ANALYSIS OF FINANCIAL HEALTH OF SELECT PRIVATE SECTOR BANKS

Botica Madhukumar
Research scholar
University College of Commerce & Business Management, Osmania University, Hyderabad-500 007,
Mail: boticamadhukumar1@gmail.com

Dr. K.Srinivas
Associate Professor,
University College of Commerce & Business Management, Osmania University, Hyderabad-500 007.
Mail: kamatamsrinivas@gmail.com

Abstract

The present study explores the financial health of selected private sector banks in India, focusing on their performance during a critical period of banking sector reforms and economic changes. The research emphasizes key financial indicators to evaluate the stability and profitability of these institutions over a defined period.
The main objective of the study is to assess the financial soundness of selected private sector banks using various financial ratios such as Capital Adequacy Ratio, Net Profit Margin, Return on Assets, and Non-Performing Assets (NPA) ratios. The study aims to compare and interpret the financial performance of these banks to highlight their strengths and weaknesses.
The purpose of the study is to provide meaningful insights to policymakers, investors, and stakeholders regarding the financial position and sustainability of private sector banks. The analysis is based on secondary data extracted from annual reports and RBI privateations.
The findings indicate that while some banks demonstrate sound capital adequacy and profitability, others struggle with high NPAs and inconsistent performance. The financial health across banks is not uniform, showing the need for targeted reforms.
In conclusion, the study suggests that continuous monitoring and policy support are essential for enhancing the financial robustness of private sector banks in India.

Key Words: *Private Sector Banks, Financial Health, Financial Performance, Profitability*

1. Introduction

The financial health and stability of banks, whether private or private, are critical indicators of their ability to withstand economic fluctuations, regulatory challenges, and competitive pressures. Assessing this health requires robust frameworks tailored to the unique characteristics of financial institutions, such as banks, which predominantly deal in services rather than manufacturing goods. One such framework, the Altman Z-Score, originally developed by Edward I. Altman in the 1960s, has been adapted beyond its initial application in manufacturing to evaluate the risk of bankruptcy for non-manufacturing entities like banks.

The Altman Z-Score integrates multiple financial ratios, including liquidity, profitability, leverage, solvency, and market valuation, into a composite score. This score categorizes companies into different zones: the Green Zone indicating low bankruptcy risk, the Grey Zone suggesting moderate risk, and the Red Zone signaling high risk. For banks, these ratios are adjusted to reflect their operational realities, such as reliance on interest income, asset quality, regulatory capital requirements, and liquidity management strategies.

In recent years, the application of the Altman Z-Score to banks has become increasingly relevant amidst global financial crises, regulatory reforms, and technological advancements reshaping the banking landscape. The score serves as a crucial tool for stakeholders, including investors, regulators, and management, in assessing the financial resilience and risk profile of banks. It provides insights into potential vulnerabilities and strengths, guiding strategic decisions related to capital allocation, risk management, and growth strategies.

This analysis aims to explore and evaluate the financial health of select private and private limited banks using the Altman Z-Score methodology. By examining trends over several years, the study seeks to identify patterns, highlight key factors influencing financial stability, and draw conclusions regarding each bank's ability to navigate challenges and capitalize on opportunities in the dynamic banking sector.

Through this exploration, we aim to provide a comprehensive understanding of how the Altman Z-Score can be leveraged effectively to assess the financial health of banks, thereby contributing to informed decision-making and enhancing transparency in the financial markets.

2. About the Private Sector Banks

S. No.	Name of the Bank	Headquarters	Founded Year	Key Features
1	Axis Bank	Mumbai, Maharashtra	1993	One of the largest private sector banks, strong digital banking, wide ATM and branch network
2	City Union Bank	Kumbakonam, Tamil Nadu	1904	Focus on SMEs and retail banking, strong regional presence in South India
3	Federal Bank	Aluva, Kerala	1931	Tech-savvy operations, strong NRI customer base, expanding digital footprint
4	HDFC Bank	Mumbai, Maharashtra	1994	India's largest private bank by market cap, known for retail banking and digital innovation
5	ICICI Bank	Mumbai, Maharashtra	1994	Pioneer in tech-driven banking, diversified services, large customer base
6	IndusInd Bank	Mumbai, Maharashtra	1994	Strong in vehicle finance and corporate banking, emphasis on customer experience
7	Kotak Mahindra Bank	Mumbai, Maharashtra	2003 (as bank)	Leading private bank, started as NBFC, strong in wealth management and digital banking

8	RBL Bank (Ratnakar Bank)	Mumbai, Maharashtra	1943	Rapid expansion in recent years, focus on digital services and financial inclusion

3. Review of literature

The literature reviewed presents a comprehensive understanding of the various dimensions affecting the financial performance and stability of private sector banks (PSBs) in India and across the globe. Several studies have analyzed bank performance using Altman Z-score.

