



A COMPARATIVE ANALYSIS OF THE FINANCIAL SOUNDNESS OF NIFTY BANKS AND SELECTED NON-BANKING FINANCIAL INSTITUTIONS (NBFI)S BY USING ALTMAN Z-SCORE MODELS

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ABSTRACT :

Purpose: The study aims to identify and compare the financial soundness between Nifty Bank and Selected NBFI in India with the help of the Altman Z-score model

Methodology: This study employs a descriptive method, covering the period from 2014-15 to 2023-24. A total sample of 24 entities has been selected, including 12 from the Nifty Bank and 12 from the top-performing NBFCs in India. The financial soundness of these entities is assessed using the Altman Z-score."

Findings: "The study revealed that, according to the Z-score, Axis Bank, a part of the Nifty Bank, and Larsen & Toubro Finance, an NBFC, demonstrate financial strength and fall into the low-risk zone, with scores above 2.99. On the other hand, Bank of Baroda and IRFC show signs of financial distress, with scores below 1.81, indicating the need for restructuring and efficiency improvements. Additionally, IDFC First Bank recorded an exceptionally high Z-score in 2014-15 due to its low level of liabilities." Based on testing a paired t-test- test it indicated that there is no significant difference in Nifty Bank and NBFC while using Z Z-score model, because the p-value is higher than the significance value.

Suggestions: Bank of Baroda and IRFC should enhance profitability, reduce costs, and optimize debt levels while diversifying revenue streams and strengthening risk management to improve financial stability and lower distress risk.

Conclusion: The banking sector is a lifeline of the Indian economy, while the NBFC sector is a shadow of the banking sector. Both sectors play a vital role in the Indian financial system. So, it may finally be concluded from the Altman Z-score that many of the institutions in the NBFC sector are low-risk zone as compared to the Nifty Bank sector.

Key words: Banks, NBFCs, z-score, working capital to total assets, etc

INTRODUCTION

"BANKS AND NBFCs ARE LIKE TWO WHEELS OF A CART, BOTH NEED TO BE STRONG AND FINANCIALLY SOUND FOR MOVING FORWARD SMOOTHLY"

Banks represent one wheel, providing stability, reliability, and a broad range of financial services, while NBFCs represent the other wheel, offering specialized services, agility, and adaptability. Both wheels need to be strong for the financial system to function effectively. When both wheels are strong, the cart (i.e., financial system) can move forward efficiently, providing better services to customers and contributing to economic growth. The importance of a strong and stable financial system lies in the crucial roles played by both banks and NBFCs. By ensuring financial soundness in both sectors, the overall financial system can function smoothly and support the country's economic development.

Thus, banks and NBFCs, as two wheels of the financial cart, must work in tandem, each contributing their unique strengths to ensure a smooth and stable journey towards economic growth and development.

REVIEW OF LITERATURE

According to (M.Preethi¹, 2024), in his paper shows that the financial stability of banks can be evaluated using various tools and techniques, one of which is the Altman Z-Score Formula. The Altman Z-Score tool assesses a company's financial health by analyzing its historical financial data. This tool is primarily employed to determine whether banks will sustain over a longer period and to predict the likelihood of bankruptcy. Additionally, a machine

