Journal of Social Commerce

Impact of Interest Rates Changes on Banking Profitability Sector in India: An Empirical Research on the Profitability Performance of Selected Nationalized Banks in India

[1]Hingu Hitenkumar Dineshbhai

[1]Research Scholar, Department of Commerce, Saurashtra University, Rajkot, India

Abstract

The study designed the impact of an interest rate change on the profitability of the banking sector in India. In this work comparative analysis of various profitability performance ratios like ROA, ROE, ROCE, Net Profit Margin Ratio, EPS, etc… and also find out the impact of interest rate on banks profitability with the help of correlation and regression analysis of selected nine nationalized banks in India. The data is collected through various annual reports of selected respective banks from 2011-12 to 2019-20. For the analysis, the data researchers have used various statistical tools like Mean, Ratio, Correlation Analysis, and Regression Analysis. This study concluded that out of all selected ratios, ROA, ROCE, Net Profit Margin Ratio, Net Interest Income/Total assets, Net Interest Margin Ratio and Capital adequacy Ratio indicated that null hypothesis is rejected which means there is a significant difference between these ratios of selected nationalized banks during the study period and also found that Bank Rate has significantly impacted on Net Profit Margin Ratio in all selected nationalized banks in India.

Introduction

A bank is a financial institution that provides banking services and other financial services to its customers. A bank is generally understood as an institution that provides fundamental banking services, such as the acceptance of deposits and the granting of loans. There are also non-bank institutions that provide certain banking services without respecting the legal definition of a bank (Tyler & Stanley, 2007; Das et al., 2017). The bank is a subset of the financial services sector. Banks are the main participants in the financial system in India. The banking sector offers services and opportunities to its customers. All banks protect money and valuables and provide loans, credits, and payment services such as current accounts, money

orders, and cashier's checks. Banks also offer investment products and insurance, as various models of cooperation and integration between financial industries have emerged. Some of the traditional distinctions between insurance companies and securities companies have decreased. Despite these changes, banks continue to maintain and perform their main function of accepting deposits and loaning funds from these deposits.

Interest Rate

The interest rate is the price requested by the lender from the borrower for the use of the borrowed money (Mishkin, 1981). In other words, interest is a commission that the borrower pays to the lender on the borrowed money as compensation for losing the opportunity to earn income from other investments that could have been made with the borrowed money. Thus, from the lender's point of view, interest can be seen as an "opportunity cost" or "monetary income" and the interest rate as the rate at which interest (or opportunity cost) accrues over some time. The longer the period for which it is borrowed, the higher the interest (or opportunity cost). The amount borrowed is called equity. The interest rate is generally expressed as a percentage of the principal and in annualized terms (Schmelzing, 2019). From a borrower's point of view, the interest rate is the cost of capital. In other words, it is the cost that a borrower has to incur to access the funds.

Bank Rate

The bank rate is most important for commercial bank and nation's central bank control to this bank rate. Bank rate is the rate charged by the central bank for lending funds to commercial banks. The minimum interest rate charged by a central bank (in the case of India, the Reserve Bank of India) while lending money to domestic banks is called the "Bank Rate". When a bank suffers from a shortage of funds, it can borrow money from the RBI to continue services (Eichengreen et al., 1985).

Bank rate management is a method by which central banks influence economic activity (Koch & MacDonald, 2014). Lower bank rates can help expand the economy by lowering the cost of funds for borrowers, and higher bank rates help reign in the economy when inflation is higher than desired. The current Bank Rate is 4.25% as per monetary policy.

Review of Literature

Here, researcher has conducted the various review before and after the selection of particular topic. Nyaberi (2018) have analyzed the effect of interest rate spread on financial performance of commercial banks in Rwanda. The main objective of this study is effect of financial performance of commercial banks in Rwanda. The Researchers have collected the data from 14 commercial banks and 42 respondents by using structured questionnaires. The researchers have also used secondary data collected from the audited financial statement of the commercial banks for the period 2014 to 2016. The data was analyzed using parametric test via F- test, T-test for the testing of the hypothesis and also used mode, median, mean, and standard deviation and also used multiple regression analysis to determine relationship between liquidity management and financial performance of commercial banks in Rwanda. This study concluded that ownership structure, market structure and business risks play significant role in explaining interest rate spread.

