IMPACT MEASUREMENT OF GLOBAL FINANCIAL CRISIS ON PROFITABILITY OF INDIAN COMMERCIAL BANKS

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Abstract: ***In the global environment, Indian banking sector has been facing several incidences starting from the pre recession periods and to post recession periods which are impacted the performance of the Indian banking sector in general and the profitability of the same in particular. The subprime mortgage crisis in US during 2006 impacted the whole world and many advanced economies were experiencing recessionary circumstances. The global turmoil had emphasized significantly during 2008 in banking industry and its poor impact on the realty sector was clearly evidenced. The financial crisis seems to have entered a new unstable phase since September 2008, which has severely damaged confidence in global financial institutions and markets. A large number of banks in the globe had been affected by this global recession and many of them got bankrupt due to the effects of recession. But inherently strong financial system of India, functionally diverse nature of business and flexible banking operations of commercial banks in India, the Indian banking sector had not been significantly affected. Instead, the banks in India remained resilient from the impact of the world's recession. Therefore, the key design of this paper is to evaluate the performance of banks in India by statistically testing the impact of global recession on Indian banking sector. Further, the paper hypothesized that the Profitability of Indian banking industry has not been adversely affected due to the world recession. For assessing profitability, several parameters like Interest income to total assets, Operating Profit to Total Asset, Return on Asset and Return on Advances have been used via ratio analysis, to check and verify the profitability efficiency, Data Envelopment Analysis has been used among select Public, private and foreign banks for a period from 2001 to 2008 as a pre recession and from 2009 to 2016 as a post recession period. Hence, this paper has evaluated that whether there is positive, negative or no impact of recession on Indian banking sector.***

Keywords: Impact Measurement, Indian Banking industry, Profitability, Global Financial Crisis, DEA.

Introduction

In the global environment, Indian banking sector has been facing several incidences starting from the pre recession periods and to post recession periods which are impacted the performance of the Indian banking sector in general and the profitability of the same in particular. The subprime mortgage crisis in US during 2006 impacted the whole world and many advanced economies were experiencing recessionary circumstances. The global turmoil had emphasized significantly during 2008 in banking industry and its poor impact on the realty sector was clearly evidenced. The periodic crises resulting from the capitalist business cycle now unfolds at the global level. The current crisis of the world economy is an outcome of the consolidation of economic power that the globalization of capital has secured for the transnational corporations. This has led to a string of problems associated with the financial, banking, real estate, and productive sectors of the economy that have triggered the current economic crisis.

Issues

The financial crisis seems to have entered a new unstable phase since September 2008, which has severely damaged confidence in global financial institutions and markets. A large number of banks in the globe had been affected by this global recession and many of them got bankrupt due to the effects of recession. But inherently strong financial system of India, functionally diverse nature of financial aspects and flexible banking operations of commercial banks in India, the Indian banking sector had not been significantly affected. Instead, the banks in India remained resilient from the impact of the world's recession. The quality in the working of financial sector truly impacts the profitability of the banks which as a whole impacts any economy and GDP of the same. Therefore, the key design of this paper is to evaluate the performance of banks in India by statistically testing the impact of global recession on Indian banking sector. Hence, this paper has to evaluate that whether there is positive, negative or no impact of recession on Indian banking sector. Further, the paper hypothesized that the Profitability of Indian banking industry has not been adversely affected due to the world recession. In the study, several parameters like Interest income to total assets, Operating Profit to Total Asset, Return on Asset and Return on Advances have been used. To check and verify the profitability efficiency, Data Envelopment Analysis has been used on Public, private and foreign banks for a period from 2001 to 2008 as a pre recession and from 2009 to 2016 as a pre recession periods.