Many researchers (e.g., **Huong, 2023**; **Kee Guek Ping, 2021**) have highlighted the role of capital structure, capital adequacy, and earning quality in determining bank profitability, while pointing out that liquidity and management efficiency may negatively impact performance.

The **CAMEL framework** is widely used in various studies (e.g., **K. Suresh & Pradhan, 2023**; **Bhiryani, 2017**; **Gupta, 2014**) to evaluate the overall financial health of both private and private sector banks, often showing that private banks tend to outperform PSBs in several key areas.

Studies like those of **Patra et al. (2023)** and **Patel (2017)** confirm that although PSBs show improvements post-reforms (such as the RBI's Prompt Corrective Action framework and bank mergers), they still face significant efficiency and stability challenges, particularly due to high levels of non-performing assets (NPAs). Conversely, private banks generally show higher profitability and operational efficiency.

The **impact of credit risk** on financial performance is also well-documented (e.g., **Isanzu, 2017**), indicating the importance of capital adequacy and controlling NPAs. Comparative analyses (e.g., **Kumar, 2018**; **Karri et al., 2016**) reinforce that private banks often exhibit superior financial indicators than PSBs.

In terms of customer perception, **Ali & Bisht (2018)** found that private sector banks enjoy higher customer satisfaction, urging PSBs to focus more on service quality. Moreover, studies like **Tamragundi & Devarajappa (2016)** underline the mixed outcomes of bank mergers, suggesting they offer benefits like business expansion but don't necessarily resolve issues of financial distress.

International studies (e.g., **Rostami, 2015**; **Perpetua, 2015**; **Shah & Jain, 2014**) further emphasize the importance of regulatory frameworks, market dynamics, and macroeconomic variables in influencing bank performance and risk levels.

Overall, the literature suggests that while PSBs have made notable progress in recent years, particularly due to regulatory reforms and government intervention, challenges such as NPA management, profitability, and operational efficiency persist. The need for structural improvements, customer-centric strategies, and stronger credit risk management practices is consistently highlighted across multiple studies.

4. Research Gap

Despite the significant role that banks play in a country's financial stability and economic development, there is a noticeable lack of comparative studies that evaluate the **financial health of select Private-Limited banks** using a comprehensive and quantitative approach. Existing literature predominantly focuses on traditional performance indicators such as profitability ratios, asset quality, and capital adequacy. However, these isolated measures often fail to provide a holistic view of a bank's long-term financial sustainability.

The **Altman Z-Score model**, which combines multiple financial ratios—including **liquidity, profitability, leverage, solvency, and market valuation**—into a single composite score, offers a more integrated and predictive measure of financial health. While widely used in corporate and manufacturing sectors, its application in the **banking sector, especially to compare private and private sector banks**, remains limited.

Furthermore, most existing studies do not clearly classify banks into distinct **zones of financial stability**—namely, the **Green Zone** (low bankruptcy risk), **Grey Zone** (moderate risk), and **Red Zone** (high risk). This study aims to address this gap by applying the Altman Z-Score to **evaluate and compare the financial position of selected private and private sector banks**, thereby providing insights into their relative risk levels and potential vulnerabilities.

5. Objectives of the Study

1) To analyse the financial health of select Private Limited sector banks using key financial indicators.
2) To apply the Altman Z-Score model to assess selected private sector banks' overall financial stability and bankruptcy risk.
3) To categorize the selected banks into Green, Grey, and Red Zones based on their Z-Score values, indicating low, moderate, or high financial risk.

6. Hypotheses

1. Hypothesis (H_0 - Null Hypothesis):
   There is **no significant difference** in the financial health of select Private Limited sector banks based on key financial indicators.
2. Alternative Hypothesis (H_1):
   There is a **significant difference** in the financial health of select Private Limited sector banks based on key financial indicators.

7. Research Methodology

1. Nature of the Study

This study is **analytical** in nature, aiming to assess the financial health of selected **Private Sector Banks** in India over a period of ten years using quantitative tools and models.

2. Data Source

The study is based entirely on **secondary data** collected from the **annual reports** of private sector banks, **RBI privatisations**, and **financial statements** available on official websites. The time frame of the data spans **ten financial years, from 2013–14 to 2022–23**.

3. Sample Selection

The study focuses exclusively on **selected Private Sector Banks (PSBs)** in India. The selection is based on parameters such as availability of consistent financial data and relevance in the Indian banking sector.

4. Analytical Tool Used: Altman Z″-Score Model

To evaluate the financial health and risk of bankruptcy of selected PSBs, the **Altman Z″-Score model** is applied. This model integrates multiple financial ratios into a single composite score, offering a comprehensive view of a firm's financial strength.

