

Impact of Credit Risk Indicators on Performance of Indian Private Sector Banks in the Post Financial Crisis Period

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Abstract: *The main aim of the study is to analyse the impact of credit risk indicators on performance of Indian private sector banks in the post financial crises period. The study period covers ten years (post financial crisis period) from 2008-2009 to 2017-2018. For the purpose of the study, top ten private sector banks have been selected based on the banks which have the highest share in Non-performing Assets. The sample private sector banks namely, ICICI Bank, Axis Bank, HDFC Bank, Jammu and Kashmir Bank, Kotak Mahindra Bank, Karur Vysya Bank, Federal Bank, Yes Bank, Lakshmi Vilas Bank, and South Indian Banks are chosen for the study. The data analysis was done using ratio analysis and statistical tools like mean, standard deviation, co-efficient of variation, compound annual growth rate and multiple regression. The findings also reveal that the credit risk indicators brunt the bank performance, thereby presenting them to incredible danger of banks financial health. Therefore, the study concludes that the banks must take strict and essential steps to recover their loans and follow the reserve banks guidelines like Prompt Corrective Action (PCA) framework and maintain enough capital to absorb the risks.*

Key Words: Credit Risk Indicators, Bank Performance, Post Financial Crises Period, Private Sector Banks, Ratio Analysis, Descriptive Statistics and Multiple Regression.

Introduction

Credit risk resources are one of the major concerns for banks in India and it reflects the execution of the banks. The large level of credit risk is dissolves the esteem of the resource. The NPAs diminishes the value of shareholders and profitability of banks as well as the Indian economy. The bank's health is incredibly determined by the non-performing assets, thus the banks should have proper NPAs management and it is fundamental part for it loans process and reduces the credit risk and retaining the credit exposure for that the government has induced to invent advisable risk mechanism in recent years of banking system weakness. Credit risk is a major concern for lenders worldwide as it is the most critical of all risks faced by the banking institution. Credit risk exists because an expected payment might not occur. Poorly managed credit risk will result in financial losses for banks, donors, investors, lenders, borrowers and savers. This is because all tend to lose confidence in banks and funds begin to dry up and when funds dry up, the banks are not able to meet its objective of providing services to the poor and quickly goes out of business. In the case of banks, credit risk is the most important factor which has to be managed. Although credit risk can be the result of different causes, these kinds of risks mainly arise from economic crises, the companies' bankruptcy, lack of rules and regulations in the companies accountancy and auditing process, the increase of off-balance sheet obligations, the devaluation of collaterals and etc. due to the increasing spate of Nonperforming loans the Basel II accord emphasized on credit risk management practices. Compliance with accord means a sound approach to tackling credit risk has been taken and this ultimately improves bank performance. Through the effective management of credit risk exposure, banks not only support the viability and profitability of their own business, they also contribute to systematic stability and to an efficient allocation of capital in the economy.

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Review of Literature

Indian Studies

Abhiman Das and Saibal Ghosh (2007)¹ has conducted a study on Determinants of Credit Risk in Indian state-Owned banks: An Empirical Investigation. The objective of their study to examine the factors affecting problem loans of Indian state-owned banks for the period of 1994-2005, taking into account both macroeconomic and microeconomic variables. The findings reveal that at the macro level, GDP growth and at the bank level, real loan growth and bank size play an important role in influencing problem loans. The study performs certain robustness tests of the results and discussions some policy implications of the analysis. From the analysis suggests that a rapid expansion of lending by banks often leads to poor loan quality, albeit with a lag, because the growth of leading may outstrip the leaders capacity to appraise and monitor its borrowers.

Malhotra et al (2011)² they made a study on “Evaluating the performance of commercial banks in India”. They analyzed the performance of commercial banks in India. The period of their study covers the pre-crisis and the crisis time. Their paper examines the behaviour of profitability, cost of intermediation, efficiency, soundness of the banking system and industry concentration for public and private sector banks. The empirical results show that competition of Indian banking industry has intensified. While the net interest margin has improved, cost of intermediation is actually rising and banks are responding to the increased costs with higher efficiency levels.

Pratha Jain Sanjay Sharma et al (2017)³ have studied “Retail credit risk management of commercial banks in Indian with special reference to private sector banks”. The main objective of their study is to analyse the non-performing assets, the status and trend of non-performing assets in private sector banks in India. Their study find that the problem of recovery is not with small borrowers but with large borrowers and a strict policy should be followed for solving the problem and Indian banks should strictly follow the reserve bank of India guidelines to reduce their non-performing loans.

Sirus Sharifi et al (2018)⁴ have conducted a study on “Relationship between credit risk management and non-performing assets of commercial banks in India”. The purpose of their study is to examine the impact of credit risk components on the performance of credit risk management and the growth of non-performing assets (NPAs) of commercial banks in India. Their results suggest that the identification of credit risk significantly affects the credit risk performance. The result of robust as credit risk identification is negatively related to annual growth in no NPAs or loans. Their study found the better credit risk of private banks compared to that of government banks and also Indian banks suffering from a high level of losses due to bad loans.

International Studies

Edward I. Altman and Anthony Saunders (1998)³¹ have studied “Credit risk measurement: Development over the Last 20 years” they analyzed two part of their research first part is, credit risk measurement of individual loans and portfolios and second part is a new approach built around a mortality risk framework to measure the risk and returns on loans and bonds is presented. Their results reveals that the there is significant improvements in data bases on historical default rates and loan returns. With the development of such data bases come new and existing approaches to measuring the ever present credit risk problems.

