"A Comparative Analysis of Capital to Risk Weighted Assets in context of Bank of Baroda and Industrial Credit and Investment Corporation of India Bank"

Abstract:

Capital adequacy ratio is common ratio for bank solvency measurement. Capital adequacy ratio is key measurement of bank's available capital against banks' risk weighted assets. The study chooses 2 leading Indian public and private sector banks Bank of Baroda and ICICI Bank for year 2020 to 2024.The objective of study includes to study about capital to risk weighted assets ratio concept and made comparison of capital adequacy ratios of selected banks. The data was collected through annual reports of selected banks. The paper uses descriptive statistics and T test for data analysis. Results of the study concludes that although ICICI Bank has fluctuation in capital to risk weighted assets and Bank of Baroda has increase in the capital adequacy ratio but there is no significant difference in the selected ratio.

Keywords: Bank, Descriptive statistics, Normality test, T- test, Capital Adequacy Ratio

1. Introduction: Capital to Risk Weighted Assets ratio (CRAR) also known as Capital Adequacy ratio is financial benchmark of the measurement of bank's obtainable capital against its risky weighted assets. It determines the risk of bank's failure as it measures the capital reserves for unexpected losses and continuesoperation during bank's downfall.

According to Reserve Bank of India (2013, July 1) master circular no. (DBODNo.BP.BC.2 /21.06.201/2013-14) International financial standard Basel norms III set certain level of capital to minimize the risk of bank's failure. This reform sets raise in capital base, prevents the practice of excessive risk taking and strict timetables. Banks are required to maintain minimum pillar 1 capital to risk weighted assets ratio at 9% ongoing basis. Total regulatory Capital will include sum of these components:

1. *Tier 1* (going on concern): (a) Common equity tier 1 Capital (b) Additional tier 1

2. *Tier 2* capital (gone concern capital)

Bank should follow following formulas for calculation of capital adequacy ratio:

1). ***Common equity Tier 1Capital Ratio*** =

$$\frac{\text{Common equity Tier 1 Capital}}{\text{Credit Risk Weighted Assets + Market Risk Weighted Assets + Operational Risk Weighted Assets}}$$

2). ***Tier 1*** **Capital Ratio** =

$$\frac{\text{Eligible Tier 1 Capital}}{\text{Credit Risk Weighted Assets + Market Risk Weighted Assets + Operational Risk Weighted Assets}}$$

3). **Total Capital CRAR[1] =**

$$\frac{\text{Eligible Total Capital}}{\text{Credit Risk RWA* + Market Risk RWA* + Operational Risk RWA*}}$$

1 CRAR= Capital to risk weighted ratio* RWA= Risk weighted assets

Total capital adequacy ratio is more important ratio as below minimum standard requirement can trigger regulatory interference. Bank of Baroda is one of the leading public sector bank in India.it was established in 20th July, 1908. In 2025 it is among top five banks by its assets size. ICICI bank formerly known as Industrial Credit and Investment Corporation of India is leading private sector bank of India while it was established in 1955 in 2025 it is one of the largest private sector bank with its broad agglomeration of financial services.

2. Review of literature:

When equity capital improves, capacity of loss bearing also improves but the cost of funding also increases. The CET1 capital, tier 1 Capital and subordinate capital are three measures of capital adequacy. The study focuses on CET 1 capital as first observant of loss is CET1. The paper selected Norwegian banks as Norwegian banks have gone through major regulatory changes.The result of study states that CET1 ratios between 12 to 19 percent.(Andersen & Juelsrud, 2023)

In paper capital adequacy determinants and relationship with bank's profitability was analyzed. Capital adequacy and return on equity were taken as dependent variables while macro variables, Return on assets, Tobin Q, credit growth, GDP growth, bank size, liquidity risk, inflation, non-performing loans etc. were used as independent variables.16 Vietnamese banks were chosen for the study with the period of 2010 to 2017.The result states negative significant relationship between capital adequacy ratio and performance. (Dao & Nguyen, 2020)

The study investigates the factors affecting capital adequacy. Three major variables affects capital adequacy of Jordan banks in which risk negatively impacts on capital adequacy ratios.Return on average assets shows biggest impact on capital adequacy among all variables. The paper also indicates lesser capital adequacy signaled moral hazard.The paper proposes overcapitalized banks are sensitive to basic factors. (AlZoubi, 2021)

Capital adequacy ratio establishes the capacity of bank to fulfill temporary risk such as market risk, credit risk and operating risk. Return on assets and return on equity were considered as dependent variables and capital adequacy ratio acted as independent ratio. The research objective was to establish whether capital adequacy ratio affects return on equity and return on assets. The research selected MEMA countries Islamic banks for study. The result states that capital adequacy ratio influences return on equity.(Alnajjar & Othman, 2021)

