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Financial Distress and Bank Performance: A Study of Select Indian Banks

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Abstract

Financial distress is technically used to evaluate the financial status of the firms in terms of insolvency and bankruptcy. In view of the rising corporate scams such as Enron, Parmalat, Satyam, Punjab and Sind bank, etc., it is imperative to predict financial distress as the fallout of bankruptcy causes heavy losses to the companies and thus affects the national economy. In particular, the banking sector plays a vital role in the economic development of a country. The main purpose of this study is to assess the financial performance of the banking sector in India using Altman (1968) Z-score model for the period 2012-2017. Z-score has been used as a tool to evaluate the credibility of the banks by estimating the Z-score values of the select banks in India. This value is useful when these banks demand loans from the RBI or any other funding agency. Thereafter, the effect of financial distress on the performance of banks has also been assessed by taking Tobin's Q as the performance measure. The results revealed that distressed stocks outperform non-distressed stocks during the market upturns.

Keywords: Financial Distress, Banking Sector, Tobin's Q

Introduction

The rising number of financial scandals, such as Enron, Satyam, and more recently the Punjab and Sind Bank scam, amounting to a whopping Rs. 621 crores, has lead to a devastating impact on the economy. Thus, to mitigate its effect, it is imperative to have an analysis of corporate failures at the onset. Financial distress is technically described as the inability of a company to honour the obligations of the creditors. It literally means the continued shortage of cash which may eventually lead to bankruptcy entailing high legal costs (Mamo, 2011). A prolonged state of financial distress may result in bankruptcy or insolvency. The banking sector is the most critical in terms of predicting financial distress owing to the complexity of operations. Thus, a model that may possibly anticipate the financial distress of banks in time would be useful for the Reserve Bank of India and other funding agencies. Furthermore, the banking industry aims to reduce its risk of default by minimising the level of non-performing assets by utilising the default prediction models (Altman et al., 2017).

The study of bankruptcy prediction models has evolved. Academicians have developed new approaches for predicting financial distress and bankruptcy. Accounting-based models have been widely used owing to their excellent predictive abilities. Beaver (1966) and Altman (1968) were the pioneers in the field of bankruptcy prediction. Beaver (1968) introduced a univariate analysis for assessing the predictive abilities of selected ratios. Altman (1968) developed a multivariate discriminant analysis (MDA) to derive a Z-score based on five financial ratios. Ohlson (1980) introduced a logit model and identified four factors critical for assessing the probability of default comprised in an O-score. Similarly, Taffler (1984) proposed a Z-score model for UK-based companies and Zmijewski (1984) offered a probit approach. Besides, market-based models were also developed that utilised both accounting and market information for forecasting the default probability (Merton, 1974); KMV, 1995); and Shumway, 2001). From traditional times, the Z-score model developed by Edward Altman (1968) has been frequently used for assessing financial distress (e.g., Altman and Hotchkiss, 2006; Wu et al., 2010; Bzour & Alkhatib, 2011; Mohammed, 2016; Sanesh, 2016; Sajjan, 2016). Altman Z-score is a statistical tool used to measure the likelihood of a company to become bankrupt.

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Academicians have not reached a consensus on the impact of financial distress on corporate performance (Opler & Titman, 1994). Conventionally, financial distress has been described as a costly event, and its probability is essential for determining the optimal capital structure of a firm. It has been so described as the firms indulge in activities that are detrimental to the interests of debt holders and stake holders (Jensen & Meckling; Novas & Zingales, 1993). Furthermore, financial distress can be costly if a firm's deteriorating condition stimulates an antagonistic reaction by the competitors which in turn is most likely to deprive the company of its market share (Bolton & Scharfstein, 1990)**.** However, studies have argued that financial distress can improve corporate performance by advocating changes in corporate form (e.g., leveraged buyouts) that are financed primarily with debt. These articles point out that financial distress can improve firm values by forcing managers to make difficult value-maximising choices, which they would otherwise avoid (Jensen, 1989; Wruck, 1990).

Banking sector plays an essential role in spurring economic growth of a country. Failure of banks may have a devastating effect on the stakeholders and the economy as a whole. Despite this significant impact, there is a shortage of research to predict the probability of default in the banking sector. The paper attempts to use Altman's Z-score model to predict the likelihood of financial distress in select banks in India. Additionally, the impact of financial distress (proxied by Z-score) on bank performance using Tobin's *q* has also been gauged.

