An Analysis of Indian Banking Sector on the basis of Capital Adequacy Norms

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Risk and Returns are the two important pillars of the banking sector. Banks by nature of its activities, attract various types of risks such as credit risk for lending & borrowing activities, operational and market risk for treasury & investment activities etc. Capital is essential and critical component for continuity of a bank as a going concern. Capital Adequacy talks about that the bank has enough capital to absorb unexpected losses or not. Capital Adequacy helps the bank to prevent from insolvency and it maintain depositors' confidence in bank. Capital to Risk Weighted Assets Ratio (CRAR) is one of the important banking regulations which helps to take care of banking risks. In this paper after a brief discussion on risks, Basel norms and its concept, relevant literature has been reviewed and research methodology has been explained. Next, an examination of CRAR values for all Indian banks is carried out and the paper analyses that there is a significant difference in CRAR of Basel I & II of public, private and foreign sector banks

Keywords: Basel Committee on Banking Supervision (BCBS), Basel I, Basel II, Basel III, Capital to Risk Weighted Assets Ratio, Credit Risk, Market Risk, Operational Risk, Tier I capital, Tier II capital, Risk weighted assets.

SECTION-I: INTRODUCTION

Banking is undoubtedly one of the most regulated industries globally and the rules governing capital are one of the most prominent aspects of such regulation. There are two typical justifications presented for regulating banks – the risk of a systematic crisis and the inability of depositors to monitor banks. Bank failures are often triggered by the inability of banks to honour repayment commitments to their creditors on time. Modigliani and Miller, contended that in perfect frictionless markets with full information, the value of a firm is independent of its capital structure. Most research on firm's capital structure thereafter has studied the implications of deviations from the 'perfect'. Taxes, financial distress, transaction costs, agency costs and asymmetric information are the important 'imperfections' considered to explain a firm's capital structure. In case of banks, research has added two other factors – bank's access to the safety net, in particular, deposit insurance and the fact that most of the bank debt originates from small, generally uninformed depositors.

In the traditional corporate finance view, capital reduces risk of failure by providing protection against unexpected losses (ULs). This is applicable to non-financial firms with relatively low financial leverage and reliance on long term debt. Banks are generally permitted to operate with more financial risk than manufacturing firms. Market values of bank assets are more volatile than other firms. Interest rate changes, borrower defaults or force majeure happenings can trigger changes in market values of bank assets, which are essentially financial assets. Practically these assets could turn more illiquid due to variety of influencing factors than real assets. Bank 's assets and liabilities greatly vary by time period, rate and composition. The assets bear the credit risk (borrower default), market risk (interest rate fluctuations) and the operational risks (failure of internal systems or people). Any one or a combination of these risks or an unanticipated disastrous event (force majeure risk) could result in eroding the value of banking assets.

Banks needs liquidity to pay off its creditors and it mainly comes from the periodic liquidation of assets (e.g. repayments, interest payments and sale of securities). If the assets start losing value, the banks would have to keep its capital to pay liabilities commitments. If the banks have not sufficient amount of capital then it face the most serious risk i.e. solvency risk. But, on the other side if bank has adequate capital, then it continues ready to access financial markets so as to increase its potential earnings. Thus, regulating the amount of capital that a bank should hold is necessarily defined which aimed at reducing the risk of banks expanding beyond their ability.

Economic Capital : It can be defined as the amount of capital considered necessary by banks to absorb potential losses associated with banking crisis- such as credit, market , operational and other risks.

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Types of Banking Risks:

- Credit Risk: Refers to the negative consequences related with defaults of contracts in lending operations due to decreasing the credit quality of the counterparty. It involve other risk like counterparty default risk, equity risk, securitization risk, concentration risk.
- Market Risk: refers to risks which result from price changes in the money and capital markets or from sensitivity to foreign exchange fluctuations. Such risks are Interest rate risk, Equity price risk, Foreign exchange risk.
- Operational risk: refers to risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This define includes legal risk, documentation risk.
- Liquidity Risk: it arises from a bank's ability to meet its obligations when they come due. It includes call risk, structural liquidity risk, contingent liquidity risk and market liquidity risk.
- Other risks: Strategic risk, Reputation risk, Capital risk, Earning risk, outsourcing risk.

