

An Impact Of Capital Adequacy Ratio On The Profitability Of Commercial Banks In India

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Abstract

Studies have also indicated that there is a positive correlation between capital adequacy ratio and profitability of banks. An increase in the capital adequacy ratio leads to an increase in the profitability and vice versa. The objective of this research is to investigate the effects of capital adequacy ratio on the financial performance of Indian commercial banks. The secondary data have been utilized for the purposes of this study. Capital adequacy is the independent variable and the profitability of commercial banks is the dependent variable for the study. The return on assets and return on equity and net interest margin are the proxies for the profitability. The information was gathered from the audited financial reports available at money control.com and investing.com for selected largest 16 banks between 2017-2018 to 2022-2023. The Linear Regression model was also used for the analysis of data. The results of the study revealed that capital adequacy ratio significantly predict return on assets, return on equity and net interest margin. An increase in the capital adequacy ratio leads to an increase in the return on assets, return on equity and net interest margin. An increase in return on assets, return on equity and net interest margin are reflected in an increase in the profitability of banks. Thus, it may be concluded that a movement in capital adequacy ratio has an impact on the profitability of commercial banks.

Keywords: Profitability, return on assets, Capital Adequacy.

INTRODUCTION

A number of factors determine the profitability of commercial banks. There are various bank-specific, industry-specific, and macroeconomic factor which are responsible for commercial banks' performance. The early studies on the financial performance of commercial banks recorded that bank-specific factors like board size, bank size, capital ratio, funding cost, revenue diversification, and bank age are the major factors determining the profitability of the banks. Studies have also indicated that there is a positive correlation between capital adequacy ratio and profitability of banks. An increase in the capital adequacy ratio leads to an increase in the profitability and vice versa.

Capital Adequacy Ratio (CAR) is the process of measuring ratio that determine the ability of banks to take in losses. It standardizes the banks' abilities to pay off its liabilities, tackle credit and operational risks. The Central Bank sets the bar on the required number that the CAR must show, thereby helping banks analyze their commercial leverage. Solvency is the amount of

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capital that a bank or other financial institution must have the financial regulator requires. This is usually expressed as a stock ratio which must be calculated as a percentage of risk-weighted assets. These requirements are fixed to ensure that financial institutions do not become too leveraged or become insolvent. Capital requirements regulate the ratio of equity to debt, which is reflected on. The return on assets, return on equity and net interest margin also play a role in determining the profitability of a commercial bank. This study has attempted to examine the role of return on assets, return on equity and net interest margin in determine the profitability of commercial banks in India.

2.0 REVIEW OF LITERATURE

The opinion regarding the adequate level of capital adequacy differs among experts, regulators and the bankers in banking and finance sector. On one side regulators emphasize on the safety of banks and prefer higher level of capital for the feasibility of insurance funds and stability of financial markets. A higher level of capital adequacy increases liquidity of bank and reduces the possibility of bank failure. On the other side bankers normally favor to operate with lower level of capital adequacy. The smaller equity base, the greater will be the financial leverage and equity multiplier, which will convert a normal return on assets into a high return on equity (Koch, 2010). Hitherto, numerous studies emphasized on the importance of capital adequacy. This required a review of related studies with a view to gain further understanding of the subject. Various researchers studied the profitability of banks relating to capital adequacy ratio;