Pooja (2019) have analyzed the growth aspects of PNB and SBI: Comparative study. The researchers have collected the data from 2012-13 to 2017-18. The present study is totally based on secondary data collected by annual reports of the both the banks. The main objective of the study is to examine the growth aspects of both the banks and also compare the growth of the

Hingu Hitenkumar Dineshbhai

same. The researchers have used various indicators like Growth of deposits, Branch expansion, Number of employees, Credit development and Borrowings. The data collected has been tabulated and analyzed by using charts. They found that the growth of SBI bank is higher as compare to PNB.

Sharma & Sharma (2017) examined comparison and analysis of profitability of top three Indian private sector banks. The researchers have collected the data from 3 top private sector banks HDFC bank, ICICI bank and AXIS bank, a period of 5 years from 2011-12 to 2015-16. The main objective of the study to measure the overall financial performance of top three private sector bank operating in India. The researchers have used various profitability ratio to measure the financial performance. The researchers have used ANOVA to test of the hypothesis. They concluded that the statistically different on the basis of two out of four financial parameters.

Maina (2015) determinants of interest rate spread on profitability of commercial banks in Kenya. The researcher has used the descriptive and correlations designs to determine the relation between independent variable and dependent variable. The researcher has collected the data from 27 commercial banks in Kenya and testing of the hypothesis researcher has used correlation method. Results of this study is inflation, operating cost has no effect on interest rate spread in commercial banks in Kenya and market structure, ownership structure and business risk play very most important role in determination of interest rate spread.

Kamunge (2013) has examined the effect of interest rate spread on the level of non-performing loans of commercial banks in Kenya. The researcher has collected the data from various commercial banks in Kenya. The period of this study is 2008 to 2012. The main objective of the study is to investigate the effect of interest rate spread on the level of non-performing loans of commercial banks in Kenya. The researcher has used ANOVA and regression model to testing of the hypothesis. The results showed that the unit changes in the long interest rate margin variable will lead to a positive change in the level of outstanding loans, while a unit change in the cost of long-term debt collection will cause a significant and negative change in the level of unsecured loans and a unitary change in the cost of the long credit assessment will cause a negative and insignificant change.

Khan & Sattar (2010) worked on what drives interest rate spread of commercial banks in Pakistan. The researchers have collected the data from 28 banks operating in Pakistan from 1997 to 2009. The main objective of the study is what drives interest rate spreads of commercial banks in Pakistan. The researchers have used to linear regression to test of the hypothesis. Researchers have used banking spread is dependent variable while bank specific indicators, Industry specific indicators and micro indicators are as taken as independent variable. They concluded in their results that competition play a key role in determination of interest rate spread. In macroeconomic environment real GDP and interest rate is very strong affect the banking spread.

Methods

Research Gap

After reviewing the literature of studies are conducted in India as well as foreign countries, it can be said that field of banking sector the financial status that research studies in this particular filed are quite limited. Researcher has deep study of methodology of various research work and found that the possibility of interest on specific topic related to banking sector and hence researcher has framed the title "Impact of interest rate change on profitability of banking sector in India".

<div align="right">Hingu Hitenkumar Dineshbhai</div>

Thus, this study aims (1) to understand the growth of the banking sector in India. (2) To examine the profitability performance of selected nationalized banks in India. (3) To analyze the impact of interest rate changes on profitability of selected nationalized banks in India.

The population of the study is all types of the banking sector in India. Sampling method used in this study is "Convenient Sampling" which is considered as Non-Probability sampling. Out of whole population sample are selected top nine public sectors banks. The following banks are selected for the purpose of the study, including; Bank of Baroda, Bank of India, Punjab National Bank, Central Bank of India, Union Bank of India, Indian Bank, Canara Bank, Indian Overseas Bank, UCO Bank

Source of Data

The collection of data is most important part research work because without data, researcher can't make analysis and interpretation of information. There are mainly two types of data collection methods first one is secondary data and primary data. In this research work researcher has used secondary source of data. The researcher has use the data published as under; Financial data and records from annual reports and financial statement of sample banks, Annual reports of RBI from 2011-12 to 2019-20, Various journals, article, reports and surveys, Various study related websites.

Period of the Study

This research work covers nine years from the year 2011-12 to 2019-20 the reason for taking this time is to make fresh data analysis and to find analyzed the impact of interest changes on banks profitability.