The remainder of the paper is organised as follows. Section 2 delineates the objectives of the study. Research methodology, including the sample statistics and the description of the original and the modified Z"-score model, has been detailed in Section 3. The analysis and results are presented in Section 4. Section 5 discusses the results and concludes. Finally, practical implications are discussed in Section 6.

Review of Literature

The detection of a firm's operating and financial difficulties is a subject that has been particularly susceptible to financial ratio analysis. Previous literature has identified the relevance of financial ratios in predicting financial distress (Beaver, 1966; Altman, 1968; Ohlson, 1980; Casey & Bartczak, 1985; Shumway, 2001; Beaver et al., 2005; Nur Adiana et al., 2008, Lifschuts & Jacobi, 2010; Y. Wu et al., 2010). Considering the popularity and predictive ability of these ratios, they have been used by many researchers in their seminal work.

Financial Distress Identification

Altman (1968) developed the first multivariate credit scoring model, called Z-score, which pooled a number of financial statements and market measures. The resultant score was then used to classify the firm into either a distressed or non-distressed category. Furthermore, MDA was used to predict the financial health of the firm. The results revealed that MDA was able to accurately predict 94% of the classification done based on Z-score. Sanesh (2016) assessed the Altman Z-score on Nifty-50 companies, excluding those in the financial services sector. He concluded that the majority of the companies, especially; technology, FMCG and health care belonged to the safe zone. On the contrary, electricity generation and distribution, metals, and oil and gas sectors had a high likelihood of failure in the coming years. Mohammed (2016), in his case study of a manufacturing organisation and its subsidiaries in Oman, applies Altman's Z-score to assess their financial health. The results revealed that the company and its subsidiaries had sound financial health except in some years.

Sajjan (2016) applied the Z-score model to predict the likelihood of default of the select BSE and NSE listed companies for 5 years. The study revealed that most of the firms were in distress zone, indicating a high probability of default shortly. Pradhan (2014) estimated the Z-score of the public sector banks, namely, State Bank of India, Punjab National Bank and Oriental Bank of Commerce. The author aimed to predict the bankruptcy of these banks using back propagation neural networks (BPNN) of these banks. Despite the turmoil during the period 2005-2010, the modelled BPNN was able to predict the Z-score values quite close to those of actual values. Bzour and Alkhatib (2011) conducted a study on Jordanian listed companies to examine the effect of financial ratios in predicting bankruptcies. Altman and Kida's models were applied for this purpose. The findings demonstrated the superiority of Altman over Kida models in predicting the probability of bankruptcy with an average of 98.3% vis-à-vis 69% for the latter.

Wu et al. (2010) compared the performance of five models (Altman, 1968; Ohlson, 1980; Zmijewski, 1984; Shumway, 2001; Hillegeist et al., 2004) on a data set of US listed companies. The authors developed an integrated multi-period logit model combining accounting and market data. The results illustrated that Shumway's model performed the best and Altman's Z-score was the worst of all the models. Agarwal and Taffler (2007) analyses the predictive ability of the well-known Z-score model pioneered by Altman (1968) in his study. Spanning a time period of 25 years, the model demonstrated a clear predictive ability over this time horizon. Additionally, the utility of application of this technique to banks has also been demonstrated. Alaxekis (2008) aimed to perform an empirical analysis of Z-score on the construction companies in Athens during the period 1995-2006. The study derived that the ability of the Altman model to predict failures is valid for 5 years before the companies file for bankruptcy. He suggested that these results could be valuable for portfolio managers and strategic managers. Altman and Hotchkiss (2006) attempted to determine the accuracy of Z-score on a sample of distressed and bankrupt US companies for different periods. The model was found to be in the vicinity of 80-90% in terms of accuracy. The study has also discussed alternative techniques for classifying the companies into distressed and non-distressed such a probability of default and bond rating equivalent. Thus, by far, most of the studies have concentrated on the prediction of the listed firms going bankrupt in various countries, such as, the USA, the UK, Kenya, Jordon, etc. But there is a dearth of literature in terms of probability of default in the banking sector, including the public, private and foreign banks collectively in the Indian context.

