Prediction of Bankruptcy and Impact of Credit Risk Management on Profitability of Commercial Banks in India: A Study

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Abstract

Banking system of a country plays a leading role in its economic development. India is also not isolate from such fact. Indian banking system plays a crucial and impactful role in both Individual and economy progress. Since the huge major flow of money into economy is controlled by banking system in India, the system policies, operational efficiencies are having linear impact on the economic development of the country. The efficiency of the banking industry of the country is the sign of economic development and public commercial banks will have to face the competition of private commercial banks as well. Hence, the present study objective is to predict the solvency condition of Indian public commercial banks and the impact of credit risk management on the profitability of commercial banks in India. To fulfil the objectives of the study, the study has been used the secondary data extracted from annual reports of the top three public commercial banks for the period from 2012 to 2022. The data were analysed using a descriptive statistics and panel data regression model and the bankruptcy is predicted using Altman's Z Score model. the results found that, public sector Indian commercial banks under the pressure to experience the bankruptcy and there is no significant impact of credit risk management on profitability of commercial banks in India.

Keywords: Bankruptcy, Credit Risk Management, Profitability.

Introduction

Banks are the economic vehicles to flow the money to the economics activities of the country. 'Banking' means the accepting, for the purpose of ending or investment, of deposits of money from the public, repayable on demand or otherwise and withdrawal by cheque, draft, order or otherwise (Banking Regulation Act, 1949, Amendment). Commercial banks refer to both Scheduled and Non-Scheduled Commercial banks which are regulated under Banking Regulation Act, 1949. AS of End-March 2001, the total outstanding loans of Indian banks stood at ₹5.1 trillion, or 23.9% of the country's annual gross domestic product (GDP) of the time. The figure had grown to ₹130.4 trillion, or 50.3% of GDP by September 2022. At the meantime, the total bank deposits are jumped from ₹9.6 trillion, or 45% of GDP, as of End-March 2001, to ₹175.4 trillion, or 67.6% of the GDP. Expressing credit and deposits in GDP terms allows us to take the size of the growth of the economy into account as well. On the other hand, the growth appears to be sharp, the interesting fact is that the Indian banking size has been stagnating for over a decade now. The lending of banks has remained around 50-53% of the GDP since March 2009 (with 2020-21 being an exception due to covid-19), and deposits have remained between 67-70% (Mint News on 23rd January 2023).

Motivation for the study

The bankruptcy and credit risk management are the major challenges to banks. The perpetual planning and policy formations are the need of the time to fight again the financial distress condition and to manage the credit risk efficiently. Since the Indian banking sector is posed to these challenges, the same is motivated to conduct the study to assess the likely bankruptcy and credit risk management and its impact on profitability of public sector commercial banks, so that input towards Indian banking industry's better step.

Review of Literatures

Review of Relevant Literature on Bank Profitability

Ongore V. O & Kusa G B (2013)[1] shown the importantly, Return on Equity (ROE), Return on Assets(ROA), Net Interest Margin (NIM) as indicators of Bank's profitability or Bank's performance.

Alper.D & Anbar. A (2011)[2] explored the bank specific and macro-economic determinants of commercial bank profitability. Bank specific profitability and performance indicators are Asset size, Capital adequacy, Asset quality, Liquidity, Deposits, Income-expenditure structure. Macro-economic variables are GDP, annual inflation rate, real interest rate.

Chong. R R & Sufian. F (2008)[3] revealed Return on Assets (ROA), Return on Equity (ROE) as the indicators of bank's financial performance and some other bank specific performance indicators are Log of Total Assets, Loans loss provisions divided by total loans, Non-Interest income divided by total assets, Total overhead expenses divided by total assets and Book value of stockholders' equity.

Davydenko A (2011)[4] displayed the bank profitability specific variables which are treated as dependent variables such as Return on Equity (ROE), Return on Assets (ROA).

Review of Literature relevant to Credit Risk Management and its impact on Profitability

Gizaw et.al., (2015)[5] thrown light on the credit risk indicators of commercial banks in Ethiopia such as Non-performing loan to total loan and advance ratio, loan loss provision ratio, Capital adequacy ratio and loan to deposit ratio and the profitability was measured by Return on Assets and Return on Equity.

