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CAPITAL ADEQUACY REQUIREMENT AND ITS IMPACT ON PROFITABILITY OF INDIAN BANKS

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Abstract

It is very essential in today's dynamic environment to manage risks faced by business organizations especially banks. India being a developing country on the world panorama and banking sector being its backbone has to be strengthened by forming better technical policies which help in reducing capital risk related to the banking sector. Banks face multiple risks in their course of business and these risks directly pose a threat on the banks profitability. Hence a minimum amount of capital is required to ensure safety and soundness of banks. Quantification of risk and assessment of the losses it can bring is a major issue. Often it is argued that banks should keep more amount of capital as reserves so as to protect it from unforeseen losses. But excess of capital in the form of reserve reduces the profitability of banks. The Capital Adequacy Framework of the Basel Committee on Banking Supervision *(BCBS)* is one of the most widely appreciated attempts toward brining international standards in banking with respect to capital adequacy thereby enabling cross country assessments and comparisons of internationally active banks. This paper makes an attempt to analyze the impact of capital adequacy on the profitability of banks.

Introduction

Financial sector reforms worldwide have brought about rapid changes in the structure of financial markets more particularly in banks. Banking prior to 80's and banking now, presents a perfect study of contrast. Yesterday's compulsion no more appears in today's priority. What was important in those days has lost its signifance today. The line of demarcation between banks and other financial service institutions is slowly disappearing. Banks are now moving away from what is known as their traditional business to new service lines. In this process they are now exposed to more risks. Risk management has thus become part and parcel of the strategic planning process of bankers. While the expected losses are generally taken care of by suitable methodology of pricing but the unexpected losses, as a result of exposure and its effect on portfolio and over individual's account is to be borne by the bank itself and is to be taken care of by the requisite capital. Hence the need for suitable capital structure and sufficient Capital Adequacy requirements is felt (Raghavan, 2004).

Banks depending upon the activities in which they are engaged they should maintain capital base in order to face any eventualities that may arise out of those activities. Regulatory capital requirements should be viewed as something which is a minimum requirement and those banks/institutions which are exposed to a higher degree of risks or forms of risk that may not be fully addressed by regulatory requirements should maintain capital base above minimum regulatory requirement. In an effort to prompt efficiency in the banking industry and after a period of worldwide liberalization and deregulation, the Basel Capital Accord Basel I which led to the endorsement of new capital adequacy frame work, Basel II marked the beginning of a new phase of re-regulation with an attempt to bring about an international harmonization of banking regulations (Bichsel and blum, 2005).

A bank with a sound capital position is able to pursue business opportunities more effectively and has more time and flexibility to deal with problems arising from unexpected losses thus achieving increased profitability (Athanasoglou et al., 2005). A Study by Hassan (2001) examined the performance of

Islamic banks' worldwide during 1994-2001. Variety of internal and external banking characteristics were used to predict profitability and the result indicated high capital lead to high profitability. Abreu (2002) found that well capitalized banks face lower expected bankruptcy costs and thus lower funding costs and this resulted into better profitability.

Stiroh (2002) assessed the potential benefits from the diversification of activities and increasing reliance on non-interest income. The result suggested that non interest income, particularly, trading revenue, is associated with higher risk and lower risk-adjusted profits. The results also showed few obvious diversification benefits from ongoing shift toward non interest income.

For the purpose of capital adequacy assessment supervisors first consider an organizations risk-based capital ratio; that is the ratio of qualifying capital to assets and off-balance sheet items that have been "risk weighted" according to perceived credit risk. Supervisors also focus on the tier one leverage ratio to help assess capital adequacy. For banking organizations risk based capital ratio also takes into account an institutions exposure to market risk.

Review of Literature

Capital adequacy has been the focus of many studies and regulator as it is considered to be one of the main drivers of any financial institution's profitability (Bourke, 1989; Berger, 1995; Thompson et al.., 2002; Navapan and Tripe, 2003; White and Morrison, 2001). White and Morrison (2001) posited that the regulator ensures that banks have enough of their own capital at stake. Bichsel and Blum (2005) supported this proposition arguing that these regulations help in reducing negative externalities (e.g., disruptions to the payments system and a general loss of confidence in the banking system) in addition to boosting the slow economic growth. These propositions leads to the question: what then do prudential capital requirements accomplish in the banking sector? This study showcases that they have a positive correlation with the bank's performance.

In assessing banks efficiency, in relation to capital composition and profitability ratios some of the key measures used (Bourke, 1989, Berger, 1995; Thompson et al., 2002; Navapan and Tripe, 2003; Hess and Francis, 2004; Welch, 2006; Giokas, 2007). Kwan and Eisenbeis (1995) and Hughes and Mooon (1995) argued that it is necessary to recognize explicitly the concept of efficiency in the empirical models linking bank capital to risk and distinguish between efficient and inefficient risk undertaking.

