Credit risk analysis of HDFC Bank and SBI Bank using credit analysis ratios and Atman's Z score

Hiteksha Upadhyay[1]
Malhar Bhavsar[2]
Charmi Doshi[3]

Abstract

The viability of Indian banks holds prime importance as it relates to financial investments and funding. The terms of credit have shifted away from traditional times to the modern scenario today. The impact of the recent crisis provides attractive opportunities to research on financial distress. The basic intent is to evaluate the terms of credit and ensure repayment.

Banks that fail to undertake proper risk management are most vulnerable to losses and become the focus of regulators. This study attempts to assess the financial performance of select Indian public and private sector banks. It includes a sample size of two banks - HDFC Bank and SBI.

The paper mainly focuses on profitability of select banks, measured by select credit risk indicator ratios and Edward Altman's Z score. Secondary data is gathered from the annual reports of State Bank of India and HDFC Bank for ten years (2009 to 2018). The score determines the financial status and health of the bank. It also includes regression analysis for dependent and multiple independent variables.

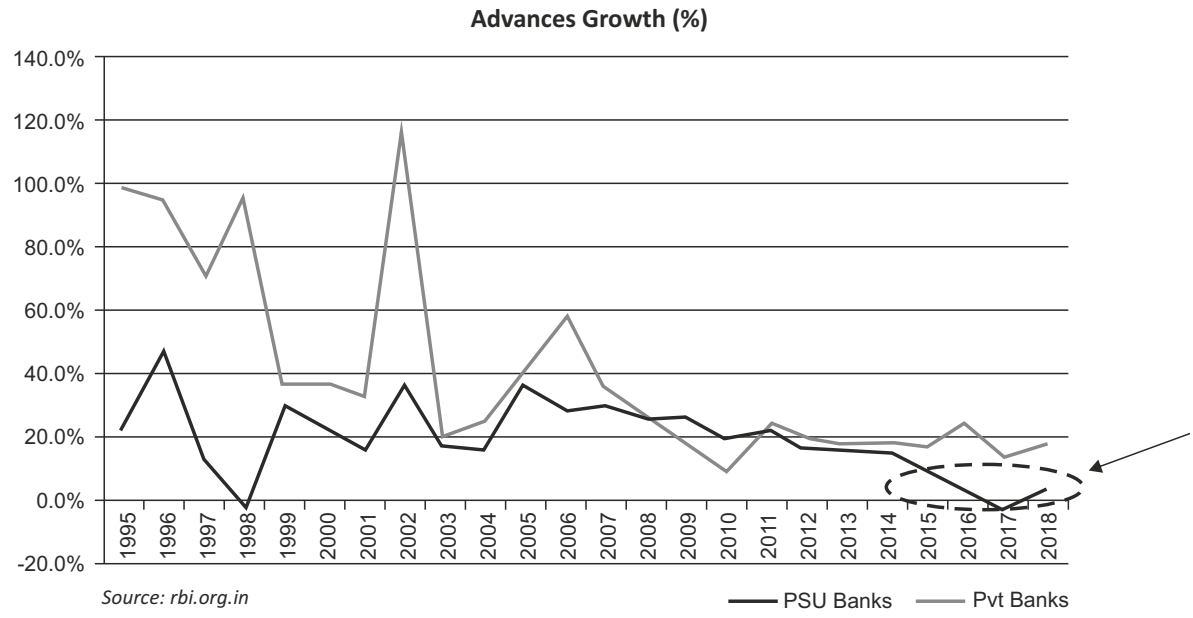
Key words: *Credit risk, Z score, Regression Analysis*

1 Assistant Professor – Finance, Faculty of Management, GLS University – Ahmedabad, Gujarat (IN)
2 PGDM Student, Batch 2017-19, GLS University – Ahmedabad, Gujarat (IN)
3 PGDM Student, Batch 2017-19, GLS University – Ahmedabad, Gujarat (IN)

Introduction

One of the major issues the financial sector faces is non-performing assets, or bad debts. Lending is an essential and inseparable part of any bank; hence, formulation and execution of sound lending policies play a vital role in efficient credit management. Since 1995, private sector banks have managed to consistently grow their credit portfolio at a much higher rate than their PSU (public sector units) peers. While assessing credit growth, we should separate the post-2014 years from the past. The credit growth of PSU banks suddenly dropped from 22% CAGR (1994-2014) to 2% CAGR (2014-2018). Whereas, credit growth of private sector banks continued to grow at 18-20% (See Figure 1).