Review of Literature

The banking performance was affected negatively in many countries due to emergence of credit crunch and liquidity problems. This situation adversely affected the confidence of investors and raised serious concerns about the stability of financial and economic system in world (Spence, 2009). Vidyakala and Madhuvanthi (2009) explains that the prudential norms adopted by the Indian banking system and the better

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regulatory framework in the country have helped the banking system remain stronger even during the global meltdown. The banking industry is indirectly affected due to the decrease in exports and drying up of overseas financing. The Indian banks do not have big exposures to subprime market, thus the impact recession on the Indian Banking sector is very small. Ghulam Mujtaba Chaudhary and Dr. Zaheer Abbas (2017) reviewed the effect of global financial crisis on efficiency and financial performance of banks in Pakistan. The comparative efficiency analysis of pre-crisis, crisis, and after-crisis period is made by applying data envelopment analysis technique. The panel data methodology is deployed for this purpose and crisis dummy is inserted to capture the effect of crisis. The significant effect of crisis on profitability of banking sector in Pakistan is not found. It is concluded that lesser integration of domestic banks with global banks helped Pakistan to survive from sever harmful effects of crisis.

Objectives

1. To examine the impact of global financial crisis on Indian Banking Industry.
2. To analyze the impact of global financial crisis in pre-recession and post recession on Indian Commercial Banks.
3. To evaluate the scale efficiency of select Indian commercial banks during pre and post global financial crisis period

Hypothesis of the Study

There is no impact of global financial crisis on Profitability of Indian Commercial Banks.

Methodology

The present study is diagnostic and secondary data were used for the purpose of analysis, according to the asset value, top 30 banks were selected 10 each from public, private and foreign banks, eighteen financial years starting from 2001 to 2016 were used for this research work. Main source of data has been collected from the Centre for Monitoring Indian Economy, Government Publications and different websites relating to it. The collected data were examined on the basis of following parameters: Interest Income to Total Assets, Ratio of Operating Profit to Total Asset, Return on Asset, Return on Advances and analyzed with paired sample t - test so as to understand the gradual effect and to measure its impact on Indian Commercial Banks. In order to assess the scale efficiency of select commercial banks during pre and post crises period, Data Envelopment Analysis has been adopted. For this, Profit After Tax has taken as output (Dependent) variable, Deposits has considered as input (Independent) variable and DEAP version 2.1 software was utilized for analysis.

Causes of Global Financial Crisis on 2007-2008

The global financial crisis, brewing for a while, really started to show its effects in the middle of 2007 and into 2008. There are five major challenges facing the banking system in the country, particularly in the wake of the global financial crisis; Maintaining the Credit Flow, Reform the Financial Sector Regulation, Regulatory Forbearance and Relaxing Regulatory Norms , Effective Implementation of Basel II Framework, The Challenge of Banking Development and Financial Inclusion in Eastern India

Around the world stock markets have fallen, large financial institutions have distorted or been bought out, and governments in even the wealthiest nations have had to come up with rescue packages to bail out their financial systems. On the one hand, many people are concerned that those responsible for the financial problems are the ones being bailed out, while on the other hand, a global financial meltdown will affect the livelihoods of almost everyone in an increasingly interconnected world. The problem could have been avoided, if ideologues supporting the current economics models weren't so vocal, influential and inconsiderate of others' viewpoints and concerns.

Analysis & Discussion

The study ensures that banking sector in India was not affected to a great extent in the crisis period and also afterwards. The efficiency of banks, instead, gradually increased based on the data which have been covered for this study. The mean efficiency scores for sample banks increased gradually throughout the period with exception of few banks for which it declined slightly. For confirmation of results and further clarity, the phenomenon is examined from perspective of financial performance. The effect of global financial crisis on profitability of commercial banks is observed in this approach.

Table 1: Ratio of Interest Income to total assets

Pre Crisis Period	Public Sector banks	Private Sector banks	Foreign Banks	All Scheduled Commercial Banks
2001	8.89	8.04	5.57	7.50
2002	8.10	7.83	4.73	6.88
2003	7.29	6.75	3.13	5.72
2004	7.22	6.53	3.49	5.74
2005	6.79	6.57	5.46	6.27
2006	6.82	7.07	6.22	6.70
2007	7.14	7.73	6.42	7.10
2008	7.37	8.52	7.07	7.65
Mean	**7.45**	**7.38**	**5.26**	**6.70**
Post Crisis Period				
2009	6.98	7.54	5.94	6.82
2010	7.06	7.38	6.05	6.83
2011	8.11	8.47	6.52	7.70
2012	8.00	8.75	6.31	7.68
2013	7.80	8.88	5.89	7.52
2014	7.78	8.74	6.43	7.65