Navapan and Tripe (2003) asserted that the proposition 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. Also Berger (1995) found presence of a positive relationship between return on equity (ROE) and the ratios of capital to assets. He argued that a higher capital ratio (with reduced risk of bankruptcy) should reduce a bank's cost of funds, which can be done by reducing the price and quantity of funds required, thereby increasing profitability (which is done by improving net interest income of bank).
According to Christian et al. (2008), capital adequacy measures provide significant information regarding a firm's returns, it has been seen that loan exposure measures do not appear to have any significant explanatory power when examining returns. The study showcases that total assets change or modification is also significant. Thus this paper has included these variables in its model to examine the relationship between capital adequacy, cost income ratio and profitability.

Capital (equity and long-term debt) represents a source of funds to the bank along with deposits and borrowings. Pringle (1971) observed that an undercapitalized bank will find itself subjected to high levels of short-term borrowing at potentially high excess costs during periods of cash crunch or inadequate capital times. Flamini et al. (2009) explained that return of banks are affected by macroeconomic variables, suggesting that low inflation and stable output growth can be promoted in macroeconomic policies to boost credit expansion.

In measuring the bank's profitability, regulators, other researchers and bank analysts have used Return On Assets (ROA) and return on equity (ROE) to assess industry performance and forecast trends in market structure as inputs in statistical models to predict bank failures and mergers and for a variety of other purposes where a measure of profitability is desired (Gilbert and Wheelock, 2007; Mostafa, 2007; Christian et al., 2008).

Assessing Capital Adequacy

For the purpose of capital adequacy assessment supervisors first consider an organizations risk- Another study, Haron (2004) measured the impact of some of the determinants of profitability. Capital variable with its coefficient was one of the most important factors in showcasing the financial condition of Greek banks. Ngo (2006) investigated the relationship between bank capital and profitability. The results showed no significant relationship between capital and profitability. Naceur (2006) studied the effects of capital regulations on cost of intermediation and profitability. Capital adequacy ratio contributed positively to banks' profitability. The results supported that capital regulations improved the performance of banking sector in Egypt. This paper focuses on analyzing the impact of capital adequacy on the profitability of banks.
based capital ratio; that is the ratio of qualifying capital to assets and off-balance sheet items that have been "risk weighted" according to perceived credit risk. Supervisors also focus on the tier one leverage ratio to help assess capital adequacy. For banking organizations risk based capital ratio also takes into account an institutions exposure to market risk.

The main objectives of the risk based capital measures are:

1. make regulatory capital requirements generally sensitive to differences in risk profiles among banking organization
2. factor off balance sheet exposures into the assessment of capital adequacy
3. minimize disincentives to holding liquid, low-risk assets
4. Achieve greater consistency in evaluation of the capital adequacy of major banks throughout the world.

The risk based capital measure focuses primarily on the credit risk associated with the nature of banking organizations and on off balance sheet exposures and on the type and quality of their capital. It provides a definition of capital and a framework for calculating risk weighted assets by separating assets and off balance sheet items into broad categories of credit risk. A banking organizations risk based capital ratio is calculated by dividing its qualifying capital by its risk weighted assets. The risk based capital measure sets forth minimum supervisory capital standards that apply to all banking organizations. Many of the banking organizations while calculating risk based capital ratio do not incorporate risks like interest rate exposure, liquidity, funding and market risk, quality and level of earnings, investments or loan portfolio concentrations, effectiveness of loan and investment policies, quality of assets, and management's ability to monitor and control financial and operating risks. Hence an overall assessment of capital adequacy

must take into account other different factors otherwise conclusions are bound to be incorrect. For risk based capital purpose a banking organization's capital will consist of two major components

(a) Tier 1 capital: core capital elements
(b) Tier 2 capital: supplementary capital elements

Tire 1 or the core capital includes common equity including capital stocks, surplus and undivided profits and minority interest in equity accounts of consolidated subsidiaries. Tier 1 capital represents the highest form of capital normally known as permanent capital Tier 2 capital is generally defined as the sum of core capital elements less goodwill and other tangible assets that do not qualify within capital as well as any other investments in subsidiaries that the central bank of any country determines and deducts from Tier 1 capital. The sum of Tire 1 and Tier 2 capital less any deductions makes up total capital which is the numerator of the risk-based capital ratio.

