

## **EMPIRICAL STUDY ON THE DETERMINANTS OF CAPITAL ADEQUACY RATIO WITH REFERENCE TO COMMERCIAL BANKS IN INDIA**

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### **ABSTRACT**

The research study is conducted particularly to analyze the determinants of capital adequacy requirement in India and determine the effect of various factors on capital adequacy ratio and profitability of the banks. According to Alfred Marshal –Capital is that part of wealth which is devoted to create further wealth. The banking sector takes the risks of all business or industry directly or indirectly, so capital management becomes more important for banking industry. Traditionally, banking operations were simple and generally operated on 3-6-3 rule but now due to evolution of additional services banking services has been complicated. The new banking regulation has motivated our study which mainly focused on practices of risk minimization related to regulatory capital assets. The purpose of the study is finding out the essence of maintaining Capital adequacy ratio according to the regulation or more than that and what are the factors leading to maintain that level of CAR. Analysis has been conducted on study of financial statements of 34 banks, 19 public banks and 15 private banks. The study covers 10 years from 2005-14. To find the relationship among those dependent and independent factors correlation analysis and multiple regression analysis have been used. The outcome of the study is showing that average CAR for the study period has been 13.37%, correlation amongst CAR and most of the factors is strongly & positively correlated. Such as, Reserve ( $r=0.62$ ), D/E ratio ( $0.62$ ), ROA ( $r=0.56$ ) and Interest income ratio ( $r=0.47$ ) while liquidity is strongly & negatively correlated to CAR ( $r=-0.69$ ).

**Keywords: Capital Adequacy Ratio, Commercial banks, Capital Assets.**

### **INTRODUCTION**

Banks are financial intermediary in an economy where it provides funds to the Government body as well private institutions for creation of employment and production of goods & services, by this way it creates credit in the economy. Through the current account, banks provide liquidity as per demand to depositors and through line of credit it also provides credit as well as liquidity to their borrowers. Worldwide bank regulator's big concern is the safety of depositor's money and by this way the capital adequacy becomes relevant and important for banking industry. Solvency and liquidity have always been the significant concern of banks in the nation and capital play's pivotal role in financing the bank's requirement and solvency position of the banks for long term. The banking industry carry the risk of all other businesses to whom it provides loans as if they got failed then first of all banking industry got affected in an economy and then others as Real Estate etc. In recent decades financial entities had been commonly gone bankrupt due to disastrous effects for society and individuals because limited liability companies are not responsible for losses more than its financial resources (Kingfisher & United bank and Bhushan steel and Syndicate bank case etc. in current scenario can be seen as example). Banking system has great importance in the financial system and influence on national economies, so banks are highly regulated

in most countries. In recent years, the banking crises has become common and very expensive to deal with and thereby bank capital adequacy concept has received a great deal of attention from regulators, bankers and academics in recent years and is likely to continue as a subject for debate for many years.

At the time of the crisis, there has always been lower probability of bank's failure to pay its debt if they have lower leverage ratio. Having more capital (Equity capital and reserves) helps banks to stay solvent and it helps in absorbing the losses occurred. In the core business of banking system, the main role of systematic risk and credit risk play a pivotal role in which the bank's success depend on the bank's ability to identify, monitor and manage effectively such risks in favorable and sound way.

The basic function of bank's capital is providing enough resources to meet possible losses on assets which may occur in future. Regulators always seem to want more capital and bankers always want less. Both sides need well-defined goals for establishing a capital adequacy strategy and both sides should be taking a broader view of the costs that are relevant in setting that strategy. From the bank stockholder's viewpoint, the function of capital is to earn a satisfactory rate of return. Commercial banks are legally required to maintain adequate capital funds.

The capacity of banks to meet its time liabilities and various risks such as operational, systematic, credit and other risks are measured by capital adequacy ratio of the banks. India's bank regulator, RBI, has prescribed a minimum ratio to be maintained by the banking system in line to BASEL Norms to ensure proper cushion for their future unexpected losses. In the face of the financial crises seen in the last few years, the maintenance of capital adequacy ratio has been mandated by the regulatory authorities to protect the interest of various stakeholders.

**BASEL III Norms:** According to Basel III norm each banks need to maintain at least capital adequacy ratio of 11.5%, increased from 9.5%. Now, Indian Banking System needs more funds to meet its obligation towards international standards set by governing bodies at the top.

**Strategy of Govt. of India to recapitalize Indian Banks under "Indra-Dhanush" project** Govt. of India has formulated a new strategy to revitalize the PSBs (Public sector banks). One of the major initiatives taken by the Govt. is funding of ₹ 20,000 crores in first round & ₹ 5,000 crores in the last quarter of the year 2015-16.

