Turkish Online Journal of Qualitative Inquiry (TOJQI)
Volume 11, Issue 4, October 2020: 797-802

Assessing Financial Soundness of Commercial Banks using Altman's Z-Score: A Comparison of Public Sector Banks and Private Sector Banks in India

Prof. Parmil Kumar[1]
Prof. (Dr.)Anupam Sharma[2]
[1]Research Scholar, Dept. of Management Studies,M.M.U. Sadopur, Ambala & Associate Professor Commerce, Govt. PG College Ambala Cantt. Ph.9050911431 E-mail:parmilkumar2512@gmail.com
[2] Associate Professor, Dept. of Management Studies, M.M.U. Sadopur, Ambala

ABSTRACT: In emerging economies like India, the issue of the financial health of banking institutions has become more important since the deregulation of the banking industry and increased competition, especially due to increased stressed assets in the banking institutions in the last some years.In India, during the boom years, a large amount of easy credit was made available to the corporates, which resulted in the duel problem of the leveraged corporate balance sheet as well as the stressed assets in the banking system.The large build-up of sub-standard assets worsening the profitability and resulting in the loss of capital of these banks.The present research aims to assess the financial soundness of commercial banks in Indiafrom 2014-15 to 2018-19. Itexamines and compares Altman's Z-score of the public sector banks and private sector banks in India. The study is based on the financial data of 39 commercial banks comprising 20 public sector banks and 19 private sector banks, uses parametric as well as non-parametric techniques to analyse and compare the financial soundness of public sector banks and private sector banks.

Key Words:*Commercial Banks, Public Sector Banks, Private Sector Banks, Financial Distress,Financial Soundness, Altman's Z-score.*

INTRODUCTION:

Now, there has been an increased link between macroeconomic development and riskiness of the financial institutions. With the increased financial re-engineering in the recent past, through the use of more and more sophisticated financial products/services, a close watch on the financial soundness of the financial institutions has become necessary.The emergence of the sub-prime crisis in the US - 2008, and its post effects, threatened the existence of many financial institutions the world over. In order to tackle the problem of the recession that erupted after the US-2008 crisis and saving the financial institutions from failing, a lot of fiscal and monitory measures(for infusion of more funds to save the economy from the effects of the 2008 US crisis) were introduced by the governments and central banking authorities' world over.In India, during the boom years,on the projection of booming demand of the economy, a large amount of easy credit was made available to the corporates for the large infrastructure projects, power projects, cement and steel plants, and for real estate projects,which createdthe leveraged corporate balance sheets. In the downturn, these corporates find it difficult to service the large debt borrowed from the financial institutions. Even for more than 40% of corporate loans,the interest coverage ratio fell below the one. This phenomenon created a twin

balance sheet (TBS) problem. On one hand, it resulted in an over-leveraged corporate balance sheet as well as the stressed assets in the banking system.So, the US-2008 crisis has shown no impact on the Indian economy and banking system till 2012-13. But, the last some years have witnessed the increasing sub-standardassets (from 2013-14 onwards) in the banking system at an alarming rate. According to an estimate the level of the stress assets amounted to Rs. 8.4 lakh crores as on 31st March 2019.The rising NPAs in the banking institutionshave forced these banks for creating high provisioning out of profits for the NPAs, which results in more pressure on the profitability of these banking institutions.As a result, the massive accumulation of sub-standard assets has harmed the profitability and resulted in the loss of the bank's capital. The impairment of assets of these undertakings not only adversely affected their capacity of earning as well affected the capacity to lend of these institutions. In India change of government and policy regime particularly de-monetization may have impacted the financial performance of financial institutions.First to fall was the Infrastructure Leasing and Financial Servicesin 2017, since then four major financial institutions have fallen, some of them rescued through merger and amalgamation with the healthy institutions.