2015	7.66	8.32	6.21	7.40
2016	7.10	7.93	6.18	7.07
Mean	**7.56**	**8.25**	**6.19**	**7.33**

Source: Computed Data

From the profitability point of view, the ratio of interest income to total assets needs to be viewed. Table 1 portrays that the mean ratio of all the selected banks was increased during the post crisis period. In the initial years of pre crisis period, the public banks showed a decreasing trend up to 2004-05, after that it depicted increasing trend. The reduction of interest income to total assets was found in 2008-09, evidenced that immediate effect of financial crisis was not positively influenced for raising interest income. In the subsequent year the banks raised their interest income till 2011-12 again it showed decreasing trend.

Table 2: Ratio of Operating Profit to Total Assets

Pre Crisis Period	Public Sector banks	Private Sector banks	Foreign Banks	All Scheduled Commercial Banks
2001	1.61	2.75	3.75	2.70
2002	2.02	2.52	3.78	2.77
2003	2.35	2.50	4.02	2.96
2004	1.39	1.39	3.40	2.06
2005	1.07	1.60	3.38	2.02
2006	1.19	1.69	3.42	2.10
2007	1.25	1.82	3.59	2.22
2008	1.33	2.02	4.68	2.68
Mean	**1.53**	**2.04**	**3.75**	**2.44**
Post Crisis Period				
2009	1.48	2.26	3.15	2.30
2010	1.58	2.05	3.48	2.37
2011	1.57	1.94	2.89	2.13
2012	1.48	2.14	2.86	2.16
2013	1.29	2.10	2.76	2.05
2014	1.33	2.21	3.05	2.20
2015	1.08	2.08	2.49	1.88
2016	1.24	2.21	2.85	2.10
Mean	**1.38**	**2.12**	**2.94**	**2.15**

Source: Computed Data

Table 2 explains the ratio of operating profit to total assets during pre and post crisis period. The mean ratio of private sector banks was increased from 2.04 percent to 2.12 percent during post crisis period while the rest of the banks showed reduction in the average ratio. The results also reveal that during pre crisis period the ratio showed fluctuating trend till 2004-05 afterwards it showed increasing trend for the selected banks. On the other hand in the post reform period the ratio decreased suddenly for all selected banks during 2008-09, indicated that the effect of financial crisis was negatively affected the operating efficiency of the selected banks except private sector banks. Subsequently, the banks increased their operating profit to total assets by raising their operational efficiency.

Table 3: Ratio of Return on Total Assets

Pre Crisis Period	Public Sector banks	Private Sector banks	Foreign Banks	All Scheduled Commercial Banks
2001	0.41	1.51	1.76	1.23
2002	1.01	1.35	1.83	1.40
2003	1.17	1.59	1.66	1.47
2004	0.85	0.96	2.06	1.29
2005	0.49	0.98	2.41	1.29
2006	0.76	0.99	2.05	1.27
2007	0.89	1.10	2.02	1.34
2008	0.97	1.09	2.06	1.38
Mean	**0.82**	**1.20**	**1.98**	**1.33**

Post Crisis Period				
2009	0.92	1.22	0.91	1.01
2010	0.92	1.33	1.56	1.27
2011	0.79	1.30	1.47	1.19
2012	0.77	1.43	1.68	1.30
2013	0.45	1.33	1.43	1.07
2014	0.41	1.25	1.45	1.03
2015	-0.68	1.06	1.18	0.52
2016	-0.36	0.76	1.40	0.60
Mean	**0.40**	**1.21**	**1.38**	**1.00**

Source: Computed Data

Another indicator of profitability, return on asset of banking industry is shown in Table 3, it captured the amount of profits that could be generated from one unit of assets held by the banking sector. The average return on assets was very low during post crisis period compared to pre crisis period for all the selected banks. In the post reform period public sector bank registered with decreasing trend even negative return on their assets during 2014 – 2016, implies that financial crisis was adversely affected the efficiency in utilization of assets.

