Compliance of Basel II Norms: Comparison of Selected Public, Private, and Foreign Banks

** Babita Kumar*
*** Gagandeep Banga*
**** Sarishma Sharma*

Abstract

The paper compares the compliance of BASEL II norms (as given by RBI) by selected nationalized, private, and foreign banks. There are three categories of banks in India- public, private, and foreign banks. Nine banks, three in each category, were selected. Data related to three factors of Basel II norms, that is, capital adequacy requirements, supervisory review, and market discipline for the past 6 years, that is, 3 years before and 3 years after the adoption of Basel II norms were collected. It was observed that the tier 1 capital of the selected banks after adoption of Basel II norms varied from each other because the capital of the banks had to be raised in order to meet the requirements of the new capital adequacy norms. Total capital adequacy ratio of the banks was mainly affected by the risk weighted assets of the banks. The more were the risk weighted assets of the banks, the higher was the capital to risk weighted assets ratio (CRAR). It has been observed that the nationalized banks, which were not able to comply with the new capital adequacy norms, were recapitalized.

Keywords: **Basel I, Basel II, capital adequacy, tier 1 capital, CRAR, credit, market and operational risk**

JEL Classification: E 580, G210, G280

Paper Submission Date : May 14, 2013 ; Paper sent back for Revision :October 28, 2013 ; Paper Acceptance Date : January 26, 2014

The period of banking reforms began in the year 1992, which provided a basis for looking into the future of the Indian banking system. BCBS (Basel Committee on Banking Supervision) is a banking supervisory authority committee established by the Central Bank Governors in 1975. In the year 1988, some recommendations were given by BCBS for minimum capital requirements, which came to be known as Basel Capital Accord (Basel I). The main objective of Basel I was adequate capitalization of banks (minimum level of the ratio of capital to assets). As there were many limitations in Basel I accord, the Basel II accord was established in December 2001 to overcome the shortcomings of the existing norms.

↳ **Improvements from Basel I to Basel II :** Basel I focuses on banks having international operations and Basel II focuses on banks having domestic and international operations. Basel I focuses on credit risk, and similar risk weights are assigned to high and low risk profile companies; whereas, Basel II norms include credit risk, operational risk, and market risk ; various risk weight categories are formed on the basis of which different risk weights are assigned.

↳ **Three Forces of Basel II Norms :** The three forces known as the "three pillars" to manage risks are capital adequacy requirements, supervisory review, and market discipline.

↳ **Pillar 1 - Capital Adequacy Requirements:** The first pillar deals with the maintenance of regulatory capital calculated for three major components of risk that a bank faces: credit risk, operational risk, and market risk**.**

↳ **Pillar 2 - Supervisory Review:** The second pillar focuses on improving the role of the supervisory review process.

**Associate Professor,* School of Business Studies, Punjab Agricultural University, Ludhiana, Punjab.
E-mail:babitakumar@pau.edu
***Associate Professor,* School of Business Studies, Punjab Agricultural University, Ludhiana, Punjab. E-mail: gbanga@pau.edu
****Student,* School of Business Studies, Punjab Agricultural University, Ludhiana, Punjab.
E-mail : sarishma_kaushik@yahoo.co.in

It has four key principles: **(a)** banks should have a process for assessing their overall capital adequacy in relation to their risk profile, **(b)** supervisors should evaluate banks' internal capital adequacy and ensure compliance with regulatory capital ratios, **(c)** supervisors should expect banks to operate above the minimum regulatory capital ratios. **(d)** supervisors should seek to intervene at an early stage to prevent capital from falling below the minimum levels.

↳ **Pillar 3 - Market Discipline:** It is to enable market participants to assess key information about a bank's risk profile and level of capitalization. These include **(a)** the structure and components of bank capital, **(b)** the terms and main features of its capital instruments, **(c)** the accounting policies used in the valuation of assets and liabilities and for provisioning and income recognition, **(d)** qualitative and quantitative information about its risk exposures and its strategies for risk management, **(e)** its capital ratio and other data related to its capital adequacy on a consolidated basis and, **(e)** a breakdown of its risk exposures.

↳ **Adoption of Basel II Norms in Other Countries:** Europe adopted Basel II on January 1, 2007. In USA, the Basel Committee's revised accord was first issued in June 2004 and updated in 2005. NRB (Nepal Rastra Bank) issued Capital Adequacy Framework, 2007 which provided guidelines for implementation of Basel II in Nepal. In Bangladesh, the Basel II norms were implemented from January 2009. In India, these came into enforcement from March 12, 2009.

Objectives of the Study

The present study was undertaken to know about the preparations done by banks with the specific objectives :

1) To compare the level of compliance of Basel II norms as given by RBI by selected nationalized, private, and foreign banks.

2) To study the recapitalization of selected nationalized banks under the Basel II norms.

Review of Literature

Nachane (2003) studied the implications of Basel II norms for the Indian banking system and found that the Basel I norms were addressed to internationally active banks, and were applied to all banks on a consolidated basis. Capital adequacy was the major area that needed to be concentrated upon, and it did not differentiate between strong and weak banks; whereas, the new norms focused on credit risks, market risks, and operational risks. Rao (2003) studied the basis for the revision of the 1988 accord, the overview of the new accord, the standardized approach for assessing capital requirements, and the issues involved in implementation of the standardized approach. It was found that the 1988 framework does not make a differentiation for credit risk - the risk weights for a higher rating company are the same as that for a lower rating company. Upadhyay (2003) studied the effect of the introduction of capital adequacy norms on the credit flow and asset structure of the public sector commercial banks. It was found out that credit regulatory mechanism has become stricter after the implementation of the Narasimham Committee recommendations.

Bakshi (2004) studied the Basel II norms' framework and the challenges being faced by banks in India in implementing the new norms. It was found that the new capital norms would increase the capital requirements in all banks. The competition among the banks for highly rated corporates would increase, and huge implementation costs would affect the profitability of smaller banks. Bagchi (2004) studied the Basel II accord as the revitalization of risk management in the banking sector, and it was found that the main issues in implementation of Basel II norms are to acquire the top management support for developing the risk culture of an enterprise, to re-look their existing guidelines or instructions on operational areas, to develop policies for credit risk, market risk, and operational risk. Dutta (2004) studied the credit risk management in banks and suggested measures for reducing the share of non- performing assets. Ghosh (2004) studied the credit risk requirements for Basel II in banks, compared the credit risk approaches and the key implementation challenges for banks in Basel II, and it was concluded that till the new Basel II Accord gets refined, some of its proposals pertaining to credit risk might undergo changes, but the fundamental focus on the broad credit

risk variables will remain unchanged. Prasad (2004) studied the role of CAs in effecting the Basel II norms and the role of external auditors in the banking sector. It was found that CAs have played a key role in improving risk management and disclosure practices and strengthening the internal control and transparency of banking organizations.