Tools and techniques of data analysis

This research work mainly focuses on impact of interest rate change on profitability of selected nationalized banks in India. The researcher used tools and techniques for data analysis. During the research, researcher used various types of accounting tools like ratio analysis, statistical tools, and graphical representation. The most suitable parametric test has been used by researcher for this study.

Results and Discussion

Ratios Analysis and Analysis of Variance of selected nationalized Banks in India

Table 1. Return on Assets Ratio

Years	BOB	BOI	PNB	CBI	CNB	UBI	INB	IOB	UCO Bank
2011-12	1.18	0.70	1.17	0.59	1.19	0.88	1.40	0.59	0.55
2012-13	1.11	0.69	1.06	0.23	0.87	0.68	1.23	0.47	0.61
2013-14	0.81	0.60	0.99	0.37	0.69	0.69	0.97	0.23	0.31
2014-15	0.68	0.47	0.60	-0.43	0.49	0.47	0.61	0.21	0.63
2015-16	0.47	0.27	0.50	0.19	0.49	0.46	0.52	-0.15	0.46
2016-17	-0.80	-0.99	-0.59	-0.46	-0.50	0.33	0.34	-1.05	-1.14
2017-18	0.19	-0.24	0.18	-0.73	0.19	0.12	0.64	-1.38	-0.79
2018-19	-0.33	-0.99	-1.60	-1.56	-0.68	-1.07	0.49	-2.54	-2.05
2019-20	0.05	-0.88	-1.28	-1.70	0.04	-0.59	0.11	-1.49	-1.87
Average	**0.37**	**-0.04**	**0.11**	**-0.39**	**0.31**	**0.22**	**0.70**	**-0.57**	**-0.37**
Max	**1.18**	**0.70**	**1.17**	**0.59**	**1.19**	**0.88**	**1.40**	**0.59**	**0.63**
Mini	**-0.80**	**-0.99**	**-1.60**	**-1.70**	**-0.68**	**-1.07**	**0.11**	**-2.54**	**-2.05**

Source: Computed from the Annual reports of the respective Banks
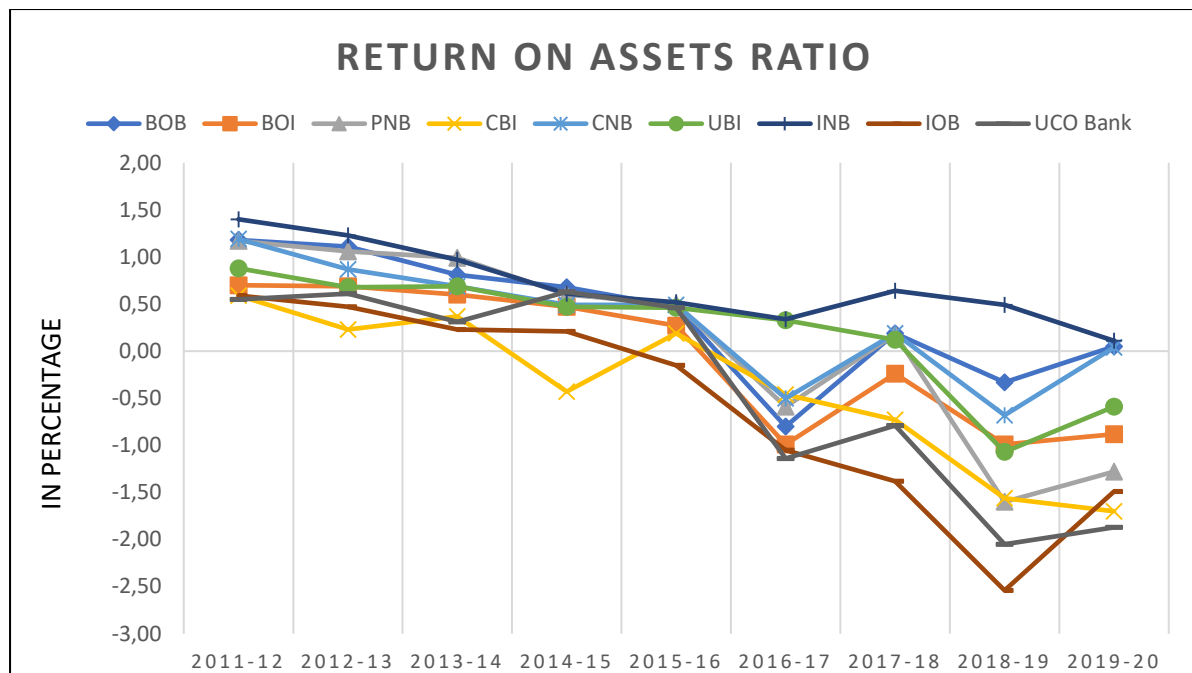
Hingu Hitenkumar Dineshbhai

