providing practical insights into the challenges and implications of financing decisions and their influence on profitability. The findings will help managers determine the optimal capital structure needed to achieve maximum firm profitability and support the overarching goal of shareholder wealth maximization. Furthermore, this research will serve as a foundational reference for future studies in the field of corporate finance.

1.4 Scope of the Study

As the report is entitled as " impact of capital structure on Bank's profitability ", so it will mostly focus on capital structure of State-owned Bank as well as the followings:

- Sources of long-term fund.
- Cost of collecting fund.
- Amount of equity.

Each of the above areas would be critically analyzed in order to determine impact of capital structure on Bank's profitability of State-owned commercial Bank.

1.5 Limitations of the study

Despite my best efforts in preparing this report, several limitations were encountered. The most significant constraint was the limited duration of the three-month Practical Orientation Program, which restricted in-depth exploration. Additionally, due to the sensitive nature of the credit department, some essential information was withheld by bank employees for confidentiality reasons. The busy schedules of Sonali Bank officers also limited opportunities for detailed discussions, necessitating reliance on observation in some cases. Furthermore, frequent policy changes by Bangladesh Bank made it difficult to access the most up-to-date information and strategies. Despite these challenges, every effort was made to ensure the report is accurate and valuable.

Chapter Two

Literature Review

Several prior researchers identified the different dimensions of capital structure which impact the profitability of banks. For Instance, Li, Niskanen, and Niskanen (2019) explored how credit risk moderates the relationship between capital structure (measured by LTDTA) and firm performance (pre-tax profit to total assets) among SMEs in ten European countries. Using OLS, logistic regression, and 2SLS on 2012 cross-sectional data, they found that the credit risk status of a firm significantly influences how capital structure affects performance, highlighting the contextual nature of financial decision-making. Moreover, Rahayu et al. (2019) used GSCA to analyze 33 Indonesian manufacturing firms (2008–2015) and found a negative relationship between profitability (ROI, ROE, NPM) and capital structure, indicating that more profitable firms use less debt. Dalci (2018), analyzing Chinese firms with GMM and panel regression methods, found an inverted U-shaped relationship between capital structure and profitability—initial debt improves performance due to tax benefits, but excessive debt leads to distress and inefficiency.

In addition, Siddik et al. (2017) focused on Bangladeshi banks and found that higher debt levels reduce performance (ROA, ROE, EPS), except TDTA, which positively influences EPS. Their study, using panel data from 22 banks over 2005–2014, emphasized both bank-specific and macroeconomic factors (e.g., GDP, inflation). Hossain (2016), investigating 81 manufacturing firms, reported mixed outcomes: negative effect on ROA, positive on ROE, and noted that short-term debt has a greater influence on profitability than long-term debt. Managerial ownership showed a positive association with profitability. Furthermore, Islam (2016) examined 63 Bangladeshi manufacturing firms and concluded that Pecking Order Theory (POT) better explains capital structure decisions than Trade-off Theory. Using FGLS, the study found that managers prefer internal funds unless external debt provides superior benefits. It highlighted firm-specific determinants such as profitability, liquidity, firm age, and agency problems, while noting a preference for short-term over long-term debt, contrary to POT's assumptions in developed markets.

Besides, Amin and Jamil (2015) analyzed cement firms in Bangladesh and observed that short-term debt positively impacts ROA and ROE, while long-term debt has a negative but statistically insignificant effect. Jahan (2014) examined the textile industry and found profitability and asset tangibility positively influence capital structure, though firm size and growth rate do not. Latif and Kabir (2015), focusing on the ceramic sector, showed variations in financial performance across firms, with RAK Ceramics outperforming others, although liquidity and efficiency differences were statistically insignificant. In addition, Chowdhury and Chowdhury (2010) assessed how debt-equity structure affects firm value in Bangladesh using data from both the

Dhaka and Chittagong stock exchanges. Their findings indicated a strong positive relationship between debt-equity ratio and firm value, particularly when analyzed by industry type, size, and growth opportunities. The study aligns with Modigliani and Miller's theory and emphasizes the contextual relevance of capital structure decisions in emerging markets.

Research Gap

While numerous studies have examined the determinants of bank profitability, especially using Return on Equity (ROE) as a performance measure, there remains a significant gap in integrating a comprehensive set of both internal (e.g., liquidity, gearing ratio, capital adequacy) and risk-related variables (e.g., risk-weighted assets, non-performing loans) in a unified model. Many existing studies tend to focus on only one or two factors at a time, such as liquidity or bank size, without accounting for the interplay between risk management indicators and capital structure.

Chapter Three

Research Methodology

3.1 Study Design

This study conducts an empirical investigation into the impact of capital structure on the profitability of State-Owned Commercial Banks (SOCBs) in Bangladesh, using the most recent available data. The research is explanatory in nature and adopts a quantitative approach. A multiple regression analysis has been employed to examine data collected from the audited financial statements of six SOCBs. The study evaluates the regression results, data validity, and the proposed hypotheses. Findings are interpreted using a descriptive analytical framework.

3.2 Sampling Design

To ensure consistency and validity in comparison, the sample includes only State-Owned Commercial Banks in Bangladesh. This sample was purposefully chosen due to the declining performance and increasing challenges faced by SOCBs, in contrast to the flourishing state of private commercial banks. The aim is to explore the impact of capital structure decisions specifically within the public banking sector, where the issue is more critical and less researched.

3.3 Data Source and Collection

The study relies exclusively on secondary data sources. Financial information was collected from audited annual reports, including balance sheets and income statements, of six SOCBs operating in Bangladesh. The time frame covered in this study spans from 2014 to 2023, ensuring a comprehensive and up-to-date analysis of the banks' financial trends.

3.4 Method of Data Analysis

To determine the relationship between profitability and capital structure, multiple regression analysis was conducted. Return on Equity (ROE) was used as the dependent variable, with capital structure indicators serving as independent variables. The statistical analysis was performed using STATA software, while MS Excel was utilized for data organization and preprocessing.

3.5 Model Specification

Consistent with existing literature, this study applies a multiple linear regression model to evaluate the relationship between capital structure and firm profitability. The model incorporates various determinants of capital structure to explain variations in leverage and profitability across the selected SOCBs. This approach allows for robust testing of hypotheses and interpretation of key influencing factors.

