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"The Effect of Credit Risk on Returns of Select Public & Private Scheduled Commercial Banks In India."

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Abstract: *This paper aims to analyze the impact of credit risk on profitability of select Scheduled Commercial Banks in India.The population was divided into two clusters of scheduled commercial banks comprising of nationalized banks and private sector banks.*

The researchers have used a two-stage cluster sampling method for the selection of the sample.Five banks each, from both the clusters have been selected for the study. Thus, the total sample size is 10. The five public sector banks and five private sector banks are selected for study. The annual report in the duration from 2009-10 to 2015-16 of each bank are used in the analysis of the data. Therefore, there are total 70 observations (10 banks 7 years) used in the quantitative analysis.*

Two dependent variables ROE and ROI are considered for measuring profitability, whereas credit-deposit ratio, secured advances and term loans to total advances, capital adequacy ratio, gross NPA, Net NPA, are considered for measuring credit risks.

Keywords: *Credit risk; Scheduled Commercial Banks; Profitability; Non-performing Assets; ROE; ROI*

I. Introduction

Commercial banks play an important role in building the economy of any country;because of their role in the economic system through lending and funding projects.(Fredrick, 2012). In his study he stated that, risk is the element of uncertainty or possibility of loss that may prevail in any business transaction, in any place, in any mode and at any time.Risks can be broadly categorized as Credit Risk, Operational Risk, Market Risk and Other Risk.In essence of lending, banks are exposed to credit risk, this is the risk that a customer likely to default in repaying the money that is lent to him by the bank, and hence there is a need for every bank to manage such risk in the process of giving out loans to their customers.

(Jackson, 2011)in his research mentioned that, Credit risk management is a very important area for the banking sector and there are manydevelopments taken placein financial institutions related to this aspect. Credit worth is considered as a key parameter of financial health and soundness of financial institutions particularly the banks. In a lender's portion, losses stem from outright default due to inability or unwillingness of a customer or counterparty to meet commitments in relation to lending, trading, settlement and other financial transactions. In the respect of credit risk, Basel II norms also adopted different credit risk management techniques. The major focus was to improve the quality of credit risk management without affecting the competitiveness of the banks. Over the last 10 years, the quality of the credit portfolios in banks worldwide stayed comparatively stable until 2007-08 financial crisis. Since then the quality of bank assets declined largely because of the global downturn.

Credit risk may take the following forms:

- In the case of lending: Principal and / or interest amount may remain overdue and unpaid.
- In the case of guarantees or letter of credit: funds may not be forthcoming from the constituent in order toeffectively discharge the liability.
- In the case of treasury operation: the payment streams due from counterparties under the respective contracts may not be forthcoming or ceases to be received.
- In the case of securities trading business, funds/ securities settlement may not be effected by the respective agencies.
- In the case of cross-border exposure: The availability and free transfer of foreign currency funds may either cease or several restrictions may be imposed by the sovereign aslegal implications.

Therefore, credits in the banking sector are extremely important,as they are likely cause a serious impact onthe profitability of the banks.

1.1 PROBLEM STATEMENT

An assumption made in the study isthat, if the framework of credit risk management is sound, the profit level will be satisfactory and vice versa. In the recent years, Nonperforming Asset (NPA) is one of the major challenges for banks in India. Over-riding NPAs impact the performance of banks and create high levels of stressed assets. An enormous level of NPAs suggests a very high probability of a large number of credit defaults that affectsboth; the profitability and net-worth of banks andalsoerodes the value of the asset. The adverse effect on the size of the balance sheet of banks witnessed since 2011-12 continued until 2015-16. It also means the decline in credit growth showing slowdown in industrial credit off-take, poor earnings growth reported by the corporate sector resulting in risk aversion and cautious approach on part of banks owing to rising NPAs.

It is also a matter of investigation to observe how banks in India monitor and assess credit risk. Credit risk management being a very multifaceted issue, requires a qualitative study supplemented with quantitative analysis. Therefore, the researchers have used annual reports from 2009-10 to 2015-16 of each bank in the sample to draw qualitative inferences and quantitative analysis. The five public sector banks were State Bank of India, Punjab National Bank, Central Bank of India, Union Bank of India and Bank of Baroda while five private sector banks are ICICI Bank, HDFC, Axis Bank, Yes bank and Kotak Mahindra Bank are selected for study.

1.2 OBJECTIVE OF THE STUDY

The primary objective in thestudy is to analyze theimpact of credit risk on profitability of the select scheduled commercial banks.