Figure 1: Credit growth of banks



Source: rbi.org.in

PSU banks had sanctioned more loans to corporates compared to their private peers, focusing on retail lending (retail lending offers better yields). This study analyses how some top PSU banks and private sector banks have fared in terms of their ROAs (return on assets) over the last decade. It is observed that ROAs of PSU banks have turned negative in the last couple of years due to higher provisions because of higher NPAs.

There are multiple reasons for private sector banks delivering better ROAs than their public peers.

Credit cards & cross selling: Cross selling includes selling of bank assurance (health and life insurance), mutual fund schemes, etc. Credit cards and cross selling businesses are of high yielding nature. These businesses have more stable fee and commission income compared to the interest income a bank earns, which is more of a commodity type business and is susceptible to interest rate volatilities. Private sector banks realized this benefit and have focused on growing these businesses. As an example, private sector banks' share in mobilising funds for mutual funds was nil until 1993. However, within a matter of 6 years, their share rose to 80% by 1999, and has remained 80%+ since then.

Out of 2.5 crore credit cards issued in India, HDFC Bank alone has issued almost 1.1 crore credit cards! That's a whopping 40% market share in the credit cards segment. Also, HDFC Bank has issued 4 credit cards for

every 10 debit cards. That's very successful cross selling, as most of these cards are issued to the bank's own customers. Exact data is not available on the same.

On the other hand, SBI has issued almost 28 crore debit cards, but only 65 lakh credit cards. For BOB, the ratio is even worse. Traditionally PSU banks have fared poorly when it comes to selling credit cards, bank assurance, auto loans, etc. And that's where private sector banks have scored resulting in higher yield assets and perhaps higher ROA / ROE (return on earnings) profile. If PSU banks start cross selling various products to their existing customers, they will enter a different league altogether, mainly due to their huge network and customer base.

Retail Lending: Until 2014, private sector banks lent Rs 150 to corporates for every Rs 100 lent to the retail consumer. Whereas, PSU banks lent Rs 700 to corporates for every Rs 100 to retail consumers. This higher exposure to the retail sector has helped private sector banks in improving their profitability.

Cost to Income: Lower Cost to Income ratio also aids in improving the ROAs of a bank. However, if a bank is growing and incurring expenses for the same, the bank might have higher Cost to Income ratio. Generally, Cost to Income ratio in the range of 45-50% is considered to be good. PSU banks in general have higher operational expenditures and lower retail business per branch, which results in higher cost to income ratio. Private sector banks have done a good job in getting higher retail business per employee / per branch, which keeps their cost to income ratios lower.

Better Net Interest Margins: Higher CASA (current account savings account) certainly helps in lowering the cost of funds for any bank. A combination of higher CASA and higher yield retail lending has resulted in better NIM (net interest margin) for private sector banks. PSU banks have a solid liability franchise that is built over decades. Their CASA / cost of funds is lowest amongst all banks. However, higher share of corporate lending brings their NIM down.

CASA (%) (current and savings account ratio): While comparing PSU banks with private sector banks, it's noteworthy that HDFC Bank, which has the lowest CASA among private sector banks, is comparable to the CASA of SBI, the best PSU bank. Better CASA leads to cheaper source of funds, which, in turn, improves the bank's ROA.

Literature Review

As credit risk has a considerable impact on the bank and its reputation, many researchers have studied the impact of credit risk using various elements and indictors. A research paper on credit risk and Z score has been evaluated. Table 1 shows the summary and outcome of literature reviewed.

Table 1: Summary of Major Literature work

Year	Author	Test	Results
2014	Abiola	Regression	NPL and CAR have a significant impact on profitability
2014	Fan Li	DuPont, Multiple Regression Analysis	Non-performing loans have a significant impact on return on equity and return on assets.
2012	Kolapo	Regression panel analysis	Results indicate that Loan and Advance ratio showed the highest impact on profitability of selected banks.
2018	Ashima Gaba	Correlation and regression	A negative relationship exists between NPA and ROA.
2018	Birori Raymond Hirwa	Regression model	Asset quality of banks had the highest influence on ROA of banks.
2016	Hazarika	Regression	Profitability, bank capital and growth in GDP (gross domestic product) are negatively associated with credit risk for all banks. On the other hand, loan loss provision has a positive influence on credit risk.
2017	Birgen Joan	Correlation	There is a positive relation between liquidity management and financial performance of banks.
2013	Sharma & Mayanka	Altman Z- Score	Canara Bank and Kotak Bank were found to be in distressed zone.
2017	Siddiqua	Statistical test	Cash out of assets positively affect ROA and ROE but influenced the NIM negatively.
2013	Kavya	Regression	Credit risk has negative correlation with performance; if credit risk is higher, then bank performance will be lower.
2017	Dudhe	Panel regression	Except SBI and PNB, all other banks exhibit a negative correlation between their gross NPA and net profit.