#### **LITERATURE REVIEW**

**Bokhari& Ali <sup>(1)</sup> (2010)** had studied and analyzed the determinants of capital adequacy ratio in banking sector of Pakistan. The results revealed that capital ratio requirement ( $r = -0.13$ ), average capital ratio ( $r=-0.09$ ), and portfolio risk level ( $r = -0.07$ ) shows weak correlation among themselves while share of deposits ( $r = -0.77$ ) and return on equity ( $r = -0.32$ ) are strongly but negatively correlated with Capital Adequacy Ratio. **Olalekan et al <sup>(3)</sup>(2013)** revealed In Nigeria deposits and capital adequacy positively related to profitability and capital adequacy considered very important in determining the profitability. **Tumiwa et al <sup>(7)</sup>(2013)** studied that risk management practices are important determinants of bank capital structure decisions. The better risk management practices, the better CEO make decisions in determining the bank's capital structure. While **Weber et al<sup>(11)</sup> (2003)** stated that there is a positive relation between portfolio risk and capital adequacy ratio for savings banks. MM approach came with new approach states that value of firm is not affected by leveraged capital structure but by its capital structure but other factors such as earning and risk of the assets (i.e. **business risk**). **Singh et al<sup>(10)</sup>(2014)** find

that there is an improvement in capital adequacy by 7.64 % due to an increase in ownership concentration by one unit. **Kurawa<sup>(5)</sup>(2014)** stated that there is a significant positive relationship between CRM and profitability of Nigerian banks and independent variables, DR ratio and CLA ratio, have indicated a clear and strong positive relationship with the independent variable *ROA*. **Mukuddem et al <sup>(2)</sup> (2008)** demonstrated on (debt and equity). **Arora <sup>(4)</sup>(2012)** In this study author has studied that various determinants affecting CAR as NPAs, Equity Capital, Loan loss Provision, Reserve & Surplus which has not been considered in studied have significant impact on CAR of banks. **Shrivastava et al <sup>(8)</sup> (2011)** stated that the risk taking ability in lending funds and banks position shown by the advance to assets ratio, also supported by **Gupta et al<sup>(12)</sup> (2012)** stated that the capital adequacy ratio has been affected by Tier I capital, coverage ratio, Equity plus loan loss reserve to total loan ratio net worth and NPA to total assets ratio.

### NEED AND SCOPE OF THE STUDY

This study is mainly focused on Indian banks listed on various stock exchanges and selection of target companies is done on the basis on their respective market size i.e. market capitalization. The purpose of the study is to find out the essence of maintaining Capital adequacy ratio according to the regulation or more than that and what are the factors leading to maintain that level of CAR as well as study the net profit which is being affected by various factors.

The new banking regulation has motivated our study which mainly focused on practices of risk minimization related to regulatory capital assets. According to Basel III norm each banks need to maintain minimum CRAR of 11.5% so that banking sector of the nation become stronger.

The problem of the study is to figure out the effects of independent variables on dependent variable such as CAR and profitability.

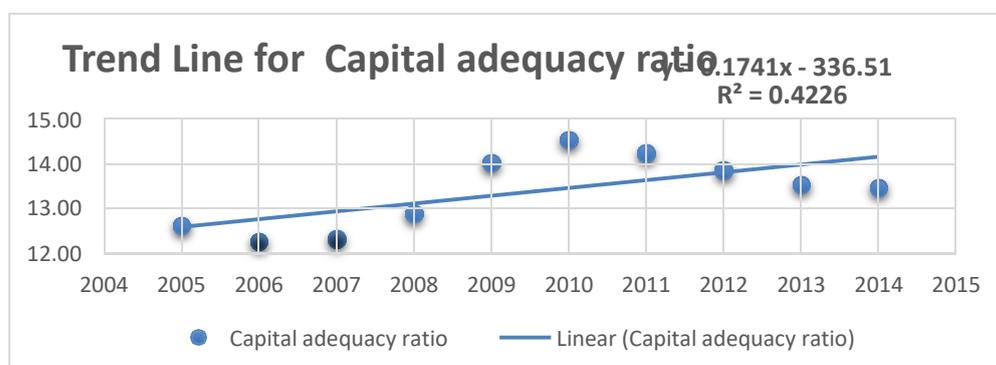
### Objective of the study:

- (1) To identify the factor affecting capital adequacy ratio of commercial Banks
- (2) To establish a relationship between various factors affecting capital adequacy ratio.

### DATA ANALYSIS

#### Best fit of regression equation

These all data are diversely distributed around the trend line which is shown by coefficient of determination ( $R^2 = 0.42$ ) i.e. 42% of data are nearly distributed towards the line only or the graph shows that CAR explain 42% of variance



Source: Moneycontrol.com

**Table A: Regression analysis for dependent variable Net profit**

SUMMARY OUTPUT		<i>Coefficients</i>	
		Intercept	1090.276222
		Total Assets	-0.34469155
		Investment	-0.120474037
		Loan & Advance	0.010076658
		Deposits	0.387325789
		Borrowings	0.374622387
		Gross NPA	-0.643415964
		Net NPA	0.287156996
		Reserve	0.657869471
<i>Regression Statistics</i>			
<i>Net Profit</i>			
Multiple R	0.999675739		
R Square	0.999351583		
Adjusted R Square	0.994164248		
Standard Error	47.75885653		
Observations	10		
F=192.65			