Kuan-Chung Chen and Che-Han Kao (2009)³⁵ they measured “measurement of credit risk efficiency and productivity change for commercial banks in Taiwan”. In their paper, they used financial ratios to assess credit risk of 34 Taiwanese commercial banks over the period 2005-2008. Their results indicates that the productivity on credit risk of seventeen banks has been over the evaluating periods while seventeen banks have been declining and according to the credit risk efficiency scores and credit risk, they classify the 34 banks into four groups. They find difference groups of banks strategies of credit risk management to survive in this changing environment.

R.W. Gakure et al (2012)⁴⁵ have conducted a study on “ Effect of credit risk management techniques on the performance of unsecured bank loans employed commercial banks in Kenya”. Their study concludes that credit approval guidelines and monitoring of borrowers affect the performance of unsecured bank loans to a great extent and that clear established process for approving new credits

and extending the existing credits has been observed to very important while managing credit risk in banks.

Rufo MENDOZA and John Paolo R. RIVERA (2017)⁸¹ in their research study “The effect of credit risk and capital adequacy on the profitability of rural banks in the Philippines”. Their paper examines the credit risk and capital adequacy of the 567 rural banks in the Philippines to investigate how both variables affect bank profitability. They found out that credit risk has a negative and statistically significant relationship with profitability. The study also reveals that the capital adequacy has no significant impact on the profitability of rural banks in the Philippines. The study concludes the banks necessary examine more deeply if capital infusion would result in higher profitability than increasing debts.

Statement of the Problem

The banking sector has a prominent role in the expansion of an economy. It is the input driver of economic enlargement of the nation and has an energetic task to play in converting the idle investment resources for their most favourable operation so as to achieve greatest efficiency. After liberalization, credit risk management plays a prominent role in the Indian economy. Nature of banking business is assimilated by the risk. Biggest challenges are resisted by the banking industry by managing the risk and measuring the risk with the Non-performing assets (NPAs). NPAs are under hard-pressure risk for the banks as credit risk not only indicates internal factors but also macro economic factors. In future, banks will unquestionably repose on the dynamics of credit risk management. In order to sustain in the market, the banks should have efficient management of credit risk so that they can retain the success for a longer period of time. Inappropriate credit practice and poor credit quality will lead to failure of banks. At the same time as banks make progress towards an incorporated comprehension of their risk profiles, much data is regularly scattered among specialty units. There is no way to know whether the capital is precisely reflecting dangers or the adequacy of loan loss reserves in order to save the potential short term credit losses without an intensive risk evaluation. Banks with inefficient credit risk management should focus on investigating the exhausting losses by regulators and investors.

The Non-Performing Assets influence the operational productivity, which in turn affects profitability, liquidity and dissolvability position of banks and it also demonstrate credit risk management. In March 2018, share of the gross NPAs in Public sectors banks represented by 88.74 per cent and a share of banking assets is under 70 per cent, with reference to bad loans NPAs amounted to 87 percent of contribution. The public sector banks, which account for over 80 per cent of NPAs in the system, should see their gross NPAs peak of 14.6 percent in march 2018 and as per Reserve Bank of India provisional data on global operations, as on currently, the aggregate amount of gross NPAs of public sector banks and schedule commercial banks were Rs. 8, 06,412 crore and Rs. 9, 49, 279 crores respectively. This will destroy the bank’s profitability gradually and the investors will be affected and as well as the Indian economy, for this Indians planned to capital infusion are sufficient to determine administrative capital needs however, will deficient to credit growth, credit risk exposures proceed to problems of loaning so, In this context, the researcher has undertaken a study on impact of credit risk indicators on performance of Indian private sector banks in the post financial crisis period. This raises the following research question:

- What is the impact of credit risk indicators on performance of Indian private sector banks in the post financial crisis period

Objective of the Study

- To examine the impact of credit risk indicators on performance of Indian private sector banks.

Hypothesis of the Study

- ❖ There is no significant difference in credit risk indicators on performance of Indian private sector banks.

Research Methodology

The present study is based on analytical in nature

Sources of Data

The present study is mainly based on secondary data. The data for this study have been collected from CMIE prowess database and also from annual reports published by the Reserve Bank

of India (RBI), Department of banking supervision, money control website and annual reports published by respective banks.

Period of the Study

The study period covers ten years from 2008-2009 to 2017-2018.

Selection of the Sample

For the purpose of the study, top ten private sector banks have been selected based on the highest share in Non-performing Assets. The sample private sector banks namely, ICICI Bank, Axis Bank, HDFC Bank, Jammu and Kashmir Bank, Kotak Mahindra Bank, Karur Vysya Bank, Federal Bank, Yes Bank, Lakshmi Vilas Bank, and South Indian Banks are chosen for the study.

Tools for Analysis

The data analysis was done using ratio analysis and statistical tools like mean, standard deviation, co-efficient of variation, compound annual growth rate, and multiple regression.