The soundness of the banking system of the country is an essential condition for economic progression.On the implication of bank failure for the economy,De-Juan [7] (1990:48)hints"bank failure might trigger off a confidence crisis resulting in deposit runs, affecting stability and contribute to demonetization and prompt capital flight, resulting in distortions in resource allocation, upward pressure on interest rates, a corporate culture with no sense of risk or disclosure, and growing losses in the system". How the health of financial institutions can affect the progression of economy, Davies [6] 2010:47)adds"banking system soundness matters because it gives some indication of how likely it is that financial problems would be transmitted to the real economy". On the same issueSchou-Zibell, et al [11] (2010: 5) remarks "banking institutions are particularly relevant because of their specific function as suppliers of liquidity to the system and because the impact of financial stress at these institutions can have significant macroeconomic costs". Kumar and Sharma [8], (2021: 2731) stresses "depositors keep money parked in commercial banks if they are assured of the safety of their deposits and as well the interest income", so the financial soundness of banking institutions becomes of prime importance for the well-functioning of the economy.Although, most of the monitory authorities employ a lot of early warning systems to identify the risk in banks still there are repeated occurrences of such events. A sharp focus on the financial soundness of such institutionsis a must, any lapse in management of banks, not only shakes the trust of citizens butalso threatens the entire financial system of the country.

Beaver [3] (1966), was the first to use financial ratios for the prediction of financial failure. Altman [2] (1968), using an equation-based model, came with his Z-score model(popularly known as Zeta-Model) for the prediction of bankruptcy of an organization, later on, modified it for service organizations/banks.The Z-score model has been widely used for assessing the soundness of the organization and has high predictability. Thoughlater on,there were being developed many bankruptcy predictionstatistical models i.e. linear discriminant analysis, multivariate discriminate analysis, quadratic discriminant analysis, and logistic regression.A lot of operational research techniques i.e. Linear Programming, Quadratic Programming, Data Envelopment Analysiswere also used for predicting financial distress. A CAMEL ratio technique based on five parameters i.e. Capital Adequacy, Assets Quality, Management effectiveness, Earning Capacity, and Liquidity of banks also came into use for assessing the financial health of the banks. Recently, a large number of intelligent

techniques i.e. Multi-Layer Perception, Probabilistic Neural Network, Auto-Associative Neural Network, Self-Organizing Map, Case-Based Reasoning, Decision Tree Approach, Support vector Machine also came into existence for the prediction of financial distress in the organizations or banks.

Though the 100% accuracy in the prediction of financial distress cannot be claimed with the use of any of the available models but a reasonable degree of accuracy in predicting the financial distress of the organization or bank can be there with the use of these models.The financial soundness of commercial banks in India has previously been gauged by many scholars using the equation-based models considering some financial ratios of the banks like Chauhan and Kumar [4] (2019),Abirami [1] (2018), Chotalia [5] (2014) Pradhan [10] (2014), and Makkar and Singh [9] (2012).The above studies reported satisfactory financial soundness of the banks but pertain to the period before 2014-15 from where onwards the financial health of these institutions have significantly affected by the rising NPAs in these banks. The present study is based on secondary data of 39 Commercial Banks consisting of 20 public sector banks and 19 private sector banks.Data of five years from 2014-15 to 2018-19, collected from RBI Publications, Data-base of CMIE, and Annual Reports of the different banks. To assess and compare the financial soundness of the banks on Altman's Z-score the following hypothesis is developed:

Hypothesis$_1$: There is no significant difference between Altman's z-score of public sector banks and private sector banks.

RESULTS AND DISCUSSION:

In the present study,an attempt has been made to assess the financial soundness of commercial banks in India using Altman's Z-Score Model. The results of Altman's Z-Score Model have been discussed in the following section:

Altman's Z-score for service organizations can be calculated as:

Z-Score = $6.56T_1 + 3.26T2 + 6.72T_3 + 1.05T_4$,

Here: T_1 stands for = Working Capital/Total Assets

T_2 stands for = Retained Earnings/Total Assets

T_3 stands for = EBIT/Total Assets

T_4stands for= Book value of Equity/Total Liabilities

The result of the Z-score for service has to be interpreted as follows:

Computed Z -Score	Financial Soundness of the Organisation
Z-Score > 2.6	'Safe- Zone'
1.1 < Z-Score < 2.6	'Grey Zone'
Z-Score < 1.1	'Distress Zone'