Karim R.A & Alam.T(2013)[6] investigated and explained the Profitability measurement using Return on Assets and Return on Equity and market based performance measurement using Tobin's Q and Economic Value Added. Meanwhile they specified that, risk based capital, credit growth, credit concentration, non-performing loans position, liquidity gap analysis.

Poundel R.P.S (2012)[7] specified various parameters to credit risk management as it affect bank's financial performance such as default rate, cost per loan assets and capital adequacy ratio.

Wanjohi J.G (2013)[8] mentioned Return on Assets and Return on Equity as indicators of bank's profitability whereas identified four sequence of processes.

Fooladi I & Fatemi.A (2019)[9] analysed the impact of credit risk management on profitability of commercial banks in India. The study focused on top ten public sector commercial banks selected on the basis of total assets. The study explored that, Non-Performing loans ratio, Loans loss provision ratio, Capital adequacy ratio, Asset quality ratio, Management, Efficiency and Liquidity as measures of Credit risk management and Return on Assets as a measure of profitability.

Review of literature relevant to Prediction of Bankruptcy.

Erdogam B.E (2008)[10] caught a model suitable to expedite the process of predicting the bankruptcy of Turkish Commercial banks. Indeed the study used the model know as Z-Score model to predict the insolvency of Turkish commercial banks in the near next two years journey.

Erdogan B E (2013)[11] applied Support Vector Machines to bankruptcy analysis using practical steps of Turkish Commercial banks.

Al-Kandari et.al.(2012)[12] listed out and applied certain ratios like Investment in Securities to Total Assets, Loans to Total Assets and Loans to Deposits as best predictors of financial distress for the banks.

Qamruzzaman Md. (2014)[13] analysed the financial position of selected commercial banks in Bangladesh for four years from 2008-2012. The study used S-Score and Z-Score to estimate the likely bankruptcy status of commercial banks in Bangladesh.

Joshi M K (2020) [14] used Altman's Z-Score model to analyse the financial performance of select Indian Public sector banks for the first five years (2009-14) and last five years (2015-19).

Objectives of the study

1. To predict the likelihood bankruptcy of Indian public sector commercial banks in next two years.
2. To examine the Credit risk management and its impact on profitability of Indian public sector commercial banks.

Hypotheses of the study

In order to achieve the study objectives and based on the literature review, the following hypotheses have been proposed for the study which are:

H_01: There is no likelihood of bankruptcy of Indian public sector commercial banks in the next two years.

H_02: There is no significant impact of Credit risk management on profitability of Indian Public sector commercial banks in India.

Methodology

Since the main objective of the study is to estimate the likely bankruptcy and impact of credit risk management on profitability of Indian public sector commercial banks, the study has been chosen Descriptive statics and Multiple regression analysis to analyse the data.

Data:

As per the requirements of the study, the secondary data from secondary sources such as annual reports of Indian public sector commercial banks were used to collect the data for the time span 2018-2022. The values are calculated and the hypothesis is calculated using MS excel.

Sample size

The sample of the study consists of Indian largest top five public sector commercial banks such as State Bank of India (SBI), Bank of Baroda (BOB), Punjab National Bank (PNB). Annual Time series data for both independent and dependent variables were extracted from the respective bank's annual audited financial statements from the period 2018-2022.

Table 1 (Rs in Cr)

Bank Name	Total Assets	Total Liabilities	Credit Facilities	Total Deposits	Net Profit (Loss)
SBI	4121817.442	4121817.442	2325902.21	33,18,432.25	12177.868
BOB	10,18,453.46	10,18,453.46	6,13,965.40	8,37,784.89	1,329.83
PNB	10,07,748	10,07,748	5,58,235	8,61,703	544

Source: Compiled and Computed from the audited annual reports of respective banks.

Limitations of the study:

The results of the study are may be based on the calculations errors and biases.

Definitions of variables

To predict bankruptcy, Altman's Z-Score model is used. Out of the various relevant articles review, the study found the following as key indicators for credit risk management, profitability of Indian public sector commercial banks.