Risk – Weighted Assets

Each asset and off-balance sheet item is assigned to one of four broad risk categories based on the obligor or if relevant the guarantors or type of collateral. The risk categories are 0, 20, 50 and 100 percent. The standard risk category that includes the majority of items is 100 percent. Appropriate value of the amount (in terms of rupees) in each category is multiplied by the risk weight associated with that category. The weighted values are added together and the resulting sum in the organization's risk – weighted assets, the denominator of the risk – based capital ratio. Off balance sheet item are incorporated into the risk based capital ratio by first being converted into credit equivalent amount. To achieve this face value amount of the item is multiplied by a credit conversion factor (0, 20, 50, or 100 percent) the credit equivalent amount is then assigned to a risk category in the same manner as on balance sheet items. For the over the counter derivative transactions the credit equivalent amount is determined by multiplying the notional principal amount of the underlying contract by a credit conversion factor and adding the resulting product (which is an estimate of the potential future exposure) to the positive mark to market value of the contract (which is the current exposure). A contract with a negative mark to market value is treated as having a current exposure of zero. Banking organizations are expected to meet a minimum ratio of capital to risk weighted assets of 8 percent with at least 4 percent taking from the Tire 1 capital.

Navapan and Tripe (2003) found the contrary - that is, negative relationship between capital and profitability exists. Ghosh et al. (2003) explained that banks are required to hold capital equal to a certain percentage of the total risk-weighted assets. Lewis (2008) explained that the expected bankruptcy costs hypothesis can be used to explain part of the observed positive relationship between capital asset ratios (CARs) and return on assets (ROA) under certain circumstances.

Objective of the Study

1. To study the impact of capital adequacy requirements on performance of Indian Banks.

Data Collection

For the purpose of this study 3 public sector and 3 private sector banks listed on S&P BSE BANKEX have been taken whose average market capitalization was highest during the study period. The period of study was from 20013-2022. The data was collected from 'Prowess' database. The banks considered are as follows:

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S. No	Bank Name
1	Bank of Baroda
2	State Bank of India
3	Union Bank of India
4	Axis Bank Ltd
5	HDFC Bank Ltd
6	ICICI Bank

Defining Variables

For the purpose of analysis Capital Adequacy Ratios and Profitability Ratios have been used as variables.

Capital Adequacy Ratios:

- Capital Adequacy Ratio (CAR)
- Debt-Equity Ratio (DER)
- Advances to Assets Ratio (AAR)
- G-Secs to Total Investments (GTI)

Profitability Ratios:

- Spread to Total Assets (STI)
- Net Profit to Average Assets (NPAA)
- Interest Income to Total Income (NITI)
- Non-Interest Income to Total Income (NIITI)
- Earnings per Share (EPS)
- Return on Assets (RoA)
- Profit Margin Ratio (PMR)

Data Analysis

Multiple regression model is used to measure the impact of capital adequacy requirements on profitability of banks. Mean of profitability ratios is considered as dependent variable. Mean of capital adequacy ratios is considered as independent variable. Thus the regression equation using various variables is as follows

$Y == \alpha 0 + \alpha 1(CAR) + \alpha 2\ (DER) + \alpha 3(AAR) + \alpha 4(GTI) + €$

Table 1: Descriptive Statistics of Capital Adequacy Ratios

Ratio	Bank	Mean	Std. Dev.	F-Value	Sig.(2 Tailed)
Capital Adequacy Ratio	BoI	12.37	1.152	2.61	0.071
	SBI	13.62	2.719		
	UBI	11.92	1.942		
	ABL	12.84	2.049		
	HDFC	13.49	2.381		
	ICICI	12.52	1.968		
Debt Equity Ratio	BoI	13.07	1.273	2.47	0.183
	SBI	11.61	1.697		
	UBI	12.49	1.477		
	ABL	12.03	1.591		
	HDFC	11.97	1.253		
	ICICI	12.83	2.527		

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Advances to Assets Ratio	BoI	51.99	2.681	3.07	0.094
	SBI	55.37	1.739		
	UBI	50.69	3.017		
	ABL	57.18	2.864		
	HDFC	54.72	2.369		
	ICICI	57.43	1.921		
G. Secs to Total Investments Ratio	BoI	67.24	4.627	0.86	0.861
	SBI	74.19	4.932		
	UBI	61.28	6.037		
	ABL	71.74	5.236		
	HDFC	69.83	6.476		
	ICICI	68.94	4.847		

Form the table above it is clear that banks under consideration over the period of study have maintained an average ration of CAR between 11.92% --13.62%. This indicates that banks have maintained a higher level of CAR than the prescribed level. Further in case of advances to assets ratio then banks differ significantly at a significant level of 0.094. The table also reveals that the average debt to equity level is also low which reflects the fact that banks prefer low levels of debt and largely their investments are in government securities indicating their risk averse nature.