Myers & Majluf (1984), Morrison and White (2001), Al- Mikhlafl et al. (2004), Liyuqi (2007), Jackson (2011) , Jeff (1990), Kolapoc (2012) , Poudel (2009), Sedhain (2012), Jha & hui (2012), Jeff (1990), Ebhodaghe (1991), Umoh (1 Al-sbbagh (2004) 991), Reynolds (2000), Yu (2000), Onoh (2002), Tanaka (2002), Navapan and Tripe (2003), Mathuva (2009), Williams (2011), Asarkaya and Ozcan (2007), Ho and Hsu (2010), Aspal, et al, (2014), Buyuksalvarc and Abdioglu (2012), Staikouras and Wood (2004), Sayilgan and Yildirim (2009), (Torbira and Zaagha, 2016), Onoalapo and Olufemi (2012), Ezike and Oke (2013), Agbeja, O., Adelakun, O.J., & Olufemi, F. I. (2015). **Myers & Majluf (1984)** revealed that in the absence of periodic adjustments in the capital ratio, banks would never hold more capital than required by the regulators or the market. Practically, however, making adjustments in the capital ratio may be costly. Equity issues can, in the case of information asymmetries, give negative information to the market on the economic value of the bank. **Morrison, and White (2005)**. in their research paper Crises and Capital Requirements in Banking stated that capital requirements combat moral hazard when the regulator has a strong screening reputation, and they otherwise substitute for screening ability. Confidence crisis can take place only in the latter case, the appropriate policy response may be to restrict capital requirements to bring improvement in the quality of surviving banks. **Al-Mikhlafl et al. (2004)** stated that both banking risk indicators and returns are affected by bank capital adequacy and this will be reflected in the bank value. The study also revealed the need for taking necessary internal actions and measures to ensure compliance with Basel 2 decisions regarding banking capital adequacy, and finally selecting the time scheduling that is suitable for execution. **Liyuqi (2007)** concluded that liquidity and risk involved in credit have negative impact on profitability of the banks. **Jackson (2011)** studied the impact of credit risk management on financial performance of commercial banks in Kenya and concluded that credit risk management have positive relationship with banks profitability. **Kolapoc (2012)** concluded that credit risk management has a significant impact on profitability of Nigerian banks. **Poudel (2009)** indicated that the net profit is proximately related with total loan and advances. An increase in the loan and advances causes an increase in net profit also. Thus, net profit depends on total loan and advances as well as other investment of banking activities. Since net profit is the net income for the banks which is net amount i.e. deducting of various

expenditure amount. Specially, increment in pass loan leads the increment in net income of the bank. **Sedhain (2012)** arrived the conclusion that capital adequacy has provided assistance for the development of appropriate prudential norms to rescue the banks and financial institutions from crisis of financial nature and alerts of failure. The dissertation further concluded that the operating environment of the bank has changed radically, and their risk management system has also improved). **Jha & hui (2012)** revealed that return on assets was significantly influenced by capital adequacy ratio, interest expenses to total loan and net interest margin, while capital adequacy ratio had considerable effect on return on equity. This study aims at examining the effect of capital adequacy and operating efficiency in the performance of commercial banks of Nepal. It also examines the effect of capital adequacy on the operating efficiency of commercial banks in Nepal. **Jeff (1990)** revealed that capital adequacy is reflected in asset size as a proxy of a well-managed bank. Capital adequacy considered the foremost benchmark and primary measure for safety and soundness for banks and financial institutions. **Ebhodaghe (1991)** highlighted that capital adequacy level as a situation where the banks' adjusted capital is adequate to take up all unexpected losses arising in the future and cover fixed assets. Moreover, there should be a sufficient surplus for running day to day operations and future expansion. **Umoh (1991)** argued that adequate capitalization is a significant variable in banking business. **Reynolds et al. (2000)** studied financial structure and bank performance using dependent variables (capital adequacy, profitability, and loan preference) were regressed to structural variables (bank assets, net income, administrative expenses and time). **Yu (2000)** documented bank size; liquidity and profitability are the main determinants of bank capital ratio in Taiwan. The study found the relationship between the equity-to-asset ratio and the liquidity ratio is significantly positive for small banks, but significantly negative for medium size banks. **Onoh (2002)** exposed that adequacy of capital is regarded as the ratio of capital that can efficiently protect operations of the banks from failure by taking in losses. Additionally, adjustments in the level of capital have to be made in the condition when there are expectations that the total operational expenses and requirements for withdrawal may go up. **Tanaka (2002)** examined the influence of regulation on bank capital adequacy on the mechanism of monetary transmission. Using a general equilibrium framework, the study revealed that the mechanism of monetary transmission is weakened if banks have low level of capital or if the capital adequacy requirement is rigid. **Navapan and Tripe (2003)** underlined that return on equity as one way of measuring the banks' performance in comparison to other banks. Study asserted that there should be a negative relationship between a bank's ratio of capital to assets and its return on equity may seem to be self-evident as to not need empirical verification. The study found negative relationship between capital and profitability exists. **Al-sbbagh (2004)** investigated the determinants of the capital adequacy ratio (CAR) in Jordanian commercial banks. Study revealed that CAR was positively affected by return on assets, loan to assets ratio, risky assets ratio and dividends payout ratio while negatively influenced by deposits assets ratio, size of bank and loan provision ratio. In the context of Nepal, **Udas (2007)** revealed that there was significant impact on NRB directives of capital adequacy on the various aspects of the commercial banks and it also helped in maintaining the stability of commercial banks in the financial market and to uplift the banking sector in Nepal to international standard. **Mathuva (2009)** found that bank profitability is positively related to the core capital ratio and tier 1 risk based capital ratio. The study, using the return on assets and return on equity as proxies for bank profitability for the period 1998 to 2007, also American Journal of Research Communication www.usa-journals.com **Williams (2011)** examined the impact of characteristics of banks, their structure of finances and macroeconomic indicators on banks capital base in the banking industry in Nigeria. The study revealed that economic indicators such as rate of inflation, real exchange rate, demand deposits, money supply, political instability, return on investment are most robust predictors of the determinants of capital adequacy in Nigeria. **Aspal, et al, 2014: 2(11) 32** ajrc.journal@gmail.com established that there