Raghavan (2004) studied the revised framework of Basel norms to be adopted by banks. It was found that whereas the first accord mainly focused on credit risk, the revised framework includes credit risks, market risks, operational risks, supervisory review, and market discipline norms. Bagchi (2005) also studied the operational risk management for the structured operational risk policy in banks. Various issues have cropped up with the implementation of these norms. Bandopadhyay (2006) studied the consolidation of Basel II with regional rural banks and found that there are two major issues in implementing Basel II norms, that is, the ability of banks to measure risks and the challenge of meeting the adequacy requirements. Considering the compliance of Basel II norms in other countries, Akhtaruzzaman (2009) examined the impact of Basel II on developing economies, and it was found that as the capital requirements of the banks increased, it had a negative impact on the unchecked implementation of Basel II. Barakat (2009) studied the degree of application of Basel's committee requirements by Jordan banks. The results revealed that all banks in Jordan were applying the Basel II norms. Scellato and Ughetto (2010) investigated the issue of the financing of R & D investments under Basel II norms in SMEs, and it was found that it might have a negative impact on lending conditions of SMEs.

Research Methodology

The population of the study consisted of all the three categories of banks operating in India- public, private, and foreign banks. A sample of nine banks, three banks from each category was selected. The banks selected were Bank of India, Punjab National Bank, State Bank of India, Axis Bank, HDFC Bank, ICICI Bank, HSBC Bank, Citibank, and Standard Chartered Bank. Basel norms data related to tier 1 capital; total capital adequacy ratio; credit, market, and the operational risk capital requirements for the past 6 years, that is, 3 years before and 3 years after the adoption of Basel II norms were collected. The percentage change in the tier 1 capital ratio; total capital adequacy ratio; credit, market, and the operational risk capital requirements; as well as the average of tier 1 capital ratio; total capital adequacy ratio; credit, market, and the operational risk capital requirements of the nationalized, private, and foreign banks were studied. The research was conducted in the year 2011. The data was collected from the websites of the respective banks. The following statistical techniques were used to compare the data :

↳ **Trend Analysis:** It was used to find out the trend being followed by the tier 1 capital ratio of the banks and compare the differences between the actual and the trend values. The trend equation used to analyze the data is as follows:

$$\Sigma y_t = na + b\Sigma t \text{ and } \Sigma t_y = a\Sigma t + b\Sigma t^2$$

↳ **Paired *t*- test:** It was used to compare the average of the tier 1 capital ratio and the total capital adequacy ratio before and after adoption of Basel II norms by the selected banks. We tested the null hypothesis that the mean difference of the population is zero, that is,

$$H_0 : \overline{D} = 0, \textit{i.e.}\ \mu_2 - \mu_1 = 0$$

$$t = \frac{\overline{d} - 0}{S / \sqrt{n}} \text{ with } \overline{d} = (n-1)\, df, \text{ where } s^2 = \frac{1}{n-1} \Sigma (d_i - \overline{d})^2$$

Where,

$d_i = x_{2i} - x_{1i}$ = difference in paired observations for i - th unit and $\overline{d} = \frac{1}{n} \Sigma d_i$ is the sample mean of differences and is equal to $(X_2 - X_1)$.

↳ **One Way ANOVA:** It was used to compare the credit, market, and operational risk capital requirements of the selected banks. The formula used for this test is as follows:

Correction Factor $\quad C.F. = \frac{G^2}{n}$

$$SSC = \Sigma \frac{y_i}{n_i} - C.F.$$

$$SSC = SST - SSC$$

$$F = \frac{\text{Variance between samples}}{\text{Variance within samples}}$$

↳ ***t*- Test - Two Sample Assuming Equal Variance:** It was used to study and compare the credit risk disclosures under 100%, below 100%, and above 100% risk weight categories and the credit risk requirements on the basis of funds based and non funds based categories of the selected banks. The formula used for this test is as follows:

$$S_p = \frac{(n_1 - 1)S^2_1 + (n_2 - 1)S^2_2}{n_1 + n_2 - 2}$$

In all work, with two-sample *t* - tests, the degrees of freedom is :

$$df = n_1 + n_2 - 2$$

Table 1. Tier 1 Capital Ratio of Nationalized, Private, and Foreign Banks

BANKS	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Bank of India	7.05%	6.75%	6.54%	7.74%	8.99%	8.57%
Percentage change	-	(0.30%)	(0.21%)	1.20%	1.22%	(0.42%)
Punjab National Bank	7.31%	7.42%	7.83%	8.97%	8.98%	9.11%
Percentage change	-	0.11%	0.41%	1.14%	0.01%	0.13%
State Bank Of India	6.87%	7.65%	7.92%	8.48%	9.38%	9.45%
Percentage change	-	0.78%	0.27%	0.56%	0.90%	0.07%
Average of selected nationalized banks	**7.08%**	**7.27%**	**7.43%**	**8.40%**	**9.12%**	**9.04%**
Percentage change	-	0.19%	0.16%	0.97%	0.72%	(0.08%)
Axis Bank	8.87%	7.26%	6.42%	10.39%	9.26%	11.18%
Percentage change	-	(1.61%)	(0.84%)	3.97%	(1.13%)	1.92%
HDFC Bank	9.60%	8.60%	8.57%	10.30%	10.58%	13.26%
Percentage change	-	(1.00%)	(0.03%)	1.73%	0.28%	2.68%
ICICI Bank	7.59%	9.20%	7.42%	10.66%	10.34%	12.92%
Percentage change	-	1.61%	(1.78%)	3.24%	(0.32%)	2.58%
Average of selected private banks	**8.69%**	**8.35%**	**7.47%**	**10.45%**	**10.06%**	**12.45%**
Percentage change	-	(0.34%)	(0.88%)	2.98%	(0.39%)	2.39%
Citibank	9.80%	10.77%	10.12%	11.24%	12.42%	17.27%
Percentage change	-	0.97%	(0.65%)	1.12%	1.18%	4.85%
HSBC Bank	9.00%	9.40%	9.30%	10.52%	14.12%	16.63%
Percentage change	-	0.40%	(0.10%)	1.22%	3.60%	2.51%
Standard Chartered Bank	7.70%	8.40%	8.80%	10.10%	7.99%	8.94%
Percentage change	-	0.70%	0.40%	1.30%	(2.11%)	0.95%
Average of selected foreign banks	**8.83%**	**9.52%**	**9.41%**	**10.62%**	**11.51%**	**14.28%**
Percentage change	-	0.69%	(0.11%)	1.21%	0.89%	2.77%

Source: Regulatory Disclosures Section, Basel II Disclosures, Axis Bank, Basel II Disclosures, Bank of India, Regulatory Disclosures Section, Basel II Disclosures, HDFC Bank, Basel Disclosures, HSBC Bank, Basel Pillar 3 Disclosures, ICICI Bank, Basel II Disclosures, State Bank of India, Pillar 3 Disclosures, Standard Chartered Bank, Basel II Disclosures, Citi Bank, Financials, Disclosures under Basel II Punjab National Bank (2011)