Table 4: Return on Advances

Pre Crisis Period	Public Sector banks	Private Sector banks	Foreign Banks	All Scheduled Commercial Banks
2001	18.92	17.52	29.48	21.98
2002	16.88	16.63	22.89	18.80
2003	15.51	14.84	25.02	18.46
2004	14.04	12.40	16.34	14.26
2005	11.60	11.85	119.66	47.71
2006	11.04	12.37	22.72	15.38
2007	11.62	13.61	18.06	14.43
2008	11.78	14.92	24.35	17.01
Mean	**13.92**	**14.27**	**34.82**	**21.00**
Post Crisis Period				
2009	11.06	13.12	18.54	14.24
2010	11.04	12.68	15.19	12.97
2011	12.31	14.14	16.73	14.39
2012	12.42	14.63	16.85	14.63
2013	12.12	14.42	16.36	14.30
2014	12.38	13.94	15.52	13.95
2015	12.87	13.08	14.97	13.64
2016	11.44	12.52	15.95	13.31
Mean	**11.96**	**13.57**	**16.26**	**13.93**

Source: Computed Data

Return on advances indicates the ratio of interest earned on advances to total advances. It showed the average yield on advances, higher the ratio reflects greater financial efficiency. Table 4 indicates that the average ratio had reduced for all the selected banks signifies these banks were failed to raise their income by expanding lending operation during post recession period. The scheduled banks reported reduction in the average ratio from 14.24% to 13.31% in the year 2009 to 2016. Thus it reveals there was a negative impact of crisis on the return on advances.

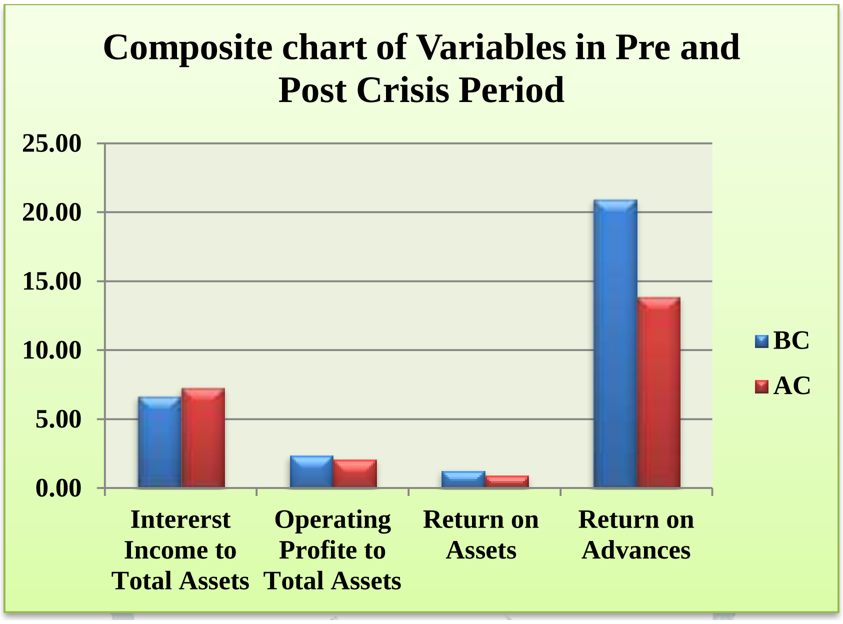
Table 5: Composite Table of Variables in Pre and Post Crisis Period

Profitability Ratios	BC	AC
Interest Income to Total Assets	6.70	7.33
Operating Profit to Total Assets	2.44	2.15
Return on Total Assets	1.33	1.00
Return on Advances	21.00	13.93

Source: Computed Data

The above table 5 shows that the mean data of four financial variables namely interest income to total assets, operating profit to total assets, return on assets and return on advances for pre and post crisis period. By observing the data of both pre and post crisis period except interest income to total assets all other three ratios were slight decline after crisis but the overall average shows the increasing trend.