Secondary Objectives

a) To assess the impact of credit quality on profitability ofselected scheduled commercial banks in India; and
b) To examine the impact cost of funds on profitability ofscheduled commercial banks in India.
c) To determine the extent to which non-performing loans affect the selected scheduled commercial banks profitability in India.
d) To determine the extent to which CAR affect the profitability of selected scheduled commercial banks.

1.3 HYPOTHESIS

1. H_0: Capital Adequacy Ratio, Gross NPA, Net NPA, Ratio of Term Loans to Total Assets and Ratio of Secured Advances to Total Assets are not the predictors of Return on Equity (ROE).

H_1: Capital Adequacy Ratio, Gross NPA, Net NPA, Ratio of Term Loans to Total Assets and Ratio of Secured Advances to Total Assets are the significant predictors of Return on Equity (ROE).

2. H_0: Capital Adequacy Ratio, Gross NPA, Net NPA, Ratio of Term Loans to Total Assets and Ratio of Secured Advances to Total Assets are not the predictors of Return on Investments (ROI).
3. H_1: Capital Adequacy Ratio, Gross NPA, Net NPA, Ratio of Term Loans to Total Assets and Ratio of Secured Advances to Total Assets are the significant predictors of Return on Assets (ROI).

II. Literature Review

2.1 Credit Risk:

(Mrs. Somanadevi Thiagarajan, 2011)in their study on '*An Analysis ofDeterminants of Profitability in Public and Private Sector Banks in India*' tried to evaluate through correlation, multiple regression and factor analysis the determinants of profitability in both categories of banks. In the analysis authors conclude that cost of borrowing and NPA have a strong correlation with profitability. ROA is used as a measure of profitability.

(Grier, 2007)in his study on '*Credit Analysis of Financial Institutions'* concluded that profitability ratios are often used in a high esteem as the indicators of credit analysis in banks, since profitability is associated with the results of management performance, ROE and ROA are the most commonly used ratios and the quality level of ROE is between 15% and 30%, for ROA is at least 1%.

(Felix, 2008)intheir research on **'***Bank Performance and Credit Risk Management'*investigated the relationship between bank performance and credit risk management. It could be inferred from their findings that return on equity (ROE) and return on assets (ROA) both measuring profitability were inversely related to the ratio of non-performing loan to total loan of financial institutions, which adversely affects on profitability.

(Ramachandran, 2011) conducted a study of 22 public sector and 15 private sector banks to predict the determinants of the credit risk in the Indian Commercial banking sector by using an econometric model. The outcome of the study is the non-performing assets had a strong and statistically significant positive influence on the current credit risk positions of the banks. They opined that the problem of NPA is not only affecting the banks but also the whole economy due to the transmission effects.

In the present study, ROI and ROE are used as indicators of profitability and its relationship with different bank specific parameters will be helpful in assessment of credit risk.

III. Research Methodology

3.1 Research Methodology

This research involved quantitative research. The researcher had adopted this method of research because it allows the researcher to be more objective about findings of the descriptive research and also enables to test hypotheses in experiments because of its ability to measure data using experimental research statistics.

3.2 Population of the Study

The Population of the study comprises of all the scheduled commercial banks in India. According to Reserve Bank of India Act 1934, Scheduled Commercial Banks are included in the second schedule.

3.3 Sampling Design

A two-stage cluster sampling denotes a primary unit from the cluster is randomly chosen and thereafter elements from the primary unit have been randomly selected. Out of 20 public sector banks, which includes SBI and its associates (now merged), and other nationalized banks and 31 private sector banks.Five each from both the clusters have been selected based on market capitalization for the study. Thus, the total sample size is 10. The five public sector banks selected are State Bank of India, Punjab National Bank, Canara Bank, Union Bank of India and Bank of Baroda while five private sector banks are ICICI Bank, HDFC, Axis Bank, Yes bank and Kotak Mahindra Bank. Annual reports from 2009-10 to 2015-16 of each selected bank are used to collect the secondary data. Therefore, there are total 70 observations (10 banks* 7 years) used in the quantitative analysis.

IV. Data Analysis And Interpretation

4.1 Credit Risk Measures

a) Purpose: To study if Capital Adequacy Ratio, Gross NPA, Net NPA, Ratio of Term Loans to Total Assets and Ratio of Secured Advances to Total Assets predict Return on Equity (ROE).

Statistical test: Step wise multiple regression analysis.

H_0: Capital Adequacy Ratio, Gross NPA, Net NPA, Ratio of Term Loans to Total Assets and Ratio of Secured Advances to Total Assets are not the predictors of Return on Equity (ROE).

H_1: Capital Adequacy Ratio, Gross NPA, Net NPA, Ratio of Term Loans to Total Assets and Ratio of Secured Advances to Total Assets are the significant predictors of Return on Equity (ROE).