The depicted chart shows the explanatory power of the model at its first instance which represents the coefficient of correlation (R) & determination (R<sup>2</sup>) and the result has found the co-relation degree among the descriptive variables i.e. R<sup>2</sup> = 0.9996 and the independent variables are explaining the behavior of the research model by R-squared =0.9993 in the selected model. F test where (F=192.65) and the standard error (47.76) is shown to be significantly fit. From multicollinearity assumption, we found the correlation between independent variable due to which it has difficult to measure the exact effect of one variable on Net profit. As per the result, the major impact on dependent variable is of GNPA at  $\beta=-0.64$  and Reserve at  $\beta=0.66$  while other variables show minor impact on dependent variable such as Total assets at  $\beta=-0.34$ , Investment at  $\beta=-0.12$ , Loan & Advance at  $\beta=0.01$ , Deposits at  $\beta=0.39$ , Borrowing at  $\beta=0.37$  and NNPA at  $\beta=0.29$ . These are not significantly impacting the net profit.

The equation is-  $Y=1090.27-0.34*X_1 + (-0.12)*X_2 + 0.0100*X_3 + 0.387*X_4 + 0.374*X_5 + (-0.643)*X_6 + 0.287*X_7 + 0.657*X_8$

**Table B: Regression analysis for dependent variable Capital Adequacy Ratio**

SUMMARY OUTPUT		<i>Coefficients</i>	
		Intercept	10.96617719
		Interest expanded	-0.009119816
		Interest income	-0.159646387
		Return on Asset	-0.344004884
		Credit to Deposit Ratio	0.047309687
		CASA	0.118064731
		Liquidity	-65.31173842
		D/E ratio	0.000671132
<i>Regression Statistics</i>			
Multiple R	0.925749644		
R Square	0.857012404		
Adjusted R Square	0.356555818		
Standard Error	0.650488038		
Observations	10		
F = 1.71			

The above chart shows the explanatory power of the model at its first instance which represents the coefficient of correlation (R=0.93) & determination (R<sup>2</sup> =0.86) and the result has found the co-relation degree among the descriptive variables and the independent variables are explaining the behavior of the research model by R-squared =0.86 in the selected model. F test where (F=1.71) and the standard error (.65) is shown to be significantly fit. From multicollinearity assumption, we found there no

correlation between independent variable. As per the result, the major impact on dependent variable is of Liquidity only at  $\beta=-65.31$  while other variables show minor impact on dependent variable such as Interest expended at  $\beta=-0.01$ , Interest income at  $\beta=-0.16$ , ROA at  $\beta=-0.34$ , Credit to deposit ratio at  $\beta=0.05$ , CASA at  $\beta=0.12$  and DE ratio at  $\beta= 0.0006$ . These are not significantly impacting the CAR.

The equation is-  $Y=10.97+(-0.009)*X_1 + (-0.159)*X_2 + (-0.344)*X_3 + 0.047*X_4 + 0.118*X_5 + (-65.3)*X_6 + 0.00067*X_7$

## **CONCLUSION**

This study provides empirical evidence related to the determinants of CAR and Net profit of Indian banking sector over the period of 2005-14. The correlation and regression results show that independent factors which has been considered in the study has significant impact on CAR and Net profit of banks.

From the study of assumption of regression, we found that there is linearity in both dependent variables but in the case of net profit there is multicollinearity which signifying those independent factors are affecting each other too, so it may not give valid result about any individual predictor (dependent variable).

In this study we have found that factors like Interest income, Debt to equity ratio and ROA has great positive impact on CAR while liquidity has negative impact. Factors like total assets, Investments, Loan & Advances, Deposits and Borrowings have great impact on Net profit of Banks. Correlation between CAR and Net profit (Replaced by ROA to have data in %) is highly positive.

When it comes to trust where most of the people believe in govt. banks and deposit their money with them, which leads to generate more deposits of by public banks than private banks but penetration of private banks are also increasing at faster pace. Loan to deposit ratio of public banks has increased as well as NNPA to loan has also increased but in case of private banks NNPA to loan ratio has decreased continuously which indicates that private sectors banks are more proactive towards NPA than public banks.

ROA of Public banks has continuously decreased while for private banks, it is increasing for the study period which is showing that private sector is performing better. Average CASA ratio of banks has increased due to increase in deposits than private banks while on the leverage side private banks are stronger than publicbanks as well as they have maintained high CAR than public banks. So overall we can say that in Indian banking sector, Private sector are performing more better than public banks at most of the ends.

The correlation results revealed a significant and positive relationship of these three total assets (0.98), Investment (0.97) and GNPA (0.87) with net profit. However, regression results are a bit different from these all results which are showing that GNPA is strongly impacting but negatively ( $\beta=-0.64$ ) and total assets ( $\beta=-0.34$ ) & Investment ( $\beta=-0.12$ ) which are weakly and negative impact on Net profit. While on dependent variable CAR, there is weakly negative impact of Interest expense ( $\beta=-0.01$ ), Interest income ( $\beta=-0.16$ ) and ROA ( $\beta=-0.34$ ) which is different from correlation which are positive.

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