Variable Specification

Credit Risk (Dependent Variables) - Credit Deposit Ratio, Capital Adequacy Ratio, Total Investments to Total Assets, Provisions Held to Gross Advances, Debt Equity Ratio, Non-Performing Loans to Total Loans, Loan Loss Provisions to Total Assets, Loan Loss Provisions to Total Loans, Total Loans to Total Deposits, Cost Per Loan Assets Ratio, Cost Per Loan Ratio and Provisions Coverage Ratio.

Bank Performance (Independent Variables) - Return on Assets, Return on Equity, Net Interest Margin and Operating Expenses to Net Revenue

Analysis of Growth Rate of Credit Risk Determinants and Bank Performance

Indicators

Return on Assets										
Banks	ICICI	Axis	HDFC	JK&B	KMB	KVB	FB	YB	LVB	SIB
MEAN	1.39	1.42	1.75	0.80	1.56	1.22	1.13	1.54	0.70	0.67
SD	0.35	0.60	0.24	1.11	0.39	0.42	0.33	0.41	0.30	0.78
CV	25.30	41.98	13.54	139.87	24.99	34.38	29.27	26.78	42.46	116.31
CAGR	-2.38	-32.10	2.51	-14.79	2.11	-10.17	-8.19	-12.89	6.64	-22.82
Return on Equity										
MEAN	10.67	15.56	18.26	11.29	14.23	15.99	11.19	20.15	10.62	10.52
SD	2.71	6.56	1.69	15.13	2.85	5.52	2.84	5.17	3.34	13.87
CV	25.41	42.15	9.23	133.97	20.00	34.50	25.41	25.64	31.42	131.79
CAGR	-1.61	-31.58	-0.43	-14.12	0.43	-11.44	-5.08	-210.66	-10.46	-109.35
Net Interest Margin										
MEAN	2.92	3.21	4.12	3.23	4.25	3.00	3.08	2.68	2.45	2.49
SD	0.65	0.64	0.69	0.16	0.82	0.49	0.45	0.57	0.48	0.18
CV	22.11	19.94	16.69	4.94	19.41	16.48	14.71	21.10	19.61	7.34
CAGR	-4.76	-4.27	-3.92	0.16	-4.42	-0.94	-3.94	-4.37	-3.27	-1.90
Operating Expenses to Net Revenue										
MEAN	1.62	6.60	1.78	2.21	2.19	1.89	2.10	2.28	3.58	2.35
SD	0.69	15.53	0.65	2.94	1.00	0.97	0.83	3.58	2.95	0.94
CV	42.43	235.36	36.17	132.92	45.87	51.24	39.75	157.17	82.42	39.82

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CAGR	-	2.13	38.33	-	8.77	22.51	-10.61	13.94	4.28	-	2.35	-112.00	8.17
Credit Deposit Ratio													
MEAN	98.43	82.10	80.06	65.28	92.74	74.98	74.47	81.79	73.63	71.51			
SD	5.20	8.79	5.21	4.48	7.46	4.18	2.66	8.73	3.23	3.22			
CV	5.29	10.70	6.50	6.86	8.04	5.57	3.58	10.67	4.38	4.51			
CAGR	-0.73	3.03	2.03	0.99	-1.94	1.18	1.26	2.45	0.86	1.10			
Capital Adequacy Ratio													
MEAN	17.93	15.08	16.04	12.96	17.92	13.89	15.84	17.18	11.68	13.34			
SD	1.30	1.39	0.91	1.50	1.39	1.02	2.26	1.72	1.61	1.23			
CV	7.24	9.20	5.67	11.57	7.78	7.38	14.24	9.98	13.81	9.25			
CAGR	1.94	1.93	-0.57	-2.35	-0.93	-0.33	-3.14	1.03	-0.48	-1.49			
Total Investments to Total Assets													
MEAN	28.41	28.32	26.42	31.09	29.60	26.29	28.07	31.86	25.60	26.00			
SD	4.85	4.41	2.87	5.62	4.49	2.57	3.29	6.65	2.03	2.48			
CV	17.09	15.56	10.86	18.06	15.16	9.78	11.71	20.88	7.94	9.55			
CAGR	-1.61	-3.37	-3.38	-2.91	-2.60	-1.56	-3.32	-3.44	1.79	-2.88			
Provisions Held to Gross Advances													
MEAN	2.45	2.34	1.91	2.27	1.54	1.52	1.63	1.63	1.58	1.29			
SD	1.56	0.72	0.37	1.21	0.45	0.75	0.38	0.23	0.89	0.39			
CV	63.51	30.81	19.17	53.51	29.43	49.32	23.47	14.18	56.12	30.45			
CAGR	21.77	9.29	5.45	3.06	16.55	6.67	-1.59	2.60	13.09	5.88			
Debt Equity Ratio													
MEAN	1.98	1.62	0.83	0.32	1.33	0.57	0.59	2.44	0.68	0.49			
SD	0.23	0.39	0.22	0.05	0.56	0.39	0.25	0.67	0.46	0.24			
CV	11.67	23.87	25.97	17.22	42.23	68.59	42.10	27.50	68.14	49.45			
CAGR	-0.49	4.36	6.64	-2.67	-9.00	34.24	12.87	2.47	19.62	9.73			
Non-Performing Loans to Total Loans													
MEAN	5.37	2.32	1.13	4.91	2.44	2.20	2.87	0.59	3.75	1.97			
SD	2.47	2.33	0.37	4.12	0.93	1.81	0.49	0.48	2.61	1.05			
CV	45.95	100.57	32.47	84.06	37.92	82.40	17.04	80.44	69.68	53.11			
CAGR	8.92	21.71	-4.19	14.73	-6.46	13.03	1.45	6.54	14.30	5.14			
Loan Loss Provisions to Total Loans													
MEAN	1.53	1.43	0.93	1.54	0.71	0.84	0.95	0.48	1.48	0.68			
SD	0.99	1.11	0.43	1.62	0.68	0.79	0.45	0.16	1.37	0.46			
CV	64.55	77.29	46.02	105.52	95.78	94.33	47.71	34.19	92.77	67.77			
CAGR	4.88	13.04	-7.27	17.79	-12.51	26.85	-5.86	-0.95	38.00	20.39			
Total Loans to Total Deposits													
MEAN	56.41	59.99	60.11	57.59	60.06	62.82	61.97	56.50	64.32	63.82			
SD	3.56	2.84	3.60	3.97	2.83	5.34	2.56	5.52	2.90	2.71			
CV	6.31	4.73	5.98	6.89	4.70	8.50	4.13	9.77	4.51	4.25			
CAGR	0.13	1.42	1.38	1.41	1.02	0.93	1.44	1.86	0.15	1.29			
Cost Per Loan Assets Ratio													
MEAN	33.45	35.51	44.42	34.30	50.79	29.94	34.59	29.36	30.57	30.79			
SD	3.76	5.28	7.24	5.57	8.51	2.81	3.41	4.60	4.06	1.85			
CV	11.25	14.88	16.30	16.24	16.75	9.39	9.85	15.66	13.28	6.02			
CAGR	-0.88	-1.71	-3.55	5.25	-3.09	2.34	-0.08	0.69	-0.94	-1.14			
Cost Per Loan Ratio													
MEAN	4.66	4.71	6.09	4.75	7.59	4.31	4.68	4.17	4.50	4.04			
SD	0.91	0.65	1.62	0.69	1.79	0.85	0.59	0.69	0.67	0.37			
CV	19.50	13.86	26.54	14.48	23.53	19.63	12.52	16.48	14.84	9.19			