Table 2: Descriptive Statistics of Capital Adequacy Ratios

Ratio	Bank	Mean	Std. Dev.	F-Value	Sig.(2 Tailed)
Spread to Total Assets	BoI	1.982	0.246	24.019	0.000
	SBI	2.854	0.168		
	UBI	2.016	0.206		
	ABL	2.547	0.364		
	HDFC	2.734	0.271		
	ICICI	1.927	0.357		
Net Profit to Total Assets	BoI	19.61	1.892	1.01	0.264
	SBI	29.48	2.463		
	UBI	21.67	2.078		
	ABL	24.67	1.904		
	HDFC	26.29	2.376		
	ICICI	23.58	2.917		
Interest Income to Total Income	BoI	68.14	1.681	14.76	0.000
	SBI	79.38	1.597		
	UBI	71.26	1.468		
	ABL	74.81	1.672		
	HDFC	77.59	1.251		
	ICICI	72.66	2.207		
Non Interest Income to Total Income	BoI	12.37	1.685	21.67	0.000
	SBI	19.64	1.438		
	UBI	14.37	1.907		
	ABL	13.71	1.756		
	HDFC	16.82	1.251		
	ICICI	14.27	1.828		
Earnings Per	BoI	26.16	3.16	11.37	0.000

Share	SBI	38.24	2.54		
	UBI	24.66	2.97		
	ABL	31.08	3.41		
	HDFC	34.57	2.72		
	ICICI	30.84	3.48		
Return on Assets	BoI	1.613	0.657	1.00	0.318
	SBI	2.371	0.479		
	UBI	1.947	0.864		
	ABL	1.854	1.067		
	HDFC	2.079	0.674		
	ICICI	1.764	0.876		
Profit Margin Ratio	BoI	11.67	2.074	0.47	0.583
	SBI	17.56	1.957		
	UBI	13.49	2.349		
	ABL	14.27	1.778		
	HDFC	15.79	1.651		
	ICICI	13.87	2.497		

From the table no 1.2 it is clear that there is a significant difference in the performance of banks of ratios like Spread to Total Assets, Interest Income to Total Income, Non Interest Income to Total Income, Earnings Per Share as the p value is less than 0.05. But in case of ratios like Net Profit to Average Assets, Return on Assets, Profit Margin Ratio there was no significant difference between the banks as p value was more than 0.05.

Table 3: Correlation Between Variables

	Mean Profitability Ratio	CAR	D/E Ratio	Advance to Asset Ratio
CAR	-0.317(*) 0.018			
D/E Ratio	0.374 0.052	-0.527(**) 0.001		
Advance to Asset Ratio	-0.072 0.618	0.264 0.147	-0.318 0.116	
G. Sec to Total Investment	0.219 0.047	-0.138 0.297	0.309 0.694	0.267 0.294

*Correlation is significant at 0.05 level (2 tailed)
**Correlation is significant at 0.01 level (2 tailed)

From the table above it can be seen that the average profitability of banks is negatively correlated with the CAR, debt to equity ratio, Advance to Asset Ratio and G- Sec. to Total Investment. The negative correlation with Capital Adequacy is in line with the view that the higher the Capital adequacy will result into lower profitability. Banks prefer to keep the capital adequacy as low as possible.

The dependent variables for the study are bank profitability as measured by average of profitability ratios. The independent variables are: the Capital to risk weighted assets (CRAR) ratio, Debt-Equity Ratio, Advances to Assets and G-securities to Total Investments. In order to assess the relationship between profitability and capital adequacy ratios, the profitability is modeled as a function of the core

capital ratio, the equity capital ratio, the total risk based capital and the total capital ratio Consistent with Gilbert and Wheelock (2007).

$$Y == \alpha 0 + \alpha 1(CAR) + \alpha 2\ (DER) + \alpha 3(AAR) + \alpha 4(GTI) + €$$

Table 4: Regression Analysis for different determinants for capital adequacy. Dependent Variable: Average of Profitability Ratios

	Unstandardized Coefficient		t	Sig.
	B	Std. Error		
1 (Constant)	12.86	9.427	1.328	0.122
CAR	-0.617	0.318	-1.249	0.137
Debt Equity	-0.028	0.219	-0.118	0.843
Assets to Advance	-0.021	0.147	-0.168	0.779
G-Securities to Total Investment	0.151	0.128	1.368	0.158

From the table above it is concluded that there is a negative relationship between profitability and capital ratios. These findings are in consistent with studies conducted earlier by various researchers. The negative relationship can be explained by the fact that the more the equity providers to a bank, the higher the claim from the banks retained earnings in the form of dividends. This leads to a decrease in retained funds which were initially available with the bank for growth and other purposes, hence we can also see a decrease in funds which are required to boost profits.

Conclusions

This study focuses on the relationship between capital adequacy and profitability of Indian banks. For this purpose average profitability ratios and average capital ratios have been used. The study concludes that bank profitability is negatively related to the CAR. In years to come when entry for foreign banks would become easier and the competition in the banking sector will increase the Indian banks will face problems in generating better profits. They can do it only by concentrating more on non-risky, non-interest income besides their regular source of income. This study also finds that the non-risk weighted capital adequacy measure is negatively related with the profitability of a bank .

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