SECTION-II: REVIEW OF LITERATURE

There are large number of literature in the area of various Basel norms and its implication on the performance of banks. But my study give stressed on the comparative analysis of the financial soundness of the Indian Banking sector and implementation of capital requirement under the Basel norms

- Sen and Ghosh (2005) studied the effect of capital adequacy on credit flows from the Indian Banking sector and supervision of Basel I and Basel II norms. The article concludes that due to the implementation of Basel II there may be prime to a drop in the proportion of banks credit to SME sector.
- Raghavan (2008) examined the relevance of Basel II norms for Indian banks. The study concluded that Basel II principles should be observed more from the viewpoint of modification one's risk management capabilities through constant mind searching relatively as regulatory guidelines to be complied with.
- Mandira and Nikaido (2007) presented an analytical evaluation of the Basel I capital adequacy regime and the current level of the CRAR of India's banking sector. According to them increased capital requirements and the huge implementation costs are likely to stance a great challenge in the path of implementation of Basel II in India. In the coming years there may be a trigger round of merging in Indian banking industry.
- Mohammed Arif Pasha, T. Srivenkataramana, K Swamy (2012), explained the basic concepts of Basel II & its impact on banking industry. They analysed the trend of CAR of different groups of banks & explained need , genesis & development of CAR.
- Dr.Bindya Kohli (2013) studied the risk management journey of Indian Banks from Basel I to Basel III. This paper explained the concept of risk and various types of risk for banks. He talks about the Basel history including all Basel norms and the approaches of Basel Norms.
- Nikhat Fatima (2014), analysed whether the capital adequacy concept indicate the financial soundness for Indian Banks. The study analyzed the trend in CAR values for top 10 scheduled commercial banks in India. The study concluded that ICICI bank maintained the highest CAR while Bank of India took up the lowest position.
- Ratna Barua, Malabika Roy & Ajitava Raychaudhuri (2015), discussed the influence of basel regulatory norms on the Indian banking Industry. Through the hypotheses testing, this paper analysed the performance of commercial banks during the period of Basel II & impact of the global financial crisis on Indian commercial banks.
- Priyanka Salgotra, Dr. Ruchika Wadhwa (2015), this paper explained one of the important banking regulations is Capital to Risk Weighted Assets Ratio (CRAR) which helps to take care of banking risks. After a brief discussion on Basel Committee, Basel norms and its concept, then review of literature has been given and then need of the analysis and objectives of the study has been explained. Next, an examination of CRAR values for selected Indian banks is carried out and the paper calculates that if there is a significant difference in CRAR of public and private sector banks and ends with an overall summarizing discussion.

SECTION-III: RISK BASED CAPITAL STANDARDS – REGULATORY CAPITAL

In the early 1980s, concern about international bank's financial health increased, as did complaints of unfair competition. It was then that the Basel Committee on Banking Supervision (BCBS) began thinking in terms of setting capital standards for banks. The committee established by central bank governors of the G10 countries in 1974, meet regularly four time a year. The international convergence of bank capital regulation began with the 1988 Basel Accord on capital standards.

Basel Accord I

The 1988 Basel Accord required internationally active banks in G10 countries to hold capital equal to at least 8 % of a basket of assets measured in accordance with their risk profiles. The definition of 'Capital' is broadly set in two tiers – Tier I being shareholder's equity & retained earnings and Tier 2 being the additional internal and external sources available to the bank. The bank has to hold at least half of its measured capital in Tier I form.

A portfolio approach is taken to measure risk, with assets classified into four discrete buckets – 10%, 20%, 50%, 100% - according to the quality of the assets. This means that some assets have no capital requirements, being considered riskless, while others have risk-weights attached to them. The two principal objectives of the Accord were : (a) to ensure an adequate level of capital in the international banking system and (b) to create a 'more level playing field' in competitive terms so that banks could no longer build business volumes without adequate capital backing. The Introduction of a capital to risk-weighted assets system for banks was recommended by the first Narasimham Committee Report in India since April 1992. It was specified that foreign banks operating in India should achieve a CRAR of 8 per cent by March 1993 while Indian banks with branches abroad should comply with the norm by March 1995. All other banks were to achieve a capital adequacy norm of 4 per cent by March 1993 and the 8per cent norm by March 1996. The RBI raised the minimum regulatory CRAR requirement to 9 per cent in its mid-term review of Monetary and Credit Policy in October 1998, and banks were directed to achieve this level by March 31, 2009.