Figure 1. Return on Assets Ratio

Above table and figure show that Return on Assets ratio during the study period form 2011-12 to 2019-20 for selected nationalized banks in India. Return on Assets ratio indicated the amount of profit a company can generate form its assets. In concern with Bank of Baroda maximum return on assets ratio was 1.18 and minimum ratio was -0.80 in the year 2011-12 and 2016-17 respectively. The average return on assets ratio was 0.37 during period of study. Form the 2011-12 to 2019-20 return on assets ratio was 1.18, 1.11, 0.81, 0.68, 0.47, -0.80, 0.19, -0.33 and 0.05 respectively. First four years return on assets ratio was positive and in the year 2016-17 return on assets ratiowas start negative.

In relation with Bank of India it was appeared that average return on assets ratio was -0.04 during the study period and maximum return on assets ratio was 0.70 and minimum ratio was -0.99 in the year 2011-12 and 2016-17 respectively. Return on assets ratio of Bank of India fluctuating trend form 2011-12 to 2019-20. PNB indicated average return on assets ratio was 0.11 and maximum ratio was 1.17 and minimum return on assets ratio was -1.60 during the study period. It was appeared that trend of return on assets ratio first four positive and after the year it was negatively trend. In relation with CBI average return on assets ratio was -0.39 for the study period. Maximum and minimum ratio of return on assets was 0.59 and -1.70 in the year 2011-12 and 2019-20 respectively.

Return on assets ratio of CBI fluctuating trend from 2011-12 to 2019-20. In concern with CNB maximum and minimum return on assets ratio was 1.19 and -0.68 in the year 2011-12 and 2018-19 respectively. The average return on assets ratio was 1.19, return on assets ratio indicated first four years will be positive and after that year it was start negative trend. In relation with UBI average return on assets ratio was 1.40 during the study period. Maximum and minimum return on assets ratio was 0.88 and -1.07 in the year 2011-12 and 2018-19 respectively. The return on assets ratio was indicated that decreasing trend during the study period form 2011-12 to 2019-20. In concern with INB the maximum and minimum return on assets ratio was 1.40 and 0.11 in the year 2011-12 and 2019-20 respectively. Return on assets ratio was indicated fluctuating trend of INB during the study period. In relation with IOB its average return on assets ratio was -0.57 during the study period. Maximum and minimum ratio was 0.59 and -2.54 in the year 2011-12 and 2018-19.

Hingu Hitenkumar Dineshbhai

In IOB, return on assets ratio indicated the decreasing trend for the period of study. In UCO Bank maximum and minimum return on assets ratio was 0.63 and -2.05 in the year 2014-15 and 2018-19 respectively. Ratio was indicated fluctuating trend of the period of study from 2011-12 to 2019-20respectively.INB average return on assets ratio was 0.70 highest ratio during period of study form 2011-12 to 2019-20 its indicated that INB more utilized their assets to generate profit with compared to other nationalized banks and other side IOB average return on assets ratio was -0.57 lowest ratio during the study period its shows that IOB not enough utilized their assets to generate profit.

Table 2. Analysis of variance of Return on Assets Ratio

Source of Variation	SS	Df	MS	F	P-value	F crit
Between Groups	12.441711	8	1.555214	2.28849	**0.030406**	2.069
Within Groups	48.929644	72	0.679578			
Total	61.3713555	80				

Source: Computed

For the purpose of testing hypothesis, the researcher has used one-way ANOVA. The significant value available from the statically analysis is 0.030 as the significant value is less than 0.05 (At 5% level of significance). The researcher may stat that Null hypothesis is rejected. So, the researcher has found that there is significant difference in Return on Assets Ratio of selected nationalized banks.