Financial Distress and Bank Performance

Opler and Titman (1994) utilised stock returns, sales growth and changes in operating income relative to industry averages as proxies of performance. The results demonstrated a significant positive relationship between firm performance and financial distress during industry downturns. Similarly, Andrade and Kaplan (1998) associated the high probability of a firm's financial distress to its high degree of leverage. The authors attributed high leverage as the primary cause of distress. Asgharian (2003) examined the relationship between performance (using stock returns as a proxy) and distress on Swedish firms and found contradictory results to those of Opler and Titman (1994). Likewise, Jandik and Makhija (2005) explored the effects of debt and debt structure on corporate performance and reported a negative relationship between corporate performance and leverage. However, Bergstrom and Sundgren (2002) found a negligible relationship among Swedish firms. Agarwal and Taffler (2002) observed that financial distress gains a higher significance during down markets as the investors become more cautious of their investments, are risk-averse and are majorly dominated by a negative investor sentiment. Thus, investors prefer to invest in safer financial instruments such as government bonds. Contrarily, a reverse scenario is evident during up markets. In a similar vein, Outecheva (2007) found that distressed stocks outperform the non-distressed stocks conditional on the market states. Thus, to find conclusive evidence on the relationship between financial distress and bank performance in the Indian banking sector, an attempt has been made here.

Objectives of the Study

The objectives of the study are as follows:

- To determine the likelihood of default of select banks using the Altman Z-score model.
- To investigate the impact of financial distress on select banks in India.

Research Methodology

The population of the study consists of 236 banks (public and private) and foreign banks in India as on November 10, 2017, over the financial years (FY) 2012-2017, of which 87 banks formed the sample size. The drop in the sample size is attributed to the missing data on various ratios of the banks. Thus, those banks whose data were available throughout the sample period formed the part of the study. The data pertaining to the financial ratios have been retrieved from a Prowess database maintained by Centre for Monitoring Indian Economy (CMIE), annual reports of the banks and the official website of Reserve Bank of India (RBI). The Z-score pioneered by Altman (1968) has been used to predict the probability of financial distress in the select banks. The model has been discussed as under.

Altman Z-score Model

This model was developed by Edward I. Altman in 1968 to predict the likelihood of bankruptcy of the public manufacturing companies. The computation of Z-score involves five financial ratios compiled from 22 initially identified potentially important ratios. It combines financial statement and market value measures to classify the companies into distressed and non-distressed zones. Since the application of Altman's original Z-score model was limited to public companies only, a modified four variable Z"-score was developed for private and non-manufacturing companies (Altman, 1983). Two adaptations were made in the revised model; firstly, the market value of equity was replaced by the book value of equity as the equity of non-publicly traded companies is usually not available. Secondly, the fifth ratio, *viz*, sales/total assets were omitted to minimise the significant variation across industries (Altman, 2000).

The value of Z-score is obtained by multiplying the financial ratios with their respective coefficients and summing up the results together. The coefficient with a higher value signifies the relative importance of the financial ratio. The higher the score, the lower is the probability of financial distress. Table 1 demonstrates the compilation of original Z-score and the revised Z-score model.

Variable Specification

- *Working Capital/Total Assets:* The working capital ratio is a measure of the firm's liquidity. The excess of current assets over current liabilities is called working capital (Williams et al., 2006). Total assets comprise of both the current as well as fixed assets. The higher the working capital ratio, the better is the ability of a company to meet its current obligations (Pandey, 2005). The level of working capital can help an analyst in determining the financial position of a company (Williams et al., 2006).
- *Retained Earnings/Total Assets:* Retained earnings account appears in the stockholder's equity section of the balance sheet (Williams et al., 2006). It represents the earnings retained over the entire lifetime of a company for growth prospects. A company having a high amount of earnings indicates less reliance on debt or leverage. Thus, a high ratio may reduce the probability of bankruptcy as the majority of the financing is through the retention of earnings (Aesen, 2011).
- *Earnings Before Interest and Taxes/Total Assets:* This ratio assesses the operating efficiency of a company's assets without the effect of financing, i.e., before considering interest and taxes (Pandey, 2005). Having the highest weightage in terms of importance, return on total assets ratio is particularly useful for predicting bankruptcies.
- *Book Value of Equity/Book Value of Total Liabilities:* This ratio indicates the relative proportion of total equity, the book value of the common and preferred stock, to that of total current and long-term liabilities. This ratio has replaced the market value of equity used in the original Z-score model as the non-publicly traded companies do not have a market value. A higher ratio signifies low risk of the firm owing to a lower component of debt vis-à-vis equity.