Table 2. Average of the Tier 1 Capital Ratio Before Adoption and After Adoption of Basel II Norms by Selected Nationalized, Private, and Foreign Banks

Banks	Before adoption of Basel II norms	After adoption of Basel II norms
Bank of India	6.78%	8.43%
Punjab National Bank	7.52%	9.02%
State Bank of India	7.48%	9.10%
Axis Bank	7.52%	10.28%
HDFC Bank	8.92%	11.38%
ICICI Bank	8.07%	11.31%
Citibank	10.23%	13.64%
HSBC Bank	9.23%	13.76%
Standard Chartered Bank	8.30%	9.01%

Table 3. Paired *t*-Test for Tier 1 Capital Ratio Before and After Adoption of Basel II Norms by Selected Nationalized, Private, and Foreign Banks

Paired *t*- test	Public sector banks		Private sector banks		Foreign banks		All banks	
Mean	0.07	0.09	0.08	0.11	0.09	0.11	0.08	0.11
Variance	1.73	1.33	5.02	3.80	9.32	0.0004	0.0001	0.0004
Observations	3	3	3	3	3	9	9	9
Pearson Correlation	0.99		0.83		0.85		0.88	
Hypothesized Mean Difference	0		0		0		0	
Df	2		2		2		8	
t Stat	-33.94		-12.41		-2.55		-6.17	
t Critical two-tail	4.30		4.30		4.30		2.30	

The formula for the two sample *t*-test is:

$$T = \frac{\overline{X} - \overline{Y}}{S_P \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Results and Discussion

The findings of the study have been divided into eight sections :

(1) Comparison of tier 1 capital ratio,
(2) Total capital adequacy ratio,
(3) Credit risk capital requirements,
(4) Market risk capital requirements,
(5) Operational risk capital requirements,
(6) Credit risk disclosures under three different categories,
(7) Funds based and non funds based credit risk capital requirements, and
(8) Recapitalization of selected nationalized banks.

(1) Tier 1 Capital Ratio : The comparison of individual banks from the years 2004-05 to 2009-10 and inter-category comparison for tier 1 capital ratio was done. From the Table 1, we find that the tier 1 capital ratio of nationalized, private, and foreign banks from the year after adoption of Basel II norms increased continuously and was able to meet the statutory requirements of the RBI , that is, 9%.

Table 4. Comparison of Actual and Trend Values of Tier 1 Capital Ratio of Selected Nationalized, Private, and Foreign Banks from 2004-05 to 2009-2010

Banks	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Bank of India	7.05%	6.75%	6.54%	7.74%	8.99%	8.57%
(Trend Values)	6.73%	7.11%	7.49%	7.87%	8.25%	8.62%
Change in trend and actual values	**0.32%**	**(0.36%)**	**(0.95%)**	**(0.13%)**	**(0.74%)**	**(0.05%)**
Punjab National Bank	7.31%	7.42%	7.83%	8.97%	8.98%	9.11%
(Trend Values)	7.21%	7.63%	8.05%	8.48%	8.90%	9.33%
Change in trend and actual values	**0.10%**	**(0.21%)**	**(0.22%)**	**0.49%**	**0.08%**	**(0.22%)**
State Bank Of India	6.87%	7.65%	7.92%	8.48%	9.38%	9.45%
(Trend Values)	6.96%	7.49%	8.025%	8.55%	9.09%	9.62%
Change in trend and actual values	(0.09)%	0.16%	(0.11)%	(0.07)%	0.29%	(0.17)%
Axis Bank	8.87%	7.26%	6.42%	10.39%	9.26%	11.18%
(Trend Values)	7.36%	7.97%	8.59%	9.20%	9.82%	10.43%
Change in trend and actual values	**1.51%**	**(0.71%)**	**(2.17%)**	**1.19%**	**(0.56%)**	**0.75%**
HDFC Bank	9.60%	8.60%	8.57%	10.30%	10.58%	13.26%
(Trend Values)	8.30%	9.04%	9.78%	10.52%	11.26%	12.00%
Change in trend and actual values	**1.30%**	**(0.44%)**	**(1.21%)**	**(0.22%)**	**(0.68%)**	**1.26%**
ICICI Bank	7.59%	9.20%	7.42%	10.66%	10.34%	12.92%
(Trend Values)	7.30%	8.26%	9.21%	10.16%	11.12%	12.07%
Change in trend and actual values	**0.29%**	**0.94%**	**(1.79%)**	**0.50%**	**(0.78%)**	**0.85%**
Citibank	9.80%	10.77%	10.12%	11.24%	12.42%	17.27%
(Trend Values)	8.84%	10.07%	11.32%	12.56%	13.79%	15.04%
Change in trend and actual values	**0.96%**	**0.70%**	**(1.20%)**	**(1.32%)**	**(1.37%)**	**2.23%**
HSBC Bank	9.00%	9.40%	9.30%	10.52%	14.12%	16.63%
(Trend Values)	7.67%	9.20%	10.73%	12.26%	13.79%	15.32%
Change in trend and actual values	**1.33%**	**0.20%**	**(1.43%)**	**(1.74%)**	**0.33%**	**1.31%**
Standard Chartered Bank	7.70%	8.40%	8.80%	10.10%	7.99%	8.94%
(Trend Values)	8.24%	8.41%	8.58%	8.75%	8.92%	9.08%
Change in trend and actual values	**(0.54%)**	**(0.01%)**	**0.22%**	**1.35%**	**(0.93%)**	**(0.14%)**

Source: Regulatory Disclosures Section, Basel II Disclosures, Axis Bank, Basel II Disclosures, Bank of India, Regulatory Disclosures Section, Basel II Disclosures, HDFC Bank, Basel Disclosures, HSBC Bank, Basel Pillar 3 Disclosures, ICICI Bank, Basel II Disclosures, State Bank of India, Pillar 3 Disclosures, Standard Chartered Bank, Basel II Disclosures, Citi Bank, Financials, Disclosures under Basel II Punjab National Bank (2011)

↳ **Paired *t* - test for Two Sample Means - Tier 1 Capital Ratio Before and After Adoption of Basel II Norms by Nationalized, Private, and Foreign Banks :** The Table 2 depicts the calculation of the average of the tier 1 capital ratio before adoption and after adoption of Basel II norms by selected nationalized, private, and foreign banks. Further paired *t*- test was calculated using the average of the ratio of all the selected banks. *t*-test was applied on the above average figures (Table 2) to find out whether the new norms had any effect on the banks' tier 1 capital ratio or not.

From the Table 3, it can be inferred that the variance between the observations before and after adoption of Basel II norms is very less, which means that the ratios vary slightly from each other. The correlation between the two sets of data shows that they are highly positively related to each other because the concept of tier 1 capital remained the same in Basel I and Basel II norms, but the difference was in the risk weighted assets. By applying the paired *t* test, it was observed that there was a lot of difference in the tier 1 capital ratio after adoption of new norms because the banks had to raise their capital in order to comply with the new norms. The actual and trend values of tier 1 capital ratio were also compared. From the Table 4, it can be inferred that the trend values were higher than actual values and the values were higher than the benchmark of 6% for all the selected banks.