Indian Banking Experience with Basel I

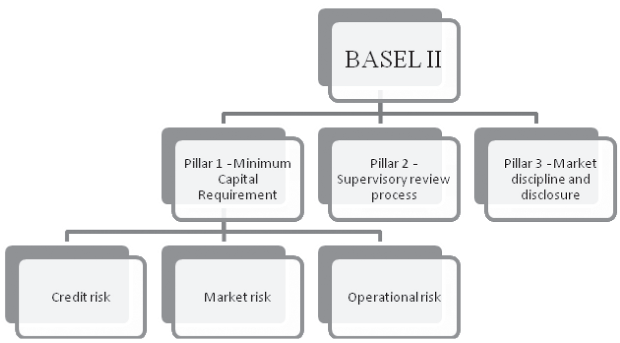
The SBI group and the foreign banks had achieved the minimum regulatory norm by March 1997. During the 2006 all the banks achieved the minimum regulatory level and by the end of March 2006 majority of the banks have achieved a CRAR level of more than 10 per cent of all categories of banks which was indicating good financial health, of the banking industry, in terms of capital adequacy norms over the recent years. After introduction of the international standards for income recognition, asset classification and provisioning norms, most of these banks had shown losses, So the government had to infuse significant capital for the public sector banks. These PSU banks had also approached themselves to the capital market to raise finance and they got significant success in raising capital as most of the IPOs were oversubscribed. After the implementation of Basel I in India Banks have been making efforts to reduce their NPAs.

Basel Accord II

It was recognized that the 'one-size-fits-all' framework of the Basel I accord had to be upgraded, since each bank had its own unique way of measuring, mitigating and managing risks. The revised framework hence provides a spectrum of approaches ranging from simple to advanced for measurement of credit risks, market risks and operational risks, all of which could lead to asset quality and value deterioration. The framework also builds in incentives for better and more accurate risk management by individual banks.

The new Accord aims at a framework, which will maintain the overall 'safety' level of capital in banks through more comprehensive and risk sensitive approaches. It is less prescriptive than Basel I and offers a range of approaches for banks capable of scaling upto more risk sensitive methodologies.

The new Accord is based on three mutually reinforcing "pillars", which together are expected to contribute to the safety and soundness of the international financial system.



First Pillar – Minimum Capital requirement: It will now take into consideration market risks and operational risks, along with credit risks. It also proposes differentiated approaches to measurement of capital from basic to advanced.

1. Capital for credit risk: (a) Standardized approach, (b) Internal ratings based approach – Foundation and advanced, (c) Securitization framework.
2. Capital for market risk: (a) Standardized approach(maturity method), (b) Standardized approach (duration method), (c) Internal models method.
3. Capital for operational risk: (a) Basic indicator approach, (b) Standardized approach, (c) Advanced measurement approach (AMA).

Second pillar – Supervisory review process: Bank managements are expected to strengthen their internal processes to set targets for capital commensurate with the risk profile and control environment of each bank. The internal processes would be subject to more rigorous review and intervention by the country's central bank.

Third pillar – Market discipline: this aims at encouraging market discipline through enhanced disclosure by banks. The new framework sets out disclosure requirements and recommendations in several areas, including the manner in which a bank calculates its capital adequacy and its risk assessment methods. The core set of disclosure requirement is applicable to all banks.

Indian Banking Experience with Basel II

The first draft guidelines on Basel II was issued by RBI in February 2005. By the end of March 2008 RBI had implemented standardized approach for credit & market risk in Basel II and basic indicator approach in Internationally active banks and by the end of March 2009 it was implemented on other scheduled commercial banks. RBI has kept a standard of minimum 9% CRAR in comparison to minimum 8% CRAR in other countries. Similarly RBI has given a target of 6% for minimum Tier I capital as against of it BCBS had set minimum requirement at 4.5%. It shows that RBI has always follow a safeguard approach and set Capital Adequacy standards more than International Requirements. Initially Government had to infused capital in public sector banks so as to maintain 51% stake in it. The following banks had less than directed capital requirements:

Banks with less than 6% Tier I capital adequacy ratio as on March 2008	**Banks with less than 9% Capital adequacy ratio as on March 2008**
Bank of Maharashtra	Bank of Maharashtra
Central Bank of India	Central Bank of India
Vijaya Bank	Vijaya Bank
UCO bank	Dena Bank
	IDBI Bank

Government had recapitalized Central Bank, UCO Bank and Vijaya Bank by Rs. 200 billion and sold its share in Bank of Maharashtra. By the end of March 2009, all Indian scheduled Banks had implemented the Basel II guidelines with basic approaches excluding Local Area Banks and Regional Rural Banks. Advanced approach was implemented in phased manner. Now it is mandatory to maintain the capital to risk-weighted assets ratio (CRAR) of Indian Banks is well above the 9 per cent for the whole banking system. During 2011-12, CRAR indicating that Indian banks remained well-capitalized.

