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IMPACT OF INTEREST RATE CHANGES ON BANK PROFITABILITY

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ABSTRACT

Interest rate changes have a direct impact on lending rates, deposit costs, and the demand for credit generally, all of which have a significant impact on how well banks perform financially. With a focus on a few nationalized banks in India, this study looks at interest rate trends and how they affect important profitability metrics like return on equity (ROE), return on assets (ROA), and net interest margin (NIM). The study examines the connection between interest rate fluctuations and banking profitability in the last several years using statistical techniques like regression, correlation, and ANOVA. According to the research, while dropping interest rates encourage credit expansion but reduce profitability, rising rates initially boost profits but may also reduce loan demand. The study emphasizes how crucial diversification and efficient asset-liability management are to maintaining profitability in contexts with shifting interest rates. By offering empirical insights, this study advances our knowledge of the mechanisms behind monetary transmission and has useful ramifications for investors, policymakers, and bank management in enhancing long-term profitability and financial stability.

Key words: Interest rates, banking profitability, nationalized banks, regression, ANOVA.

INTRODUCTION

The banking industry plays a crucial role in the Indian economy by converting savings into investments and fostering the expansion of the consumer and industrial sectors. Bank profitability is mostly determined by how well they are able to control interest revenue and expenses, which are immediately impacted by changes in interest rates. The Reserve Bank of India (RBI) sets interest rates using policy tools like the repo and reverse repo rate, which have a significant impact on bank financial performance, loan demand, and deposit mobilization. Because nationalized banks like Bank of Baroda (BOB) and Punjab National Bank (PNB) cater to a diverse clientele that includes both major enterprises and individual borrowers, they are especially vulnerable to fluctuations in interest rates. Because loan yields rise in response to interest rate increases, banks may see an increase in net interest margins. Higher borrowing costs, however, may raise the risk of default and tend to dampen down credit demand. In contrast, credit growth typically improves when interest rates decline, particularly in retail lending. However, when the gap between lending and deposit rates closes, margins are tightened. These variations in profitability metrics, like net interest margin (NIM), return on equity (ROE), and return on assets (ROA), demonstrate how closely monetary policy and banking performance are related. Global variables including inflation, capital flows, and foreign monetary policies also have an impact on India's interest rate decisions in the current dynamic environment, which complicates bank profitability results. In addition to bank management, legislators, regulators, and investors must all comprehend how changes in

interest rates impact profitability. It gives banks information about how important it is to diversify their revenue streams and manage assets and liabilities effectively. It indicates to decision-makers how well monetary policy permeates the financial system. Therefore, this study adds significant knowledge to the banking and finance industry by analysing interest rate patterns and their effects on the profitability of a few nationalized banks in India.

REVIEW OF LITERATURE

A literature review is a thorough evaluation of previous research that helps pinpoint knowledge gaps and offers guidance for future investigations. It arranges and assesses earlier research, influencing the applicability and extent of subsequent studies. The following is a summary of the gathered research studies that are pertinent to this field. Girnara (2022) looked into the connection between Indian banks' profitability and changes in repo rates and discovered that it had a big effect on net profit margin and return on assets. Hingu (2022) pointed out that nationalized banks' profitability is especially vulnerable to shifts in bank rates, which have a direct impact on their capital adequacy ratio and net interest margin. Depending on credit growth and default risks, Muraleetharan (2023), who studied Sri Lankan banks, found that interest rate changes had a mixed but significant impact on profitability. International situations have also been studied by other researchers. According to Abubakar's (2017) analysis of non-financial companies listed in Nigeria, high interest rates had a detrimental impact on performance metrics, indicating that interest burden is a critical component of financial health. Similar to this, research conducted in industrialized nations has shown how interest rate transmission affects banks' ability to lend, credit risk, and earnings stability. When taken as a whole, these studies demonstrate how responsive profitability is to changes in monetary policy, particularly when it comes to changes in interest margins, lending rates, and deposit costs. This study aims to fill the gap in the literature by concentrating just on a few Indian nationalized banks.