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CAGR	-3.21	-2.97	-7.37	4.09	-7.10	2.18	-3.13	-4.21	0.30	-2.42
Provisions Coverage Ratio										
MEAN	27.04	69.97	80.56	29.47	25.44	40.32	32.63	114.17	36.65	34.05
SD	10.90	19.96	19.94	9.38	14.54	29.92	14.52	67.06	16.57	16.03
CV	40.32	28.53	24.75	31.81	57.14	74.21	44.49	58.73	45.22	47.08
CAGR	-3.71	-7.13	-3.21	2.67	-6.46	12.23	-7.21	-7.03	20.73	14.50

Source: Computed Data

Impact of Credit Risk on Operational Performance of Private Sector Banks in the Post Financial Crisis Period

Table 1

Impact of Credit Risk on Operational Performance of ICICI Bank Multiple Regression Analysis of ICICI Bank

H_{01} : There is no significant difference in Credit Risk on Operational Performance of ICICI Bank

Credit Risk Variables	R Square	Adjusted R Square	Std. Error	R Square Change	F Change	Sig. F Change
Credit Deposit Ratio	.746	.542	3.52049	.746	3.663	.094
Capital Adequacy Ratio	.806	.651	.76708	.806	5.198	.050*
Net NPA to Net Advances	.954	.932	.89348	.974	43.087	.000*
Total Investments to Total Assets	.884	.792	2.21563	.884	9.548	.015*
Provisions Held to Gross Advances	.877	.778	.73505	.877	8.873	.017*
Debt Equity Ratio	.543	.177	.20930	.543	1.485	.333
Non-Performing Loans to Total Loans	.924	.902	.81348	.874	36.087	.001*
Cost Income Ratio	.935	.884	3.91781	.935	18.099	.004*
Loan Loss Provisions to Total Assets	.946	.901	.31715	.946	94.395	.003*
Loan Loss Provisions to Total Loans	.932	.896	1.39759	.938	19.712	.003*
Total Loans to Total Deposits	.757	.563	3.57687	.757	3.893	.084
Cost Per Loan Assets Ratio	.917	.851	1.45474	.917	13.812	.007*
Cost Per Loan Ratio	.978	.960	.18057	.978	55.612	.000*
Provisions Coverage Ratio	.806	.651	6.43588	.806	5.204	.050*

Source: Computed data

*Indicates statistical significance at 5 per cent level

The table 1 shows that while analysing the regression analyses between credit risk and operational performance of ICICI bank. The credit risk variables particularly, capital adequacy ratio, net NPA to net advances, total investments to total assets, provisions held to gross advances, non-performing loans to total loans, cost income ratio, loan loss provisions to total assets, loan loss provisions to total loans, cost per loan assets ratio, cost per loan ratio and provisions coverage ratio which are statistically significant at 5 per cent level and the adjusted value of these variables portrays the more than 90 per cent influences the dependent variables. Hence, the null hypothesis is rejected. It is inferred that there is a significant differences between credit risk variables and operational performance indicators like, return on assets, return on equity, net interest margin and operating expenses to net revenues of ICICI bank.