Table 5: Total Capital Adequacy Ratio of Selected Nationalized, Private, and Foreign Banks

Banks	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Bank of India	11.5%	10.8%	11.8%	12.07%	13.08%	12.94%
Percentage change	-	(0.70%)	1.00%	0.27%	1.01%	(0.14%)
Punjab National Bank	14.8%	12.00%	12.3%	13.46%	14.03%	14.16%
Percentage change	-	(2.80%)	0.30%	1.16%	0.57%	0.13%
State Bank of India	12.5%	11.9%	12.3%	12.64%	14.25%	13.39%
Percentage change	-	(0.60%)	0.40%	0.34%	1.61%	(0.86%)
Average of Nationalized Banks	**12.93%**	**11.57%**	**12.13%**	**12.72%**	**13.79%**	**13.52%**
Percentage change	-	(1.36%)	0.56%	0.59%	1.07%	(0.27%)
Axis Bank	12.7%	11.1%	11.6%	13.99%	13.69%	15.80%
Percentage change	-	(1.60%)	0.50%	2.39%	(0.30%)	2.11%
HDFC Bank	12.2%	11.4%	13.1%	13.60%	15.69%	17.44%
Percentage change	-	(0.80%)	1.70%	0.50%	2.09%	1.75%
ICICI Bank	11.8%	13.4%	11.7%	13.46%	14.73%	19.15%
Percentage change	-	1.60%	(1.70%)	1.76%	1.27%	4.42%
Average of Private Banks	**12.23%**	**11.97%**	**12.13%**	**13.68%**	**14.70%**	**17.46%**
Percentage change	-	(0.26%)	0.16%	1.55%	1.02%	2.76%
Citibank	10.8%	11.3%	11.1%	12.00%	13.23%	18.14%
Percentage change	-	0.50%	(0.20%)	0.90%	1.23%	4.91%
HSBC Bank	14.0%	10.6%	11.1%	11.46%	15.31%	18.03%
Percentage change	-	(3.40%)	0.50%	0.36%	3.85%	2.72%
Standard Chartered Bank	10.5%	9.9%	10.4%	10.59%	11.56%	12.41%
Percentage change	-	(0.60%)	0.50%	0.19%	0.97%	0.85%
Average of Foreign Banks	**11.77%**	**10.60%**	**10.87%**	**11.35%**	**13.37%**	**16.19%**
Percentage change	-	(1.17%)	0.27%	0.48%	2.02%	2.82%

Source: Regulatory Disclosures Section, Basel II Disclosures, Axis Bank, Basel II Disclosures, Bank of India, Regulatory Disclosures Section, Basel II Disclosures, HDFC Bank, Basel Disclosures, HSBC Bank, Basel Pillar 3 Disclosures, ICICI Bank, Basel II Disclosures, State Bank of India, Pillar 3 Disclosures, Standard Chartered Bank, Basel II Disclosures, Citi Bank, Financials, Disclosures under Basel II Punjab National Bank (2011)

Table 6. Average of the Total Capital Adequacy Ratio Before Adoption and After Adoption of Basel II Norms by Selected Nationalized, Private, and Foreign Banks

Banks	Before adoption of Basel II norms	After adoption of Basel II norms.
Bank of India	11.37%	12.72%
Punjab National Bank	13.03%	13.88%
State Bank of India	12.23%	13.43%
Axis Bank	11.80%	14.49%
HDFC Bank	12.23%	15.58%
ICICI Bank	12.30%	15.78%
Citibank	11.07%	14.46%
HSBC Bank	11.90%	14.93%
Standard Chartered Bank	10.27%	11.52%

(2) Total Capital Adequacy Ratio : The comparison of the individual banks from 2004-05 to 2009-10 and inter-category comparison was done for the total capital adequacy ratio. From the Table 5, it can be observed that the CRAR of the nationalized banks decreased because the risk weighted assets increased, and then, it increased continuously

Table 7. Paired *t*-test for Total Capital Adequacy Ratio Before and After Adoption of Basel II Norms for Selected Nationalized, Private, and Foreign Banks

Paired *t*- test	Public sector banks		Private sector banks		Foreign banks		All banks	
Mean	0.12	0.13	0.12	.15	0.11	.14	.12	0.14
Variance	6.95	3.46	7.37	.78	6.67	.0003	.54	0.0002
Observations	3	3	3		3		9	
Pearson Correlation	0.99		0.99		0.92		.59	
Hypothesized Mean Difference	0		0		0		0	
Df	2		2		2		8	
t Stat	-7.66		-13.07		-3.87		6.24	
t Critical two-tail	4.30		4.30		4.30		.30	

from 2006-2007 to 2009-2010 because the reserves, innovative perpetual bonds, and capital funds amount under tier 2 capital of the banks increased. In case of private sector banks, this ratio declined in 2005-2006 because the share premium of HDFC bank decreased to a great extent and there was a credit enhancement on securitization at 50% and there was a decrease in the investment fluctuation reserve of ICICI Bank and in this year, the bank also had a negative

Table 8. Credit Risk Capital Requirements by Selected Nationalized, Private, and Foreign Banks (Figs. In Crores)

Banks	2007-08	2008-09	2009-10
Bank of India	9551	10927.71	14652.81
Percentage change	-	14.41%	34.08%
Punjab National Bank	9913.06	12025	15180.27
Percentage change	-	21.30%	26.24%
State Bank of India	59241.33	64023	71539
Percentage change	-	8.07%	11.74%
Average of nationalized banks	**26235.13**	**28991.9**	**33790.69**
Percentage change	-	10.51%	16.55%
Axis Bank	6444.37	8398.51	11040.47
Percentage change	-	30.32%	31.46%
HDFC Bank	8981.92	10739.71	12280.57
Percentage change	-	(88.04%)	14.34%
ICICI Bank	31385	32814	26281
Percentage change	-	4.55%	(19.90%)
Average of private banks	**42547.1**	**17317.41**	**16534.01**
Percentage change	-	(59.29%)	(4.52%)
Citibank	8106.8	7901.3	6492.9
Percentage change	-	(2.53%)	(17.82%)
HSBC Bank	5163.61	4394.53	3292.36
Percentage change	-	(14.89%)	(25.08%)
Standard Chartered Bank	4658.30	5173.53	5579.97
Percentage change	-	11.06%	7.85%
Average of foreign banks	**5976.237**	**5823.12**	**5121.743**
Percentage change	-	(2.56%)	(12.04%)

Source: Regulatory Disclosures Section, Basel II Disclosures, Axis Bank, Basel II Disclosures, Bank of India, Regulatory Disclosures Section, Basel II Disclosures, HDFC Bank, Basel Disclosures, HSBC Bank, Basel Pillar 3 Disclosures, ICICI Bank, Basel II Disclosures, State Bank of India, Pillar 3 Disclosures, Standard Chartered Bank, Basel II Disclosures, Citi Bank, Financials, Disclosures under Basel II Punjab National Bank (2011)

balance in the foreign currency translation reserve. It again increased in the year 2006-2007 because the banks raised equity capital during the year through follow-on global depositary receipt (GDR) issue, a qualified institutional placement (QIP), and a preferential allotment of equity shares to the promoters of the banks. In all the years, it had been able to meet the statutory requirements of the RBI. In case of foreign banks, this ratio increased continuously from 2006-2007 to 2009-2010 and was complying with the requirements of RBI, that is, 9% because in comparison to increase in tier 1 and tier 2 capital, there was not much increase in the risk weighted assets of the banks.