Other than the studies listed in Table 1, Kishori & Sheeba (2017) emphasized on accounting numbers and fundamental investing factors influencing credit risk. Multiple regression was applied using selected fundamental ratios to examine credit risk involved in the bank. Bandyopadhyay (2006) studied the probability of corporate default and focused on corporate bonds. Using multiple discriminant analysis, a new model and Z score is developed to examine credit risk.

Research Gap

The research studies on credit and Z-Score listed in Table 1 indicate that banks and financial institutions were still unexplored and not deeply examined. This study focuses on credit risk analysis of top public and private sector banks.

RESEARCH METHODOLOGY

Research Objective

- To study the ratios affecting credit risk and profitability.
- To analyse the impact of credit risk on profitability.
- To study the Altman Z-score of selected banks.

Sample units

Sample units of the banks for this project were taken according to top market capitalization of public and private sector banks. In case of private sector banks, HDFC Bank had the highest market capitalization of Rs. 582,250.59 crore; among PSU banks, SBI had the highest market capitalization of Rs. 239,402.70 crore.

Table 2: Market capitalization of private and public sector banks (as on December 2018)

	Name of the Bank	Market capitalization (Rs in crore)
Private sector Banks	HDFC	582,250.59
	Kotak Mahindra Bank	248,044
	ICICIbank	219,047.01
	IndusInd bank	179,205.99
	Bandhan bank	90,290.33
Public Sector banks	SBI	239,402.70
	IDBIBank	33,266
	Bank of Baroda	27,023
	PNB	26,423
	Canara Bank	16,113.05
	Bank of India	14,257.56

Source: NSE India

Research design

In this research, explanatory research design is used to find the cause and effect relationship between the various indicators of credit risk and profitability. Though the research starts with description of the variables, the ultimate aim is to find the cause and effect relationship between the variables, so explanatory research design is used.

Source of Data

Data has been collected from published annual reports of SBI and HDFC Bank. Model application has been carried out using 10 years' data starting from 2009 to 2018.

Tools and Models used

This study is focused on examination of credit risk. Researchers have used Altman's Z-Score model to examine the banks' financial strength. Further, regression analysis is done to verify the relationship between profitability and credit risk.

ALTMAN'S Z-SCORE

Z-Score equation is widely used for measuring credit risk. Z-score is computed with the multiplication of accounting ratios with the coefficients. Z-score model helps in analysing the financial status of companies with computation of financial ratios (Jayadev, 2006). The Z-score basic tool was evolved in 1968 for manufacturing companies. Altman, in 1983, again made changes to the Z-score for the usage of private firms. The model was revised again in 1993 for emerging firms and non-manufacturers, and included only four variables:

$Z = 6.56 X1 + 3.26 X2 + 6.72 X3 + 1.05 X4$

Z = Overall Score

X1 = Working Capital / Total Assets

X2 = Retained Earnings / Total Assets

X3 = Earnings before Interest and Taxes/Total Assets

X4 = Book Value of Equity / Total Liabilities

MULTIPLE REGRESSION:

Multiple regression is an extension of simple linear regression. It is used when the researcher wants to predict the value of a variable based on the value of two or more other variables. The variable the researcher wants to predict is called the dependent variable (or sometimes, the outcome, target or criterion variable). The variables we are using to predict the value of the dependent variable are called the independent variables (or sometimes, the predictor, explanatory or regression variables).

The general form given for multiple regression models is:

Y= ß0 + ß1CAR + ß2NPA + ß3 LDR+ ß4 LR+ ß5 CLR+ ß6 PCR+ ß7 PAR+ ß8 LAR.....(1)

ß0- Constant terms and ß1, ß2, ß3, ß4, ß5, ß6, ß7, ß8- coefficient of independent variables.