Table 2
Impact of Credit Risk on Operational Performance of Axis Bank
Multiple Regression Analysis of Axis Bank

H₀₁: There is no significant difference in Credit Risk on Operational Performance of Axis Bank

Credit Risk Variables	R Square	Adjusted R Square	Std. Error	R Square Change	F Change	Sig. F Change
Credit Deposit Ratio	.846	.722	4.63152	.846	6.850	.029*
Capital Adequacy Ratio	.497	.095	1.31979	.497	1.236	.402
Net NPA to Net Advances	.998	.996	.08035	.998	519.155	.000*
Total Investments to Total Assets	.795	.631	2.67628	.795	4.853	.057
Provisions Held to Gross Advances	.971	.947	.16564	.971	41.218	.001*
Debt Equity Ratio	.646	.362	.30793	.646	2.277	.195
Non-Performing Loans to Total Loans	.997	.995	.15807	.997	487.244	.000*
Cost Income Ratio	.960	.928	1.77259	.960	29.800	.001*
Loan Loss Provisions to Total Assets	.985	.973	.11613	.985	83.206	.000*
Loan Loss Provisions to Total Loans	.988	.978	.16438	.988	101.327	.000*
Total Loans to Total Deposits	.862	.752	4.63644	.862	7.828	.022*
Cost Per Loan Assets Ratio	.715	.487	3.78387	.715	3.137	.121
Cost per Loan Ratio	.894	.808	.28610	.894	10.498	.012*
Provisions Coverage Ratio	.941	.894	6.48667	.941	20.055	.003*

Source: Computed data

*Indicates statistical significance at 5 per cent level

It is seen from table 2 that while analysing the regression analyses between credit risk and operational performance of Axis Bank. The credit risk variables mainly, credit deposit ratio, net NPA to net advances, total investments to total assets, provisions held to gross advances, non-performing loans to total loans, cost income ratio, loan loss provisions to total assets, loan loss provisions to total loans, total loans to total deposits, cost per loan ratio and provisions coverage ratio which are statistically significant at 5 per cent level and the adjusted value of these variables exhibits the more than 90 per cent influences the dependent variables. Therefore, the null hypothesis is rejected. It is concluded that there is a significant differences between credit risk variables and operational performance indicators namely, return on assets, return on equity, net interest margin and operating expenses to net revenues of Axis Bank.

Table 3

Impact of Credit Risk on Operational Performance of HDFC Bank
Multiple Regression Analysis of HDFC Bank

H_{01} : There is no significant difference in Credit Risk on Operational Performance of HDFC Bank

Credit Risk Variables	R Square	Adjusted R Square	Std. Error	R Square Change	F Change	Sig. F Change
Credit Deposit Ratio	.955	.918	1.48967	.955	26.238	.001*
Capital Adequacy Ratio	.560	.208	.80978	.560	1.592	.308
Net NPA to Net Advances	.807	.653	.07861	.807	5.225	.049*
Total Investments to Total Assets	.740	.531	1.96549	.740	3.550	.099
Provisions Held to Gross Advances	.919	.854	.13984	.919	14.162	.006*
Debt Equity Ratio	.762	.571	.14099	.762	3.996	.080
Non-Performing Loans to Total Loans	.952	.914	.10777	.952	24.922	.002*
Cost Income Ratio	.984	.971	1.83555	.984	77.459	.000*
Loan Loss Provisions to Total Assets	.923	.862	.08060	.923	15.041	.005*
Loan Loss Provisions to Total Loans	.940	.892	.14101	.940	19.495	.003*
Total Loans to Total Deposits	.943	.897	1.63409	.943	20.651	.003*
Cost Per Loan Assets Ratio	.897	.815	3.11130	.897	10.928	.011*
Cost Per Loan Ratio	.995	.992	.14768	.995	268.29	.000*
Provisions Coverage Ratio	.628	.330	16.3234	.628	2.108	.217

Source: Computed data

*Indicates statistical significance at 5 per cent level

It is evident from table 3 that while analysing the regression analyses between credit risk and operational performance of HDFC Bank. The credit risk variables chiefly, credit deposit ratio, net NPA to net advances, provisions held to gross advances, non-performing loans to total loans, cost income ratio, loan loss provisions to total assets, loan loss provisions to total loans, total loans to total deposits, cost per loan asset ratio and cost per loan ratio which are statistically significant at 5 per cent level and the adjusted value of these variables shows the more than 90 per cent influences the dependent variables. Hence, the null hypothesis is rejected. It is concluded that there is a significant differences between credit risk variables and operational performance indicators like, return on assets, return on equity, net interest margin and operating expenses to net revenues of HDFC Bank.

Table 4

Impact of Credit Risk on Operational Performance of Jammu and Kashmir Bank
Multiple Regression Analysis of Jammu and Kashmir Bank

H_{01} : There is no significant difference in Credit Risk on Operational Performance of Jammu and Kashmir Bank

Credit Risk (Dependent Variables)	R Square	Adjusted R Square	Std. Error	R Square Change	F Change	Sig. F Change
Credit Deposit Ratio	.910	.838	1.8013	.910	12.672	.008*
Capital Adequacy Ratio	.869	.764	.72849	.869	8.282	.020*
Net NPA to Net Advances	.950	.911	.62833	.950	23.923	.002*
Total Investments to Total Assets	.752	.553	3.7558	.752	3.781	.089
Provisions Held to Gross Advances	.944	.900	.38375	.944	21.269	.002*
Debt Equity Ratio	.382	-.112	.05756	.382	.773	.587