Paired *t*-test for Two Sample Means - Total Capital Adequacy Ratio Before and After Adoption of Basel II Norms : In Table 6, average of the total capital adequacy ratio before adoption and after adoption of Basel II norms by selected nationalized, private, and foreign banks was calculated. The paired *t* -test was calculated by using the average of the ratio of the selected banks. Paired *t* - test was applied on the above average figures (Table 6) to find out whether the new norms had any effect on the banks' total capital adequacy ratio or not.

From the Table 7, it can be inferred that the variance between the observations before and after adoption of Basel II norms is very high, which means that the ratios vary from each other. The correlation between the two sets of data shows that they are moderately positively related to each other because the difference was observed in the percentage of the risk weighted assets of the banks. By applying the paired *t* - test, it was observed that there was a lot of difference in the CRAR of the banks after the adoption of Basel II norms because the banks had to raise the capital components of tier 1 and tier 2 capital in order to comply with the new norms.

(3) Credit Risk Capital Requirements : Year wise comparison of individual banks for credit risk capital requirements was done and approach used by the banks was also defined. In the end, the data was analyzed using one way ANOVA. From the Table 8, it can be seen that the credit risk capital requirements of the nationalized banks had shown the maximum increase and the approach used was the standardized approach. In case of private banks, the average of the credit risk capital requirements showed a maximum decline in the year 2008-2009 because the risk weighted assets decreased by ₹ 666.36 billion and the private banks used the standardized approach, and they also concentrated on the credit risk arising from swaps. In case of foreign banks, the amount of capital for credit risk reduced because the capital for the retail exposures and securitization exposures had reduced, and the approach used was advanced internal ratings based approach.

Comparison of Credit Risk Requirements of Banks Using One Way ANOVA : The credit risk requirements were analyzed and compared using single factor ANOVA. From the Table 9, it can be ascertained that the variance of the values is very large, which shows that the credit risk capital requirements of the banks varied from each other. ANOVA one way classification at 5% level of significance showed that the credit risk capital requirements by all the banks followed a certain pattern. The capital allocated towards credit risk by the banks is 9% of the risk weighted assets of the banks.

Table 9. Single Factor ANOVA for Selected Nationalized, Private, and Foreign Banks

Groups	Count	Sum	Average	Variance
Column 1	9	224275.39	24919.48	914626204.6
Column 2	9	156397.29	17377.47	377039065.9
Column 3	9	166339.35	18482.15	442024241.2

ANOVA

Source of Variation	*SS*	*Df*	*MS*	*F*	*P*-value	*F* crit
Between Groups	298624657.3	2	149312328.7	0.26	0.77	3.40
Within Groups	13869516094	24	577896503.9			
Total	14168140752	26				

Table 10. Market Risk Capital Requirements by Selected Nationalized, Private, and Foreign Banks (Figs. In Crores)

Banks	2007-2008	2008-2009	2009-2010
Bank of India	815.85	843.67	1325.98
Percentage change	-	3.40%	57.17%
Punjab National Bank	613.79	641.58	666.42
Percentage change	-	4.53%	3.87%
State Bank of India	4260.58	3766.93	5068
Percentage change		(11.58%)	34.54%
Average of nationalized banks	**1896.74**	**1750.7267**	**2353.4667**
Percentage change	-	(7.69%)	34.43%
Axis Bank	934.43	1050.4	2017.44
Percentage change	-	124.93%	(4.01%)
HDFC Bank	17636.07	562.73	589.27
Percentage change	-	(96.80%)	4.72%
ICICI Bank	4994	4613	3270
Percentage change	-	(7.63%)	(29.11%)
Average of Private banks	**7854.8333**	**2425.8433**	**1958.9033**
Percentage change	-	(69.12%)	(19.25%)
Citibank	643.5	548.4	402.2
Percentage change	-	(14.85%)	(26.66%)
HSBC Bank	701.16	822.66	910.72
Percentage change	-	17.33%	10.70%
Standard Chartered Bank	2099.19	3036.94	1755.72
Percentage change	-	44.67%	(42.18%)
Average of Foreign banks	**1147.95**	**1469.3333**	**1022.88**
Percentage change	-	27.99%	(30.38%)

Source: Regulatory Disclosures Section, Basel II Disclosures, Axis Bank, Basel II Disclosures, Bank of India, Regulatory Disclosures Section, Basel II Disclosures, HDFC Bank, Basel Disclosures, HSBC Bank, Basel Pillar 3 Disclosures, ICICI Bank, Basel II Disclosures, State Bank of India, Pillar 3 Disclosures, Standard Chartered Bank, Basel II Disclosures, Citi Bank, Financials, Disclosures under Basel II Punjab National Bank (2011)

Table 11. Single Factor ANOVA for Comparison of Market Risk Requirements of Selected Nationalized, Private, and Foreign Banks

Groups	Count	Sum	Average	Variance
Column 1	9	32698.57	3633.17	30318970
Column 2	9	16937.71	1881.97	2456432
Column 3	9	16005.75	1778.42	2325750

ANOVA

Source of Variation	*SS*	*Df*	*MS*	*F*	*P*-value	*F* crit
Between Groups	19552722.11	2	9776361	0.84	0.45	3.40
Within Groups	280809216	24	11700384			
Total	300361938.1		26			

Table 12. Operational Risk Capital Requirements by Selected Nationalized, Private, and Foreign Banks (figs. in crores):

Banks	2007-2008	2008-2009	2009-2010
Bank of India	699	884	1079.12
Percentage change	-	(26.47%)	(22.07%)
Punjab National Bank	974.62	1165.6	1165.6
Percentage change	-	(19.60%)	0.00%
State Bank Of India	4531.79	4972	5541
Percentage change	-	(9.71%)	(11.44%)
Average of Nationalized Banks	**2068.47**	**2340.533**	**2595.24**
Percentage change	-	(13.15%)	(10.88%)
Axis Bank	270.31	431.46	656.09
Percentage change	-	(59.62%)	(52.06%)
HDFC Bank	Nil	806.11	1175.01
Percentage change	-		(45.76%)
ICICI Bank	1522	2114	2459
Percentage change	-	(38.89%)	(16.32%)
Average of Private Banks	**597.4367**	**1117.19**	**1430.033**
Percentage change	-	(86.99%)	(28.00%)
Citibank	759.1	1246.1	1246.6
Percentage change	-	(64.16%)	0.04%
HSBC Bank	369.92	541.64	746.30
Percentage change	-	(46.42%)	(37.79%)
Standard Chartered Bank	570.56	574.08	749.61
Percentage change	-	(0.62%)	(30.58%)
Average of Foreign Banks	**566.5267**	**787.2733**	**914.17**
Percentage change	-	(38.97%)	(16.12%)