Correlation and Regression Analysis:

Table 3. For Bank of Baroda:

Year	Bank Rate	ROA	ROE	ROCE	Net Profit Margi	Operating Profit	EPS	Net NPA	Net Interes	Capital Adequ
2011-12	9.50	1.18	20.15	2.00	19.38	6.54	116.37	0.35	2.45	14.52
2012-13	8.50	1.11	18.22	1.96	16.87	5.34	127.84	0.54	2.30	14.67
2013-14	9.00	0.81	14.01	1.69	12.73	2.41	108.84	1.28	2.06	13.30
2014-15	8.50	0.68	12.61	1.44	11.66	0.20	107.38	1.52	1.81	12.28
2015-16	7.75	0.47	8.53	1.43	7.91	-2.33	15.83	1.89	1.84	12.61
2016-17	6.75	-0.80	-13.42	1.36	-12.24	-23.59	-23.89	4.96	1.89	13.18
2017-18	6.25	0.19	3.43	1.63	3.27	-12.73	6.00	4.72	1.94	12.24
2018-19	6.50	-0.33	-5.60	1.72	-5.57	-20.82	-10.53	5.49	2.15	12.13
2019-20	5.40	0.05	0.94	1.78	0.87	-11.77	1.64	3.33	2.36	13.42

Table 4. Correlation Analysis for Bank of Baroda

Correlations		Bank Rate	ROA	ROE	ROCE	Net Profit Margin Ratio	Operating Profit Margin Ratio	EPS	Net NPA Ratio	Net Interest Margin Ratio	Capital Adequacy
Bank Rate	Pearson Correlation	1	.784*	.789*	.270	.791*	.828**	.875**	-.836**	.095	.473
	Sig. (2-tailed)		.012	.011	.482	.011	.006	.002	.005	.809	.198
	N	9	9	9	9	9	9	9	9	9	9

Hingu Hitenkumar Dineshbhai

ROA	Pearson Correlation	.784*	1	.999**	.576	.999**	.983**	.911**	-.926**	.361	.545
	Sig. (2-tailed)	.012		.000	.104	.000	.000	.001	.000	.340	.129
	N	9	9	9	9	9	9	9	9	9	9
ROE	Pearson Correlation	.789*	.999**	1	.550	1.000**	.985**	.911**	-.928**	.335	.520
	Sig. (2-tailed)	.011	.000		.125	.000	.000	.001	.000	.379	.151
	N	9	9	9	9	9	9	9	9	9	9
ROCE	Pearson Correlation	.270	.576	.550	1	.553	.468	.495	-.424	.929**	.711*
	Sig. (2-tailed)	.482	.104	.125		.123	.203	.175	.256	.000	.032
	N	9	9	9	9	9	9	9	9	9	9
Net Profit Margin Ratio	Pearson Correlation	.791*	.999**	1.000**	.553	1	.985**	.910**	-.930**	.341	.531
	Sig. (2-tailed)	.011	.000	.000	.123		.000	.001	.000	.369	.141
	N	9	9	9	9	9	9	9	9	9	9
Operating Profit Margin Ratio	Pearson Correlation	.828**	.983**	.985**	.468	.985**	1	.917**	-.974**	.282	.555
	Sig. (2-tailed)	.006	.000	.000	.203	.000		.000	.000	.461	.121
	N	9	9	9	9	9	9	9	9	9	9
EPS	Pearson Correlation	.875**	.911**	.911**	.495	.910**	.917**	1	-.901**	.297	.571
	Sig. (2-tailed)	.002	.001	.001	.175	.001	.000		.001	.438	.108
	N	9	9	9	9	9	9	9	9	9	9
Net NPA Ratio	Pearson Correlation	-.836**	-.926**	-.928**	-.424	-.930**	-.974**	-.901**	1	-.301	-.643
	Sig. (2-tailed)	.005	.000	.000	.256	.000	.000	.001		.431	.062
	N	9	9	9	9	9	9	9	9	9	9
Net Interest Margin Ratio	Pearson Correlation	.095	.361	.335	.929**	.341	.282	.297	-.301	1	.734*
	Sig. (2-tailed)	.809	.340	.379	.000	.369	.461	.438	.431		.024
	N	9	9	9	9	9	9	9	9	9	9
Capital Adequacy Ratio	Pearson Correlation	.473	.545	.520	.711*	.531	.555	.571	-.643	.734*	1
	Sig. (2-tailed)	.198	.129	.151	.032	.141	.121	.108	.062	.024	
	N	9	9	9	9	9	9	9	9	9	9
**. Correlation is significant at the 0.01 level (2-tailed).											
*. Correlation is significant at the 0.05 level (2-tailed).											