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Non-Performing Loans to Total Loans	.984	.971	.70075	.984	76.595	.000*
Cost Income Ratio	.915	.847	5.6948	.915	13.463	.007*
Loan Loss Provisions to Total Assets	.983	.969	.17536	.983	72.211	.000*
Loan Loss Provisions to Total Loans	.979	.962	.31452	.979	58.512	.000*
Total Loans to Total Deposits	.920	.856	1.7553	.920	14.381	.006*
Cost Per Loan Assets Ratio	.780	.604	3.5034	.780	4.434	.067
Cost Per Loan Ratio	.822	.679	.39012	.822	5.765	.041*
Provisions Coverage Ratio	.460	.028	9.2434	.460	1.065	.461

Source: Computed data

*Indicates statistical significance at 5 per cent level

From table 4 it is seen that regarding the regression analyses between credit risk and operational performance of Jammu and Kashmir Bank. The credit risk variables primarily, credit deposit ratio, capital adequacy ratio, net NPA to net advances, provisions held to gross advances, non-performing loans to total loans, cost income ratio, loan loss provisions to total assets, loan loss provisions to total loans, total loans to total deposits, cost per loan ratio which are statistically significant at 5 per cent level and the adjusted value of these variables exhibits the more than 85 per cent influences the dependent variables. Therefore, the null hypothesis is rejected. It can be concluded that there is a significant differences between credit risk variables and operational performance indicators namely, return on assets, return on equity, net interest margin and operating expenses to net revenues of Jammu and Kashmir Bank.

Table 5

Impact of Credit Risk on Operational Performance of Kotak Mahindra Bank
Multiple Regression Analysis of Kotak Mahindra Bank

H_{01} : There is no significant difference in Credit Risk on Operational Performance of Kotak Mahindra Bank

Credit Risk Variables	R Square	Adjusted R Square	Std. Error	R Square Change	F Change	Sig. F Change
Credit Deposit Ratio	.794	.628	4.54509	.794	4.805	.058
Capital Adequacy Ratio	.593	.268	1.19370	.593	1.822	.262
Net NPA to Net Advances	.891	.805	.24256	.891	10.266	.013*
Total Investments to Total Assets	.540	.172	4.08384	.540	1.466	.337
Provisions Held to Gross Advances	.900	.820	.19276	.900	11.257	.010*
Debt Equity Ratio	.686	.435	.42045	.686	2.735	.150
Non-Performing Loans to Total Loans	.899	.818	.39545	.899	11.102	.011*
Cost Income Ratio	.972	.949	2.98701	.972	42.927	.000*
Loan Loss Provisions to Total Assets	.911	.839	.15140	.911	12.719	.008*
Loan Loss Provisions to Total Loans	.912	.842	.27150	.912	12.959	.008*
Total Loans to Total Deposits	.783	.609	4.62396	.783	4.512	.065
Cost Per Loan Assets Ratio	.934	.881	2.94150	.934	17.579	.004*
Cost Per Loan Ratio	.971	.947	.41091	.971	41.256	.001*
Provisions Coverage Ratio	.761	.570	9.52839	.761	3.986	.081

Source: Computed data

*Indicates statistical significance at 5 per cent level

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The table 5 exhibits that while analysing the regression analyses between credit risk and operational performance of Kotak Mahindra Bank. The credit risk variables mainly, net NPA to net advances, provisions held to gross advances, non-performing loans to total loans, cost income ratio, loan loss provisions to total assets, loan loss provisions to total loans, cost per loan assets ratio and cost per loan ratio which are statistically significant at 5 per cent level and the adjusted value of these variables reveals the more than 80 per cent influences the dependent variables. For that reason, the null hypothesis is rejected. It is concluded that there is a significant differences between credit risk variables and operational performance indicators that is, return on assets, return on equity, net interest margin and operating expenses to net revenues of Kotak Mahindra Bank.

Table 6

**Impact of Credit Risk on Operational Performance of Karur Vysya Bank
Multiple Regression Analysis of Karur Vysya Bank**

H_{01} : There is no significant difference in Credit Risk on Operational Performance of Karur Vysya Bank

Credit Risk Variables	R Square	Adjusted R Square	Std. Error	R Square Change	F Change	Sig. F Change
Credit Deposit Ratio	.946	.904	1.29810	.946	22.068	.002*
Capital Adequacy Ratio	.303	-.255	1.14816	.303	.542	.714
Net NPA to Net Advances	.861	.662	.76705	.801	5.031	.049*
Total Investments to Total Assets	.864	.755	1.27444	.864	7.916	.022*
Provisions Held to Gross Advances	.906	.831	.30810	.906	12.081	.009*
Debt Equity Ratio	.768	.583	.25038	.768	4.139	.076
Non-Performing Loans to Total Loans	.859	.746	.91335	.859	7.622	.023*
Cost Income Ratio	.743	.537	5.45420	.743	3.607	.096
Loan Loss Provisions to Total Assets	.925	.864	.17534	.925	15.335	.005*
Loan Loss Provisions to Total Loans	.809	.656	.46251	.809	5.291	.048*
Total Loans to Total Deposits	.105	-.611	7.82901	.105	.147	.957
Cost Per Loan Assets Ratio	.414	-.055	2.88632	.414	.883	.535
Cost Per Loan Ratio	.498	.096	.80390	.498	1.239	.401
Provisions Coverage Ratio	.787	.617	18.50693	.787	4.630	.062