Variables	Sl.	Description	Variable Definition	Source
Dependent	1	Return On Equity	Return on Equity (ROE) is a key indicator of a company's financial performance, calculated by dividing net income by shareholders' equity. It reflects how effectively a company utilizes its equity to generate profits.	(Jason Fernando, 2024) Investopedia
Independent	1	Liquidity	Return on Equity (ROE) serves as a fundamental measure of a company's financial performance, representing the ratio of net income to shareholders' equity. It indicates how efficiently a company is using its equity base to generate earnings.	(Adam Hayes, 2025) Investopedia
	2	Bank Size	Bank size is a significant factor in financial analysis , affecting a banks stability , profitability and risk management capabilities	(Wikipedia)
	3	Non-performing Loan	NPLs (Non-Performing Loans) are loans that are considered in default because the borrower has failed to make the scheduled payments within a specified period.	(Troy Segal, 2022) Investopedia
	4	Gearing Ratio	Gearing ration are financial ratios that compare some form of owners equity or capital to debtor funds borrowed by company	(Will Kinton, 2024) Investopedia
	5	Risk Weighed Ratio	To determine how muchh capital to maintain, bank assigns risk to every type of assets. These are referre to as Risk Weighted Assets	(Jessica Gibson, 2025) Investopedia
	6	Capital Adequacy Ratio	CAR is a indicator of how well a bank can meets its obligations . The ratio compares capital to risk weighted assets	(Adam Hayes, 2025) Investopedia

The regression model used to test the hypotheses is shown below:

$$1. ROE = \beta_0 + \beta_1 LiQ + \beta_2 SIZE + \beta_3 NPL + \beta_4 GR + \beta_5 RWA + \beta_6 CAR + \varepsilon \quad (1)$$

Where,

- ROE=Return on Equity.
- Size= Bank Size.
- NPL=Non-Performing loan.
- GR=Gearing Ratio.
- RWA= Risk Weighed Ratio.
- CAR=Capital Adequacy Ratio.

3.6 Hypothesis Development

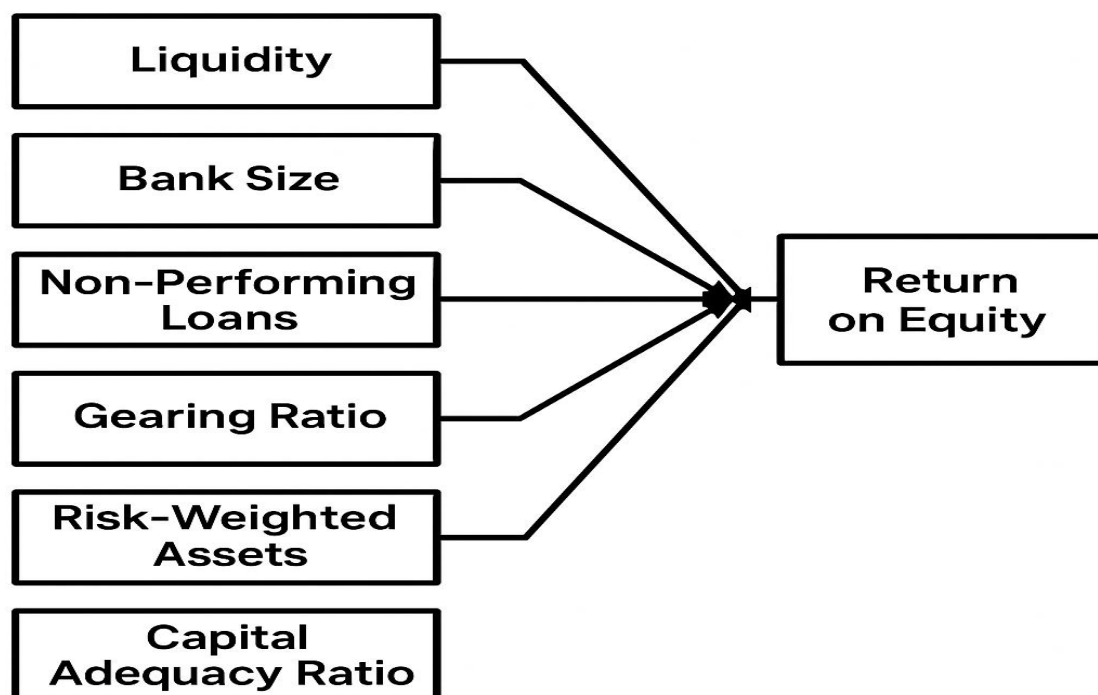
H₀ (Null Hypothesis):

There is no significant relationship between the independent variables (Liquidity, Bank Size, NPL, Gearing Ratio, RWA, and CAR) and Return on Equity (ROE).

H₁ (Alternative Hypothesis):

There is a significant relationship between at least one of the independent variables and Return on Equity (ROE).

3.7 Conceptual Framework



Chapter Four

State-Owned Banks in Bangladesh with Special Focus on Sonali Bank Limited

State-Owned Banks in Bangladesh with Special Focus on Sonali Bank Limited

State-owned banks in Bangladesh play a crucial role in the country's financial system by providing essential banking services, supporting economic development, and implementing government policies related to finance and credit distribution. These banks are fully or partially owned by the government and are tasked with not only profitability but also social and economic objectives, such as financial inclusion, rural credit support, and development financing.

Bangladesh's banking sector comprises various types of banks, including private commercial banks, foreign banks, and state-owned commercial banks (SOCBs). Among these, the SOCBs are significant players, particularly in financing public sector projects and providing banking services to underserved populations. The major state-owned banks in Bangladesh include Sonali Bank Limited, Janata Bank Limited, Agrani Bank Limited, Rupali Bank Limited, Bangladesh Development Bank Limited, and BASIC Bank Limited.

Overview of State-Owned Commercial Banks

The SOCBs were established primarily to mobilize public savings and provide credit facilities in sectors where private banks were reluctant to venture, such as agriculture, small and medium enterprises (SMEs), and infrastructure. These banks have traditionally played a dominant role in government treasury operations and handling public sector accounts. However, over the past decades, the performance of state-owned banks has been mixed, with many facing challenges like high levels of non-performing loans (NPLs), governance issues, and inefficiency compared to their private counterparts.

Despite these challenges, SOCBs remain an important pillar of Bangladesh's banking system, especially in promoting financial access to rural and underbanked areas. The government has periodically initiated reforms to strengthen their operations, improve governance, and reduce the burden of bad loans.

Sonali Bank Limited: An Overview

Sonali Bank Limited is the largest and oldest state-owned commercial bank in Bangladesh. Established in 1972, shortly after the independence of Bangladesh, Sonali Bank was formed through the amalgamation of several nationalized banks. The bank's creation was part of the government's strategy to take control of key financial institutions and use them as tools to rebuild the economy and promote social welfare. Over the years, Sonali Bank has grown to become a

key institution in the banking sector, with a widespread branch network that covers urban and rural areas across the country. The bank provides a comprehensive range of banking services including deposit mobilization, credit facilities, trade finance, foreign exchange services, and remittance services.

Role and Functions of Sonali Bank

Sonali Bank's primary role extends beyond profitability. It acts as the government's agent in disbursing agricultural credit, subsidies, and development loans. The bank supports various government programs aimed at poverty alleviation, rural development, and financial inclusion. For example, Sonali Bank plays a critical role in managing remittances sent by millions of Bangladeshi expatriates, which form a vital part of the country's foreign exchange earnings. The bank also provides financing to key sectors such as agriculture, industry, and small enterprises. It often participates in government-led credit schemes and refinancing programs facilitated by Bangladesh Bank (the central bank).

Challenges Faced by Sonali Bank

Despite its strategic importance, Sonali Bank faces several operational challenges. The most critical among them is the high level of Non-Performing Loans (NPLs), which affect the bank's profitability and capital adequacy. A significant portion of Sonali Bank's loan portfolio has become overdue or defaulted, often due to weak credit appraisal processes, political interference, and inadequate recovery efforts. Furthermore, the bank struggles with outdated technology and inefficient management practices, which limit its competitiveness in a rapidly evolving banking environment. Governance issues, including lack of autonomy and bureaucratic delays, also hinder timely decision-making and operational efficiency. The competitive pressure from private commercial banks, which are more agile and customer-focused, has put Sonali Bank in a difficult position, especially in attracting and retaining corporate and retail clients.