Chart 1



Data Envelopment Analysis (DEA):

Data Envelopment Analysis is a non-parametric method using a mathematical technique called liner programming (LP). Charnes, Cooper and Rhodes (1978) first introduced DEA that measured efficiency based on Farrell's (1957) concept of efficiency measure. They developed a model which had an input oriented and assumed constant returns to scale. It is sometimes named as CCR model, later Banker, Charnes and Cooper (1984) proposed a model which assumes variable returns to scale. This model is also referred to as BCC model. The latter measures efficiency without the scale effect and the calculation of scale efficiency is possible by determining the difference between the two models' efficiency scores. It provides a means of calculating apparent efficiency levels within a group of organizations. These organizations are known as Decision-making units (DMUs) in DEA and LP method solves a linear mathematical problem by generating a "virtual" efficient DMU and compares it with the observed DMU under analysis. The "virtual" efficient DMU is created from the DMUs which are found to efficient (best practice) and become benchmarks to the observed DMU. DEA identifies the "best practice" DMUs and give a perfect score of one and incising trend (Full Efficiency), any divergence and decreasing trend from the "best practice" is considered inefficient. The degree of inefficiency depends on the score the DMUs received. The efficiency score based on one or multiple inputs and outputs is given by:

$$Efficiency \frac{Weighted\ sum\ of\ inputs}{Weighted\ sum\ of\ outputs}$$

S.No	Name of Banks	Pre-Recession Period				Post-Recession Period			
		CRS	VRS	SE	Efficiency Trend	CRS	VRS	SE	Efficiency Trend
	Public Sector Banks								
1	State bank of India	0.970	1.000	0.970	Drs	0.929	1.000	0.929	Drs
2	PNB	0.929	0.945	0.983	Drs	0.858	0.872	0.985	Drs
3	Bank of Baroda	0.896	0.910	0.984	Drs	0.847	0.865	0.980	Drs
4	Bank of India	0.913	0.927	0.985	Drs	0.730	0.740	0.986	Drs
5	Canara Bank	0.913	0.929	0.983	Drs	0.837	0.845	0.990	Drs
6	Union Bank	0.898	0.908	0.989	Drs	0.837	0.838	0.999	Irs
7	IDBI Bank	0.925	0.927	0.998	Drs	0.751	0.752	0.998	Irs
8	Syndicate Bank	0.853	0.861	0.991	Drs	0.783	0.786	0.997	Irs
9	Central Bank	0.797	0.807	0.988	Drs	0.501	0.502	0.998	Irs
10	Oriental Bank	0.869	0.875	0.993	Drs	0.767	0.770	0.996	Irs
	Private Sector Banks								
11	HDFC Bank	0.942	0.948	0.993	Drs	0.996	0.999	0.997	Drs
12	ICICI Bank	0.977	0.995	0.982	Drs	1.000	1.000	1.000	Con
13	Axis Bank	0.899	0.903	0.996	Drs	0.965	0.966	0.999	Irs
14	Yes Bank	0.824	0.838	0.984	Irs	0.935	0.947	0.988	Irs
15	Kotak Mahindra	0.799	0.813	0.983	Irs	0.927	0.940	0.987	Irs
16	IndusInd Bank	0.839	0.846	0.992	Irs	0.848	0.860	0.986	Irs
17	Federal Bank	0.865	0.870	0.994	Irs	0.779	0.790	0.987	Irs
18	JK Bank	0.669	0.671	0.997	Irs	0.757	0.767	0.987	Irs
19	South Indian bank	0.816	0.825	0.989	Irs	0.765	0.778	0.983	Irs
20	Karnataka bank	0.795	0.803	0.990	Irs	0.827	0.842	0.982	Irs
	Foreign Sector Banks								
21	Citibank N.A	0.972	0.974	0.998	Drs	0.973	0.983	0.990	Irs
22	Standard Chartered	1.000	1.000	1.000	Con	0.965	0.976	0.988	Irs
23	H&SB corpn.ltd.	0.917	0.917	1.000	Con	0.930	0.940	0.989	Irs
24	Deutsche Bank Ag	0.911	0.927	0.983	Irs	0.933	0.952	0.980	Irs
25	DBS bank ltd.	0.758	0.784	0.967	Irs	0.658	0.676	0.974	Irs
26	Bank Of America Na	0.949	0.978	0.970	Irs	0.967	1.000	0.967	Irs
27	BNP Paribas	0.751	0.776	0.968	Irs	0.808	0.833	0.970	Irs
28	Barclays Bank Plc	0.745	0.767	0.971	Irs	0.753	0.778	0.967	Irs
29	JPMC Bank NA	0.960	1.000	0.960	Irs	0.961	0.990	0.970	Irs
30	R B of Scotland	0.835	0.844	1.990	Irs	0.758	0.782	0.970	Irs

Table 6

Scale Efficiency of Select Indian Commercial banks during pre and post Crisis period.