Altman Z-score

The Z-score formula for predicting bankruptcy was published in 1968 by Edward I. Altman. The Z-score uses multiple corporate income and balance sheet values to measure the financial health of a company. Where,

T_1 = (Current Assets − Current Liabilities) / Total Assets

T_2 = Retained Earnings / Total Assets

T_3 = Earnings before Interest and Taxes / Total Assets

T_4 = Market Value of Equity / Total Liabilities Z-Score bankruptcy model: $Z = 6.56T_1 + 3.26T_2 + 6.72T_3 + 1.05T_4$.

Zones of discriminations:

Z-Score	Financial Position
Less than or equal 1.23	Institutions are belonging high risky area meaning that about experience bankruptcy.
Score between 1.23 to 2.90	Known as grey area indicating those institutions having possibility become bankruptcy if necessary actions may not undertake.
Score more than or equal 2.90	Institutions are performing with greater financial stability.

Source:www.CFI.com

* Credit Risk Management variables are Non-Performing loan ratio, Capital Adequacy ratio, Loan and Advance to deposit ratio (LTDR), Loan loss provision ratio (LLPR).

✓ Non-Performing loan ratio: It is the ratio of Nonperforming loan to total loan. It represents how much of the banks loans and advances are becoming nonperforming, more the ratio that sends bad message to bank management.

✓ Capital Adequacy ratio: It refers to the amount of equity and other reserves which the bank holds against its risky assets. The purpose of this reserve is to protect the depositor from any unexpected loss.

✓ Loan and advance to deposit ratio: This ratio can use to assess the liquidity in banks. This ratio indicates ability of banks to withstand deposit withdrawals and willingness of banks to meet loan demand by reducing their cash assets.

✓ Loan loss provision to ratio: It is a contra income account that enables banks to recognize in their profit and loss statements the expected loss from a particular loan portfolio. Depositors are protected against unexpected loss capital adequacy.

* **Profitability** of Indian Public sector commercial banks has been measured using key indicators such as Return on Assets and Return on Equity.

✓ Return on Assets: It is the net income against total assets employed in the business. Higher the ratio, higher the net income is generating by employing total assts.

✓ Return on Equity: It is the other variable used to measure profitability performance. It is a ratio of net income and total equity. It represents the rate of return generated by the owner's equity.

Table 2. Descriptive Statistics of Study Variables

Variables	Mean	Std.dev.	Min.	Max.
ROA	-0.05	0.60	-1.6	0.63
ROE	-1.29	11.71	-32.85	12.33
CAR	9.08	6.39	0.09	15.84
NPLR	0.05	0.06	0.01	0.30
LTDR	0.484	0.32	0	0.75
LLPR	0.02	0.01	0	0.06
E(in Cr)	47,633.26	758283.69	-1639961.57	1296867.16

Source: Compiled and Computed from audited annual reports of respective banks

To provide a definite overview of profitability performance and credit risk management indicators considered under the descriptive statistics, namely mean, standard deviation, minimum and maximum values are computed for the sample of 3 selected commercial banks for a 5 years' period are summarised in Table 2.

Results of Descriptive Statistics
Profitability performance of Indian Public sector commercial banks

To assess profitability performance, return on assets and return on equity were employed in the study and the result showed in the table 2 that on average the banks under study earned a -0.05 per cent return on assets with a 0.60 per cent standard deviation. The minimum return of the commercial banks during the study period is -1.6 whereas 0.63 is the maximum during the study period.

Further as a one more measure, the study is used return on equity is used to measure the profitability of the commercial banks and the results on Table 2 showed that, -1.29 per cent is the average return on equity with 11.71 per cent standard deviation. The mean value of minimum return on equity of commercial banks during the study period is -32.85 with a maximum of 12.33 on an average basis during the study period. The mean value of earnings of the commercial banks during the study is 47,633.26 in crores.

Credit Risk Management measures of Indian public sector commercial banks

The table 1 showed that, the Indian public sector commercial banks' mean value of capital adequacy ratio is 9.08 per cent with 6.39 per cent standard deviation, it implies that, 9.08 per cent CAR for its risk weighted assets on an average basis which is near to the standard as prescribed by RBI (9 per cent) and higher than the Basel norms (8 per cent). The mean value of Non-performing loan ratio of banks is reflecting 5 per cent depicts that selected commercial banks have lower credit defaults on an average basis.