Source: Calculated with the help of SPSS Statistics

Above table indicated correlation analysis between interest rate, return on assets, return on equity, return on capital employed, net profit margin ratio, operating profit margin ratio, earning per share and net NPA ratios of Bank of Baroda during the study period from 2011-12 to 2019-20. The correlation between bank rate and Return on Assets (ROA) and indicated 0.78

Hingu Hitenkumar Dineshbhai

which is moderately positive. It means if bank rate increase so return on assets also increase and via-a-vis. same position has been happed in Return on Equity (ROE) with bank rate because the correlation between those variables are 0.79 and it is moderately positive. The Correlation between Return on Capital Employed (ROCE) and Bank Rate is 0.27 which means there is no relation between those variables.

The relationship between Bank Rate and Net Profit Margin Ratio indicated 0.79 which means significantly positive and it is near to 1. The relationship between Operating Profit Margin Ratio and Bank Rate indicated 0.83 which is indicated highly positive and it also seems that both variables are significantly associated. Bank Rate and Earning per Share (EPS) associated to each other up to extent 0.86 which is significantly positive. Out of selected variables only one variable named as Net NPA assets ratio has significantly negative associated with Bank Rate up to extent of -0.84 which indicated if Bank Rate increase then Net NPA ratio decrease and via-a-vis. The correlation with Bank Rate and Net Interest Margin Ratio indicated by 0.095 which means there is no correlation between these variables. The relation with Capital Adequacy Ratio and Bank Rate shows that 0.473 which means there is no strong relation with each other.

For the testing of hypothesis researcher perform the correlation analysis between bank rate and various selected profitability performance ratio like ROA, ROE, ROCE, NPMR, OPMR, EPS, Net NPA Ratio, Gross NPA Ratio, NIMR and Capital Adequacy Ratio. For the ratio like ROCE, Net Interest Margin Ratio and Capital Adequacy Ratio Correlation analysis indicated there is no significance relation between aforesaid ratio due to p-value is more than 0.05 that's why null hypothesis are accepted and further ratio are rejected because p-value is less than 0.05 (At 5% level of significance).

Table 5. Regression Analysis for Bank of Baroda

Regression Statistics	
Multiple R	0.791
R Square	0.626
Adjusted R Square	0.572
Standard Error	6.847
Observations	9

Table 6. Regression ANOVA for Bank of Baroda

ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	550.14	550.14	11.73	0.011
Residual	7	328.25	46.89		
Total	8	878.40			

Table 7. Regression Model for Bank of Baroda

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-38.58	13.24	-2.91	0.022	-69.89	-7.26	-69.89	-7.26
Bank Rate	5.90	1.72	3.42	0.011	1.82	9.97	1.82	9.97

Source: Calculated with the help of MS Excel

Above indicated regression analysis between net profit margin ratio as dependent variable and bank rate as independent variable. The relationship between two variables indicated by multiple R 0.79 which means the variables are significantly positive associated. R square 0.626 is indicated 62.6% variability can be explain by this regression analysis and adjusted R square

Hingu Hitenkumar Dineshbhai

0.572 is indicated 57.2% bank rate has been associated with net profit margin ratio. Here, significance value is 0.01 which is less than 0.05 that indicated model for regression analysis is significant and it also express bank rate has impacted on net profit margin ratio.

Table 8. Major findings Regarding Ratio and ANOVA

Sr. No.	Ratios	Calculated Value	Table Value	P- Value	Results of H_0
1.	Return on Assets Ratio	2.288	2.069	0.03	Rejected
2.	Return on Equity Ratio	1.849	2.069	0.08	Fail to Reject
3.	Return on Capital Employed Ratio	7.939	2.069	1.337E-07	Rejected
4.	Net Profit Margin Ratio	2.093	2.069	0.04	Rejected
5.	Operating Profit Margin Ratio	1.451	2.069	0.19	Fail to Reject
6.	Earnings Per Share Ratio	1.955	2.069	0.06	Fail to Reject
7.	Operating Profit/Total Assets Ratio	1.853	2.069	0.08	Fail to Reject
8.	Gross NPA Ratio	1.644	2.069	0.12	Fail to Reject
9.	Net NPA Ratio	1.855	2.069	0.08	Fail to Reject
10.	Interest Income/Total Assets Ratio	6.918	2.069	1.01E-06	Rejected
11.	Interest Expenses/Total Assets Ratio	6.991	2.069	8.75E-07	Rejected
12.	Net Interest Margin Ratio	6.447	2.069	2.67E-06	Rejected
13.	Capital Adequacy Ratio	4.2680	2.069	0.00031	Rejected