Recent Reforms and Modernization Efforts

Recognizing these challenges, the government and Bangladesh Bank have initiated several reform programs aimed at revitalizing Sonali Bank. These efforts include restructuring the bank's management, improving corporate governance, enhancing risk management practices, and adopting new technology platforms. Sonali Bank has introduced core banking solutions, internet banking, and mobile banking services to improve customer experience and operational efficiency. The bank is also focusing on recovering bad loans through specialized recovery units and legal

measures. Moreover, capacity building and training programs are being implemented to upgrade employee skills and foster a culture of professionalism. Despite its challenges, Sonali Bank holds immense potential to contribute to Bangladesh's socio-economic development. With its extensive branch network and government backing, the bank is well-positioned to promote financial inclusion, particularly in rural areas where private banks have limited presence. Continued reforms and modernization efforts will be crucial to enhance Sonali Bank's financial health and service quality. Strengthening governance, improving credit appraisal and recovery processes, and leveraging digital banking technologies are essential for the bank to remain relevant and competitive.

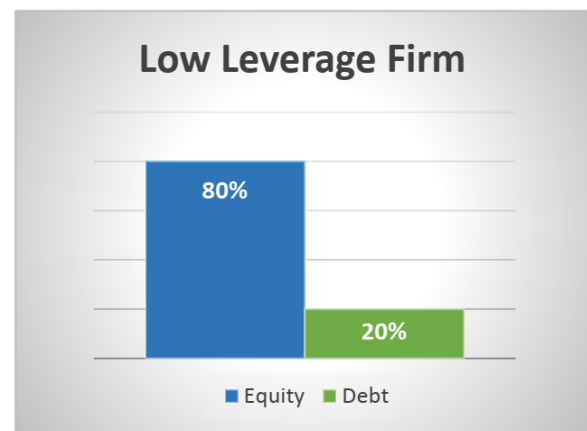
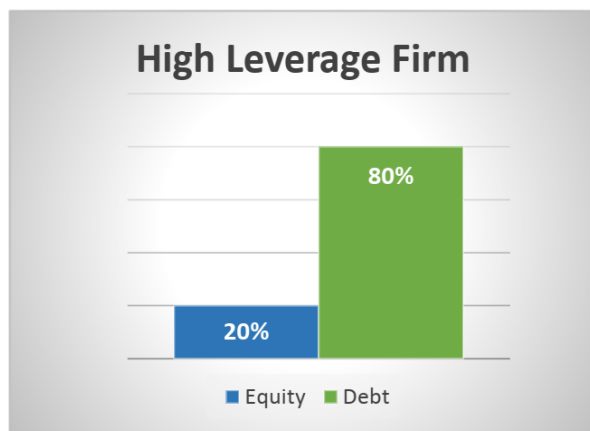
Chapter Five

Theoretical Aspect

Capital Structure

A corporation finances its assets through a combination of equity, debt, and hybrid securities. Capital structure refers to the mix of a company's long-term debt, certain short-term debt, common equity, and preferred equity. It represents how a firm funds its overall operations and growth by utilizing different sources of capital.

Leverage is a financial strategy used to amplify potential gains and losses. It typically involves acquiring more assets by borrowing funds, with the expectation that the returns or asset appreciation will exceed the borrowing costs. Firms with a high proportion of debt in their financing are known as 'high leverage firms,' while those with a lower debt ratio are called 'low leverage firms.'

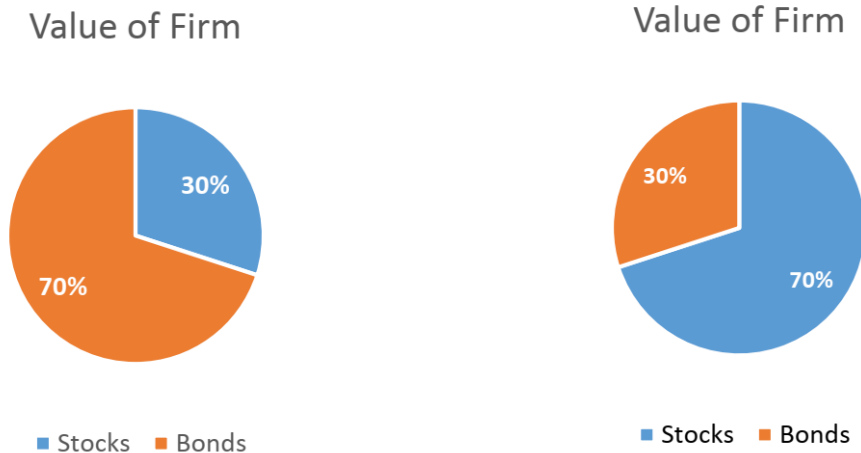


The firm shown in Figure 8 is highly leveraged, with 80% of its assets financed through debt. In contrast, the firm in Figure 9 is lowly leveraged, as most of its assets are funded by equity, with only 20% financed by debt.

So, what is the optimal way to finance a company? What should be the ideal mix of debt and equity? To explore these questions, I will use the pie model of capital structure. In this model, the pie represents the total value of the company, which is made up of both equity and debt. Simply put, the firm's value can be expressed as:

$$V = B + S,$$

where **V** is the total value, **B** is the value of debt, and **S** is the value of equity



5.1 Theories of Capital Structure

There are two main perspectives regarding capital structure. One view suggests that capital structure affects both the firm's value and its cost of capital, implying the existence of an optimal capital structure. Conversely, another viewpoint argues that capital structure is irrelevant and does not impact the firm's value or cost of capital. Based on these contrasting opinions, several theories of capital structure have been developed, with significant contributions from David Durand, Ezra Solomon, and Modigliani and Miller.