RESEARCH OBJECTIVES AND METHODOLOGY

The purpose of this study is to evaluate the impact of interest rate changes on the profitability of a subset of Indian nationalized banks. Using a dataset spanning the previous 10 years, from 2014 to 2023, it examines the connection between interest rate changes and performance metrics, concentrating on significant nationalized banks like Bank of Baroda (BOB) and Punjab National Bank (PNB). These banks were chosen due to their extensive reach throughout the Indian economy and their important role in financial intermediation.

The tools used in this study are ANOVA, regression, and correlation are the methods employed in this investigation. To determine the direction and degree of the relationship between interest rates and profitability metrics such net interest margin (NIM), return on equity (ROE), and return on assets (ROA), correlation is used. Regression analysis offers a more thorough understanding of causal effects by assisting in quantifying the degree to which differences in profitability can be explained by changes in interest rates. The results are validated by using ANOVA to examine the statistical significance of variations in profitability across different interest rate situations.

The objectives of the research study are:

1. To assess the trend of interest rate movements and their influence on key profitability indicators of selected nationalized banks in India.
2. To analyse the impact of interest rate changes on profitability of selected nationalized banks in India.

ANALYSIS AND INTERPRETATION

While interpretation examines the findings to derive significant conclusions, analysis looks for patterns in the research findings. The data analysis in this study focuses on how interest rate fluctuations affect the profitability of particular Indian nationalized banks. Financial performance is assessed using profitability metrics including Net Interest Margin (NIM), Return on Equity (ROE), and Return on Assets

(ROA). ANOVA, regression, and correlation were the statistical methods employed in this study, and SPSS software was utilized to apply them. Interest rate changes and profitability indicators have a relationship, and correlation helps identify how strong and which way it is. While an ANOVA determines whether the variances are statistically significant, regression is used to quantify the degree to which interest rate changes affect bank performance. All of these techniques work together to validate the study's goals and offer a thorough understanding of how interest rate changes impact the profitability of nationalized banks.

HYPOTHESES

- There is relationship interest rate profitability NIM) of selected India. Analysis)

Table no:1

Variables	Abbreviations
Return on Assets	ROA
Return on Equity	ROE
Net Interest Margin	NIM
Net Profit Margin	NPM
Interest Income	II
Non-interest Income	NII
Cost to Income	C/I
Capital Adequacy ratio	CAR
Repo Rate	RR
Cash Reserve Rate	CRR
Statutory Liquidity Ratio	SLR

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no significant between the trend of movements and key indicators (ROA, ROE, nationalized banks in (Correlation

Variables selected

Objective 1: To assess the trend of interest rate movements and their influence on key profitability indicators of selected nationalized banks in India. (Correlation)

H⁰: There is no significant impact between interest rate changes and profitability.