Capital adequacy ratio, net interest margin, non-performing loans were taken as variable for determining banks financial status. There were 27 Indonesian banks selected for the study period limits 2012 to 2016. Multiple linear regression analysis, T-test were performed to analyses the data.The results of data shows Capital adequacy ratio have no significant effect on banks profitability.(Silaban, 2017)

Capital adequacy ratio reduces local and cross brodar transaction risk. The study includes 33 banks of Egypt for the period of 2003 to 2013. The study includes time of international crisis. Before international crisis of 2008 the assets quality, size, profitability were significant variable and liquidity, management quality, credit Risk. The study uses multiple regression for analysis.(Hafez & El-Ansary, 2015)

Maintaining minimum capital adequacy ratios reduces systematic and probability of failure. The objective of paper was to know about required regulatory Capital ratios by analyzingrelationship between profitability and capital adequacy ratios. The study selected sample of us bank holding companies for year 2003 to 2009. The results of study state that capital adequacy ratios negatively effect the profitability when it were fall below 6 %.(Abou-El-Sood, 2015)

The paper examines independent variables bank size, debt equity ratios, cost income ratio, equity and total adequacy ratio affects dependent variables bank performance measurable as return on assets. The fixed assets model of data analysis was used for 10 Nepalese commercial banks. The output of study shows total Capital adequacy ratio has negative significant effect on return on assets.(Chalise, 2019)

3. Objectives of study:

1) To study the concept of capital to risk weighted assets credit exposure.

2) To compare the capital to risk weighted assets credit exposure of selected banks.

4. Research Methodology:

a) **Type of research:** This research is descriptive and comparative case study in nature.

b) Scope of study: This study includes public and private sector banks of India. Name of selected banks are: 1). **Bank of Baroda** 2)**.** Industrial credit and investment corporation Bank **(ICICI Bank)**

c) Sampling technique: The banks are selected on the basis of random sample selection. The base of selection was highest market share in public and private sector banks.

d) Type of data: The data used in the study is secondary.

e) **Source of data:** The data which were required for the study collected through Annual reports of Bank of Baroda, Annual reports of ICICI Bank, Reports and circulars of Reserve bank of India.

f) Duration of the study: 5 years data were collected which starts from year 2020 to 2024.

g) Tools used for the study: Normality test, Independent t- test, percentage, total capital adequacy ratio, tables, trend analysis chart.

5. Hypothesis:

Null Hypothesis: H_o There is no significant difference inTotal Capital Adequacy Ratio between Bank of Baroda and ICICI Bank

Alternative Hypothesis: H_1There is a significant difference in Total Capital Adequacy Ratio between Bank of Baroda and ICICI Bank

6. Data Interpretation:

Year	Total Capital Adequacy Ratio In %
2020	**13.30**

2021	**14.99**
2022	**15.68**
2023	**16.24**
2024	**16.31**

Table 1.1 Bank of Baroda*

***Source: Author's creation**

Interpretation: Table1.1 showing Capital adequacy ratio of Bank of Baroda. The ratio was calculated on the basis of total capital adequacy ratio Basel III framework. In 2020 the ratio was 13.30% and in 2021 it was 14.99% than in 2022 it was 15.68 % followed by 16.24% in 2023 and 16.31 % in 2024 which is showing continuous improvement in previous years.

Chart 1.1^^ socrce: author's creation

Interpretation: Trend anlysis chart showing a increasing line which indicatates continuous growth in capital adeqaucy ratio. On x axis years are indicated and on y axis ratio are indiacting.although it is increasing every year but in last year the rate of increament is falling.

Year	Total Capital Adequacy Ratio In %
2020	16.10
2021	19.10
2022	19.20
2023	18.30
2024	16.30

Table 1.2

ICICI Bank

Interpretation: Table 1.2 showing capital adequacy ratio of ICICI Bank. The ratio was calculated on the basis of total capital adequacy ratio Basel lll framework. Capital adequacy ratio was 16.10% in 2020 and 19.10% in 2021 which is showcasing rapid increase than we can see slight increase in 2022 the ratio was 19.20% than we see decrease in the ratio in year 2023 showing 18.30% and we can see rapid decrease in ratio in year 2024 when the ratio remained 16.30%. It could be said that ICICI Bank has not been able toretain a continuous capital adequacy.

Chart 1.2

Interpretation: Trend anlysis chart 1.2 shows a line which is increasing in first 2 years ; 2020,2021 which remins steady in next year in 2023 it start falling.which shows rapid growth and rapid fall in total capital adequacy ratio.

The data was collected through Annual reports of related banks of relevant years and analyzed by using SPSS software, for execution of comparison; Independent T test has been used. Before performing the test, four assumptions are made:-

1. **Independence of data**: The data used for study are independent from each other. As sample of two banks and for years that are vary from others. So the observation (5 observations each) from each other.