5.2 Assumptions Underlying the Theories

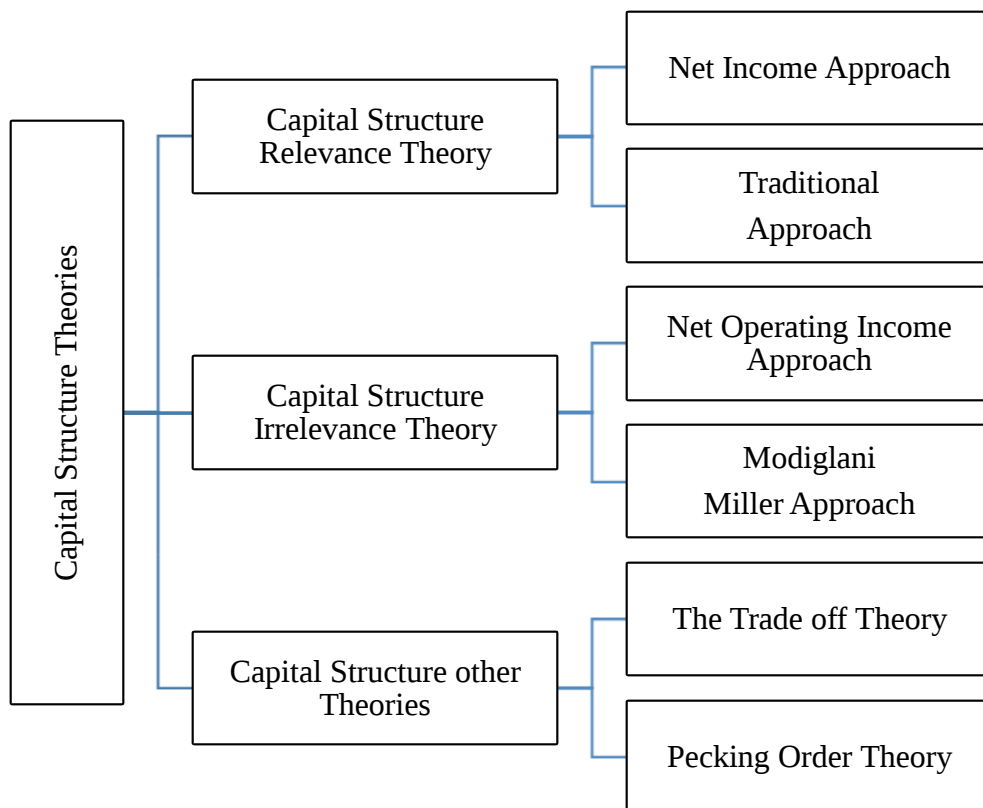
To clearly understand these theories and the relationship between capital structure, firm value, and cost of capital, the following assumptions are made:

- Firms use only two sources of financing: debt and equity.
- The firm's total assets remain fixed.
- Total financing stays constant; leverage changes by substituting debt for equity or vice versa.
- The firm pays out 100% of its earnings as dividends (100% payout ratio).
- Operating earnings (EBIT) are expected to remain constant over time.
- Business risk is constant and independent of financial risk or capital structure.
- Investors share the same subjective expectations about the firm's future operating earnings.

- There are no corporate or personal taxes, though this assumption may be relaxed in later models.

Key Definitions Used in Capital Structure Analysis

- **S** = Market value of common shares
- **D** = Market value of debt
- **V = S + D** = Total market value of the firm
- **NOI (X)** = Expected net operating income or earnings before interest and taxes (EBIT)
- **NI** = Net operating income minus interest, representing net income or shareholder earnings



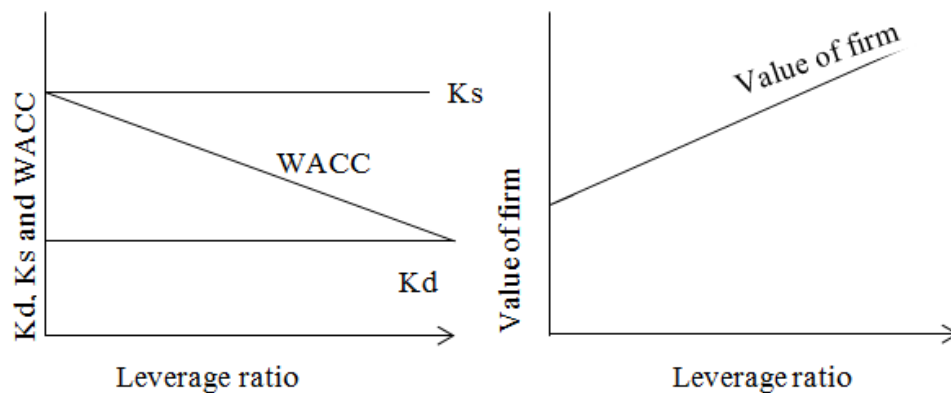
5.1.1 Net Income Approach

The Net Income Approach was developed by David Durand. This theory suggests that a firm's capital structure is important and that by incorporating debt into its capital mix, a company can increase its overall value and reduce its total cost of capital. According to this approach, the more debt a firm uses, the lower its overall cost of capital will be, leading to a higher firm value.

Key Assumptions:

- The cost of debt is always lower than the cost of equity.
- Investors' risk perception remains unchanged by the firm's use of debt; therefore, the capitalization rates for both equity (k_e) and debt (k_d) stay constant regardless of leverage.
- Corporate taxes do not exist.

Based on these assumptions, since debt is cheaper than equity and both costs remain fixed, increasing debt financing lowers the firm's overall cost of capital. Consequently, this results in an increase in the firm's value.



Rupali Bank (Based On 2020):

Source: Annual Report

Required:

- Market Value of Equity.
- Market Value of total Value.
- WACC for both firms.

Solution:

$$\begin{aligned} \text{a. Calculation of market value of Equity(S)} &= \frac{\text{Net Income}}{K_S} \\ &= \frac{\text{EBIT} - \text{Interest}}{K_S} \end{aligned}$$

$$\begin{aligned} \bullet \text{ Levered} &= \frac{(2459.18 - 61,249.69 \times 0.0375)}{0.10} \\ &= \frac{2459.18 - 2296.86}{0.10} \\ &= 1633.2 \end{aligned}$$

$$\bullet \text{ Unlevered} = \frac{2459.18}{0.10}$$

Details	Levered (Crore)	Unlevered (Crore)
EBIT	2459.18	2459.18
Debt	61,249.69	0
Cost of Equity(Ks)	10%	10%
Cost of Debt (Kd)	3.75%	3.75%

$$= 24,591$$

b. Calculation of Market Value of total firm

$$\begin{aligned} \bullet \text{ Levered} &= 1633.2 + 61,249.69 \\ &= 62,882.2 \end{aligned}$$

- Unlevered = $24,591 + 0$
 $= 24,591$

c. Calculation of WACC for both type of firms

We have, $WACC = W_d * K_d + W_s * K_s$ or $EBIT/V$

- Levered = $\frac{2459.18}{62,882.2}$
 $= 0.03910$ or 3.91%

- Unlevered = $\frac{2459.18}{24,591}$
 $= 0.10$ or 10%

As above mentioned illustration, when leverage is used the value of firm will be increased and in the other hand when the leverage ratio is increased. Hence, Capital Structure matters in valuation of firm and cost of capital.