The Loan and Advance to deposit ratio implies that, how much of banks core funds are being used for lending, the data as in the above table 2 on loan and advances to deposit ratio of 80 per cent, which indicates that, high core fund Indian public sector commercial banks are being used for loans and advances during the study period. Further, it is understood that there is pressure on resources as well as capital adequacy issues in the Indian commercial banks.

Loan loss provision ratio is 2 per cent as shown in the table 2 which implies that, how protected a bank is against future losses, since the 2 per cent is the minimal amount of provision has been maintained during the study period against to cover the loss on loans in the Indian commercial banks.

Table 3-Z-Score of Indian Public sector commercial banks

Commercial Bank	Z-Score	Zone
State Bank of India	0.41	Red
Bank of Baroda	0.69	Red
Punjab National Bank	0.67	Red

Source: Compiled and computed from annual reports of respective commercial banks.

The table 3 depicts of likelihood bankruptcy of Indian public sector commercial banks. As per the Z-Score model, if the Z-score of an institution less than or equal to 1.23 implies that, high risky area meaning that about to experience bankruptcy in next two years. Meanwhile the selected commercial banks' Z-Score of SBI, BOB and PNB during the study period is 0.41, 0.69 and 0.67 respectively which means, all these banks are under high risky area (Red) that are about to experience bankruptcy in the next two years.

Testing of Hypothesis and Results Discussion

H_01: There is no likelihood of bankruptcy of Indian public sector commercial banks in the next two years.

Since all the sample Indian public sector commercial banks have Z-Score less than 1.23 shown in the table 3 which indicates that, there is likelihood of bankruptcy of the commercial banks in the next two years. Hence, the H_01 is reject.

H_02: There is no significant impact of Credit risk management on profitability of Indian Public sector commercial banks in India.

Table 4: Regression analysis

Model	R	R^2	Adjusted R^2	Standard Error
1	0.76	0.59	0.45	0.01
a. Predictors: Credit Risk Management variables				
b. Dependent Variables: Profitability variables				

The adjusted R^2 of model is 45% which means that 45% change in dependent variable (Profitability) is caused by the independent variables (Credit risk management variables).

Table 5

Model	Sum o R^2	Df	Mean square	F	Sig.
1	Regression	1	0.00	4.33	0.12
	Residual	3	0.00	0.00	
	Total	4			
a. Predictors: Credit Risk Management variables b. Dependent Variables: Profitability variables					

The above ANOVA table shows that there is no significant impact of credit risk management on profitability of Indian Public sector commercial banks because the significant value is 0.12 which is greater than common alpha 0.05 at 5% level of significance. Hence the H_02 is accepted.

Recommendations

The Indian public sector commercial bank's return on assets and return on equity is negative during the study period 2018-2022 as found in the table 2, hence it is the right time to policy makers to focus on using effectively its assets including human capital with cost cutting strategies including focus on green banking and virtual bank branches for improving return on its assets and equity employment.

The capital adequacy of banks during the study is just above the standard prescribed by RBI (9%) which is positive sign but meanwhile banks must design sensitive lending policies to reduce the risk weighted assets and current liabilities to make free the pressure the capital to be maintained against risk weighted assets.

The core fund used for lending loan is more than 80% which has put pressure on the core fund of banks and capital adequacy of commercial banks, hence, there is a need of unleash the pressure on bank's core fund.

The loan loss provisions are about just 2% which in turn may not sufficient to manage the loan loss with such provision, therefore policy has to come out to reach out comfortable loan loss provisions to tackle future loan loss.

The Z-Score of the sample commercial banks are less than 1.23(red zone) which implies that commercial banks are about to experience bankruptcy in next two years, so banks must have discipline in retained earnings, incomes and especially in maintaining fixed and current assets to not to pose the bankruptcy in near future.

As the regression model shows there is no significant impact of credit risk management on profitability of banks still banks must have to manage efficiently to avoid dis comfortable conditions such as low loan loss provision, using the fund other than core fund for lending and profitability.

Conclusion

The bank's role is just not an act of developing country's infrastructure or economy it's about improving the life of the country as well as individual. Since, the public sector banks moto is service than making profit, there is need of strong policies measures safeguard the public sector banks in India. In spite, the public sector banks moto is service to the Indians citizen, there is need of discipline in the business of the banks for the sustainable development of banks as well as India.

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