exists negative relationship between the equity capital ratio and equity. **Asarkaya and Ozcan (2007)** analyzed the determinants of capital structure and identified the factors that explain why banks hold capital beyond the amount required by the regulation. The findings suggested that lagged capital, portfolio risk, economic growth, average capital level of the sector and return on equity are positively correlated with capital adequacy ratio and a negative correlation of share of deposits with capital adequacy ratio. **Ho and Hsu (2010)** investigated the relation between firms' financial structures and risky investment strategy in Taiwan's banking industry. The results found that the restrictions on capital adequacy ratio have influenced banks' risky investment strategies, as market share and leverage are positively related. Finally, the regression results found that financial structures for banking firms are positively related to the states of business cycle. **Aspal, et al, (2014)** opined that insured banks must have sufficient capital that may afford a cushion to absorb possible future losses. There should be adequate funds for banks' operations and expansion, as well as protection and safety for stakeholder and depositors' deposits are ensured. Similarly, a study by **Buyuksalvarc and Abdioglu (2012)** used profitability, deposits, size of banks and liquidity as bank specific factors to assess their impact on capital adequacy requirements. The prime motive of private sector banks in India is the profitability. The profitability is mere source for Their survival, growth, expansion and diversification solely depend upon the profitability **Staikouras and Wood (2004)** concluded that bank profitability is influence positively by concentration and market share. **Sayilgan and Yildirim (2009)** found that capital adequacy has positive impacts on profitability of banks. Financial performance is an assessment of the financial conditions or profitability of a bank in order to gain insight into the health of the bank using an index that relates to two pieces of financial data, called financial ratios (**Torbira and Zaagha, 2016**). Research has also shown that capital adequacy indeed influences the financial performance of businesses in general and banks in particular. **Onoalapo and Olufemi (2012)** 's study revealed that, capital adequacy ratio does not impact the profits of banks return on assets, return on capital employed and percentage of profit before Tax represent. Similarly, Santos (2000) asserted that bank regulation requiring higher capital levels negatively affect bank development and credit expansion by causing an increase in fixed and operating costs. However, **Ezike and Oke (2013)** study indicated that capital adequacy Shareholders Fund proxy capital adequacy make positive influence on banks' profit, total assets, total deposits, return on assets, earnings per share, loans and advances and credit risk, although not statistically significant. examined the effect of capital adequacy on profitability of deposit-taking in banks in Nigeria. The results revealed that there was a strong positive relationship between the capital adequacy ratio and the profitability of banks in Nigeria. However, other internal and external factors were also responsible for the profitability of banks. **Agbeja, O., Adelakun, O.J., & Olufemi, F. I. (2015)** examined if capital adequacy ratio affects bank profitability. This study found that higher the capital adequacy ratio, higher the profitability of the banks.

Research Methodology

Problem Statement

The Capital Adequacy Ratio is related with the profitability of commercial banks in India.