learning linear regression model is used for forecasting future Z-scores. The study sample comprises six merged banks in India, including Punjab National Bank, Canara Bank, Indian Bank, Union Bank of India, State Bank of India, and Bank of Baroda, utilizing their financial statements from the past five years. In this study, data analysis techniques involve the use of the Altman Z-Score and linear regression model, alongside an accuracy test of the predicted linear values. **(B. Uday Kumar, 2024)** represented in his study highlights that nearly 75% of the country's financial activities are handled by nationalized banks, predominantly government-owned. Post its merger with five affiliates in April 2017, SBI became one of the world's top 50 banks and the largest public sector bank in India by volume. The stability of a nation's financial system is crucial for its economic health, as demonstrated by the collapse of Lehman Brothers. To analyze bank stability, metrics like CAMEL rating and the Altman Z-Score model are utilized. This research adapts the Altman model for Indian banks, finding most banks financially adequate, with only two outliers. The study suggests employing a hybrid model for more specific viability assessments. **According to the (Jayesh K Pandya, 2024)** He shows in the study that the Indian banking system is currently experiencing rapid growth. To ensure economic stability, maintaining the solvency of banks is essential. The Altman Z-score is a widely used tool for assessing a company's financial health and potential crisis. This study employed the modified Altman Z-score, known as the Altman Z''-score, to evaluate the solvency of the top five selected public sector banks over five years from 2017–18 to 2021–22. Hypothesis testing was conducted using descriptive statistics. The findings indicate that, on average, Bank of India, Canara Bank, and Punjab National Bank fall within the grey zone, suggesting a lower probability of bankruptcy. In contrast, Bank of Baroda and State Bank were classified in the distress zone, indicating a higher likelihood of financial instability in the future. **As per (Bajaj, 2023)**, shows that the empirical findings suggest that the Z-score model is a reliable indicator of banks' financial health in India. Compared to Axis Bank's high Z'' Score, other banks currently exhibit relatively low Z-scores, which could signal potential future failures. While the Z'' Score has proven effective in predicting banking crises, certain factors may have introduced bias into the analysis. To validate the Z-score's accuracy as a predictive tool, comprehensive data collection from both public and private sector banks was essential for this study. **(Arshe Azam, 2023)**, says in his study aims to assess the financial health of five selected Indian private sector banks over five years from 2018 to 2022. Among the 21 private banks listed on various Indian Stock Exchanges, the researcher has chosen a sample of five banks for quantitative analysis using the well-known insolvency.

RESEARCH GAP: Previous studies show inconsistencies due to varying research subjects, requiring re-examination with different samples and periods. Limited comparative studies exist on Nifty banks and NBFCs using Altman Z Score model. This research proposes a hybrid model to better analyze financial soundness in India's evolving financial sector.

STATEMENT OF THE PROBLEM: India's banking culture presents challenges for customers in choosing safe institutions for deposits and financing. This research evaluates the financial soundness of Nifty banks and NBFCs using Altman Z-Score models to identify financial health and distress risks. By comparing these institutions, the study provides insights for stakeholders to make informed decisions.

RESEARCH METHODOLOGY

1. OBJECTIVES OF THE STUDY:

To evaluate the financial health of Nifty Banks and Selected Listed Non-bank financial service institutions (NBFI) in India using the Altman Z-Score model

2. RESEARCH QUESTION

How does the financial health of Nifty Banks compare to Selected Listed Non-bank Financial Service Institutions (NBFI) in India when evaluated using the Altman Z-Score model?

3. RESEARCH DESIGN AND PERIOD OF STUDY

The study is a comparative, descriptive, and analytical research covering 10 years (2014-15 to 2023-24).

4. SAMPLING TECHNIQUES

The study employs the purposive sampling technique to select Nifty Banks and the top 12 listed Non-bank Financial Service Institutions (NBFI) on the National Stock Exchange (NSE) in India.

TABLE NO 3.1 SAMPLE PLAN OF THE STUDY

Nifty Banks	Symbols	Established	Market Capitalization (INR)	Net Profit (INR)
IndusInd Bank Ltd.	INDUSINDBK	1994	₹1,20,000 crore	₹3,500 crore
Au Small Finance Bank Ltd.	AUBANK	2017	₹10,000 crore	₹300 crore
ICICI Bank Ltd.	ICICIBANK	1994	₹5,00,000 crore	₹12,000 crore
Axis Bank Ltd.	AXISBANK	1993	₹3,50,000 crore	₹8,000 crore
HDFC Bank Ltd.	HDFCBANK	1994	₹8,00,000 crore	₹18,000 crore
Bank of Baroda	BANKBARODA	1908	₹2,00,000 crore	₹6,000 crore
Punjab National Bank	PNB	1894	₹1,50,000 crore	₹4,000 crore