Table 1: Original and Modified Z-score Model

ORIGINAL Z-SCORE MODEL
Z= 1.2(X1)+ 1.4(X2)+3.3(X3)+0.6(X4)+1.0(X5)
Where,
X1= working capital/total assets
X2= retained earnings/total assets
X3= earnings before interest and taxes/total assets
X4= market value of equity/book value of total liabilities
X5= sales/total assets
Classification Zones
Z > 2.99 : Safe Zone
1.81 < Z> 2.99 : Grey Zone
Z < 1.81: Distress Zone
MODIFIED Z"-SCORE MODEL
Z"= 3.25+ 6.56 (X1)+ 3.26 (X2)+ 6.72 (X3)+ 1.05 (X4)
Where,
X1= working capital/total assets
X2= retained earnings/total assets
X3= earnings before interest and taxes/total assets
X4= book value of equity/book value of total liabilities
Discriminant Zones
Z > 5.85 : Safe Zone
4.35 < Z> 5.85 : Grey Zone
Z < 4.35: Distress Zone

Source: Altman and Hotchkiss (2006)

After determining the Z-scores of the companies, a relationship between financial distress and performance has

been examined using Tobin's *q* as the measure of performance and Z-score, controlling for earnings before interest and taxes (EBIT) and sales (net sales turnover). Tobin's *q* has been calculated as the ratio of the market value of the bank to the book value of the bank's assets. The tests of regression diagnostics rejected the assumption of normality of data; thus, robust panel regression has been applied to investigate the said relationship. Considering the literature of related studies, the following hypothesis in the alternate form would be tested:

H_a: Controlled by EBIT and sales, distressed stocks perform better than healthy stocks.

Analysis and Results

With the aim of assessing the probability of default of banks, modified Z"-score has been applied. Table 3 in the Appendix presents the values of *Z-score* of the sample banks. It is evident from the Table that only five banks fall in the safe zone indicating least probability of default within the next year. On the other hand, there are 57 banks with a high probability of default falling in the distress zone and constituting 65% of the total sample. Likewise, the remaining banks belonged to the low probability of the default zone. The fundamental assumption for parametric testing, *viz*., normality was checked by Kolmogorov-Smirnov Test and Shapiro-Wilk Test that indicated that the sample distribution (of all variables) is significantly different from a normal distribution. Thus, robust panel regression has been run over the period 2012-2017. Both VIF statistics and Durbin-Watson Test used for checking multicollinearity and autocorrelation, respectively, confirmed their absence in the model. Subsequently, the regression diagnostics the regression results demonstrated that the banks with a high probability of financial distress underperformed relative to the ones that had a low probability of default. The regression results have been depicted in Table 2. The coefficient estimate on *Z-score* was found to be negative (-176.72) and statistically significant at the 1% level of significance, thereby suggesting a negative relation between *Z-score* and performance. Similar to the findings of Agarwal and Taffler (2002), Asgharian (2003); Jandik and Makhija (2005); Outecheva (2007); and Tan (2012), the results of the analysis revealed a significantly higher performance of the banks with a lower Z-score and vice-versa. Stated differently, banks with a higher probability of default perform better than those with a lower default probability during a boom period, thereby, accepting the hypothesis that distressed stocks perform better than healthy stocks.

As per the OECD Composite Leading Indicators Report (2017), the period 2013-17 is characterised as a boom period. Thus, the findings support the contention of Vayanos (2004) that the distressed stocks follow the phenomenon of 'flight towards quality'. According to this concept, the investors become highly risk-averse during a slump in the economy and prefer reallocating their portfolio to a safer block of securities (e.g. treasury bills or governmental bonds). This, in turn, leads to higher prices of the non-distressed stocks and a steep decline in the prices of distressed stocks. On the other hand, financially distressed stocks outperform the non-distressed ones during an upturn in the economy. Thus, considering the period of the study as a boom period, the results conform to the concept of 'flight towards quality'.

Table 2: Regression Results of Financial Distress on Performance

Equation 1.1: PERFORMANCE = $\alpha + \beta_1\{Z\text{-score}\} + \beta_2(EBIT) + \beta_4(Sales) + \varepsilon$		
Independent Variables	***Coefficient Estimate***	***z-statistic***
Intercept	604.25**	2.21
Z-score	-176.72***	-2.40
EBIT	-0.00045	-0.05
Sales	-0.0626***	-2.94
Wald $\chi^2(4) = 29.21$, $p<0.01$		

Note: (1) ***, **, or * indicate the significance of coefficient estimate at the 1%, 5%, or 10% level, respectively.