DATA ANALYSIS AND INTERPRETATION

Table 3 represents interpretation of Altman's Z-score value.

Table 3 - Interpretation of Altman's Index

Score 1993	Interpretation
Z> 2.60	Non-Bankrupt Firms, Safe Zone
1.10<Z<2.60	Difficult to Predict, Grey Zone
Z<1.10	Difficult zone, Bankrupt Firms

Source: Author-constructed using Altman Theory

Empirical Results

Considering model requirement, the mentioned ratios were calculated and applied. Table 4 shows the calculation of Z-score of SBI. Table 5 represents Z-score of HDFC Bank. Further, regression analysis has been done, considering ROI (Return on Investment) as an independent variable.

Table 4: Z-score calculation of SBI

Year	6.56xA	3.26XB	6.72XC	1.05XD	Z SCORE	Zone
2018	0.047016	-0.61784	0.105183	0.000305	-0.46533	**Distress**
2017	0.040574	1.008938	0.126276	0.000354	1.176142	**Grey**
2016	0.022046	1.144599	0.128678	0.000417	1.295741	**Grey**
2015	0.119034	1.66375	0.12768	0.00044	1.910904	**Grey**
2014	0.130351	1.573104	0.120359	0.000497	1.824311	**Grey**
2013	0.081107	2.345114	0.133355	0.000524	2.5601	**Safe**
2012	0.07981	2.284483	0.15887	0.000602	2.523765	**Safe**
2011	0.094485	1.510868	0.139127	0.000633	1.745113	**Grey**
2010	0.098686	2.445165	0.116874	0.000735	2.661459	**Safe**
2009	-0.04281	2.593882	0.12483	0.000838	2.67674	**Safe**

Source: Authors' calculations

INTERPRETATION:

Average Z-score has been computed for the period 2009-2018. In 2009 and 2010, the Z-score is above 2.60 which indicates the bank is in the safe zone. In 2009 and 2010, Z-score was 2.67 and 2.66 respectively. As per Z-score, the bank is financially healthy and not heading towards bankruptcy. The bank is in the safe zone.

But in 2011, the bank's Z-score fell to 1.74. The Z-score

indicates that the bank is in the grey area. As per the Z-score, values between 1.11 and 2.60 indicate that State Bank of India is considered to be in the grey area. In this condition, the bank may experience financial problems that must be dealt with through proper management. Any delay in managing credit risk may result in the bank facing bankruptcy.

Then again, SBI's Z-score started increasing after 2011. In 2012 and 2013, SBI's Z-score was 2.52 and 2.56 respectively. From 2014 to 2017, SBI's Z-score fluctuated in the range of 1.11 to 2.60. It indicates that SBI is in the grey zone. In this condition, it is difficult to predict whether the bank is solvent.

In 2018, the Z-score was negative (-0.46) which indicates that SBI is in the distress zone. A Z-score of below 1.10 indicates that SBI is experiencing financial difficulties and high risk.

When SBI was in the distress zone, the government injected considerable funds either through recapitalization or through open market operations.

Table 5: Z-score calculation of HDFC Bank

Year	6.56xA	3.26XB	6.72XC	1.05XD	Z SCORE	ZONE
2018	0.475699	5.343104	1.4784	0.000598	7.297801	**Safe**
2017	-0.05891	5.49081	1.8144	0.00075	7.247052	**Safe**
2016	0.020302	4.593606	1.4112	0.000886	6.025993	**Safe**
2015	0.042737	4.581871	1.2768	0.001061	5.902469	**Safe**
2014	-0.0235	4.56536	0.6048	0.001239	5.147903	**Safe**
2013	-0.12427	4.410929	-0.2016	0.001518	4.086572	**Safe**
2012	-0.32021	4.011396	-0.1344	0.001821	3.558609	**Safe**
2011	0.015988	3.712366	-0.9408	0.002191	2.789746	**Safe**
2010	0.275024	3.515673	6.9888	0.002665	10.78216	**Safe**
2009	-0.18663	3.236164	6.1152	0.00307	9.167803	**Safe**

Source: Authors' calculations

INTERPRETATION:

HDFC Bank's Z-score has remained in the safe zone since the last decade. As per the Z-score, the bank is financially healthy and solvent. The bank is in the safe zone. The highest Z-score in the last decade was in 2010 at 10.78 and the lowest Z-score was 2.78 in 2011.