State Bank of India	SBIN	1955	₹4,00,000 crore	₹10,000 crore
Federal Bank Ltd.	FEDERALBANK	1931	₹30,000 crore	₹1,000 crore
Canara Bank	CANBK	1906	₹1,80,000 crore	₹5,500 crore
IDFC First Bank Ltd.	IDFCFIRSTB	2015	₹20,000 crore	₹700 crore
Kotak Mahindra Bank Ltd.	KOTAKBANK	1985	₹4,50,000 crore	₹11,000 crore
Listed NBFC (On the basis of net profit) as per 2025				
Bajaj Finance	Bajaj Fin	1987	₹460,446.60 crore	₹12644.11 crore
Shriram Finance	Shriram Fin	1974	₹99176.10 crore	₹7190.48 crore
IRFC	IRFC	1986	₹183,847.74 crore	₹6412.10 crore
Muthoot finance	Muthoot Fin	1939	₹87254.16 crore	₹4049.67 crore
Chola Invest.	Chola Invest	1978	₹102,839.59 crore	₹3422.76 crore
Bajaj Holding	Bajaj Holding	1945	₹125,651.49 crore	₹2896.46 crore
L& T Finance	L&T Fin	1994	₹34848.32 crore	₹2286.23 crore
Poonawalla Fin	Poonawalla Fin	2009	₹24662.89 crore	₹2055.96 crore
M & M financial	M&M Financial	1991	₹33118.38 crore	₹1759.62 crore
Manappuram Fin	Manappuram Fin	1949	₹16650.22 crore	₹1657.78 crore
Motilal Oswal	Motilal Oswal	1987	₹41610.91 crore	₹1490.38 crore
Sundaram Fin	Sundaram Fin	1954	₹50436.15 crore	₹1454.01 crore

Updated last: Showing 12 of 12 stocks. Last Updated: 12 Dec, 2024.

5. MODELS USED IN THE STUDY

1) Altman Z score models (1968)

The Altman Z-score model, developed by Edward Altman in 1968, is a financial formula used to predict the probability of a firm going bankrupt within the next two years. This model, first introduced in Altman's paper "Financial Ratios, Discriminant Analysis, and the Prediction of Corporate Bankruptcy," combines several financial ratios to generate a Z-score that indicates the financial health of a company (Altman, 1968).

6. MODEL SPECIFICATION EQUATION

1. **Altman Z Score model** The Altman Z score model was fix the model equation in 1968, which shows the below. (Altman, 1968)

$$z = 1.2 (X1) + 1.4 (X2) + 3.3 (X3) + 0.6 (X4) + 0.99(X5)$$

Whereas,

X1 = Working Capital / Total Asset Ratio

X2 = Retained Earnings / Total assets ratio

X3 = Earnings Before interest and tax / Total Assets ratio

X4 = Market value equity Share / Total Liabilities

X5 = Total Sales / Total Assets

7. CRITERIA FOR FINANCIAL SOUNDNESS INDICATOR

The discriminant zones are assigned based on the Z-score value and S-score value they obtained, which portrays the financial soundness of the banks

Table No. 2 Scale of Zone based on Z-score Model

Score vale	Discriminate Zone	Description
Z-score value		
Z > 2.99	Safe zone	It indicates that the bank is financially healthy and least possibility of facing financial distress
1.81 > 2.99	Gray zone	The banks under the Gray zone imply that they have minimum risk and less possibility of facing instant financial distress in the upcoming year
Z < 1.81	Distress zone	The bank falls under a distress zone means they have maximum risk and have high possibility of facing bankruptcy shortly.

SOURCES : (Altman, 1968)

8. HYPOTHESIS OF THE STUDY

There is no significant difference in the Nifty Bank and NBFI by using the mean of the Altman Z-Score model.

DATA ANALYSIS AND INTERPRETATION

ALTMAN Z SCORE BASED ON THE OVERALL MEAN OF NIFTY BANKS AND SELECTED NBFCs

The Altman Z-score provides a comprehensive evaluation of their financial health based on the overall mean for the top 12 Nifty banks and the top 12 NBFCs over the last ten years. This score integrates critical financial ratios to predict bankruptcy risk. Higher Z-scores for these banks and NBFCs indicate robust financial stability and lower bankruptcy risk, reflecting their effective financial management and operational efficiency. Conversely, lower Z-scores suggest areas for potential improvement in their financial strategies.

Table No-3

Altman Z score of Nifty Bank and selected NBFCs during the study period 2014-15 to 2023-24

(₹ in times)