FIGURE 1

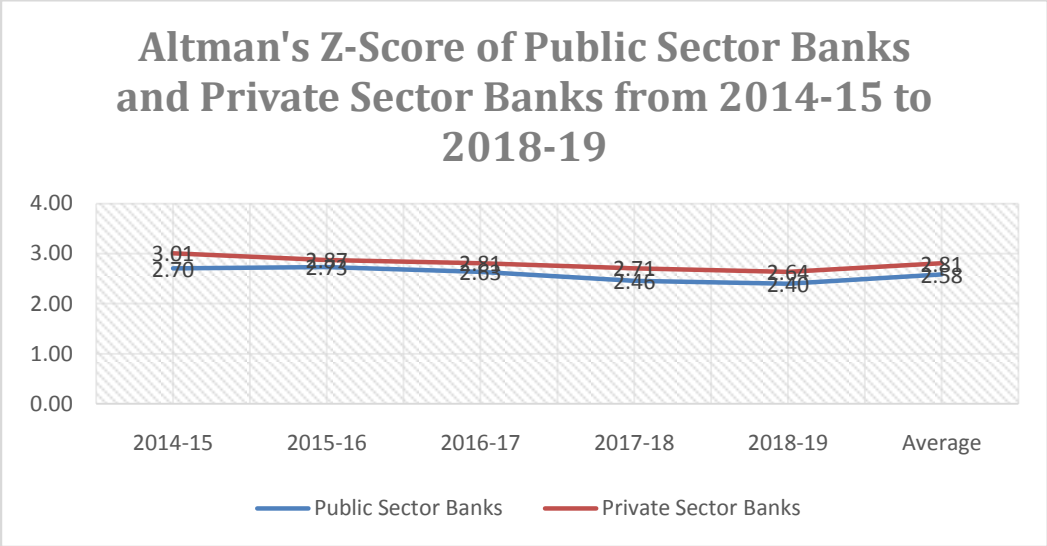

TABLE 1

Altman's Z-Score of Public Sector Banks and Private Sector Banks from 2014-15 to 2018-19

(Results of Parametric t-test)

Year	Ownership Group	N	Mean	Std. Deviation	Std. Error Mean	Mean Difference	t-value
2014-15	PSB	20	2.7048	0.56811	0.12703	-0.303	-1.134#
	PrSB	19	3.0079	1.02513	0.23518		
2015-16	PSB	20	2.7299	0.51891	0.11603	-0.1407	-0.557#
	PrSB	19	2.8707	0.99675	0.22867		
2016-17	PSB	20	2.6333	0.49938	0.11167	-0.1781	-0.667#
	PrSB	19	2.8115	1.07887	0.24751		
2017-18	PSB	20	2.4556	0.41145	0.092	-0.2545	-1.036#
	PrSB	19	2.7102	0.99264	0.22773		
2018-19	PSB	20	2.3984	0.47476	0.10616	-0.2385	-0.969#
	PrSB	19	2.637	0.96825	0.22213		
Average Z-Scores	PSB	20	2.5844	0.4547	0.10167	-0.223	-0.895#
	PrSB	19	2.8074	0.99206	0.22759		

Source: Researcher's Reproduced Data from STRBs # **INDICATES THE VALUE IS NOT SIGNIFICANT**

TABLE 2

Z-Scores of Public Sector Banks and Private Sector Banks from 2014-15 to 2018-19
(Results of Non-parametric Test)

	2014-15	2015-16	2016-17	2017-18	2018-19	Average Z-Score of Banks
Mann-Whitney U	152	185	180	169	168.5	173
Wilcoxon W	362	395	390	379	378.5	383
Z	-1.068#	-0.14#	-0.281#	-0.59#	-0.604#	-0.478#

Asymp. Sig. (2-tailed)	0.286	0.888	0.779	0.555	0.546	0.633
Exact Sig. [2*(1-tailed Sig.)]	.296[a]	.901[a]	.792[a]	.569[a]	.550[a]	.647[a]

a. Not corrected for ties.

b. Grouping Variable: Bank Group

Value is Not Significant

As per Table 1 and Figure 1, the public sector banks have the five-year average Z-score of 2.58, with an SD of 0.455 while the private sector banks have an average Z-score of 2.807, with an SD of 0.992, during the study period of five years. Thepublic sector banks have the highestmean Z-score of 2.73 in the year 2015-16 and the lowest Z-score of2.40in the year 2018-18. The private sector banks have the highest meanZ-score of 3.01 in the year 2014-15and the lowest Z-score of 2.64 in the year 2018-19. The average Z-score of public sector banks is showing a declining trend from the year 2015-16 onwards while the average Z-score that of theprivate sector banksshowing a declining trend during the entire study period.The average Z-score value of the public sector banks in the years 2017-18 and 2018-19 was in the 'Grey zone'.