REGRESSION ANALYSIS AND INTERPRETATION:

This model measures the effect of the credit risk on profitability of banks measured by ROC, which is an indicator of profitability. ROC is used as a dependent variable. Indicators of credit risk - CAR, NPA, LDR, CLR, PCR, LR, PAR, SAR, DAR and LAR are used as the independent variables.

R2 is the coefficient of the multiple determination. This coefficient measures the strength of association. The F test in multiple regression is used to test the null hypothesis that the coefficient of the multiple determination in the population is equal to zero. The partial regression coefficient in multiple regression is denoted by ß1. This denotes the change in the predicted value per unit change in X1, when the other independent variables are held constant.

Table 6: Credit risk measurement ratios and formulae

	VARIABLES	FORMULAE
Profitability	Return on Capital (ROC)	Net income – dividend/debt + equity*100
Credit Risk	Capital adequacy ratio (CAR)	Tier 1 capital + tier 2 capital/ risk weighted assets * 100
	Non-performing-assets ratio (NPA)	Net non-performing assets/ total advances * 100
	Loan to deposit ratio (LDR)	Total loans/ total deposits*100
	Cost per loan ratio (CLR)	Total operating cost/ total amount of loans disbursed*100
	Provision coverage ratio (PCR)	Total provision / gross NPA*100
	Leverage Ratio (LR)	Total debt/ total equity *100
	Problem asset ratio (PAR)	Net non-performing assets/ total assets *100
	Loan Asset Ratio:	Total loss assets/ gross NPA*100

Source: Compiled using literature work

Table 7: HDFC BANK

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	1.000[a]	1.000	.996	.10860	2.729
a. Predictors: (Constant), LAR, LR, CLR, CAR, NPA, PAR, PCR, LDR					
b. Dependent Variable: ROE					

Source: Authors' calculations

Interpretation:

The "R" column represents the value of R, the multiple correlation coefficient. The *R* value represents the simple correlation and is 1.000 (the "**R**" Column), which indicates a high degree of correlation. The R^2 value (the "**R Square**") indicates the extent of the total variation in the dependent variable. Our R square is 1.000 which shows our independent variable has 100% impact on the dependent variable. That means the dependent variable is highly correlated with the independent variable.

Table 8: ANOVA table of HDFC Bank ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.159	8	3.270	277.272	.046[b]
	Residual	.012	1	.012		
	Total	26.171	9			
a. Dependent Variable: ROE						
b. Predictors: (Constant), LAR, LR, CLR, CAR, NPA, PAR, PCR, LDR						

Source: Authors' calculations

Interpretation:

The Anova table shows whether the overall regression model is a good fit for data. If the p-value for variable is less than the significance level, our sample data provides enough evidence to reject the null hypothesis. The table shows that the independent variable statistically significantly predicts the dependent variable, here, $p < 0.046$, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable (i.e., it is a good fit for the data).

Table 9: Coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-45.627	6.994		-6.523	.097
	CAR	.418	.128	.230	3.261	.189
	NPA	-13.701	2.835	-.544	-4.833	.130
	LDR	.326	.063	1.133	5.154	.122
	LR	2.954	.173	1.077	17.125	.037
	CLR	.169	.107	.361	1.572	.361
	PCR	-.035	.019	-.371	-1.852	.315
	PAR	-.139	.084	-.293	-1.664	.345
	LAR	.153	.024	.479	6.259	.101
a. Dependent Variable: ROE						

Source: Authors' calculations

Interpretation:

The general equation to predict dependent variable from CAR, NPA, LDR, LR, CLR, PCR, PAR, LAR is predicted

= -45.627+ (0.418*CAR) – (13.701*NPA) + (0.326*LDR) + (2.954*LR) + (0.169*CLR) – (0.035*PCR) – (0.139*PAR) + (0.153*LAR).

Coefficient indicates how much the dependent variable varies with independent variables when all other independent variables are held constant; consider the effect of CAR in the table. CAR is equal to 0.418 (see coefficient Table 9). This means that for each year of increase in CAR, there is a decrease in dependent variable of 0.418.

Table 10: State Bank of India

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.998[a]	.996	.967	1.03071	2.489
a. Predictors: (Constant), LAR, PAR, CAR, PCR, LDR, CLR, LR, NPA					
b. Dependent Variable: ROE					

Source: Authors' calculations

Interpretation:

The "R" column represents the value of R, the multiple correlation coefficient. The *R* value represents the simple correlation and is 0.998; that means 99% (the "**R**" Column), which indicates a high degree of correlation. The R^2 value (the "**R Square**") indicates the extent of the total variation in the dependent variable. Our R square is 0.996 which shows our independent variable has 99.6% impact on the dependent variable. That means the dependent variable is highly correlated with the independent variable.