5. Financial Ratios Considered in Z″-Score Model

The Z″-Score for non-manufacturing and private firms is calculated using the following formula:

$$Z' = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

Where:

- 1X1 = (Current Assets – Current Liabilities) / Total Assets (Working Capital Ratio)
- 2X2 = Retained Earnings / Total Assets
- 3X3 = EBIT / Total Assets (Profitability Measure)
- 4X4 = Book Value of Equity / Total Liabilities (Solvency Ratio)

6. Classification Zones (Based on Z″-Score):

- **Z″ > 2.6** → Safe Zone (Low risk of bankruptcy)
- **1.1 < Z″ < 2.6** → Grey Zone (Moderate risk)
- **Z″ < 1.1** → Distress Zone or Red Zone (High risk of financial distress).

8. Data Analysis

The financial health of banks is a crucial determinant of the stability and efficiency of any country's financial system. In India, private sector banks (constitute a significant share of the banking industry, playing a vital role in financial inclusion, credit distribution, and economic development. However, over the past decade, these banks have faced increasing financial stress due to rising non-performing assets (NPAs), falling profitability, and capital adequacy concerns. To assess their financial position more scientifically and objectively, a detailed data analysis is essential.

9. Results:

Table : Analysis of financial health of Private Sector banks

Year	Axis Bank		City Union Bank		Federal Bank		HDFC Bank	
	Z Score	Zone	Z Score	Zone	Z Score	Zone	Z Score	Zone

Mar-14	1.11	Red Zone	1.28	Grey Zone	1.20	Red Zone	0.81	Red Zone
Mar-15	1.14	Red Zone	1.37	Grey Zone	1.19	Red Zone	1.14	Red Zone
Mar-16	1.12	Red Zone	1.37	Grey Zone	1.14	Red Zone	1.06	Red Zone
Mar-17	1.00	Red Zone	1.37	Grey Zone	1.04	Red Zone	0.92	Red Zone
Mar-18	1.07	Red Zone	1.34	Grey Zone	1.11	Red Zone	1.04	Red Zone
Mar-19	0.99	Red Zone	1.26	Grey Zone	1.12	Red Zone	1.30	Grey Zone
Mar-20	0.96	Red Zone	1.17	Red Zone	1.07	Red Zone	1.16	Red Zone
Mar-21	1.14	Red Zone	1.26	Grey Zone	1.05	Red Zone	1.03	Red Zone
Mar-22	1.05	Red Zone	1.32	Grey Zone	1.20	Red Zone	1.08	Red Zone
Mar-23	0.98	Red Zone	1.36	Grey Zone	1.14	Red Zone	1.04	Red Zone
Average	**1.05**	**Red**	**1.31**	**Grey**	**1.12**	**Red**	**1.05**	**Red**

Analysis of the financial health of Private Sector banks

Year	ICICI Bank		IndusInd Bank		Kotak Mahindra Bank		RBL	
	Z Score	Zone	Z Score	Zone	Z Score	Zone	Z Score	Zone
Mar-14	1.11	Red Zone	4.45	Green Zone	3.36	Green Zone	13.02	Green Zone

Mar-15	1.17	Red Zone	1.00	Red Zone	1.17	Red Zone	0.83	Red Zone
Mar-16	1.09	Red Zone	1.14	Red Zone	1.00	Red Zone	0.81	Red Zone
Mar-17	1.16	Red Zone	1.08	Red Zone	1.09	Red Zone	0.86	Red Zone
Mar-18	1.26	Grey Zone	1.17	Red Zone	1.27	Grey Zone	0.96	Red Zone
Mar-19	1.28	Grey Zone	1.10	Red Zone	1.29	Grey Zone	0.97	Red Zone
Mar-20	1.13	Red Zone	1.19	Red Zone	1.28	Grey Zone	1.21	Red Zone
Mar-21	1.19	Red Zone	1.10	Red Zone	1.56	Grey Zone	1.29	Grey Zone
Mar-22	1.29	Grey Zone	1.39	Grey Zone	1.55	Grey Zone	1.40	Grey Zone
Mar-23	1.28	Grey Zone	1.67	Grey Zone	1.48	Grey Zone	1.60	Grey Zone
Average	**1.19**	**Red**	**1.52**	**Grey**	**1.50**	**Grey**	**2.29**	**Green**

Axis Bank

Axis Bank reported an average Z-Score of **1.05**, placing it in the **Red Zone**, indicating a high risk of financial distress. Throughout the ten-year period, the bank remained consistently in the Red Zone, failing to surpass the critical threshold of 1.1 in most years. Although the bank reached its highest Z-Score in FY 2014–15 (1.14), the overall trend remained weak, with the score dropping to as low as 0.96 in FY 2019–20. The persistent low scores may be attributed to increasing credit costs, moderate profitability, or volatile market conditions. The data reflects

a need for Axis Bank to strengthen its capital adequacy, improve operational efficiency, and manage asset quality more prudently.