Group Statistics						
	BANK	N	Mean	Std. Deviation	Std. Error Mean	Variance
CAPITAL ADEQUACY RATIO	BANK OF BARODA	5	15.3040	1.23937	.55426	1.536
	ICICI BANK	5	**17.8000**	1.50333	.67231	2.260

Table 2.1 Group Statistics, Variance *

**Source: SPSS software*

Interpretation: The result of descriptive statistics table 2.1 shows a statistical significant difference in mean values of capital adequacy ratio of two banks. ICICI Bank showed more mean Bank of Baroda that means capital adequacy of ICICI Bank is more significant than capital adequacy of Bank of Baroda.

2. **Homogeneity of data:** Both the dependent variables have approximately same variance. As we can see from the group statistics table 2.1 Bank of Baroda has a variance of 1.536 and ICICI bank has 2.260 variance.

3. **Random Sampling:** Both samples were collected from annual reports without any biasness.

4. **Normality:** The samples 5 each are approximately normally distributed. As sample size is less than 50 so Shapiro Wilk test of normality is proposed.

Tests of Normality			
	BANK	Kolmogorov-Smirnov[a]	Shapiro-Wilk

		Statistic	df	Sig.	Statistic	df	Sig.
CAPITAL ADEQUACY RATIO	BANK OF BARODA	.219	5	.200*	.863	5	.238
	ICICI BANK	.241	5	.200*	.828	5	.135
*. This is a lower bound of the true significance.							
a. Lilliefors Significance Correction							

Table 2.2 Normality Test {*Source: SPSS Software}*

Interpretation: As the p value .238> 0.05 and .135> 0.05 for both the dependent variables, so the distribution is normal.

After we tested all assumptions, the data was subjected to independent sample T-test.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
CAPITAL ADEQUACY RATIO	Equal variances assumed	.924	.365	-2.865	8	.021	-2.49600	.87132	-4.50528	-.48672
	Equal variances not assumed			-2.865	7.719	.022	-2.49600	.87132	-4.51807	-.47393

Table 2.3 Independent T- Test *Source: SPSS Software*

From the above T test table 2.3p value is .021 which is smaller than significant value 0.05 so null hypothesis (H_0) is accepted that there is no significant difference between capital adequacy ratio of bank of Baroda and ICICI Bank and alternative hypothesis is rejected.

7. Results:

The null hypothesis (H_o) is accepted that there is no statistically significant difference in capital adequacy ratio of Bank of Baroda and ICICI Bank on the basis of T test. Although mean values of ICICI bank is showing more significance.

8. References:

1. Abou-El-Sood, H. (2015). Are regulatory capital adequacy ratios good indicators of bank failure? Evidence from US banks. International Review of Financial Analysis, 48, 292–302. https://doi.org/10.1016/j.irfa.2015.11.011
2. Alnajjar, A., & Othman, A. H. A. (2021). The impact of Capital Adequacy Ratio (CAR) on Islamic Banks' performance in selected MENA countries. International Journal of Business Ethics and Governance, 116–133. https://doi.org/10.51325/ijbeg.v4i2.70
3. AlZoubi, M. (2021). Bank capital adequacy: the impact of fundamental and regulatory factors in a developing country. Journal of Applied Business Research (JABR), 37(6), 205–216. https://doi.org/10.19030/jabr.v37i6.10395
4. Andersen, H., & Juelsrud, R. E. (2023). Optimal capital adequacy ratios for banks. Latin American Journal of Central Banking, 5(2), 100107. ISSN 2666-1438, https://doi.org/10.1016/j.latcb.2023.100107.(https://www.sciencedirect.com/science/article/pii/S2666143823000285)
5. Chalise, S. (2019). The impact of Capital adequacy and Cost-Income Ratio on performance of Nepalese commercial banks. International Journal of Economics and Management Studies, 6(7), 78–83. https://doi.org/10.14445/23939125/ijems-v6i7p112
6. Dao, B. T. T., & Nguyen, K. A. (2020). Bank Capital Adequacy Ratio and Bank Performance in Vietnam: A Simultaneous Equations Framework. Journal of Asian Finance Economics and Business, 7(6), 39–46. https://doi.org/10.13106/jafeb.2020.vol7.no6.039.
7. Hafez, H. M., & El-Ansary, O. A. (2015). Determinants of capital adequacy ratio: an empirical study on Egyptian banks. Corporate Ownership and Control, 13(1), 1166–1176. https://doi.org/10.22495/cocv13i1c10p4
8. Silaban, P. (2017). The effect of capital adequacy Ratio, net interest margin and Non-Performing loans on bank profitability: the case of Indonesia. International Journal of Economics and Business Administration, V(Issue 3), 58–69. https://doi.org/10.35808/ijeba/135