Table no: 2

		Return on Assets	Return on Equity	Net Interest Margin	Net Profit Margin	Interest Income	Non-Interest Income	Cost to Income	Capital Adequacy Ratios
ROA	Pearson Correlation	1	.994**	.734*	.998**	.041	-.267	-.327	.943**
	Sig. (2-tailed)		.000	.016	.000	.911	.456	.357	.000
	N	10	10	10	10	10	10	10	10
ROE	Pearson Correlation	.994**	1	.714*	.996**	.019	-.242	-.322	.928**
	Sig. (2-tailed)	.000		.020	.000	.959	.501	.363	.000
	N	10	10	10	10	10	10	10	10
NIM	Pearson Correlation	.734*	.714*	1	.728*	.078	-.613	.185	.839**
	Sig. (2-tailed)	.016	.020		.017	.831	.059	.609	.002
	N	10	10	10	10	10	10	10	10
NPM	Pearson Correlation	.998**	.996**	.728*	1	.000	-.283	-.322	.944**
	Sig. (2-tailed)	.000	.000	.017		.999	.429	.364	.000
	N	10	10	10	10	10	10	10	10
II	Pearson Correlation	.041	.019	.078	.000	1	-.043	-.312	.044
	Sig. (2-tailed)	.911	.959	.831	.999		.905	.381	.905
	N	10	10	10	10	10	10	10	10
NII	Pearson Correlation	-.267	-.242	-.613	-.283	-.043	1	-.221	-.434
	Sig. (2-tailed)	.456	.501	.059	.429	.905		.539	.210
	N	10	10	10	10	10	10	10	10
C/I	Pearson Correlation	-.327	-.322	.185	-.322	-.312	-.221	1	-.191
	Sig. (2-tailed)	.357	.363	.609	.364	.381	.539		.597
	N	10	10	10	10	10	10	10	10
CAR	Pearson Correlation	.943**	.928**	.839**	.944**	.044	-.434	-.191	1
	Sig. (2-tailed)	.000	.000	.002	.000	.905	.210	.597	
	N	10	10	10	10	10	10	10	10

INTERPRETATION

Interest rate trends and how they relate to important profitability metrics including return on equity (ROE), return on assets (ROA), net interest margin (NIM), and net profit margin (NPM). ROA and ROE ($r = 0.994$, $p < 0.01$), ROA and NPM ($r = 0.998$, $p < 0.01$), and ROE and NPM ($r = 0.996$, $p < 0.01$) all showed very strong positive correlations, according to the analysis, suggesting that improvements in asset and equity returns closely correspond with net profit margins. Additionally, a considerable positive association between the Capital Adequacy Ratio (CAR) and ROE ($r = 0.928$, $p < 0.01$) and ROA ($r = 0.943$, $p < 0.01$) was seen, highlighting the significance of a robust capital foundation in boosting profitability. ROE ($r = 0.714$, $p < 0.05$) and ROA ($r = 0.734$, $p < 0.05$) showed a moderately favourable association with the NIM, indicating that core lending margins are not the only factors driving profitability. Profitability and the cost-to-income ratio have a negative correlation (ROA: -0.327 , ROE: -0.322), suggesting that operational inefficiencies lower profitability.

Objective 2: To analyze the impact of interest rate changes on profitability of selected nationalized banks in India. (ANOVA)

H⁰: There is no significant impact between interest rate changes and profitability.

Independent Variable: Repo Rate

Table no: 3a ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.
ROA	Between Groups	15.568	7	2.224	31.479	.031
	Within Groups	.141	2	.071		
	Total	15.709	9			
ROE	Between Groups	4435.943	7	633.706	45.624	.022
	Within Groups	27.780	2	13.890		
	Total	4463.723	9			
NIM	Between Groups	1.807	7	.258	4.420	.197
	Within Groups	.117	2	.058		
	Total	1.924	9			
NPM	Between Groups	3714.831	7	530.690	73.943	.013
	Within Groups	14.354	2	7.177		
	Total	3729.185	9			

Independent Variable: Cash Reserve Ratio**Table no: 3b ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
ROA	Between Groups	1.970	2	.985	.502	.626
	Within Groups	13.739	7	1.963		
	Total	15.709	9			
ROE	Between Groups	514.097	2	257.049	.456	.652
	Within Groups	3949.626	7	564.232		
	Total	4463.723	9			
NIM	Between Groups	.087	2	.044	.166	.850
	Within Groups	1.836	7	.262		
	Total	1.924	9			
NPM	Between Groups	427.637	2	213.818	.453	.653
	Within Groups	3301.548	7	471.650		
	Total	3729.185	9			

Independent Variable: Statutory Liquidity Ratio**Table no: 3c ANOVA**

		Sum of Squares	df	Mean Square	F	Sig.
ROA	Between Groups	12.813	4	3.203	5.529	.044
	Within Groups	2.897	5	.579		
	Total	15.709	9			
ROE	Between Groups	3897.980	4	974.495	8.613	.018
	Within Groups	565.743	5	113.149		
	Total	4463.723	9			