Table 11: ANOVA table of SBIANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	288.095	8	36.012	33.898	.132[b]
	Residual	1.062	1	1.062		
	Total	289.158	9			
a. Dependent Variable: ROE						
b. Predictors: (Constant), LAR, PAR, CAR, PCR, LDR, CLR, LR, NPA						

Source: Authors' calculations

Interpretation:

The Anova table tests whether the overall regression model is a good fit for data. The table shows that the independent variable is statistically not significant to predict the dependent variable; here, p > 0.132, which is more than 0.05, and indicates that there is insufficient evidence in the sample to conclude that no correlation exists. Overall, the regression model is statistically not significant to predict the outcome variable (i.e., it is not a good fit for the data).

Table 12: Coefficients Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-99.883	42.872		-2.330	.258
	CAR	3.895	1.059	.485	3.677	.169
	NPA	-6.893	2.555	-1.761	-2.698	.226
	LDR	.350	.183	.281	1.916	.306
	LR	3.733	1.487	.639	2.511	.241
	CLR	-.324	.337	-.119	-.959	.513
	PCR	-.181	.088	-.415	-2.057	.288
	PAR	3.233	4.534	.424	.713	.606
	LAR	.099	.069	.111	1.444	.386
a. Dependent Variable: ROE						

Source: Authors' calculations

Interpretation:

The general equation to predict the dependent variable from CAR, NPA, LDR, LR, CLR, PCR, PAR, LAR is predicted

= -99.883+ (3.895*CAR) – (6.893*NPA) + (.0350*LDR) + (3.733*LR) +-(0.324*CLR) – (0.181*PCR) +(3.233*PAR) + (0.099*LAR).

In Table 12 and Table 9, significance value indicates whether or not to include variables in the final model. If it is above 0.05, then it is not included in the final model.

Conclusion:

A comprehensive process, system and practices are followed by Indian banks in credit risk management. Detailed investigation at each stage starting from assessment, sectioning decision, disbursement, timely monitoring to recovery plan, makes credit policy strong. It is imperative to investigate why despite a robust system, risk is recurring and not mitigated as per policy.

In this paper, HDFC Bank and SBI were chosen for the study as both banks have the highest market capitalization among private sector banks and public sector banks respectively. As per Altman Z-score, HDFC Bank has the overall highest Z-score. SBI's overall Z-score was lower than that of HDFC Bank. HDFC Bank's Z-score over the last decade from 2009 to 2018 is above 2.60, which indicates that the bank is financially healthy and is considered in the safe zone. Overall, the regression model is statistically not significant to predict the outcome variable (i.e., it is not a good fit for the data) of HDFC Bank because the significance level is above 0.05. For SBI, the regression model is statistically significant to predict the outcome variable (i.e., it is a good fit for the data).

Limitations and future scope

The presented model considers specific ratios. This means that research is based on financial and accounting ratios only; no fundamental or technical aspects are taken into consideration. However, the study is not only based on Altman's Z-score. Regression is carried out to verify results. But the researchers may add some other elements in regression; Piotroski F-score could also be analysed to fortify analysis.

Hiteksha Upadhyay *is Assistant Professor at the Faculty of Management, GLS University. She has an overall experience of 8 years in academics at post graduate and graduate levels. She has been teaching courses like Management Accounting, Strategic Financial Management, Mergers and Acquisitions, Banking and Insurance, Financial Management and Security Analysis and Portfolio Management. She has presented many research papers in areas of Capital Markets and finance in various International and national conferences. A number of her publications are indexed in EBSCO, ProQuest and with other databases. She was awarded for the best research paper in UGC sponsored national conference. She has successfully cleared a number of NSE's NCFM Module tests. She is a lifetime member of Indian Accounting Association. She can be reached at hiteksha.joshi@glsuniversity.ac.in*

Malhar Bhavsar *is a Management Trainee at HDB Financial Services Limited. He has overall experience of 5 months in the credit department. He has done a summer internship in the credit department of MSME Business Loan at Union Bank of India for 2 months. He has done PGDM-Finance from NRIBM-GLS University. He has done a SIP project on 'A study on Credit Appraisal of MSME Business Loan' at Union Bank of India. He can be reached at malharbhavsar.nrpgdm17@gmail.com*