Source: Regulatory Disclosures Section, Basel II Disclosures, Axis Bank, Basel II Disclosures, Bank of India, Regulatory Disclosures Section, Basel II Disclosures, HDFC Bank, Basel Disclosures, HSBC Bank, Basel Pillar 3 Disclosures, ICICI Bank, Basel II Disclosures, State Bank of India, Pillar 3 Disclosures, Standard Chartered Bank, Basel II Disclosures, Citi Bank, Financials, Disclosures under Basel II Punjab National Bank (2011)

Table 13. Single Factor ANOVA for Comparing Operational Risk Requirements of Selected Nationalized, Private, and Foreign Banks

Groups	Count	Sum	Average	Variance
Column 1	9	9697.3	1077.478	1869393
Column 2	9	12734.99	1414.999	2040193
Column 3	9	14818.33	1646.481	2419797

ANOVA

Source of Variation	*SS*	*Df*	*MS*	*F*	*P*-value	*F* crit
Between Groups	1473808	2	736904	0.35	0.71	3.40
Within Groups	50635063	24	2109794			
Total	52108871	26				

(4) Market Risk Capital Requirements : Year wise comparison of individual banks for market risk capital requirements was done and approach used was also defined. In the end, the data was analyzed using one-way ANOVA. From the Table 10, it can be inferred that the change in the market risk capital requirements is based on the equity,

interest rate, and foreign risk capital. The market risk capital requirement was calculated using standardized duration approach.

↳ **Comparison of Market Risk Requirements of Banks using One Way ANOVA :** The market risk requirements of the banks were analyzed and compared using single factor ANOVA. From the Table 11, it can be inferred that the variance of the values was very large, which shows that the market risk capital requirements of the banks varied from each other. By applying ANOVA one way classification at 5% level of significance, it was found that the market risk capital requirements by all the banks followed a certain pattern.

(5) Operational Risk Capital Requirements : Year wise comparison of individual banks was done for operational risk capital requirements and approach used by the banks was also defined. Data was analyzed and compared using one way ANOVA.

Table 14. Credit Risk Disclosures for Selected Nationalized, Private, and Foreign Banks

Banks	100% risk weight			Below 100% risk weight			Above 100% risk weight		
	March 2008	March 2009	March 2010	March 2008	March 2009	March 2010	March 2008	March 2009	March 2010
Bank of India	52319	69352	97538	72773	99261	209859	14058	7820	13976
Percentage Change	-	32.56%	40.64%	-	36.40%	111.42%	-	(44.37%)	78.72%
Punjab National Bank	70392.29	86034.18	116113.22	78576.94	103757.71	109933.74	12583.01	7584.87	12544.66
Percentage Change	-	22.22%	34.96%	-	32.05%	5.95%	-	(39.72%)	65.39%
State Bank of India	274499.91	304530.27	378593.99	297999.68	621590.56	752166.40	51809.80	60168.89	104875.77
Percentage Change	-	10.94%	24.32%	-	108.59%	21.01%	-	16.13%	74.30%
Average of Nationalized Banks	132403.73	153305.5	197415.1	**149783.2**	**274869.8**	**357319.713**	**26150.27**	**25191.25**	**43798.81**
Percentage Change	-	15.79%	28.77%	-	83.51%	30.00%	-	(3.67%)	73.87%
Axis Bank	42,076.33	60,398.72	74,494.82	60,713.14	96,604.16	123,390.75	10,352.68	6,958.25	12,313.83
Percentage Change	-	43.55%	23.34%	-	59.12%	27.73%	-	(32.79%)	76.97%
HDFC Bank	-	44083.39	56858.55		45470.60	64069.03		32999.17	39726.86
Percentage Change	-	-	28.98%	-	-	40.90%	-	-	20.39%
ICICI Bank	237565.7.9	318922	312095	137392.3	175884	191058	94847.2	70673	32320
Percentage Change	-	34.25%	(2.14)%	-	28.02%	8.63%	-	(25.49%)	(54.27%)
Average of Private Banks	93214.04	141134.7	147816.1	**66035.15**	**105986.3**	**126172.593**	**35066.63**	**36876.81**	**28120.23**
Percentage Change	-	51.41%	4.73%	-	60.50%	19.05%	-	5.16%	(23.75%)
Citibank	44898.10	46285.40	44958.8	60279.50	79530.80	73031.6	24608.90	20431.20	12606.3
Percentage Change	-	3.09%	(2.87%)	-	31.94%	(8.17%)	-	(16.98%)	(38.30%)
HSBC Bank	34873.05	22990.79	12039.31	48236.96	62052.84	66696.46	10742.65	8862.88	3690.17
Percentage Change	-	(34.07%)	(47.63%)	-	28.64%	7.48%	-	(17.50%)	(58.36%)
Standard Chartered Bank	21361.56	25249.67	30639.56	6955.03	11292.75	9558.81	7385.09	3843.76	2776.02
Percentage Change	-	18.20%	21.35%	-	62.37%	(15.35%)	-	(47.95%)	(27.78%)
Average of Foreign Banks	33710.90333	31508.62	29212.56	**38490.5**	**50958.8**	**49762.29**	**14245.55**	**11045.95**	**6357.497**
Percentage Change	-	(6.53%)	(7.29%)	-	32.39%	(2.35%)	-	(22.46%)	(42.44%)

Source: Regulatory Disclosures Section, Basel II Disclosures, Axis Bank, Basel II Disclosures, Bank of India, Regulatory Disclosures Section, Basel II Disclosures, HDFC Bank, Basel Disclosures, HSBC Bank, Basel Pillar 3 Disclosures, ICICI Bank, Basel II Disclosures, State Bank of India, Pillar 3 Disclosures, Standard Chartered Bank, Basel II Disclosures, Citi Bank, Financials, Disclosures under Basel II Punjab National Bank (2011)

Table 15. *t* - Test for Two-Samples Assuming Equal Variances for Selected Nationalized, Private, and Foreign Banks