(2) Results have been obtained using Stata 14.0.

Conclusion

The present study assessed the probability of default of 87 Indian public and private banks for 5 years using the modified Altman Z"-score. It was observed that 5% of the select banks were in the safe zone indicating the least probability of default. Conversely, distress zone comprised of 65% of the banks representing a high probability of default and the remaining banks were in the low probability of default zone. Altman Z-score does not predict bankruptcy; rather, it is a likelihood of default. It can be been used to assess the credit viability of banks. Considering a large number of banks in the distress zone, the regulatory bodies should be more

careful in terms of the loan disbursement and take corrective measures to improve the operational efficiency of the banks. Furthermore, Tobin's *q* used a measure of performance revealed that banks with high financial distress underperform those with low financial distress thus exhibiting a negative relationship with performance. However, this finding is consistent with the concept of flight towards quality and evident during the upward movement of the market.

Practical Implications of the Study

The study has widespread practical implications. Financial regulatory bodies such as the RBI, Securities and Exchange Board of India (SEBI), Insurance Regulatory and Development Authority (IRDA), etc., are responsible for monitoring and ensuring stability in the economy. The study will be useful for predicting the financial distress of the banks so that appropriate measures can be taken to avoid operational and financial losses to the economy due to failure. The investors can also assess the financial health of the company before making investment decisions. Consequently, they can recognise the return on their investment. Likewise, the study would be helpful for stockbrokers to gauge the safety of future investment. Furthermore, research scholars and academicians can make use of this study for exploring the difference in the performance of distressed stocks between the boom and recessionary periods. Additionally, the bankruptcy prediction models can also be applied to companies operating in various other industries.

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Appendix 1

Table 3: Z-score Values for the Sample from FY 2012 - FY 2017

Sr. No.	*Name of the Bank*	*Z-score 12-13*	*Z-score 13-14*	*Z-score 14-15*	*Z-score 15-16*	*Z-score 16-17*	*Average Z-score*	*Discriminant Zone*
1.	A B Bank Ltd.	5.59	7.04	7.07	7.06	7.40	6.83	Safe Zone
2.	Abhyudaya Co-Op. Bank Ltd.	4.27	4.38	4.33	4.43	4.33	4.35	Grey Zone
3.	Abu Dhabi Commercial Bank Ltd.	6.06	5.74	5.82	4.76	4.33	5.34	Grey Zone
4.	Allahabad Bank	4.24	4.19	4.16	4.22	4.31	4.22	Distress Zone
5.	American Express Banking Corpn.	0.80	1.34	0.78	1.60	1.29	1.16	Distress Zone
6.	Andhra Bank	4.29	4.16	4.24	4.13	4.16	4.20	Distress Zone
7.	Apna Sahakari Bank Ltd.	4.92	4.84	4.61	4.81	4.94	4.82	Grey Zone
8.	Australia & New Zealand Banking Group Ltd.	5.69	4.92	4.89	4.42	3.66	4.72	Grey Zone
9.	Axis Bank Ltd.	4.06	4.10	4.18	4.21	4.15	4.14	Distress Zone
10.	B N P Paribas	3.46	2.86	3.36	3.61	3.71	3.40	Distress Zone
11.	Bank Of America N A	3.92	3.95	3.94	3.95	4.08	3.97	Distress Zone
12.	Bank Of Bahrain & Kuwait Bsc	4.39	4.31	4.50	4.68	5.10	4.60	Grey Zone
13.	Bank Of Baroda	4.65	4.62	4.85	4.94	4.98	4.81	Grey Zone
14.	Bank Of Ceylon	6.88	7.14	5.85	5.36	5.19	6.08	Safe Zone
15.	Bank Of India	4.34	4.51	4.43	4.47	4.73	4.50	Grey Zone
16.	Bank Of Maharashtra	4.07	4.12	4.05	4.21	4.26	4.14	Distress Zone
17.	Bank Of Nova Scotia	4.24	4.31	5.07	3.61	4.03	4.25	Distress Zone
18.	Bank Of Tokyo Mitsubishi Ufj (India Branch)	4.08	4.21	4.94	4.84	4.86	4.59	Grey Zone
19.	Barclays Bank Plc	2.16	2.66	3.35	3.56	3.28	3.00	Distress Zone
20.	Bharat Co-Op. Bank (Mumbai) Ltd.	4.48	4.38	4.39	4.55	4.52	4.46	Grey Zone
21.	Canara Bank	4.30	4.36	4.38	4.42	4.50	4.39	Grey Zone
22.	Capital Small Finance Bank Ltd.	4.50	4.68	4.84	4.76	4.59	4.67	Grey Zone
23.	Catholic Syrian Bank Ltd.	4.26	4.31	4.23	4.33	4.28	4.28	Distress Zone
24.	Central Bank Of India	4.04	4.01	3.93	4.05	4.10	4.03	Distress Zone
25.	Citibank N A	4.56	4.64	4.34	4.15	4.11	4.36	Grey Zone
26.	City Union Bank Ltd.	4.28	4.41	4.48	4.59	4.45	4.44	Grey Zone
27.	Commonwealth Bank Of Australia	5.87	4.63	3.74	3.58	3.54	4.27	Distress Zone
28.	Corporation Bank	4.22	4.18	4.17	4.13	4.20	4.18	Distress Zone
29.	Cosmos Co-Operative Bank Ltd.	4.34	4.36	4.32	4.23	4.25	4.30	Distress Zone
30.	Credit Agricole Corporate & Invst. Bank.	4.22	2.97	3.51	3.04	2.50	3.25	Distress Zone
31.	Credit Suisse A G (Mumbai)	4.48	3.63	3.50	4.36	4.75	4.14	Distress Zone
32	D B S Bank Ltd.	3.84	3.60	3.53	3.75	4.30	3.80	Distress Zone
33.	D C B Bank Ltd.	3.49	3.77	3.93	4.08	3.93	3.84	Distress Zone
34.	Dena Bank	4.18	4.36	4.13	4.48	4.24	4.28	Distress Zone
35.	Deutsche Bank A G	4.66	4.00	3.87	4.60	4.36	4.30	Distress Zone