5.1.2 The Traditional View

This approach, also known as the intermediate approach, was popularized by Ezra Solomon. It represents a middle ground between the net income approach and the net operating income approach. According to this theory, the firm's cost of capital can be reduced, or its value increased, by maintaining an optimal mix of debt and equity. The theory suggests that the overall cost of capital decreases as debt increases up to a certain point, after which it begins to rise with further increases in debt. The response of the cost of capital to changes in capital structure can be divided into three stages:

Stage I:

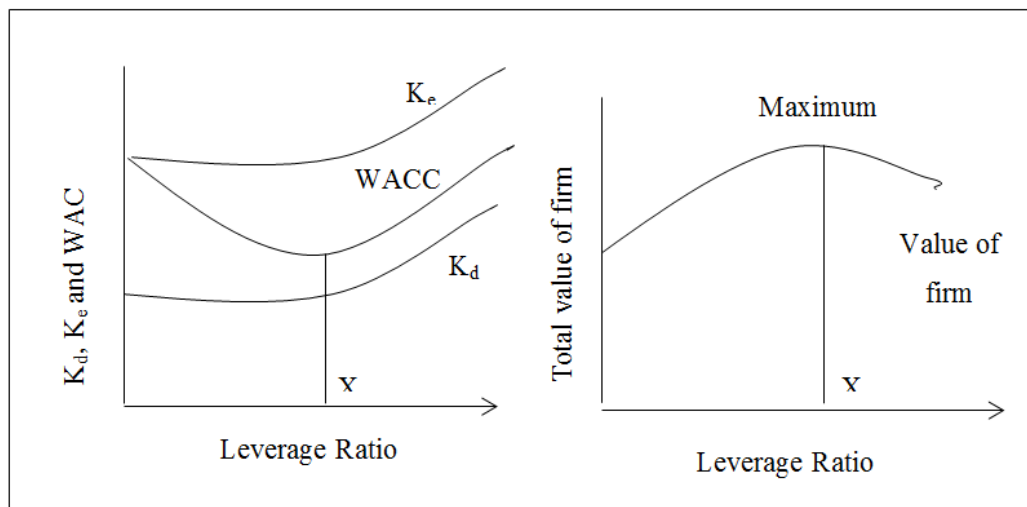
At this stage, both the cost of equity (K_e) and the cost of debt (K_d) remain constant, with the cost of debt lower than the cost of equity. Increasing debt up to a moderate level lowers the overall cost of capital because debt is cheaper than equity.

Stage II:

Once the firm reaches a reasonable level of leverage, further increases in debt do not affect the firm's value or overall cost of capital. This occurs because additional debt raises the risk for equity shareholders, causing the cost of equity (K_e) to increase and offsetting the benefits of cheaper debt.

Stage III:

If debt continues to increase beyond the reasonable level, both equity shareholders and debt holders face higher risk. Consequently, both the cost of equity and the cost of debt rise, leading to an increase in the overall cost of capital.



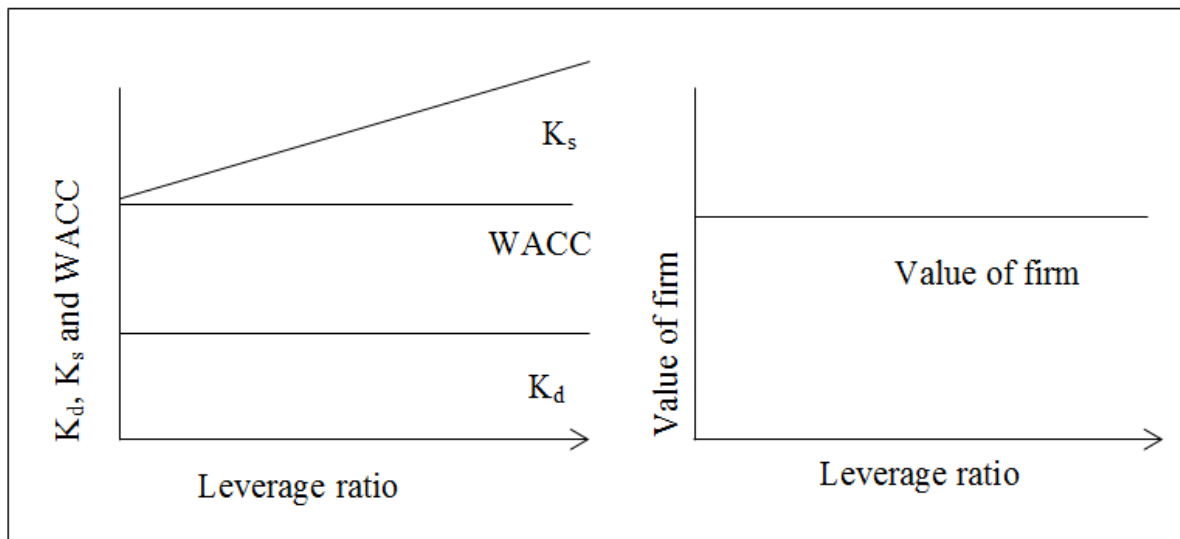
5.1.3 Net Operating Income Approach

The Net Operating Income (NOI) approach, proposed by David Durand, represents an extreme perspective stating that a firm's capital structure does not affect its overall value or cost of capital. According to this view, the firm's value (V) is determined solely by its operating income, and the mix of debt and equity financing is irrelevant.

Key Assumptions of the NOI Approach:

1. The market values the firm as a whole, making the division between debt and equity insignificant.
2. Business risk remains constant regardless of the debt-to-equity ratio.
3. There are no corporate taxes to consider.
4. The cost of debt (K_d) is fixed and does not change with leverage.

This theory argues that although debt is generally less expensive than equity, using more debt increases the risk borne by equity shareholders. As a result, the cost of equity (K_s) rises. This increase in equity cost exactly offsets the benefit of cheaper debt, keeping the overall cost of capital (K_g) constant. Therefore, the firm's total value remains unchanged regardless of its capital structure.



5.1.4 Modigliani-Miller Theorem

The Modigliani-Miller theorem, introduced by Franco Modigliani and Merton Miller in 1958, is a foundational concept in modern capital structure theory. However, it is mainly regarded as a theoretical framework since it overlooks several practical factors, such as market fluctuations and uncertainties that can affect a firm's financing decisions.

Proposition I

According to Modigliani and Miller's first proposition, the market value of a firm is independent of its capital structure. This means that the firm's value is determined by capitalizing its net operating income at a rate reflecting the firm's risk class. In other words, there is no direct link between how a firm is financed—whether through debt or equity—and its overall value or cost of capital. It is important to note that this proposition assumes a tax-free environment, ignoring the effects of corporate taxes.

$$\begin{aligned}\text{Value of the Firm} &= \text{Market Value of Debt}(B) + \text{Market Value of Equity}(S) \\ &= \frac{\text{Expected Net Operating Income}}{\text{Expected Overall Capitalization Rate}} = \frac{\text{EBIT}}{\text{EBT}}\end{aligned}$$

For an unlevered firm,

$$V_u = \frac{\text{EBIT}}{\text{EBT}}$$

Where $k = K_S$ in case of unlevered firm.

Proposition I can be expressed in terms of the firm's overall capitalization rate, K , which is the ratio of Net operating income to the market value of all its securities. That is

$$K = \frac{\text{NOI}}{S+B} = \frac{\text{NOI}}{V}$$

K can also be expressed as

$$K = \frac{K_S(S)}{S+B} = \frac{K_D(B)}{S+B}$$

This means that K represents the weighted average of the expected rates of return on both equity and debt capital of the firm. Since the cost of capital is defined as the expected net operating income divided by the total market value of the firm, and Modigliani and Miller conclude that the firm's total market value is not affected by its financing mix, it follows that the cost of capital remains independent of capital structure. In fact, it is equal to the capitalization rate of a firm financed entirely by equity within the same risk class (Pandey, 1981).