		$z = 1.2 (X1) + 1.4 (X2) + 3.3 (X3) + 0.6 (X4) + 0.99(X5)$							
Banks		WC/TA (X1)	RE/TA (X2)	EBIT/TA (X3)	BE/TL (X4)	TS/TA (X5)	Z SCORE	DECISION	RANK
NIFTY BANK	BANKBARODA	0.0049	0.062	0.044	0.056	0.0625	0.3334	High risk	12
	CANBK	0.0169	0.054	0.051	0.038	0.0684	0.3547	high risk	10
	AUBANK	-0.0228	0.123	0.055	0.649	0.0786	0.7936	High risk	4
	PNB	0.0178	0.064	0.041	0.049	0.0655	0.3405	High risk	11
	SBIN	0.0165	0.061	0.047	0.090	0.0645	0.3782	High risk	9
	AXISBANK	0.1554	0.841	0.432	0.230	0.5763	3.4980	low risk	2
	INDUSINDBK	0.0177	0.111	0.068	0.342	0.0829	0.6883	High risk	6
	ICICIBANK	0.0168	0.120	0.055	0.402	0.0686	0.6788	High risk	7
	IDFCFIRSTB	-3.9977	-5.080	-5.113	41274.162	0.0759	24735.7902	low risk	1
	KOTAKBANK	-0.0077	0.143	0.062	0.899	0.0765	1.0107	High risk	3
	FEDERALBNK	0.0305	0.083	0.059	0.127	0.0732	0.4962	High risk	8
	HDFCBANK	-0.0036	0.111	0.063	0.599	0.0745	0.7921	High risk	5
NBFCs	BAJAJ FINANCE LTD	0.5388	0.203	0.104	1.892	0.1572	2.564788	Moderate risk	5
	SHRIRAM FINANCE LTD	0.4866	0.165	0.101	0.329	0.1429	1.487091	High risk	8
	IRFC	0.2625	0.059	0.058	0.083	0.0581	0.696319	High risk	12
	MUTHOOT FINANCE	0.4778	0.233	0.132	0.785	0.1694	1.973866	High risk	6
	CHOLAMANANDALAM FINANCE	0.3539	0.122	0.095	0.685	0.1318	1.450462	High risk	9
	BHIL	0.7163	0.959	0.118	2.159	2.4195	6.282265	low risk	2
	LARSEN & TOURBO	0.6154	0.512	0.067	20.753	7.6973	21.748507	low risk	1
	PFL	0.2146	0.222	0.086	0.524	0.1505	1.315515	High risk	10
	M&M FINANCE	0.0795	0.610	0.110	2.310	1.0134	3.701666	Low risk	4
	MANNAPURAMFINANCE	0.4748	0.253	0.127	0.246	0.1863	1.675097	High risk	7
	MOTILAL OSWAL	0.4333	0.439	0.088	4.191	0.1870	4.12469	Low risk	3
	SFHL	0.4268	0.176	0.093	0.043	0.1154	1.205506	High risk	11

The above table shows the Altman Z score. Most NIFTY banks, including Bank of Baroda (0.3334), PNB (0.3405), and SBI (0.3782), fall under **high-risk**, indicating financial distress and a potential need for restructuring. Axis Bank (3.4980) is in the **low-risk zone**, demonstrating strong financial stability and resilience. IDFC First Bank (24735.7902) appears as an extreme outlier, suggesting data inconsistencies. Kotak Bank (1.0107) and AU Bank (0.7936) remain in the **high-risk zone**, requiring operational improvements and financial restructuring to mitigate risks.

Larsen & Toubro (21.7485) and BHIL (6.2823) are in the **low-risk category**, showcasing solid financial health and stability. **Bajaj Finance (2.5648)** falls into the **moderate-risk zone**, reflecting a balanced but cautious financial position. **Shriram Finance (1.4870), Mannapuram Finance (1.6751), and IRFC (0.6963)** are in **high risk**, signaling financial vulnerabilities requiring improved capital efficiency and profitability management. **Motilal Oswal (4.1247) and M&M Finance (3.7017)** also exhibit **low risk**, ensuring better financial sustainability.

HYPOTHESIS OF THE STUDY

There is no significant difference in the Nifty Bank and NBFI by using the mean of the Altman Z-Score model.

t-Test: Paired Two-Sample for Means		
	Z SCORE (Nifty bank)	Z SCORE (NBFC)
Mean	2062.096	4.018415
Variance	50984768	33.69523
Observations	12	12
Pearson Correlation	-0.01717	
Hypothesized Mean Difference	0	
df	11	
t Stat	0.998449	
P(T<=t) one-tail	0.169759	
t Critical one-tail	1.795885	
P(T<=t) two-tail	0.339519	
t Critical two-tail	2.200985	

Since the t-statistic is lower than the critical values and p-values are greater than 0.05, **we fail to reject the null hypothesis (H_0)**. This means that there is no significant difference between no significant difference in the Nifty Bank and NBFI by using the mean of the Altman Z-Score model. Therefore, the models do not show a statistically significant variation in their scoring of Nifty Banks' and NBFCs' financial conditions.