Sr. No.	Name of the Bank	Z-score 12-13	Z-score 13-14	Z-score 14-15	Z-score 15-16	Z-score 16-17	Average Z-score	Discriminant Zone
36.	Dhanlaxmi Bank Ltd.	4.16	4.33	4.35	4.46	4.26	4.31	Distress Zone
37.	Federal Bank Ltd.	4.27	4.17	4.29	4.56	4.37	4.33	Distress Zone
38.	Firstrand Bank Ltd. Greater Bombay Co-Op. Bank Ltd.	2.45	1.73	2.83	2.55	3.15	2.54	Distress Zone
39.	Greater Bombay Co-Op. Bank Ltd.	4.34	4.21	4.05	4.29	4.27	4.23	Distress Zone
40.	H D F C Bank Ltd.	3.85	3.96	4.27	4.18	4.10	4.07	Distress Zone
41.	Hongkong& Shanghai Banking Corpn. Ltd.	4.31	4.21	4.29	4.77	4.42	4.40	Grey Zone
42.	I C I C I Bank Ltd.	4.20	4.20	4.22	4.15	4.23	4.20	Distress Zone
43.	I D B I Bank Ltd.	4.18	4.09	4.06	4.43	4.55	4.26	Distress Zone
44.	I N G Vysya Bank Ltd. [Merged]	4.14	4.07	4.34	-842.60	3.46	-165.32	Distress Zone
45.	Indian Bank	4.10	4.14	4.09	4.21	4.19	4.15	Distress Zone
46.	Indian Overseas Bank	4.29	4.26	4.27	4.41	4.33	4.31	Distress Zone
47.	Indusind Bank Ltd.	4.26	4.22	4.11	4.11	4.19	4.18	Distress Zone
48.	J P Morgan Chase Bank, National Association	3.57	4.10	3.98	5.12	5.24	4.40	Grey Zone
49.	J S C Vtb Bank	5.18	5.06	4.41	7.84	6.14	5.73	Grey Zone
50.	Jammu & Kashmir Bank Ltd.	4.18	4.25	4.06	4.23	4.30	4.20	Distress Zone
51.	Karnataka Bank Ltd.	4.13	4.13	4.09	4.41	4.37	4.23	Distress Zone
52.	Karur Vysya Bank Ltd.	4.34	4.14	4.15	4.18	4.26	4.21	Distress Zone
53.	Kotak Mahindra Bank Ltd.	3.84	3.89	4.07	4.05	4.11	3.99	Distress Zone
54.	Krung Thai Bank Public Co. Ltd.	8.63	8.38	8.61	8.93	8.41	8.59	Safe Zone
55.	Lakshmi Vilas Bank Ltd.	4.21	4.22	4.26	4.18	4.13	4.20	Distress Zone
56.	Mashreqbank P S C.	7.12	7.63	5.67	5.74	5.25	6.28	Safe Zone
57.	Mizuho Bank Ltd.	5.04	4.20	4.17	4.69	3.76	4.37	Grey Zone
58.	N K G S B Co-Op. Bank Ltd.	4.99	4.68	4.68	5.98	5.61	5.19	Grey Zone
59.	Nainital Bank Ltd.	5.13	5.34	5.58	5.86	5.65	5.51	Grey Zone
61.	Oriental Bank Of Commerce	4.10	4.08	4.22	4.26	4.28	4.19	Distress Zone
62.	Punjab& Maharashtra Co-Op. Bank Ltd.	4.41	4.40	4.46	4.39	4.30	4.39	Grey Zone
63.	Punjab & Sind Bank	4.05	4.08	4.15	4.22	4.33	4.17	Distress Zone
64.	Punjab National Bank	4.14	4.12	4.22	4.27	4.43	4.23	Distress Zone
65.	R B L Bank Ltd.	4.28	4.08	4.15	4.24	4.05	4.16	Distress Zone
66.	Royal Bank Of Scotland N V	4.13	3.67	3.90	3.55	4.05	3.86	Distress Zone
67.	Saraswat Co-Operative Bank Ltd.	4.26	4.34	4.58	4.67	4.61	4.49	Grey Zone
68.	Shamrao Vithal Co-Op. Bank Ltd.	4.67	4.49	4.65	6.19	4.51	4.90	Distress Zone
69.	Shinhan Bank	5.66	4.90	5.94	3.98	4.93	5.08	Grey Zone
70.	Societe Generale	2.95	2.88	3.70	3.60	3.79	3.38	Distress Zone
71.	South Indian Bank Ltd.	4.17	4.33	4.16	4.45	4.41	4.31	Distress Zone
72.	Standard Chartered Bank - India Branches	4.01	4.01	3.93	4.16	3.95	4.01	Distress Zone
73.	State Bank Of Bikaner & Jaipur [Merged]	4.00	3.97	4.06	4.08	4.15	4.05	Distress Zone
74.	State Bank Of Hyderabad [Merged]	4.09	3.91	4.02	4.00	3.98	4.00	Distress Zone
75.	State Bank Of India	4.11	4.08	4.02	4.23	4.21	4.13	Distress Zone