City Union Bank

City Union Bank demonstrated comparatively better financial health with an average Z-Score of **1.31**, positioning it within the **Grey Zone**. Over the ten-year period, the bank consistently hovered around the 1.3 mark, with scores ranging from 1.17 to 1.39. Despite not entering the Green Zone, the bank managed to avoid the Red Zone in all years except FY 2019–20. This relative consistency reflects a moderately stable financial position, supported by prudent lending and strong regional customer engagement. While improvements are needed to move toward financial safety, the bank has maintained resilience against major financial stress.

Federal Bank

Federal Bank maintained an average Z-Score of **1.12**, which places it in the **Red Zone**. Despite minor improvements in some years, the bank could not break past the 1.3 threshold. In all years, the Z-Scores fluctuated narrowly between 1.04 and 1.20, showing minimal progress. This persistent low performance indicates challenges in profit margins, asset management, or cost controls. To improve financial stability, Federal Bank must address its risk-weighted asset profile and look toward improving returns and capital utilization.

HDFC Bank

HDFC Bank, despite its reputation as a leading private sector bank, recorded an average Z-Score of **1.05**, placing it in the **Red Zone**. Except for a single year (FY 2018–19) where it reached 1.30, HDFC Bank remained consistently below the safe threshold. This result is somewhat unexpected for a high-performing retail-focused bank and may stem from conservative capital structures, dividend policies, or high provisioning. Although operationally strong and profitable, HDFC Bank needs to translate its market position into stronger solvency metrics for long-term financial health.

ICICI Bank

ICICI Bank posted an average Z-Score of **1.19**, putting it in the **Red Zone** overall. While it showed some improvement in the latter half of the study period—crossing into the Grey Zone from FY 2017–18 onwards—the early years were marked by low scores. This gradual upward trend indicates improving fundamentals, better credit risk management, and increased profitability. However, the bank still falls short of Green Zone levels, signaling that continued focus on sustainable lending practices and capital strengthening is required.

IndusInd Bank

IndusInd Bank exhibited a mixed trend with an average Z-Score of **1.52**, placing it in the **Grey Zone**. The bank started strong in FY 2013–14 with an impressive score of 4.45 (Green Zone), but subsequent years showed a significant decline, falling into the Red Zone multiple times until FY 2018–19. Only in recent years (2021–22 and 2022–23) did the bank return to Grey Zone levels, indicating partial recovery. The early strength followed by mid-term deterioration suggests volatility in asset quality or profitability. Recent improvements should be consolidated through robust governance and strategic capital allocation.

Kotak Mahindra Bank

Kotak Mahindra Bank maintained a steady performance with an average Z-Score of **1.50**, squarely in the **Grey Zone**. The bank consistently improved its scores from the Red Zone in early years to the Grey Zone in later years, peaking at 1.56 in FY 2020–21. Its gradual and sustained financial strengthening reflects prudent management, a healthy loan book, and superior cost control. While the bank has not yet entered the Green Zone, its trend shows strong potential to achieve financial safety with continued strategic focus.

RBL Bank

RBL Bank stood out with the highest average Z-Score among the private banks at **2.29**, placing it in the **Green Zone**, the only bank in this category to do so. However, this average is skewed by an extremely high score of 13.02 in FY 2013–14. In the subsequent years, the bank's Z-Scores fell dramatically, remaining in the Red Zone until FY 2020–21, and only returning to the Grey Zone in the last three years. Despite the high average, the inconsistency and sharp fluctuations raise concerns about financial sustainability. The bank must maintain this recovery phase to justify long-term financial resilience.

10. Conclusion

The Altman Z″-Score analysis of selected **Private Sector Banks** over a 10-year period reveals that most of these institutions face **significant financial vulnerabilities**. While none consistently remained in the **Green Zone**, banks like **Kotak Mahindra Bank**, **IndusInd Bank**, and **City Union Bank** managed to maintain positions within the **Grey Zone**, indicating moderate financial stability and resilience. Notably, **RBL Bank**, despite an exceptionally high initial score, showed **inconsistent performance**, suggesting vulnerability despite a high average.

Conversely, major players such as **HDFC Bank**, **Axis Bank**, and **ICICI Bank** remained mostly in the **Red Zone**, highlighting surprising levels of financial distress risk given their

scale and market presence. **Federal Bank** also remained in the Red Zone, reflecting challenges in asset quality and capital adequacy.

The analysis underlines a critical need for **targeted reforms**, including improving profitability, managing non-performing assets, and enhancing capital buffers. While private sector banks are often considered more efficient and dynamic than their public counterparts, this empirical evidence suggests that **financial robustness is not guaranteed**, and continuous strategic efforts are needed to improve long-term sustainability.

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