Basel Accord III

After the financial crisis of 2008, there is a great need to increase the safety and stability of the banking sector. This can be done by bringing some improvement in the quality and quantity of the capital components maintained by commercial banks under Basel II. That is why, in December 2010 final guidelines were issued for Basel III. These norms have aim to make out most of the banking activities are more capital intensive such as their trading book activities. The main purpose of Basel III is to bring a more strong banking system by giving focus on four aspects i.e. Capital, Leverage, Funding and Liquidity.

Features of Basel III

- Capital Conservation Buffer: To face the future stress, an additional reserve buffer of 2.5% provided & with that total Tier I capital reserves required to maintain at 7%. The main purpose of this buffer to create so that it can be used as safeguard in times of financial stress by the entire banking system.

Timeline of Basel III Implementation in India

S.N		31.03.14	31.03.15	31.03.16	31.03.17	31.03.18	31.03.19
1	Minimum common Equity Tier I	5.0	5.5	5.5	5.5	5.5	5.5
2	Capital Conservation Buffer	0.0	0.0	0.625	1.25	1.875	2.5
3	(1) + (2)	5	5.5	6.125	6.75	7.375	8.0
4	Minimum Tier I Capital	6.5	7.0	7	7	7	7
5	Minimum total capital	9	9	9	9	9	9
6	(2) + (5)	9	9	9.625	10.25	10.875	11.5
7	Phase in of all deductions from Common Equity Tier I	40	60	80	100	100	100

Source : Secondary Data

- Countercyclical Capital Buffer (CCCB): Final guidelines has issued by RBI on implementation of CCCB on February5, 2015 in India. The gap between the GDP and credit disbursement shall become the main base for the creation of CCCB in India. Suppose if credit is growing more than GDP, in that case bank regulators can increase their capital requirements with the help of the countercyclical Buffer varying between 0%- 2.5%.
- Leverage Ratio: It is the part of capital defined as a percentage of the total exposure and total exposure comprises with balance sheet exposures, derivative exposures, securities financing transaction exposures and off balance sheet items. Minimum Tier 1 leverage ratio of 3% is required to maintain during the corresponding period upto January 1, 2017. Currently leverage ratio is more than 4.5% in the Indian Banking system. From 1 April, 2015 on a quarterly basis, it is required for the banks to disclose their leverage ratio and its components as per the guidelines specified.
- Liquidity Coverage ratio: As per the planning for 2015, a new instrument is implemented to cover the liquidity risk of banks. The standard requirement is that it should not be lower than 100%. It is created to ensure that banks should have an adequate level of high quality assets that are able to converted into cash within a 30 day time period in case of any liquidity stress in the economy. For this purpose also New Basel Accord introduced Net Funding Stability Ratio which is defined as the ratio, for a bank, of its "available amount of stable funding" divided by its "required amount of stable funding".

SECTION-IV: RESEARCH METHODOLOGY

Statement of Research Problem

In modern economies, Banking plays a crucial role in the financial stability & security of financial system of a country. Failure of a bank brings serious repercussion as we see in the recent episodes of financial turmoil. Risk and returns are the two important pillars of the Banking Industry. Due to lending & borrowing activities, credit risk is always present and due to Treasury & investment operations, operational and market risks are inevitable. Capital adequacy risk weighted requirement is the good financial soundness indicator to assess the risks of the banks. I prompt to do this research to analysis the risk management journey of Indian banking sector from Basel I to Basel III.

Objectives of the study

1. To study the historical background of the Basel Norms.
2. To analysis the trends of CAR of different Banking sector.
3. To check out the financial soundness of each banking group in all Basel norms period.

Hypotheses:

In order to achieve the aforementioned objectives, following hypotheses have been formulated which shall be put to the test :

H1: there is no significant difference of CRAR of PSBs in the period of Basel I & Basel II

H2 : there is no significant difference of CRAR of Private sec banks in the period of Basel I & II

H3: there is no significant difference of CRAR of FSBs in the period of Basel I & II.