Source: Computed data

*Indicates statistical significance at 5 per cent level

The table 6 it is clear that while analysing the regression analyses between credit risk and operational performance of Karur Vysya Bank. The credit risk variables like, credit deposit ratio, net NPA to net advances, total investment to total assets, provisions held to gross advances, non-performing loans to total loans, cost income ratio, loan loss provisions to total assets and loan loss provisions to total loans which are statistically significant at 5 per cent level and the adjusted value of these variables describes the more than 75 per cent influences the dependent variables. Hence, the null hypothesis is rejected. It is inferred that there is a significant differences between credit risk variables and operational performance indicators namely, return on assets, return on equity, net interest margin and operating expenses to net revenues of Karur Vysya Bank.

Table 7

Impact of Credit Risk on Operational Performance of Federal Bank
Multiple Regression Analysis of Federal Bank

H_{01} : There is no significant difference in Credit Risk on Operational Performance of Federal Bank

Credit Risk Variables	R Square	Adjusted R Square	Std. Error	R Square Change	F Change	Sig. F Change
Credit Deposit Ratio	.605	.289	2.24711	.605	1.913	.247
Capital Adequacy Ratio	.910	.838	.90669	.910	12.676	.008*
Net NPA to Net Advances	.973	.951	.12225	.973	44.221	.000*
Total Investments to Total Assets	.792	.625	2.01116	.792	4.758	.059
Provisions Held to Gross Advances	.661	.389	.29772	.661	2.435	.178
Debt Equity Ratio	.621	.318	.20479	.621	2.049	.226
Non-Performing Loans to Total Loans	.839	.726	.91335	.839	7.622	.021*
Cost Income Ratio	.876	.777	4.41480	.876	8.818	.017*
Loan Loss Provisions to Total Assets	.966	.938	.06742	.966	35.097	.001*
Loan Loss Provisions to Total Loans	.983	.970	.07879	.983	72.649	.000*
Total Loans to Total Deposits	.773	.592	2.15186	.773	4.262	.072
Cost Per Loan Assets Ratio	.623	.321	2.80975	.623	2.062	.224
Cost Per Loan Ratio	.685	.432	.44177	.685	2.714	.151
Provisions Coverage Ratio	.932	.878	5.07943	.932	17.130	.004*

Source: Computed data

*Indicates statistical significance at 5 per cent level

The table 7 it is seen that while analysing the regression analyses between credit risk and operational performance of Federal Bank. The credit risk variables principally, capital adequacy ratio, net NPA to net advances, non-performing loans to total loans, cost income ratio, loan loss provisions to total assets, loan loss provisions to total loans and provisions coverage ratio which are statistically significant at 5 per cent level and the adjusted value of these variables portrays the more than 80 per cent influences the dependent variables. Therefore, the null hypothesis is rejected. It can be concluded that there is a significant differences between credit risk variables and operational performance indicators namely, return on assets, return on equity, net interest margin and operating expenses to net revenues of Federal Bank.

Table 8

Impact of Credit Risk on Operational Performance of Yes Bank
Multiple Regression Analysis of Yes Bank

H_{01} : There is no significant difference in Credit Risk on Operational Performance of Yes Bank

Credit Risk Variables	R Square	Adjusted R Square	Std. Error	R Square Change	F Change	Sig. F Change
Credit Deposit Ratio	.902	.823	3.67409	.902	11.444	.010*
Capital Adequacy Ratio	.151	-.528	2.11998	.151	.223	.915
Net NPA to Net Advances	.958	.924	.09692	.958	28.472	.001*
Total Investments to Total Assets	.941	.894	2.16527	.941	19.984	.003*
Provisions Held to Gross Advances	.358	-.155	.24740	.358	.698	.626
Debt Equity Ratio	.727	.508	.47040	.727	3.327	.110
Non-Performing Loans to	.910	.838	.19238	.910	12.596	.008*

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Total Loans						
Cost Income Ratio	.871	.767	2.46421	.871	8.415	.019*
Loan Loss Provisions to Total Assets	.777	.598	.06674	.777	4.353	.069
Loan Loss Provisions to Total Loans	.636	.345	.13134	.636	2.185	.207
Total Loans to Total Deposits	.911	.840	3.80450	.911	12.813	.008*
Cost Per Loan Assets Ratio	.962	.931	1.20340	.962	31.584	.001*
Cost Per Loan Ratio	.655	.379	.54103	.655	2.375	.184
Provisions Coverage Ratio	.432	-.022	67.80334	.432	.951	.506

Source: Computed data

*Indicates statistical significance at 5 per cent level

It is evident from table 8 that the regression analyses between credit risk and operational performance of Yes Bank. The credit risk variables mainly, credit deposit ratio, net NPA to net advances, total investment to total assets, non-performing loans to total loans, cost income ratio, total loans to total deposits and cost per loan assets ratio which are statistically significant at 5 per cent level and the adjusted value of these variables demonstrated the more than 85 per cent influences the dependent variables. Therefore, the null hypothesis is rejected. It can be concluded that there is a significant differences between credit risk variables and operational performance indicators namely, return on assets, return on equity, net interest margin and operating expenses to net revenues of Yes Bank.