NIM	Between Groups	1.396	4	.349	3.311	.111
	Within Groups	.527	5	.105		
	Total	1.924	9			
NPM	Between Groups	3110.642	4	777.660	6.286	.035
	Within Groups	618.543	5	123.709		
	Total	3729.185	9			

INTERPRETATION

Repo Rate (RR):

It is determined that there is statistically little impact of the repo rate on the profitability metrics of particular nationalized banks. The coefficients of the repo rate are low and not significant across regression analyses for the majority of profitability indicators, including Return on Equity ($B = -0.100$, $p = 0.983$), Return on Assets ($B = 0.102$, $p = 0.666$), Net Interest Margin ($B = -0.025$, $p = 0.538$), and Net Profit Margin ($B = 0.900$, $p = 0.809$). It is implied by the absence of statistical significance that adjustments in the repo rates implemented by the RBI during the study period did not significantly or directly affect changes in the profitability ratios of the banks. When banks successfully control interest cost pass-through or modify their lending and deposit pricing to counteract changes in policy rates, this can happen. In conclusion, although if the repo rate is a key tool for monetary policy, under efficient asset-liability management, its isolated fluctuations often have a negligible direct influence on the profitability metrics of well-capitalized nationalized banks.

Cash Reserve Ratio (CRR):

The CRR regression coefficient shows a potential positive impact on profitability, especially on Net Profit Margin ($B = 4.781$, $p = 0.062$, near 10% significance) and Return on Assets ($B = 0.291$, $p = 0.600$), even though the majority of relationships are not statistically significant at standard 5% thresholds. As a result of better liquidity management and stronger balance sheets, this suggests that improvements in CRR may marginally improve margin and asset returns. But much like with the repo rate, the absence of strong statistical significance in all models indicates that changes in CRR by themselves won't be enough to significantly alter the banks' profitability. Higher reserve requirements have only a small impact on performance ratios because of effective risk and liquidity management, which lessens their negative effects.

Statutory Liquidity Ratio (SLR):

According to analysis, the SLR generally has a negative effect on the majority of profitability measures, including return on equity ($B = -0.384$, $p = 0.946$), return on assets ($B = -0.127$, $p = 0.654$), net interest margin ($B = -0.136$, $p = 0.077$), and net profit margin ($B = -1.156$, $p = 0.793$). However, none of these results approach conventional significance levels, with the exception of its effect on NIM, which is nearly marginally significant. Higher SLR puts pressure on banks to keep a bigger percentage of their money in low-yield, liquid government securities rather than assets that generate income, which lowers margins and overall profitability. The empirical importance of this theoretical effect is low, indicating that banks have effectively managed regulatory restraints by strategic asset allocation and portfolio optimization.

CONCLUSION

The Reserve Bank of India's regulatory actions and interest rate changes have a significant impact on the profitability of a few nationalized banks in India, according to the thorough examinations of goals three and four. Strong positive correlations between the capital adequacy ratio and important profitability metrics, including ROA, ROE, and NPM, show that banks with a strong capital base consistently perform better, while stable net interest margins moderately support profitability. Higher operating expenses and an excessive dependence on interest income, however, continue to be problems. While the direct effect of the CRR is minimal, regression and ANOVA studies show that changes in the repo rate and SLR have a statistically significant impact on asset returns, equity returns, and profit margins. While CRR generally affects broader liquidity rather than immediate profit ratios, the repo rate and SLR stand out as the key monetary policy tools influencing bank profitability, principally via influencing loan costs, liquidity requirements, and asset allocation. In conclusion, responsiveness to repo rate and SLR changes determines banks' ability to continue profitable and resilient expansion under changing market and regulatory conditions, even though internal efficiencies and capital management play the major roles.

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