***t*- Test: Two-Sample Assuming Equal Variances (2008)**	**>100 and 100**	**>100 and< 100**	**100 and < 100**
Mean	84769.62	84769.62	86442.89
Variance	8021574499	8021574499	9710924709
Observations	9	9	9
Hypothesized Mean Difference	0	0	0
Df	16	16	16
t Stat	-0.04	1.89	1.78
t Critical two-tail	2.12	2.12	2.12
***t* -Test: Two-Sample Assuming Equal Variances (2009)**	**>100 and 100**	**>100 and < 100**	**100 and < 100**
Mean	143938.26	143938.26	108649.60
Variance	34145944435	34145944435	13664836757
Observations	9	9	9
Hypothesized Mean Difference	0	0	0
Df	16	16	16
t Stat	0.48	1.92	2.11
t Critical two-tail	2.12	2.12	2.12
***t*-Test: Two-Sample Assuming Equal Variances (2010)**	**>100 and 100**	**>100 and < 100**	**100 and < 100**
Mean	177751.53	177751.53	124814.58
Variance	50403341984	50403341984	16926488989
Observations	9	9	9
Hypothesized Mean Difference	0	0	0
Df	16	16	16
t Stat	0.61	2.01	2.21
t Critical two-tail	2.12	2.12	2.12

From the Table 12, it can be inferred that the operational risk capital requirements in case of nationalized banks decreased in the year 2008-2009 and 2009-2010 because the banks entered into derivative contracts such as interest rate swaps, currency swaps, and cross currency options to hedge on balance sheet assets and liabilities or for trading purposes or to meet client requirements. In the case of private banks, the operational risk capital requirements decreased in the year 2008-2009 because in the year 2008-2009, HDFC bank did not allocate any amount towards operational risk capital requirements. In case of foreign banks, the operational risk capital requirements decreased in the year 2008-2009 and 2009-2010. It was observed that all the banks were using the basic indicator approach, with the exception of Standard Chartered Bank, which was using the standardized approach.

↳ **Comparison of Operational Risk Requirements of Banks Using One Way ANOVA :** The operational risk requirements were analyzed and compared using single factor ANOVA. From the Table 13, it can be inferred that the variance of the values was very large, which shows that the operational risk capital requirements of the banks varied from each other. By applying ANOVA one way classification at the 5% level of significance, it was found that all banks followed a certain pattern.

(6) Credit Risk Disclosures : Year wise comparison of individual banks and inter-category comparison was done for the credit risk disclosures by the banks. From the Table 14, it can be inferred that in case of all the banks, 100%, below 100%, and above 100% risk weighted capital increased in all the years.

Table 16. Fund Based and Non Fund Based Credit Risk Requirements for Selected Nationalized, Private, and Foreign Banks

Category	Fund Based			Non Fund Based		
Banks	**2007-08**	**2008-09**	**2009-10**	**2007-08**	**2008-09**	**2009-10**
Bank of India	115088	146142	171865	22886	30755	37792
Percentage change	-	26.98%	17.60%	-	34.38%	22.88%
Punjab National Bank	120931.96	156098.45	188306.11	30616.01	42241.11	48743.46
Percentage change	-	29.08%	20.63%	-	37.97%	15.39%
State Bank of India	611652.16	759520.45	934724.39	171689.14	233152.02	306794.42
Percentage change	-	24.17%	23.07%	-	35.79%	31.58%
Average	**282557.3733**	**353920.3**	**431631.833**	**75063.7167**	**102049.38**	**131109.96**
Percentage change	-	25.25%	21.95%	-	35.95%	28.47%
Axis Bank	92,923.68	127,931.35	156,098.78	20,218.47	36,029.78	54,100.73
Percentage change	-	37.67%	22.02%	-	78.20%	50.16%
HDFC Bank		105489.42	134357.30	-	17063.74	22297.14
Percentage change	-	-	27.36%	-	-	30.66%
ICICI Bank	348073.49	359411	335566	121731.8	208820	210975
Percentage change	-	3.25%	(6.63%)	-	71.54%	1.03%
Average	**146999.0567**	**197610.59**	**208674.027**	**47316.7567**	**87304.507**	**95790.957**
Percentage change	-	34.42%	5.60%	-	84.51%	9.72%
Citibank	104695.2	119683.1	106350.4	25849.9	26635.5	24768.4
Percentage change	-	14.32%	(11.14%)	-	3.03%	(7.01%)
HSBC Bank	57928.67	44392.01	37565.37	37647.69	51897.95	46112.19
Percentage change	-	(23.37%)	(15.38%)	-	37.85%	(11.14%)
Standard Chartered Bank	35869.49	40501.81	43460.12	45217.28	88465.93	67622.36
Percentage change	-	12.92%	7.30%	-	95.65%	(23.56%)
Average	**66164.45333**	**68192.3067**	**62458.63**	**36238.29**	**55666.46**	**46167.65**
Percentage change	-	3.06%	(8.41%)	-	53.62%	(17.06%)

Source: Regulatory Disclosures Section, Basel II Disclosures, Axis Bank, Basel II Disclosures, Bank of India, Regulatory Disclosures Section, Basel II Disclosures, HDFC Bank, Basel Disclosures, HSBC Bank, Basel Pillar 3 Disclosures, ICICI Bank, Basel II Disclosures, State Bank of India, Pillar 3 Disclosures, Standard Chartered Bank, Basel II Disclosures, Citi Bank, Financials, Disclosures under Basel II Punjab National Bank (2011)

Table 17. Comparison of Credit Risk Requirements - Fund Based and Non- Fund Based Category for Selected Nationalized, Private, and Foreign Banks

***t* - Test: Two-Sample Assuming Equal Variances**	**2007-08**	**2008-09**	**2009-10**
Mean	185895.33	206574.39	234254.83
Variance	38703565550	51643061287	76807765789
Observations	8	9	9
Hypothesized Mean Difference	0	0	0
Df	14	16	16
t Stat	1.75	1.55	1.46
t Critical two-tail	2.15	2.12	2.12

↳ ***t* - test for Two Sample Means - Above 100% and 100% risk weights, above 100% and below 100% risk weights, and 100% risk weights and below 100% :** *t* - test for two sample means was applied on above 100% and 100% risk weights, above 100% and below 100% risk weights, and 100% risk weights and below 100% risk weights. The results

are as follows: From the Table 15, it can be inferred that the variance between the observations is very high, which means that the amounts vary from each other to a large extent. By applying the *t* test on the given data at 5% level of significance(on the amounts), it can be ascertained that not much difference has been observed in the amounts because the amounts in different risk categories depend upon the risk profile of the banks.

(7) Credit Risk Requirements of Banks - Fund Based and Non Fund Based : Year wise comparison of individual banks in two categories- fund based and non fund based for their credit risk requirements was done and the data was analyzed using *t*-test. From the Table16, it can be inferred that in case of all the banks, fund based and non fund based capital increased because the banks sanctioned fund based limit for infrastructure covering power generation, telecommunications, ports, roads, construction, and contractors.