Objectives of the Study

The main objectives of the study are:

1. To study the capital adequacy trend along with concurrent profitability for selected commercial banks in India.
2. To assess the impact of capital adequacy on the banks' profitability

Hypotheses

The research hypothesized that:

1. H₀: Capital adequacy ratio has no significant impact on the return on assets of the commercial banks in India.
2. H₀: Capital adequacy has no impact on the return on equity of the commercial banks in India.
3. H₀: Capital adequacy has no impact on the net interest margin of the commercial banks in India.

METHODOLOGY

The commercial banks in India served as the population for the study.

SAMPLE AND SAMPLING TECHNIQUE

16 largest commercial banks (based on the size of the bank) served as the sample for the study. The assets of the banks provided the list of the 16 largest commercial banks in India. The State Bank of India came out to be the largest bank with the largest capital and the Indian Overseas Bank, was the smallest bank of the sample.

Variables for the Study:

The capital adequacy was treated as the predictor variable. The profitability of the commercial banks served as the dependent variable for the study. The return on assets, return on equity and net interest margin were used to measure the profitability of the commercial banks.

Statistical techniques:

The Linear Regression analysis technique was used for the study was used to compute the values of the coefficients of the variables under study.

Data Collection

The data for capital adequacy and the profitability was obtained from the audited annual financial results of the selected banks for a period of five years from 2018 to 2022. Table 1 presents the data on capital adequacy ratio of 16 selected largest commercial banks in India is presented in tables.

ANALYSIS AND INTERPRETATION**TABLE 1 CAPITAL ADEQUACY RATIO**

Name of Bank	Capital Adequacy Ratio				
	2018	2019	2020	2021	2022
Years	2018	2019	2020	2021	2022
SBI	12.60	12.72	13.06	13.74	13.83
HDFC	17.11	18.52	18.79	18.90	19.26
ICICI	16.89	16.11	19.12	19.26	18.34
PNB	9.20	9.73	14.14	14.32	14.50
BOB	12.13	13.42	13.30	14.99	15.84
CAN B	11.90	13.65	13.18	14.90	16.68
UBI	11.78	12.81	12.56	14.52	16.04
Axis	15.84	17.53	19.12	18.54	17.64
BOI	14.19	13.10	14.93	17.04	16.28

IB	13.21	14.12	15.71	16.53	16.49
KMB	17.45	17.89	22.26	22.69	21.80
CBI	9.61	11.72	14.81	13.84	14.12
INDB	14.16	15.04	17.38	18.42	17.86
IDBI	11.58	13.31	15.59	19.06	20.44
YB	16.50	8.50	17.50	17.40	17.90
IOB	10.21	10.72	15.32	13.83	16.10

TABLE 2- RETURN ON ASSETS

Name of Bank	RETURN ON ASSETS				
	2018	2019	2020	2021	2022
Year	2018	2019	2020	2021	2022
SBI	-0.18	0.02	0.36	0.45	0.63
HDFC	1.69	1.71	1.78	1.78	1.78
ICICI	0.34	0.72	1.31	1.65	2.01
PNB	-1.60	-1.28	0.04	0.16	0.26
BOB	-5.60	0.94	0.76	1.07	8.46
CANARA	0.04	-0.30	0.22	0.46	0.78
UBI	-0.59	-0.52	0.27	0.44	0.65
AXIS BANK	0.58	0.17	0.66	1.10	0.72
BOI	-0.88	-0.45	0.29	0.46	0.49
IB	0.11	0.24	0.47	0.58	0.74
KMB	1.55	1.65	1.81	1.99	2.23
CBI	-1.70	-0.31	-0.24	0.27	0.3
INDUS	1.18	1.43	0.78	1.14	1.61
IDBI	-4.71	-4.29	0.45	0.80	1.10
YES	0.45	-6.36	-1.26	0.33	0.20
IOB	-2.54	-1.49	-3.27	0.30	0.57

1. CAPITAL ADEQUACY RATIO AND RETURN ON ASSETS**H0:1 THERE IS NO SIGNIFICANT IMPACT OF CAPITAL ADEQUACY RATIO ON RETURN ON ASSETS**