Charmi Doshi *is a Management Trainee at HDB Financial Services Limited. She has overall experience of 5 months in the credit department. She has done a summer internship in the credit department of 'Salaried Personal Loan' at Kotak Mahindra Bank for 2 months. She has done PGDM-Finance from NRIBM-GLS University. She has done SIP project on 'A study on Credit Underwriting of Salaried Personal Loan' at Kotak Mahindra Bank. She can be reached at charmidoshi.nrpgdm17@gmail.com*

References

- Bandyopadhyay, A. (2006). Predicting probability of default of Indian corporate bonds: logistic and Z-score model approaches. The Journal of Risk Finance, Volume 7, ISSUE 3, pp.255-272.
- Kishori, B., & Sheeba, J. (2017). A Study on the Impact of Credit - State Bank of India. IJARIIE Vol-3 Issue-3, 2587-2594.
- Sharma, N., & Mayanka. (2013). Altman Model and Financial Soundness of Indian Banks. International Journal of Accounting and Financial Management Research (IJAFMR), 55-60.

Annexure

SBI										
Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Current Assets	191898.64	171971.65	167467.66	174861.3	132549.63	114820.16	97163.17	122874.15	96183.85	104403.8
Current Liability	167,138.08	155,235.19	159,875.57	137,698.04	96,926.65	95,455.07	80,915.09	105,248.39	80,336.70	110,697.57
Working Capital	24,760.56	16,736.46	7,592.09	37,163.26	35,622.98	19,365.09	16,248.08	17,625.76	15,847.15	-6,293.77
Total Assets	3,454,752.00	2,705,966.30	2,259,063.03	2,048,079.80	1,792,748.29	1,566,261.03	1,335,519.24	1,223,736.21	1,053,413.74	964,432.08
Retained Earnings	-654745	837469.908	793166.3115	1045243.255	865085.6331	1126705.802	935880.7626	567148.4325	790113.51	767369.0799
Net Profit	-6,547.45	10,484.10	9,950.65	13,101.57	10,891.17	14,104.98	11,707.29	7,370.35	9,166.05	9,121.23
Retained Earnings (%)	100	79.88	79.71	79.78	79.43	79.88	79.94	76.95	86.2	84.13
EBIT	54,074.78	50,847.90	43,257.81	38,913.50	32,109.24s	31,081.72	31,573.54	25,335.57	18,320.91	17,915.23
Market Value of Equity	892.46	797.35	776.28	746.57	746.57	684.03	671.04	635	634.88	634.88
Total Debt	3068485.36	2362445.05	1954913.03	1781943.54	1577539.38	1,371,922.28	1,170,652.93	1,053,501.77	907,127.83	795,786.81

HDFC BANK										
Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Current Assets	122915.08	48952.1	38918.84	36331.45	39583.65	27280.17	20937.72	29668.84	29942.39	17506.62
Current Liability	45,763.72	56,709.32	36,725.13	32,484.46	41,344.40	34,864.17	37,431.87	28,992.86	20,615.94	22,720.62
Working Capital	77151.36	-7757.22	2193.71	3846.99	-1760.75	-7584	-16494.15	675.98	9326.45	-5214
Total Assets	1,063,934.32	863,840.19	708,845.57	590,503.07	491,599.50	400,331.90	337,909.49	277,352.61	222,458.56	183,270.78
Retained Earnings	3253346.053	2573239	1735361.17	1413939.14	1166039.3	920266.239	720238.69	621427.96	523122.02	419702.92
Net Profit	17,486.73	14,549.64	12,296.21	10,215.92	8,478.38	6,726.28	5,167.07	3,926.39	2,948.69	2,244.95
Retained Earnings (%)	99.72	100	81.23	81.24	81.2	80.53	80.47	80.44	81.36	81.04
EBIT	32,624.81	25,732.39	21,363.55	17,404.47	14,360.09	11,427.62	8,950.40	7,725.36	6,429.72	5,178.96
Market Value of Equity	519.02	512.51	505.64	501.3	479.81	475.88	469.34	465.23	457.74	425.38
Total Debt	911875.61	717668.53	599442.66	496009.2	406776.47	329,253.58	270,552.96	222,980.47	180,320.13	145,497.42