Level of significance $\alpha = 0.05$

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Capital Adequacy Ratio	70	10.38	10.22	20.60	14.7376	2.67311	7.146
Gross NPAs to Gross Advances	70	9.79	.20	9.99	2.8773	2.17641	4.737
Net NPA	70	8.60	.01	8.61	1.4610	1.56341	2.444
Ratio of term loans to total advances	70	48.88	36.00	84.88	60.2824	14.33760	205.567
Ratio of secured advances to total advances	70	48.90	45.22	94.12	80.4699	8.05285	64.848
Cost of funds	70	3.60	4.49	8.09	6.0579	.92379	.853
Return on Equity	70	38.50	-13.48	25.02	14.7741	7.31323	53.483
Valid N (listwise)	70						

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.913[a]	.834	.818	3.11979	.834	52.692	6	63	.000	1.215

a. Predictors: (Constant), Cost of funds, Net NPA, Ratio of secured advances to total advances, Ratio of term loans to total advances, Capital Adequacy Ratio, Gross NPAs to Gross Advances

b. Dependent Variable: Return on equity

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3077.160	6	512.860	52.692	.000[b]
	Residual	613.186	63	9.733		
	Total	3690.346	69			

a. Dependent Variable: Return on equity
b. Predictors: (Constant), Cost of funds, Net NPA, Ratio of secured advances to total advances, Ratio of term loans to total advances, Capital Adequacy Ratio, Gross NPAs to Gross Advances

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	34.567	6.777		5.101	.000	21.024	48.110
	Capital Adequacy Ratio	-.168	.263	-.062	-.639	.525	-.695	.358
	Gross NPAs to Gross Advances	-1.091	.370	-.325	-2.951	.004	-1.830	-.352
	Net NPA	-3.103	.546	-.663	-5.679	.000	-4.195	-2.011
	Ratio of term loans to total advances	-.075	.048	-.146	-1.554	.125	-.171	.021
	Ratio of secured advances to total advances	-.056	.058	-.062	-.972	.335	-.172	.059
	Cost of funds	-.100	.467	-.013	-.215	.830	-1.033	.832

a. Dependent Variable: Return on equity

b) Purpose: To study if Capital Adequacy Ratio, Gross NPA, Net NPA, Ratio of Term Loans to Total Assets and Ratio of Secured Advances to Total Assets predict Return on Equity (ROI).

Statistical test: Step wise multiple regression analysis

H_0: Capital Adequacy Ratio, Gross NPA, Net NPA, Ratio of Term Loans to Total Assets and Ratio of Secured Advances to Total Assets are not the predictors of Return on Investments (ROI).

H_1: Capital Adequacy Ratio, Gross NPA, Net NPA, Ratio of Term Loans to Total Assets and Ratio of Secured Advances to Total Assets are the significant predictors of Return on Assets (ROI).

Level of significance $\alpha = 0.05$

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Capital Adequacy Ratio	70	10.38	10.22	20.60	14.7376	2.67311	7.146
Gross NPAs to Gross Advances	70	9.79	.20	9.99	2.8773	2.17641	4.737
Net NPA	70	8.60	.01	8.61	1.4610	1.56341	2.444
Ratio of term loans to total advances	70	48.88	36.00	84.88	60.2824	14.33760	205.567
Ratio of secured advances to total advances	70	48.90	45.22	94.12	80.4699	8.05285	64.848
Cost of funds	70	3.60	4.49	8.09	6.0579	.92379	.853
Return on Investments	70	3.23	5.77	9.00	7.4504	.71915	.517
Valid N (listwise)	70						

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin - Watson
					R Square Change	F Change	df1	df2	Sig. F Change	

1	.662[a]	.439	.385	.56382	.439	8.209	6	63	.000	1.305

a. Predictors: (Constant), Cost of funds, Net NPA, Ratio of secured advances to total advances, Ratio of term loans to total advances, Capital Adequacy Ratio, Gross NPAs to Gross Advances
b. Dependent Variable: Return on Investments

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.658	6	2.610	8.209	.000[b]
	Residual	20.027	63	.318		
	Total	35.685	69			

a. Dependent Variable: Return on Investments
b. Predictors: (Constant), Cost of funds, Net NPA, Ratio of secured advances to total advances, Ratio of term loans to total advances, Capital Adequacy Ratio, Gross NPAs to Gross Advances