Linear regression was performed on the capital adequacy and return on assets. The results of regression analysis are presented in the following table:

TABLE 3 – SUMMARY RESULTS

Regression Weights	Intercept	Beta Coefficient	R ²	F	t-value	p-value
CAR ROA	12.72	0.144598	0.5204	35.46346	3.755512	0.0023

Where: CAR = Capital adequacy ratio
ROA = Return on assets

On the basis of the results, the equation can be expressed as:

$$Y = \beta_0 + \beta_1 X + \epsilon$$

$$ROA = 12.72 + 0.144598 \text{ CAR} + e$$

In this equation, β_0 is the return on assets intercept and refers to the estimated value of CAR when ROA is equal to 0. The coefficient β_1 is the regression coefficient denotes that the estimated increase in the return on assets for every unit increase in capital adequacy ratio. The symbol ϵ is a random error component.

In the above capital adequacy ratio is the independent variable and return on assets is the dependent variable. Regression coefficient measures how strongly capital adequacy ratio predicts the return on assets. The R^2 (0.5204) indicates that variance in the return on assets is being explained by capital adequacy ratio.

The hypothesis tests if capital adequacy ratio carries a significant impact on return on assets. The dependent variable return on assets was regressed on predicting variable capital adequacy ratio to test hypothesis H_0 . Capital adequacy ratio significantly predicted return on assets $F(1, 79) = 35.46$, $p < 0.05$, which indicates that the capital adequacy ratio plays a significant role in shaping return on assets ($b = 0.144$, $p < .05$). These results clearly directed the significant impact of capital adequacy ratio on return on assets.

2. IMPACT OF CAPITAL ADEQUACY RATIO ON RETURN ON EQUITY

Name of Bank	RETURN ON EQUITY				
	2018	2019	2020	2021	2022
SBI	-3.37	0.39	6.95	8.86	12.33
HDFC	14.12	15.35	15.27	15.39	15.74
ICICI	3.19	6.99	11.21	13.94	15.89
PNB	-32.85	-24.20	0.58	2.41	3.90
B0B	-5.60	0.94	0.76	1.07	8.46
CANARA	1.16	-6.78	5.05	9.85	14.40
UBI	-12.15	-9.46	4.87	7.94	0.76
AXIS BANK	7.01	1.91	6.48	6.48	11.30
BOI	7.01	1.91	6.48	11.36	7.66
IB	1.97	3.94	11.88	10.52	11.00
KMB	11.47	12.25	11.01	11.90	13.17
CBI	-29.79	-6.07	-4.95	4.38	5.43
INDUS	12.52	12.84	6.58	9.73	13.52
IDBI	-48.94	-46.82	4.45	7.34	8.04
YES	6.39	-75.56	-10.42	3.15	1.76
IOB	-47.45	-22.84	-52.78	4.90	7.43

2. CAPITAL ADEQUACY RATIO AND RETURN ON EQUITY

H_0 :1 THERE IS NO SIGNIFICANT IMPACT OF CAPITAL ADEQUACY RATIO ON RETURN ON EQUITY

Linear regression was performed on the capital adequacy and return on equity. The results of regression analysis are presented in the following table:

TABLE 5: SUMMARY RESULTS

Regression Weights	Intercept	Beta Coefficient	R ²	F	t-value	p-value
CAR ROE	12.72	6.39	0.5736	17.49	4.1822	0.001075

Where: CAR = Social media strategy

ROA = Return on equity

On the basis of the results, the equation can be expressed as:

$$Y = \text{Intercept} + \beta_1 X + \epsilon.$$

$$\text{ROE} = 11.27 + 6.39 \text{ CAR} + e$$

In this equation, β_0 is the return on equity intercept and refers to the estimated value of CAR when ROE is equal to 0. The coefficient β_1 is the regression coefficient denotes that the estimated increase in the return on equity for every unit increase in capital adequacy ratio. The symbol ϵ is a random error component.

In the above capital adequacy ratio is the independent variable and return on equity is the dependent variable. Regression coefficient measures how strongly capital adequacy ratio predicts the return on equity The R² (0.5736) indicates that variance in the return on equity is being explained by capital adequacy ratio.