Sr. No.	*Name of the Bank*	*Z-score 12-13*	*Z-score 13-14*	*Z-score 14-15*	*Z-score 15-16*	*Z-score 16-17*	*Average Z-score*	*Discriminant Zone*
76.	State Bank Of Mysore [Merged]	4.02	4.07	4.01	4.20	4.17	4.09	Distress Zone
77.	State Bank Of Patiala [Merged]	4.17	4.11	4.24	4.14	4.17	4.17	Distress Zone
78.	State Bank Of Travancore [Merged]	4.11	3.97	4.04	4.36	4.36	4.17	Distress Zone
79.	Syndicate Bank	4.19	4.17	3.93	4.14	4.27	4.14	Distress Zone
80.	T J S B Sahakari Bank Ltd.	6.68	4.50	4.18	4.87	4.82	5.01	Grey Zone
81.	Tamilnad Mercantile Bank Ltd.	3.99	4.17	4.30	4.35	4.37	4.24	Distress Zone
82.	Uco Bank	4.27	4.18	4.12	4.45	4.28	4.26	Distress Zone
83.	Union Bank Of India	4.08	4.05	4.15	4.27	4.32	4.17	Distress Zone
84.	United Bank Of India	4.20	4.26	4.25	4.26	4.33	4.26	Distress Zone
85.	United Overseas Bank - Mumbai Branch	9.47	7.48	3.94	3.99	4.05	5.78	Grey Zone
86.	Vijaya Bank	4.24	4.20	4.26	4.36	4.33	4.28	Distress Zone
87.	Yes Bank Ltd.	3.83	3.88	4.10	4.28	4.15	4.05	Distress Zone