Findings Regarding Correlation and Regression Analysis

For Bank of Baroda

The relation with Bank rate and various profitability ratios like Return on Assets Ratio, Return on Equity Ratio, Net Profit Margin Ratio Operating Profit Margin Ratio EPS Ratio indicated by 0.783, 0.789, 0.791, 0.828, and 0.875 which means Bank Rate and profitability ratio indicated strong positive relation. Out of one variables named as Net NPA Ratio indicated negative correlation with Bank Rate it was -0.836. Net Interest Margin Ratio and Capital Adequacy Ratio indicated by 0.095 and 0.473 with bank rate which means there is no correlation with those variables.

For the testing of hypothesis researcher perform the correlation analysis between bank rate and various selected profitability performance ratio like ROA, ROE, ROCE, NPMR, OPMR, EPS, Net NPA Ratio, Gross NPA Ratio, NIMR and Capital Adequacy Ratio. For the ratio like ROCE, Net Interest Margin Ratio and Capital Adequacy Ratio Correlation analysis indicated there is no significance relation between aforesaid ratio due to p-value is more than 0.05 that's why null hypothesis are accepted and further ratio are rejected because p-value is less than 0.05 (At 5% level of significance).

Regression Analysis indicated significance value is 0.01 which is less than 0.05 that indicated model for regression analysis is significant and it also express bank rate has impacted on net profit margin ratio. In this work researcher also found that same position happened in Bank of India, Punjab National Bank, Central Bank of India, Canara Bank, Indian Bank, Union Bank of India, Indian Overseas Bank and UCO Bank.

Hingu Hitenkumar Dineshbhai

Conclusion

The above strategies, if implemented and monitored closely, will ensure the early restructuring of a bank. The quality of product, service and process will be highly critical for the success of any business enterprise in the new era. This chapter mainly deal with basic finding related to data analysis. The findings related to various profitability ratio, correlation and regression model. And also give some suggestion related to how improve banks profit.

References

Pooja, S. K. (2019, December). Growth aspects of PNB and SBI: A comparative study. *International Journal of Research in Commerce, Economics & Management, 9*(12), 1-6.

Sharma, G., & Sharma, D. (2017). Comparison and Analysis of Profitability of Top Three Indian Private Sector Banks. *International Journal of Engineering Technology Science and Research*, *4*(6), 173-180.

Maina, M. W. (2015). *Determinants of interest rate spread among commercial banks of Kenya* (Doctoral dissertation).

Khan, W. A., & Sattar, A. (2014). Impact of interest rate changes on the profitability of four major commercial banks in Pakistan. *International journal of accounting and financial reporting*, *4*(1), 142.

Das, P., Verburg, R., Verbraeck, A., & Bonebakker, L. (2017). Barriers to innovation within large financial services firms: An in-depth study into disruptive and radical innovation projects at a bank. *European Journal of Innovation Management*.

Tyler, K., & Stanley, E. (2007). The role of trust in financial services business relationships. *Journal of Services Marketing*.

Mishkin, F. S. (1981, January). The real interest rate: An empirical investigation. In *Carnegie-Rochester Conference Series on Public Policy* (Vol. 15, pp. 151-200). North-Holland.

Schmelzing, P. (2019). Eight centuries of global real interest rates, RG, and the 'suprasecular'decline, 1311–2018. *RG, and the 'Suprasecular'Decline*, 1311-2018.

Eichengreen, B., Watson, M. W., & Grossman, R. S. (1985). Bank rate policy under the interwar gold standard: a dynamic probit model. *The Economic Journal*, *95*(379), 725-745.

Koch, T. W., & MacDonald, S. S. (2014). *Bank management*. Cengage Learning.

Nyaberi, N. N. (2018). *Effect of Interest Rate Spread on Financial Performance of Commercial Banks in Kenya* (Doctoral dissertation, University of Nairobi).

Kamunge, E. M. (2013). *The Effect of Interest Rate Spread on the Level of Non Performing Loans of Commercial Banks in Kenya* (Doctoral dissertation, University of Nairobi).

Hingu Hitenkumar Dineshbhai