The hypothesis tests if capital adequacy ratio carries a significant impact on return on equity The dependent variable return on equity was regressed on predicting variable capital adequacy ratio to test hypothesis H₀. Capital adequacy ratio significantly predicted return on equity $F(1, 79) = 17.49$ $p < 0.05$, which indicates that the capital adequacy ratio plays a significant role in shaping return on equity ($b = 6.39$, $p < .05$). These results clearly directed the significant impact of capital adequacy ratio on return on equity.

3. MPACT OF CAPITAL ADEQUACY RATIO ON NET INTEREST MARGIN

TABLE 6: NET INTEREST MARGIN

Name of Bank	NET INTEREST MARGIN				
	2018	2019	2020	2021	2022
Years	2018	2019	2020	2021	2022
SBI	2.16	2.4	2.48	2.44	2.42
HDFC	3.87	3.67	3.71	3.48	3.52
ICICI	2.8	3.02	3.16	3.36	3.92
PNB	1.94	2.21	2.09	2.41	2.18
BOB	2.15	2.36	2.37	2.49	2.55
CAN B	2.08	1.81	2.08	2.15	2.33
UBI	2.06	2.07	2.3	2.33	2.55
Axis	2.71	2.75	2.93	2.81	3.26
BOI	2.18	2.32	1.96	1.91	2.48
IB	2.5	2.45	2.5	2.49	2.84
KMB	3.6	3.74	4	3.91	4.39
CBI	2.04	2.14	2.23	2.45	2.87
INDB	3.18	3.92	3.72	3.73	3.84

IDBI	1.84	2.32	2.86	3.03	3.45
YB	2.57	2.63	2.71	2.04	2.23
IOB	2.11	2.03	2.15	2.1	2.63

H0:1 THERE IS NO SIGNIFICANT IMPACT OF CAPITAL ADEQUACY RATIO ON NET INTEREST MARGIN

Linear regression was performed on the capital adequacy and net interest margin. The results of regression analysis are presented in the following table:

TABLE 7: SUMMARY RESULTS

Regression Weights	Intercept	Beta Coefficient	R²	F	t-value	p-value
CAR	12.6	0.6587	0.4011	8.7076	2.95	0.011
ROE						

Where: CAR = Capital adequacy ratio

NIM = Net interest margin

On the basis of the results, the equation can be expressed as:

$$Y = \beta_0 + \beta_1 X + \epsilon$$

$$\text{NIM} = 12.6 + 0.6587 \text{ CAR} + e$$

In this equation, β_0 is the net interest margin intercept and refers to the estimated value of CAR when NIM is equal to 0. The coefficient β_1 is the regression coefficient denotes that the estimated increase in the net interest margin for every unit increase in capital adequacy ratio. The symbol ϵ is a random error component.

In the above capital adequacy ratio is the independent variable and net interest margin is the dependent variable. Regression coefficient measures how strongly capital adequacy ratio predicts net interest margin The R^2 (0.4011) indicates that variance in the net interest margin is being explained by capital adequacy ratio.

The hypothesis tests if capital adequacy ratio carries a significant impact on net interest margin The dependent variable net interest margin was regressed on predicting variable capital adequacy ratio to test hypothesis H0. Capital adequacy ratio significantly predicted net interest margin $F(1, 79) = 8.7076$, $p < 0.05$, which indicates that the capital adequacy ratio plays a significant role in shaping net interest margin ($b = 0.6587$, $p < .05$). These results clearly directed the significant impact of capital adequacy ratio on net interest margin.

RESULTS:

The results of the study revealed that capital adequacy ratio significantly predict return on assets, return on equity and net interest margin. An increase in the capital adequacy ratio leads to an increase in the return on assets, return on equity and net interest margin. An increase in return on assets, return on equity and net interest margin are reflected in an increase in the profitability of banks. Thus, it may be concluded that a movement in capital adequacy ratio has an impact on the profitability of commercial banks.

SOCIAL RELEVANCE OF RESEARCH

The research will be useful for banks' personnel responsible for making policies and decisions for the conduct of bank's business. The research will also be helpful to research scholars for reference and use in their research.

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