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	8.017	1.225		6.546	.000	5.569	10.464
	Capital Adequacy Ratio	-.073	.048	-.271	-1.534	.130	-.168	.022
	Gross NPAs to Gross Advances	.034	.067	.104	.514	.609	-.099	.168
	Net NPA	.019	.099	.042	.194	.847	-.178	.216
	Ratio of term loans to total advances	-.014	.009	-.288	-1.664	.101	-.032	.003
	Ratio of secured advances to total advances	-.013	.010	-.148	-1.264	.211	-.034	.008
	Cost of funds	.383	.084	.492	4.538	.000	.214	.551

a. Dependent Variable: Return on investments

Bank Name			Return on Equity	Return on Investment	Capital Adequacy Ratio	Gross NPAs to Gross Advances	Net NPA	Ratio of term loans to total advances	Ratio of secured advances to total advances	Cost of Funds
1. SBI	Return on Equity	Pearson Correlation	1	-.542	.425	-.577	-.816*	-.893**	.198	-.133
		Sig. (1-tailed)		.104	.171	.088	.013	.003	.335	.388
		N	7	7	7	7	7	7	7	7
	Return on Investment	Pearson Correlation	-.542	1	-.007	.891**	.741*	.391	.433	.754*
		Sig. (1-tailed)	.104		.494	.004	.028	.193	.166	.025
		N	7	7	7	7	7	7	7	7
2. BANK OF	Return on Equity	Pearson Correlation	1	-.818*	.526	-.985**	-.998**	.301	-.671*	-.179
		Sig. (1-tailed)		.012	.113	.000	.000	.256	.049	.351
		N	7	7	7	7	7	7	7	7

BARODA	Return on Investment	Pearson Correlation	-.818*	1	-.306	.814*	.816*	-.175	.739*	.341
		Sig. (1-tailed)	.012		.252	.013	.013	.354	.029	.227
		N	7	7	7	7	7	7	7	7
3. CANARA BANK	Return on Equity	Pearson Correlation	1	-.686*	.740*	-.936**	-.953**	-.709*	-.854**	-.542
		Sig. (1-tailed)		.044	.029	.001	.000	.037	.007	.104
		N	7	7	7	7	7	7	7	7
	Return on Investment	Pearson Correlation	-.686*	1	-.782*	.425	.480	.956**	.947**	.849**
		Sig. (1-tailed)	.044		.019	.171	.138	.000	.001	.008
		N	7	7	7	7	7	7	7	7
4. UNION BANK OF INDIA	Return on Equity	Pearson Correlation	1	-.940**	.900**	-.819*	-.847**	-.794*	-.831*	-.826*
		Sig. (1-tailed)		.001	.003	.012	.008	.017	.010	.011
		N	7	7	7	7	7	7	7	7
	Return on Investment	Pearson Correlation	-.940**	1	-.907**	.846**	.864**	.837**	.890**	.848**
		Sig. (1-tailed)	.001		.002	.008	.006	.009	.004	.008
		N	7	7	7	7	7	7	7	7
5. PUNJAB NATIONAL BANK	Return on Equity	Pearson Correlation	1	-.814*	.777*	-.938**	-.991**	.951**	-.669	-.128
		Sig. (1-tailed)		.013	.020	.001	.000	.001	.050	.393
		N	7	7	7	7	7	7	7	7
	Return on Investment	Pearson Correlation	-.814*	1	-.747*	.906**	.774*	-.848**	.823*	.646
		Sig. (1-tailed)	.013		.027	.002	.021	.008	.011	.059
		N	7	7	7	7	7	7	7	7
6. ICICI BANK	Return on Equity	Pearson Correlation	1	.688*	-.665	-.906**	-.293	-.483	.932**	.449
		Sig. (1-tailed)		.044	.051	.002	.262	.136	.001	.156
		N	7	7	7	7	7	7	7	7
	Return on Investment	Pearson Correlation	.688*	1	-.569	-.622	-.217	-.337	.845**	.411
		Sig. (1-tailed)	.044		.091	.068	.320	.230	.008	.180
		N	7	7	7	7	7	7	7	7
7. HDFC BANK	Return on Equity	Pearson Correlation	1	.283	-.256	-.766*	-.126	-.688*	.794*	.877**
		Sig. (1-tailed)		.269	.290	.022	.394	.044	.017	.005
		N	7	7	7	7	7	7	7	7
	Return on	Pearson Correlation	.283	1	-.865**	-.541	.070	-.122	.631	.538