Among the public sector banks, the eightbanksi.e. Syndicate Bank(1.59), United Bank of India(1.76), Bank of Maharashtra (1.87), Allahabad Bank(2.004), Central Bank of India(2.35), Dena Bank(2.49), and IDBI Bank(2.53) have a mean Z-score below 2.60, during the study period and placed in the'Grey zone'. While among the private sector banks, eight banks i.e. Jammu and Kashmir Bank (1.26), HDFC Bank (1.64), Axis Bank (1.83),Kotak Mahindra Bank (1.86),ICICI Bank (1.91), DCB Bank (1.94), Indusind Bank (2.055) and Yes Bank (2.20) have the mean Z-score below 2.60 and placed in 'Grey-zone'.Among all the banks, Jammu and Kashmir Bank, have the Z-score below 1.1 continuously for three years from 2016-17 to 2018-19, remained inthe 'distress zone. Among the sampled banks, therest twenty-four banks i.e. thirteenpublic sector banks and elevenprivate sector banks are placed in the 'Safe- zone'.

Table 2 indicates that the computed t-value is not found significant inany of year from 2014-15 to 2018-18, as well as on thefive-year average Z-score of the banking groups, indicating that there is no significant difference in the mean Z-score of the public sector banks and that of the private sector banks during the study period. Similar results are shown by Table 2 as computed z-value under Mann-Whitney U-Test is not found significant in any of year as well as average level.Hypothesis$_1$ is accepted and concluded that the Z-score of the public sector banks and private sector banks does not differ significantly.

SUMMARY AND CONCLUSIONS:

The public sector banks have an average Z-score of 2.584, with an SD of 0.455, the resultant C.V. of 17.262, while the private sector banks have an average Z-score of 2.807, with an SD of 0.992, the resultant C.V. of 35.337, during the study period of five years. The mean Z-score of public sector banks is in the 'Grey-zone'. The rising stress assets have considerably affected the financial health of these institutions asmany banks have very low EBIT/TA ratios during the study period.Though the private sector banks have better mean Z-scores than the public sector banks, the Z-score differencebetween the public sector banks and thatof the private sector banks is not statistically significant.

REFERENCES:

[1]Abirami, K. (2018). Financial soundness of Indian banking industry: Bankometer analysis. *International Journal of Applied Research*, *4*(3), 357-362.

[2] Altman, E. I. (1968). Financial ratios, discriminant analysis, and the prediction of corporate bankruptcy. *The journal of finance*, *23*(4), 589-609.

[3] Beaver, W. H. (1966). Financial ratios as predictors of failure. *Journal of accounting research*, 71-111.

[4] Chauhan, P., & Kumar, S. (2019). Analysis of Scheduled Commercial banks: Bankometer Model.*International Journal of 360 Management Review*, 7(1), 30-39.

[5] Chotalia, P. (2014). Evaluation of financial health of sampled private sector banks with Altman Z-score model. Indian Journal of Social Sciences and Research, 2(2), 7-11.

[6] Davies, S. M. (2010). Banking system soundness during the financial crisis. *IFC Bulletin*, *25*, 47-51.

[7] De Juan, A. (1990). Does Bank Insolvency Matter? And what to do about it? *Financial Systems and Development in Africa, Welt bank, Washington DC*, 43-65.

[8] Kumar, P., & Sharma, A. (2021). Ownership does matter in the Financial Performance of a Banking Undertaking: Evidence from the Comparative Financial Performance of Public Sector Banks and Private Sector Banks in India. *International Journal of Management*, 11(12), 2730 -2744.

[9] Makkar, A. and Singh, S. (2013). Analysis of the Financial Performance of Indian Commercial Banks: A Comparative Study. *Indian Journal of Finance*, 7, 41-49.

[10] Pradhan, R. (2014). Z score estimation for Indian banking sector. *International Journal of Trade, Economics and Finance*, *5*(6), 516-520.

[11] Schou-Zibell, L., Albert, J. R., & Song, L. L. (2010). A macro-prudential framework for monitoring and examining financial soundness.*ADB Working Paper Series on Regional Economic Integration*, No. 43.