Table 9

Impact of Credit Risk on Operational Performance of Lakshmi Vilas Bank**Multiple Regression Analysis of Lakshmi Vilas Bank**

H_{01} : There is no significant difference in Credit Risk on Operational Performance of Lakshmi Vilas Bank

Credit Risk Variables	R Square	Adjusted R Square	Std. Error	R Square Change	F Change	Sig. F Change
Credit Deposit Ratio	.726	.507	2.26662	.726	3.315	.110
Capital Adequacy Ratio	.536	.166	1.47385	.536	1.446	.343
Net NPA to Net Advances	.859	.720	.98897	.789	14.669	.043*
Total Investments to Total Assets	.616	.309	1.68998	.616	2.004	.232
Provisions Held to Gross Advances	.911	.841	.35336	.911	12.874	.008*
Debt Equity Ratio	.949	.908	.14109	.949	23.088	.002*
Non-Performing Loans to Total Loans	.842	.736	1.78070	.742	18.604	.041*
Cost Income Ratio	.490	.082	12.18700	.490	1.202	.413
Loan Loss Provisions to Total Assets	.956	.920	.24594	.956	26.921	.001*
Loan Loss Provisions to Total Loans	.959	.926	.37364	.959	29.133	.001*
Total Loans to Total Deposits	.724	.503	2.25344	.724	3.281	.112
Cost Per Loan Assets Ratio	.939	.890	1.34473	.939	19.228	.003*
Cost Per Loan Ratio	.926	.867	.24343	.926	15.643	.005*
Provisions Coverage Ratio	.353	-.164	17.88141	.353	.683	.633

Source: Computed data

*Indicates statistical significance at 5 per cent level

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The table 9 it is observed that while analysing the regression analyses between credit risk and operational performance of Lakshmi Vilas Bank. The credit risk variables like, net NPA to net advances, provisions held to gross advances, debt equity ratio, non-performing loans to total loans, loan loss provisions to total assets, loan loss provisions to total loans, cost per loan assets ratio and cost per loan ratio which are statistically significant at 5 per cent level and the adjusted value of these variables examines the more than 85 per cent influences the dependent variables. As a result, the null hypothesis is rejected. It is inferred that there is a significant differences between credit risk variables and operational performance indicators that is, return on assets, return on equity, net interest margin and operating expenses to net revenues of Lakshmi Vilas Bank.

Table 10

**Impact of Credit Risk on Operational Performance of South Indian Bank
Multiple Regression Analysis of South Indian Bank**

H_{01} : There is no significant difference in Credit Risk on Operational Performance of South Indian Bank

Credit Risk Variables	R Square	Adjusted R Square	Std. Error	R Square Change	F Change	Sig. F Change
Credit Deposit Ratio	.470	.045	3.15016	.470	1.107	.445
Capital Adequacy Ratio	.709	.476	.89302	.709	3.046	.127
Net NPA to Net Advances	.841	.713	.53246	.841	6.602	.031*
Total Investments to Total Assets	.822	.673	1.48263	.802	5.058	.050*
Provisions Held to Gross Advances	.896	.814	.16932	.896	10.82	.011*
Debt Equity Ratio	.407	-.068	.25196	.407	.856	.547
Non-Performing Loans to Total Loans	.839	.710	.56411	.839	6.504	.032*
Cost Income Ratio	.851	.732	2.76224	.851	7.131	.027*
Loan Loss Provisions to Total Assets	.878	.780	.13890	.878	8.984	.017*
Loan Loss Provisions to Total Loans	.871	.768	.22141	.871	8.433	.019*
Total Loans to Total Deposits	.544	.179	3.13810	.544	1.489	.332
Cost Per Loan Assets Ratio	.482	.068	1.79185	.482	1.164	.425
Cost Per Loan Ratio	.959	.925	.10125	.959	28.90	.001*
Provisions Coverage Ratio	.577	.238	13.99788	.577	1.702	.285

Source: Computed data

*Indicates statistical significance at 5 per cent level

The table 10 it is understood that, while analysing the regression analyses between credit risk and operational performance of South Indian Bank. The credit risk variables specifically, net NPA to net advances, total investments to total assets, provisions held to gross advances, non-performing loans to total loans, cost income ratio, loan loss provisions to total assets, loan loss provisions to total loans and cost per loan ratio which are statistically significant at 5 per cent level and the adjusted value of these variables shows the more than 85 per cent influences the dependent variables. As a result, the null hypothesis is rejected. It is inferred that there is a significant differences between credit risk variables and operational performance indicators that is, return on assets, return on equity, net interest margin and operating expenses to net revenues of South Indian Bank.

Conclusion

The present study indicates that during the study period the credit risk indicators are most influencing factors of banks performance. They are moreover significant effect of banks thereby presenting them to incredible danger of banks financial health. The credit risk indicators have been significantly affects the operational performance of select private sector banks in the post financial crisis period. Therefore the banks seek to reduce their Non-performing loans and loan loss provisions. Therefore, the study concludes that the banks must take strict and essential steps recover their loans and follow the reserve banks guidelines like PCA framework and maintain enough capital to absorb the risks. Furthermore the banks should manage the efficient credit risk management strategies in order to motivating investors and confidence savers in banks which lead to efficient financial stability of banks. This will help to enable to overall growth of economy and bring trust among the investors across the globe it will help to develop the Indian economy.

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