	Investment	n								
		Sig. (1-tailed)	.269		.006	.105	.440	.397	.064	.107
		N	7	7	7	7	7	7	7	7
8. AXIS BANK	Return on Equity	Pearson Correlation	1	-.282	-.507	-.682*	-.859**	.499	.789*	-.283
		Sig. (1-tailed)		.270	.123	.046	.007	.127	.017	.270
		N	7	7	7	7	7	7	7	7
	Return on Investment	Pearson Correlation	-.282	1	.092	.197	.396	-.629	-.277	.776*
		Sig. (1-tailed)	.270		.422	.336	.190	.065	.274	.020
		N	7	7	7	7	7	7	7	7
9. KOTAK MAHINDRA BANK LTD	Return on Equity	Pearson Correlation	1	-.612	.128	-.498	-.504	.812*	.773*	-.008
		Sig. (1-tailed)		.072	.392	.128	.125	.013	.021	.493
		N	7	7	7	7	7	7	7	7
	Return on Investment	Pearson Correlation	-.612	1	-.658	-.134	.029	-.859**	-.740*	.593
		Sig. (1-tailed)	.072		.054	.388	.476	.007	.029	.080
		N	7	7	7	7	7	7	7	7
10. YES BANK LTD.	Return on Equity	Pearson Correlation	1	.725*	-.285	-.530	-.593	-.761*	.337	.825*
		Sig. (1-tailed)		.033	.268	.110	.080	.024	.230	.011
		N	7	7	7	7	7	7	7	7
	Return on Investment	Pearson Correlation	.725*	1	-.583	.039	-.004	-.912**	.829*	.947**
		Sig. (1-tailed)	.033		.085	.467	.496	.002	.011	.001
		N	7	7	7	7	7	7	7	7

V. Findings

The regression analysis shows that the model is best fit for ROE as the R^2value is 0.834. The significance value in ANOVA table is 0.000, which is less than 0.05, thus overall model is found to be significant rejecting the null hypothesis and alternate hypothesis is accepted. Therefore CAR, Gross NPA, Net NPA, Ratio of term loans to total advances, Ratio of secured advances to total advances and Cost of Funds are strong predictors of Return on Equity in all the banks.The regression model for ROI is somewhat weak as the R^2value is 0.439. However, significance value in ANOVA table is 0.000 < 0.05 indicating significant relationship between Return on Investments and the independent variables selected. The correlation of the different factors with dependent variables ROE and ROI shows a marked difference in both clusters of the banks. The various banks chosen in the sample and their degree of correlation is as follows –

SBI: -ROE has a strong correlation with Net NPA and Term Loans/Total Advances while it is moderate with Gross NPA/Gross Advances. Gross NPA, Net NPA and Cost of funds have strong correlation with ROI.

Bank of Baroda: - Correlation of Gross and Net NPAs with ROE is strong while that of CAR and Secured/Total Advances is moderate. ROI shows strong correlation with Gross and Net NPA along with Secured/Total Advances.

Canara Bank: - All independent variables except Cost of Funds have a strong correlation with ROE. CAR, Term Loan/Total Advances, Secured/Total Advances & Cost of funds have a strong correlation with ROI.

Union Bank of India: - All independent variables have a strong correlation with both ROE and ROI.

Punjab National Bank: - All independent variables except Cost of Funds have a strong correlation with ROI however, ROE shows similar degree of correlation except with cost of funds.

ICICI Bank: -CAR, Gross NPAs and Secured/Total Advances reveal a strong correlation with ROE while only Secured/Total Advances have a strong correlation with ROI. Gross NPA has a moderate correlation with ROI.

HDFC Bank: - Gross NPAs, Secured/Total Advances and Cost of Funds have a strong correlation with ROE and it is moderate with Term Loans/Total Advances. ROI has a strong correlation with CAR and moderate with Gross NPAs, Secured/Total Advances and Cost of Funds.

Axis Bank: - ROE correlation with Gross & Net NPA and Secured/Total Advances is strong and the same is moderate with CAR. ROI has strong correlation with Cost of Funds and moderate with Term Loan/Total Advances.

Kotak Mahindra Bank: - Strong correlation of ROE with Term Loans/Total Advances, Secured/Total Advances and moderate with Net NPAs. In case of ROI it is strong with Term Loans/Total Advances, Secured/Total Advances and moderate with CAR and Cost of Funds.

Yes Bank: - Cost of Funds and Term Loans/Total Advances have a strong correlation with ROE and moderate correlation exists for Gross and Net NPA. ROI has a very strong correlation with Term Loans/total Advances, secured Loans/Total advances and Cost of Funds while it is moderate with CAR.

VI. Conclusion

From the above analysis, it can be concluded that the rising levels of Gross NPA, Net NPA are the most important factors affecting the profitability of both public and private sector banks. These factors are major elements of credit risk in banking system. Effective regulatory and legislative measures are essential to bring them within acceptable limits to improve the health of Indian banking system.

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