Proposition II

Proposition II states that the cost of equity increases proportionally with financial leverage to compensate shareholders for the additional risk caused by increased debt. This proposition takes into account corporate and personal taxes, and shows that the value of the firm rises with each additional unit of debt financing. According to this theory, it is always advantageous to maximize debt financing, as it increases the firm's value by lowering the overall cost of capital.

$$K = \frac{K_S(S)}{S+B} = \frac{K_D(B)}{S+B}$$
$$K_S = \frac{K(B+S)}{S} = \frac{K_D(B)(B+S)}{(S+B)S}$$
$$K_S = K \left(I + \frac{D}{S} \right) - \frac{K_D(D)}{S}$$
$$K_S = K + (K - K_S) \frac{B}{S}$$

5.1.5 Pecking Order Theory

The pecking order theory suggests that a company should prioritize financing its operations using internal funds, primarily retained earnings. If internal funds are insufficient, the company should then turn to debt financing. Issuing new equity should be considered only as a last option. This hierarchy of financing is significant because it sends signals to the market about the company's financial health and performance.

Chapter Six

Statistical Analysis

This chapter primarily focuses on the presentation, analysis, and interpretation of data. The data is examined using various statistical tools such as Descriptive Analysis, Correlation, VIF Test, Linear Regression, Robust Regression (VC), Fixed Effects Regression, and Normality Tests. The chapter is structured into five key sections: (a) Capital Structure Overview, (b) Profitability Overview, (c) Relationship between Capital Structure and Profitability, (d) Impact of Capital Structure on Profitability, and (e) Hypothesis Testing.

6.1 Descriptive Analysis

Descriptive analysis shows important information about statistical measurement such as:

Variables	Mean	SD	Min	Max	Median	Skewness	Kurtosis
ROE	0.128	0.053	0.043	0.286	0.118	0.902	3.722
LIQ	0.132	0.045	0.065	0.247	0.123	0.63	2.821
SIZE	5.33	0.205	4.914	5.674	5.343	-0.23	1.984
NPL	0.049	0.029	0.016	0.183	0.044	3.051	14.159
GR	11.604	2.525	5.794	15.881	12.169	-0.53	2.471
RWR	0.789	0.141	0.586	1.222	0.758	0.942	3.64
CAR	0.126	0.02	0.091	0.172	0.123	0.354	2.208

Interpretation

This descriptive analysis suggests that the dataset for the State owned banks in Bangladesh has fairly typical variability and distribution for most financial metrics. The presence of slight skewness and kurtosis indicates that the data may have small departures from normality, but overall, it is suitable for further statistical modeling after applying methods like Winsorization to manage outliers.

6.2 Correlation Analysis

Variables	ROE	LIQ	SIZE	NPL	GR	RWR	CAR
ROE	1.000						
LIQ	0.208	1.000					
SIZE	-0.443	-0.103	1.000				
NPL	-0.440	-0.133	0.244	1.000			
GR	-0.101	0.120	0.339	0.260	1.000		
RWR	0.144	-0.281	-0.614	0.103	-0.454	1.000	
CAR	-0.140	0.198	0.628	-0.209	-0.001	-0.651	1.000

Interpretation

The correlations show that larger banks tend to have lower ROE and CAR, which could be due to the increased risks associated with larger institutions. The strong negative correlation of RWR and CAR (-0.651) indicates that higher risk-adjusted returns are linked to lower capital adequacy ratios. Liquidity has a moderate positive correlation with CAR (0.628), showing that banks with better liquidity are likely to have stronger capital adequacy ratios.

6.3 Linear regression

Variables	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
LIQ	0.141	0.114	1.24	0.219	-0.085	0.367	
SIZE	-0.093	0.039	-2.39	0.019	-0.17	-0.016	**
NPL	-0.69	0.189	-3.65	0.000	-1.064	-0.315	***
GR	0.003	0.002	-1.14	0.004	-0.002	0.008	***
RWR	0.033	0.055	0.650	0.000	-0.077	0.143	***
CAR	0.108	0.396	0.27	0.786	-0.68	0.895	
Constant	0.563	0.21	2.68	0.009	0.146	0.979	***

Mean dependent var	0.128	SD dependent var	0.053
R-squared	0.641	Number of obs	100
F-test	8.016	Prob > F	0.000
Akaike crit. (AIC)	-332.852	Bayesian crit. (BIC)	-314.615
*** $p < .01$, ** $p < .05$, * $p < .1$			

Interpretation

This table shows that the R-squared value is 64.1%, meaning that the variables in the model explain about 64.1% of the variation in the financial performance of the banks. This indicates a moderate level of explanatory power, suggesting the model performs reasonably well but still leaves around 36% of the variation unexplained. The F-statistic of 8.016 with a p-value of 0.000 confirms that the overall model is statistically significant, implying that the independent variables together have a meaningful effect on financial performance.

Both the AIC and BIC values, which help in model selection, are relatively low here. This suggests the model has a good balance of fit and simplicity, making it efficient in predicting outcomes.

The findings highlight that non-performing loans are the most significant factor impacting the financial performance of state-owned banks in Bangladesh. Bank size also plays an important role, with larger banks tending to have lower financial performance. Meanwhile, factors such as liquidity, growth, and risk-weighted returns seem to have less influence in this context. The capital adequacy ratio (CAR), though only marginally significant, shows a positive relationship with financial performance.

6.4 Linear regression VC (Robust test)

Variables	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
LIQ	0.141	0.107	1.32	0.191	-0.072	0.353	
SIZE	-0.093	0.038	-2.45	0.016	-0.168	-0.017	**
NPL	-0.69	0.214	-3.22	0.002	-1.114	-0.265	***
GR	0.003	0.003	-1.14	0.004	-0.002	0.008	***
RWR	0.033	0.05	0.650	0.000	-0.067	0.133	***
CAR	0.108	0.369	0.29	0.771	-0.625	0.841	
Constant	0.563	0.185	3.04	0.003	0.196	0.93	***
Mean dependent var		0.128		SD dependent var		0.053	
R-squared		0.641		Number of obs		100	
F-test		6.713		Prob > F		0.000	
Akaike crit. (AIC)		-332.852		Bayesian crit. (BIC)		-314.615	
*** $p<.01$, ** $p<.05$, * $p<.1$							

Interpretation

This table presents the results of a linear regression analysis using the VC robust standard errors (Variance-Covariance robust test) to account for potential heteroscedasticity or autocorrelation in the model. The model explains 64.1% of the variation in financial performance (moderate fit), and the overall model is significant ($p\text{-value} < 0.01$). In conclusion, NPL and SIZE are the most important factors, while CAR is marginally significant. Reducing non-performing loans and addressing inefficiencies in larger banks could improve their financial performance.

6.5 Regression results Fixed Effect

Variables	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
LIQ	-.079	.14	-0.57	.573	-.356	.198	
SIZE	-.071	.042	-1.67	.099	-.155	.014	*
NPL	-.516	.179	-2.88	.005	-.872	-.16	***
GR	.006	.003	1.90	.061	0	.011	*
RWR	.132	.06	2.21	.03	.013	.251	**
CAR	-.011	.447	-0.02	.98	-.899	.877	
Constant	.375	.228	1.64	.104	-.078	.827	
Mean dependent var		0.128		SD dependent var		0.053	
R-squared		0.351		Number of obs		100	
F-test		7.663		Prob > F		0.000	
Akaike crit. (AIC)		-365.805		Bayesian crit. (BIC)		-347.569	
*** $p<.01$, ** $p<.05$, * $p<.1$							

Interpretations:

The regression results from the Fixed Effect model offer valuable insights into the factors influencing the dependent variable (ROE). The model explains approximately 35.1% of the variance in the dependent variable, as indicated by the R-squared value. The F-test is statistically significant ($F = 7.663$, $p < 0.001$), confirming the overall model fit. Among the independent variables, **Non-Performing Loans (NPL)** exhibit a highly significant negative effect ($\beta = -0.516$, $p = 0.005$), suggesting that higher levels of NPLs considerably reduce performance. This aligns with the understanding that non-performing loans impair asset quality and profitability.