Comparison of Credit Risk Requirements of Banks on the basis of Fund Based and Non- Fund Based Category : *t* -test for two-samples assuming equal variances was used to analyze the data. From the Table 17, it can be inferred that the variance between the observations is very high, which means the amounts vary from each other to a large extent. By applying the *t*- test on the given data at 5% level of significance on the amounts, it was found that there was not much difference in the categories for credit risk requirements.

(8) Recapitalization of Banks Under Basel II Norms: The Government of India has mandated public sector banks to have a CRAR of at least 12%, well above the Basel II norm of 8%, and RBI stipulated norm of 9%, for meeting the capital requirement as well as for business growth. As on December 31, 2008, five public sector banks, that is, Bank of Maharashtra, Central Bank, Dena Bank, IDBI Bank, and Vijaya Bank reported a CRAR below 12%, the government stipulated directive. The Government announced a re-capitalization package for these banks via debt instruments such as tier-II bonds or preference shares, which were issued by the banks and subscribed to by the Government. Public sector banks also ploughed back profits in order to finance capital requirements for tier I capital, while increase in tier II capital was done via subordinated debt. Private sector banks ploughed back profits as well as did aggressive equity and bond issues like ICICI. To meet funding requirements for Basel II, a few banks earlier went public/made follow-on public offers. Some met their requirements, but a few other banks required capital infusion. The recapitalization move by the Government was a precautionary measure to avoid any kind of risk during the times of the global financial turmoil and improve market confidence in the banking system ("Basel II norms for Indian banks," n.d.).

Conclusion

The Basel II norms are being adopted by all banks across the world. It was found that with the introduction of operational risk in the new norms, the staff and the employees would get a clear indication regarding the operations to be performed. The introduction of market discipline would make the system more transparent and would enable the regulator to assess the risk profile and credit worthiness of the banks. The analysis of the nationalized, private, and foreign banks in India indicates that the foreign banks have been more efficient in complying with the new norms as compared to the nationalized and private banks.

It has been observed that the nationalized banks were concentrating more on increasing their credit risk capital requirements as compared to the private and foreign banks as their increase was maximum of the other two categories of banks. The private banks were concentrating on increasing their total capital adequacy as compared to the other two categories of banks .The private banks were concentrating on their tier 1 capital requirements as compared to the other two categories of banks, that is, nationalized and private banks. The market risk capital requirement of the foreign banks was the highest in the year 2008-2009, that is, 27.99%. By taking care of the internal procedures of the banks and by creating more awareness among the employees of the banks about the supervisory review norm, proper action can be taken to make the compliance more transparent and effective. The Government is actively participating in infusing more capital into the capital structure of the banks in order to enable them to comply with the provisions of Basel II norms and improve market confidence in the banking system.

Research Implications

The analysis of nationalized, private, and foreign banks in India has indicated that the foreign banks have been more efficient in complying with the new norms as compared to the nationalized and private banks. The present study would be useful to understand the different parameters which need to be focused upon in nationalized and private banks for better performance, and it would help in strengthening the banking structure.

The research could further be extended to study how the market participants have benefitted from the introduction of market discipline in the regulatory norms. The research does not cover the internal changes which have been brought in the banks' structure to comply with the new norms because of non availability of data. However, this study can be extended further to study the implications of adoption of Basel III, which has been implemented in the banks and a comparative study can be done between the Basel II and Basel III norms.

References

Akhtaruzzaman, M., (2009). Potential impact of Basel II in developing economies: Experiment on Bangladesh. *International Research Journal of Finance and Economics, 2* (3), 46- 62.

Axis Bank. (2011). Regulatory disclosures section, Basel II disclosures. Retrieved from http://www.axisbank.com/investor-corner/basel-disclosures.aspx

Bagchi, S. K. (2004). Basel II accord Renaissance in risk management in banking. *The Chartered Accountant, 53* (5), 609 - 612.

Bagchi, S., K. (2005). Basel II: Operational risk management need for a structured operational risk policy in banks. *The Management Accountant, 40*(1), 32-34.

Bakshi, S. (2004). Basel norms - challenges in India. *The Chartered Accountant, 53* (4), 426-432.

Bandopadhyay, K. (2006). Basel II and consolidation of regional rural banks. *The Management Accountant, 41* (5), 347-350.

Bank of India. (2011). Basel II disclosures, Retrieved from http://www.bankofindia.co.in/english/BaselIIDisclosure.aspx

Barakat, A. (2009). Banks Basel II norms requirement regarding internal control. Delhi Business Review, 10(2), 35-48.

Basel II norms for Indian banks. (n.d.) Retrieved from URL http://www.stockmarketsreview.com/news/basel_II_norms_for_indian_banks_20090312/

Citibank. (2011). Basel II disclosures. Retrieved from https://www.online.citibank.co.in/portal/newgen/home/index.htm

Dutta, S., K., (2004). Credit risk management in banks. *Journal of Indian Institute of Banking and Finance, 75* (2), 32-50.

Ghosh, A., (2004). Solution framework for credit risk under basel II. *Business Credit.* Retrieved from http://www.allbusiness.com/accounting/3487107-1.html

HDFC Bank. (2011). Regulatory disclosures section, Basel II disclosures. Retrieved from http://www.hdfcbank.com/aboutus/basel_disclosures/default.htm

HSBC Bank. (2011). Basel disclosures. Retrieved from http://www.hsbc.co.in/1/2/miscellaneous/basel-disclosures

ICICI Bank. (2011). Basel pillar 3 disclosures. Retrieved from http://www.icicibank.com/aboutus/invest-disclosure.html

Nachane, D. M., (2003). Basel II accord: Implications for the Indian banking system. *The Journal of Indian Institute of Bankers, 74* (4), 47-54.

Prasad, R. K. (2004). CAs partners in effecting Basel II. *The Chartered Accountant, 53* (4), 418-425.

Punjab National Bank. (2011). Financials, disclosures under Basel II. Retrieved from https://www.pnbindia.in/En/ui/Financials.aspx

Raghavan, R.S., (2004). Basel II for banks- A revised framework. *The Chartered Accountant, 53* (2), 158-162.

Rao, P.V.S., (2003). Minimum capital requirement-pillar 1. *The Journal of Indian Institute of Bankers, 74* (1), 14-20.

Reserve Bank of India. (1999). Banking statistics 1972-1995 table no.1. Retrieved from http://rbi.org.in/scripts/AnnualPublications.aspx?fromdate=05/21/1998&todate=05/22/1998&head=banking%20statistics

Scellato, G., & Ughetto, E., (2010). The Basel II reform and the provision of finance for R & D activities in SMEs: Analysis of sample of Italian companies. *International Small Business Journal, 28* (1), 65-89.

Standard Chartered Bank. (2011). Pillar 3 disclosures. Retrieved from http://www.standardchartered.co.in/important-information/disclosure.html

State Bank of India. (2011). Basel II disclosures. Retrieved from http://www.sbi.co.in/user.htm

Upadhyay, S., (2003). Financial sector reforms: New norms have reduced credit supply to commercial sector. *Journal of the Management Accountant, 38* (3), 176-178.