Research Design:

A Research design is the framework or a plan for a study that guides the collection and analysis of data. It is the blue print for conducting a research or completing the research study. Descriptive Research design: Descriptive studies are designed to describe the characteristics of the concerns which is undertaken in the study. This research design covers accurate descriptions of the variables relevant to the decision making.

Sample design & Period of the Study:

Data of CRAR of 26 Public Sector Banks, 19 Private sector Banks, 22 Foreign sector banks is collected for the study from 2004 to 2015.

Data collection & Analysis:

The data for the study shall be collected mainly from **secondary sources**. For the purpose of the analysis detailed information would be collected from the various volumes of published materials of the banks from the Indian Bank Association (IBA), Mumbai, and annual reports of respective banks as well. Besides, data will also be collected from Report on trend & progress of Banking in India, RBI Publications and annual issue of IBA Bulletins and RBI bulletins.

Data is analyzed with the help of statistical tool mean, Variance & t- test.

Limitation of the study:

1. One of the major limitations of the study is that it considered CRAR is only factor for the analysis of financial soundness or risk management. Hence, it will not analyse the other quantitative and qualitative aspects of risk management.
2. This study is not considered all banks in all 3 sectors. Considered only those banks which were established before 2004.

SECTION-V: DATA ANALYSIS & INTERPRETATION

The CRAR of all the bank group showed increasing trend, with moderate fluctuations. CRAR of the entire bank groups have been studied under Basel I from 2004 to 2008 and under Basel II from 2009 to 2013 & Basel III from 2013 to 2015. The averages CRAR of all three bank group showed a marked improvement under the Basel II regime and was at the higher level against the minimum regulatory requirement of 9 %. T-test is used to analysis the financial soundness of all the banks under Basel I & II. Basel III is implementing in phased manner, & only 2 years is not significant period to compare with its predecessors.

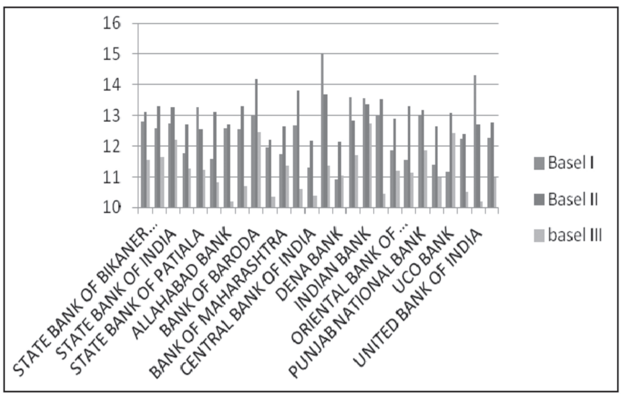
Public Sector Bank:

t-Test: Paired Two Sample for Means		
	Basel I	*Basel II*
Mean	12.47877	12.98769
Variance	0.963509	0.261402
Observations	26	26
Pearson Correlation	0.449312	
Hypothesized Mean Difference	0	
Df	25	
t Stat	-2.94977	
P(T<=t) one-tail	0.003405	
t Critical one-tail	1.708141	
P(T<=t) two-tail	0.00681	
t Critical two-tail	2.059539	

Source : Generated by the Researcher

H1: there is no significant difference between the CRAR of PSBs in the regime of Basel I & Basel II.

The Average CRAR of PSBs has increased marginally from Basel I to Basel II as specified in the table. According to Bank wise Dena bank had lowest average in both Basel I & II, United Bank of India has highest average in Basel I & corporation bank has highest in Basel II. But in case of difference among the different banks, then we can say that there is more variability in Basel I as compare to Basel II. Since the



computed value of t is more than the critical value, hence Null hypothesis rejected. It means there is significant difference between the CRAR of basel I & II.

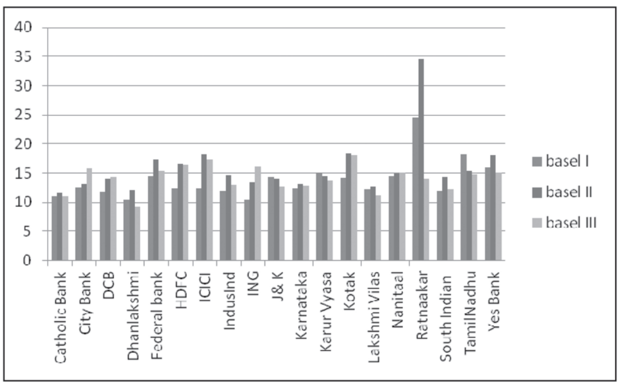
Private sector banks:

t-Test: Paired Two Sample for Means		
	basel I	*basel II*
Mean	13.71958	15.83895
Variance	10.96069	24.8819
Observations	19	19
Pearson Correlation	0.85545	
Hypothesized Mean Difference	0	
Df	18	
t Stat	-3.35361	
P(T<=t) one-tail	0.001768	
t Critical one-tail	1.734064	
P(T<=t) two-tail	0.003537	
t Critical two-tail	2.100922	