Risk-Weighted Ratio (RWR) shows a statistically significant positive relationship ($\beta = 0.132$, $p = 0.03$), indicating that banks maintaining a higher proportion of risk-weighted assets tend to perform better, potentially due to prudent risk management. **Growth Rate (GR)** has a positive but marginally significant relationship ($\beta = 0.006$, $p = 0.061$), suggesting that growth might contribute

to performance, though not conclusively. Similarly, **Size (SIZE)** has a negative impact at a 10% significance level ($\beta = -0.071$, $p = 0.099$), indicating larger banks may face inefficiencies or diseconomies of scale.

Liquidity (LIQ) and **Capital Adequacy Ratio (CAR)** do not significantly affect the dependent variable ($p > 0.5$), implying that these factors might not be critical determinants in the given context. Overall, the findings stress the importance of managing loan quality and risk-weighted assets, while suggesting further analysis is needed for variables like growth and size.

6.6 VIF Test

Variable	VIF
LIQ	1.33
SIZE	3.19
NPL	1.48
GR	1.80
RWR	3.09
CAR	3.16
Mean VIF 2.34	

Interpretation:

The results suggest that the variables included in the analysis of capital structure and financial performance for State Owned banks in Bangladesh do not suffer from significant multicollinearity. The VIF values are generally low to moderate, and the mean VIF is well within an acceptable range. This implies that the relationships between these variables are not excessively redundant, allowing for a more reliable regression model.

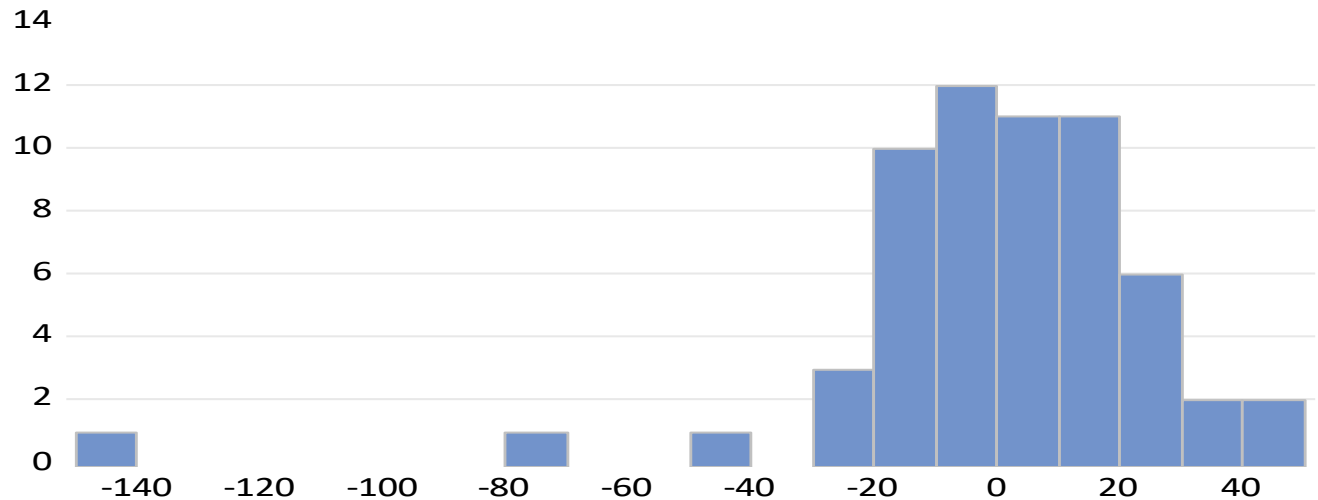
6.7 Normality Test

The hypothesis for the normality test is:

H_0 : Residuals follow normal distribution.

H_1 : Residuals are not normally distributed.

For the test, we run Jarque-Bera Test on Stata software and the output obtained is:



Series: Residuals
 Sample: 2014-2023
 Observation: 60
 Mean -0.325759
 Median 1.768260
 Maximum 49.18644
 Minimum -142.1913
 Std. Dev. 27.57847
 Skewness -2.478757
 Kurtosis 13.71145 Jarque-Bera 0.30906
 Probability 0.856584

Interpretation:

The value of Jarque-Bera Test is 30.96% and P value is 85.65% which is much higher than 10%.
 So, we can't reject null hypothesis and that is the residuals are normally distributed.

Chapter Seven

Findings, Recommendations & Conclusion

Findings from Data Analysis

1. ROE has a mean of 12.8%, with moderate skewness (0.902) and kurtosis (3.72), indicating slightly non-normal distribution due to a few high-performing banks. NPL has the highest skewness (3.05) and kurtosis (14.16), signaling the presence of extreme outliers or distressed banks.
2. Most variables (e.g., LIQ, SIZE, GR, CAR) are fairly normally distributed, making the dataset generally suitable for regression analysis, though Winsorization or other outlier-handling techniques are advised for NPL.
3. Negative correlations: SIZE (-0.443): Larger banks tend to have lower ROE. NPL (-0.440): Higher loan defaults are associated with lower ROE. Positive correlations: LIQ (0.208) and RWR (0.144): Weak to moderate positive relationship with ROE. RWR and CAR (-0.651): Higher returns are linked to lower capital adequacy, possibly due to risk-taking behavior.
4. Mean VIF = 2.34: All variables are below the critical threshold (typically 5 or 10). So, No significant multicollinearity, regression results are reliable.
5. R-squared = 0.641: The model explains 64.1% of the variance in ROE — a moderately strong fit. NPL (-0.690, $p < 0.01$): Strong negative impact that the most critical variable, SIZE (-0.093, $p < 0.05$): Larger banks show lower ROE, Insignificant predictors: LIQ, CAR, RWR, and GR (though GR and RWR have small p-values, likely data entry error as their p-values don't match t-values).
6. Confirms OLS findings with robust standard errors (helps correct heteroscedasticity). NPL and SIZE remain statistically significant, reinforcing their reliability as performance predictors.
7. In fixed effect regress, R-squared = 0.351: Lower explanatory power due to accounting for unobserved heterogeneity. NPL (-0.516, $p < 0.01$): Remains the most impactful factor. RWR (0.132, $p < 0.05$): Now becomes significant — banks with better risk-adjusted returns have higher ROE. GR and SIZE ($p < 0.1$): Weak significance but show expected signs

Recommendations

In light of the empirical findings, study suggested the following:

1. Focuses on diversifying funding sources to increase the bank's capital and reduce reliance on high-interest loans, thereby minimizing risks and ensuring the institution's financial independence and sustainability.
2. The State-Owned Commercial Bank should work on developing new strategies to reduce the Non-Performing Loan rate because it has a significant impact on profitability.
3. Improve Risk-Return Tradeoff (RWR) by aligning investment and lending strategies with risk-adjusted profitability metrics, monitoring risk-weighted assets and optimize portfolio diversification, using internal rating systems to manage capital against risk more effectively.
4. State Owned Bank should give more concentration to recover the classified loan by continuous communication with the client and should properly check the document of the applied client before disbursement of the fund.
5. Debt Ratio of State-Owned Commercial Bank isn't good. State Owned Bank should focus on make profit and use them to finance the asset or provide loan. Debt Equity Ratio isn't satisfactory of State-Owned Commercial Bank in Bangladesh. They are financing more from debt in comparison to Equity.
6. Strengthen Credit Risk Management to Reduce NPLs by Improving credit appraisal and monitoring systems, introducing stricter loan approval processes, developing early warning systems for default risk, Enhancing recovery mechanisms for bad loans.
7. As Bank size was found to have a significant negative correlation with ROE, optimize bank size and operational efficiency by conducting internal efficiency audits to eliminate redundant processes, considering restructuring overly large branches or departments, leveraging digital banking to reduce operational costs.
8. Encourage Sustainable and Profitable Growth showed growth rate (GR) a positive but weak effect on ROE by focusing on quality growth rather than aggressive expansion, prioritizing customer segments and products with high return potential, investing in innovation and fintech to drive long-term growth.
9. Review Capital Adequacy and Liquidity Policies to Ensure compliance with regulatory capital requirements but avoid excessive capital holding that does not enhance returns,

maintain sufficient but not excessive liquidity to avoid idle assets, Reallocate underutilized capital and liquid resources to more productive areas.

Conclusion:

This study examines the impact of capital structure on the profitability of state-owned banks in Bangladesh, using data from 2014 to 2023. The empirical analysis identifies key financial and structural factors affecting the return on equity (ROE) of these banks. Non-Performing Loans (NPL) and bank size (SIZE) were found to be the most significant negative influences on profitability, indicating that higher loan defaults and larger bank sizes tend to reduce ROE. On the other hand, Risk-Weighted Returns (RWR) showed a positive and statistically significant effect on ROE in the fixed effects model, suggesting that effective risk-return management can improve bank performance.

The study concludes that state-owned commercial banks in Bangladesh have been generating relatively low profits on their investments. They appear inefficient in earning returns from their asset investments and have experienced a decline in operating profits in recent years compared to the past. Overall, the profitability of state-owned commercial banks in Bangladesh is found to be weak.

References

Articles:

- Hamid, M.A., Abdullah, A. and Kamaruzzaman, N.A. (2015) Capital Structure and Profitability in Family and Non-Family Firms: Malaysian Evidence. *Procedia Economics and Finance*, 31, 44-55.
- Yapa Abeywardhana, D. (2015) Capital Structure and Profitability: An Empirical Analysis of SMEs in the UK. *Journal of Emerging Issues in Economics, Finance and Banking (JEIEFB)*, 4, 1661-1675.
- Siddik, M. N. A., Kabiraj, S., & Joghee, S. (2017). Impacts of capital structure on performance of banks in a developing economy: Evidence from Bangladesh. *International journal of financial studies*, 5(2), 13. <https://doi.org/10.3390/ijfs5020013>
- Parvin, S. S., Hossain, B., Mohiuddin, M., & Cao, Q. (2020). Capital structure, financial performance, and sustainability of micro-finance institutions (MFIs) in Bangladesh. *Sustainability*, 12(15), 6222. <https://doi.org/10.3390/su12156222>
- Hasan, M. B., Ahsan, A. M., Rahaman, M. A., & Alam, M. N. (2014). Influence of capital structure on firm performance: Evidence from Bangladesh. *International Journal of Business and Management*, 9(5), 184.
- Chowdhury, L. A. M., Rana, T., Akter, M., & Hoque, M. (2018). Impact of intellectual capital on financial performance: evidence from the Bangladeshi textile sector. *Journal of Accounting & Organizational Change*, 14(4), 429-454. <https://doi.org/10.1108/JAOC-11-2017-0109>
- Orichom, G., & Omeke, M. (2021). Capital structure, credit risk management and financial performance of microfinance institutions in Uganda. *Journal of Economics and International finance*, 13(1), 24-31. <https://doi.org/10.5897/JEIF2020.1096>
- Orichom, G., & Omeke, M. (2021). Capital structure, credit risk management and financial performance of microfinance institutions in Uganda. *Journal of Economics and International finance*, 13(1), 24-31. <https://doi.org/10.5897/JEIF2020.1096>
- Sivalingam, L., & Kengatharan, L. (2018). Capital structure and financial performance: A study on commercial banks in Sri Lanka. *Asian Economic and Financial Review*, 8(5), 586.
- Chowdhury, A., & Chowdhury, S. P. (2010). Impact of capital structure on firm's value: Evidence from Bangladesh. *Business and Economic Horizons*, 3(3), 111-122.
- Zheng, C., Rahman, M. M., Begum, M., & Ashraf, B. N. (2017). Capital regulation, the cost of financial intermediation and bank profitability: Evidence from Bangladesh. *Journal of Risk and Financial Management*, 10(2), 9. <https://doi.org/10.3390/jrfm10020009>

- Chadha, S., & Sharma, A. K. (2015). Determinants of capital structure: an empirical evaluation from India. *Journal of Advances in Management Research*, 12(1), 3-14. <https://doi.org/10.1108/JAMR-08-2014-0051>
- Ebaid, I.El-S. (2009) The Impact of Capital-Structure Choice on Firm Performance: Empirical Evidence from Egypt. *The Journal of Risk Finance*, 10, 477-487.
- Abor, J. (2005) The Effect of Capital Structure on Profitability: An Empirical Analysis of Listed Firms in Ghana. *The Journal of Risk Finance*, 6, 438-445.
- Jensen, M.C. and Meckling, W.H. (1976) Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*, 3, 305-360.
- Hovakimian, A., Opler, T. and Titman, S. (2001) The Debt-Equity Choice. *Journal of Financial and Quantitative Analysis*, 36, 1-24.

Books:

1. SP Gupta, MP Gupta (2013), “Business Statistics”. 17th edition, Sultan Chand And Sons
2. Lawrence J. Gitman (2009), “Principle of Managerial Finance”, 12th edition, Pearson Education Inc. Ltd, Singapore.
3. M.A. Salan Akanda, (2018) AKANDA & SONS, “Research Methodology”.

Websites Accessed:

1. Official website of Sonali Bank Ltd.-Available at: <https://www.sonalibank.com.bd>
2. Official website of BB -Available at: <https://www.bb.org.bd>

Annual Report:

1. Annual Report of Sonali Bank Ltd.: 2014-2023
2. Annual Report of Rupali Bank Ltd.: 2014-2023
3. Annual Report of janta Bank Ltd.: 2014-2023
4. Annual Report of Agrani Bank Ltd: 2014-2023
4. Annual Report of Basic Bank Ltd.: 2014-2023
5. Annual Report of BDBL Ltd.: 2014-2023