FINDINGS OF THE STUDY

- Finding to X1 (working capital to total assets ratio):** Axis Bank and Federal Bank lead NIFTY Banks in efficiency, while BHIL and L&T rank highest among NBFCs. IDFC First Bank and AU Bank face liquidity challenges, requiring strategic restructuring.
- Findings to X2 (Retained earnings to total assets ratio):** Axis Bank and BHIL lead in retained earnings, showing strong reinvestment capacity, while IDFC First Bank and IRFC struggle with financial sustainability, requiring strategic restructuring.
- Findings to X3 (EBIT to Total assets ratio):** Axis Bank and Muthoot Finance excel in EBIT to total assets, showcasing strong earnings efficiency, while IDFC First Bank and IRFC face financial challenges, requiring improved asset utilization.
- Findings to X4 (Book Equity to Total Liabilities ratio):** IDFC First Bank and Larsen & Toubro show strong equity backing, ensuring financial resilience, while Canara Bank and SFHL rank lowest, needing improved financial reorganization and investor trust.
- Findings to X5 (Total Sales to Total Assets Ratio):** Axis Bank and Larsen & Toubro demonstrate strong revenue efficiency, while Bank of Baroda and IRFC face challenges with asset utilization, requiring operational optimization and revenue diversification.
- Findings to Z score:** Axis Bank and Larsen & Toubro demonstrate financial strength, falling in the low-risk zone, while Bank of Baroda and IRFC show signs of financial distress, requiring restructuring and efficiency improvements. IDFC First Bank's extreme Z-score suggests potential data inconsistencies rather than genuine stability.

SUGGESTIONS OF THE STUDY

- It is suggested that the managements of IDFC First Bank and M&M Finance should optimize current assets, enhance cash management, and leverage AI for efficiency, while Nifty Bank and NBFCs must implement KPIs to improve working capital strategies.
- It is advisable that the management of IDFC First Bank and IRFC should boost revenue and cut costs to enhance profitability, optimize dividend policy to reduce debt, and improve asset utilization. Banks must focus on interest margins, while NBFCs should refine asset quality and diversify revenue streams.

3. IDFC First Bank and IRFC should expand revenue streams, optimize costs, and leverage AI for efficiency, while banks must reduce non-performing assets and NBFCs should enhance fintech collaboration for profitability.
4. Canara Bank and SFHL should strengthen investor confidence through transparency, corporate governance, and strategic growth initiatives while optimizing capital structure to enhance profitability and equity value.
5. Bank of Baroda and IRFC should explore new revenue streams, optimize loan portfolios, and implement risk management to reduce reliance on interest income while investing in growth initiatives and AI for financial improvement.
6. Bank of Baroda and IRFC should enhance profitability, reduce costs, and optimize debt levels while diversifying revenue streams and strengthening risk management to improve financial stability and lower distress risk.

CONCLUSION

The banking sector is a lifeline of the Indian economy, while the NBFC sector is a shadow of the banking sector. Both sectors play a vital role in the Indian financial system. Banking function is accepting deposits and lending loans to the customer, while non-banking financial institutions do not accept deposits but lend and provide additional services. So, the study compares the banking sector and NBFI to provide better services to the customer.

The present study concluded that based on Altman Z score analysis show Bank of Baroda (0.3334), Punjab National Bank (0.3405) and IRFC (0.6963) are placed in the high-risk zone, which means that the Z score value is below 1.81 due to weaker profitability and inefficient use of asset management. It is also the effect of inadequate working capital. On the other hand, Axis Bank (3.4980), Larsen & Turbo (21.74) and BHIL (6.282) demonstrate strong financial health, securing their place in the low-risk category and it indicates a safe zone because its Z score value is above 2.99. Institutions in the moderate risk zone, such as Bajaj Finance (2.564), Muthoot Finance (1.9738), which are considered between 1.81 to 2.99, need to focus on operational enhancements and debt management strategies to transition and move into the safe zone and sustain long-term financial stability. So, it may finally be concluded from the Altman Z-score that many of the institutions in the NBFC sector are low-risk zone as compared to the Nifty Bank sector.

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