Source : Generated by the Researcher

H1: there is no significant difference between the CRAR of Private Sector Banks in the regime of Basel I & Basel II.

The Average CRAR of Private sector banks has increased significantly from Basel I to Basel II as it is appear in the table itself. According to the Bank wise, Highest CRAR in both the basel norms is of Ratnaakar Bank & ING has lowest in Basel I & Catholic bank in Basel II. In case of Private banks Variability of CRAR among the banks is more in Basel II as compare to Basel I. similarly as in case of PSBs since the computer value of t is greater than the critical value, hence we rejected Null hypothesis. It means there is significant difference between the CRAR of Basel I & Basel II.



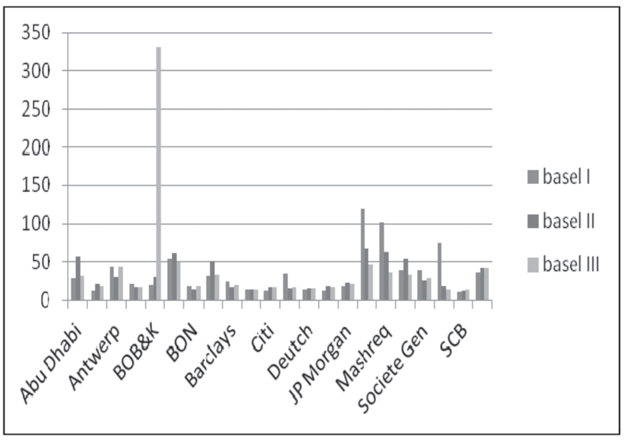
Foreign Sector Banks:

t-Test: Paired Two Sample for Means		
	basel I	*basel II*
Mean	35.14191	30.73890909
Variance	861.0628	367.0331123
Observations	22	22
Pearson Correlation	0.685269	
Hypothesized Mean Difference	0	
Df	21	
t Stat	0.965404	
P(T<=t) one-tail	0.172665	
t Critical one-tail	1.720743	
P(T<=t) two-tail	0.345329	
t Critical two-tail	2.079614	

Source : Generated by the Researcher

H1: there is no significant difference between the CRAR of Foreign Sector Banks in the regime of Basel I & Basel II.

The average CRAR in Basel I is higher than Basel II because with the implementation of Basel Norms initially some foreign banks take much aggressive approach & their CRAR present in 3 digit no. for example K.Thai & Mashreq. Then after that they adopted conservative approach. That is why also variability figure in Basel I is much higher than Basel II figure as apparent in table. Standard charted bank has lowest CRAR average in both the Basel. Since the average figure of CRAR of foreign banks were higher in Basel I as compare to other sector banks then they reduce that average marginally so that become comparable with other two sector banks. That is why Null hypothesis is accepted in case of foreign banks. It means there is no significant difference CRAR of Basel I & II.



CONCLUSION:

The Basel Accord or the mandatory maintenance of a minimum capital against deterioration of asset quality in a crisis in the history of central banking. It has special significance because of its validity across borders for all banks from countries who are signatories. In this paper, CRAR of all sector banks were analyzed in the period of Basel I & II regime through the hypotheses testing. It may be concluded that Indian Banks were enabled to maintain comfortable CRAR according to the international standards. In fact most of the banks have maintained their CRAR at higher level over the years depending on the risk weight assigned to each type of loan and thus it supports the strength of the banking system in India.

Since all the banks in India have ensured a CRAR which is above the minimum set by the regulators, they are in position to comfortably withstand the shock arising from a possible emergency. Bank category wise, the performance of private banks & foreign banks was more noticeable as compare to Public sector banks. PSBs would require to maintain higher CRAR than the minimum requirements in each year. The inclusion of counter-cyclical capital buffer will raise the overall capital requirements of Indian banks further.

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