Source: Computed value, **Note:** Irs - Increasing, Drs - Decreasing, Con - Constant.

The above table 6 reports the result pertaining to the above mentioned relative efficiency measures for Indian commercial banks on pre and post recession. It can be observed from the above table out of 30 banks 14 banks have been found to be relatively technically efficient with increasing in efficiency trend on pre recession and the post recession period out of 30 banks 23 banks have been found to be relatively technically efficient with increasing in efficiency trend. If a comparison is made between the proportion of public, private and foreign banks efficiency during the pre and post periods of recession, the following results are obtained on pre recession public sector banks are in completely decreasing trend private (70%), foreign (90%) and post recession public sector have been increased as (50%), private (90%), foreign (100%). Hence it may conclude that recession have a positive impact on the performance of the commercial banks in the Indian scenario. In general the private sector banks are performed better than public sector banks and foreign banks fared better than both public and private sector banks during the post recession period.

Chart 2
Scale Efficiency on pre and post recession period of Indian commercial banks

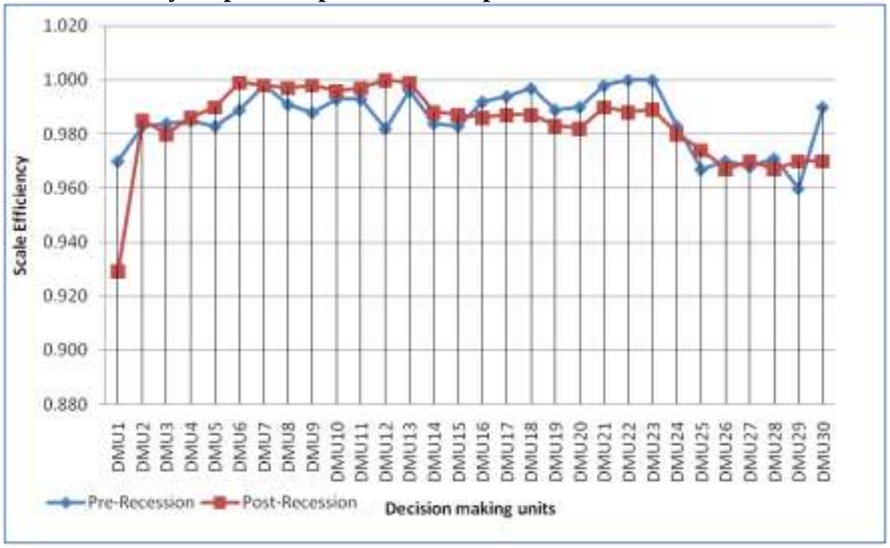


Table 7: Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 BC - AC	1.65500	3.63121	1.81561	-4.12307	7.43307	.912	3	.429

Source: Computed Data

The above table 6 shows the result of paired sample t – test of Indian Commercial Banks for before global financial crisis (BC) and after global financial crisis (AC) in various indicators of profitability ratios. The significant value is greater than 0.05 (.429), hence the null hypothesis is accepted. The paired difference shows that there is no significant difference between the BC and AC with the mean value of 1.65. It leads to conclude that global financial crisis is not having any significant or favorable impact on the profitability ratio on banking industry.

Conclusion

The global financial crisis had been one of the most important economic shocks in the post-war period. Indian banking industry remains flexible from the affects of the global recession. There is a trust among the people in the country about the strength of the banking system. The present study assessed the effect of global financial crisis on the profitability position of Indian banking sector. The result signifies that mean value of selected profitability ratios were declined during post recession period except interest income to total assets. It could be suggest that to avoid the declining of the profit efficiency levels of over the period of post financial crisis, banks should discover the potential external and internal determinates that can significantly influence to the improvement of public, private and foreign bank's efficiency. According to the result of t- test with accompanied of all profitability variables, global financial crisis is not having any significant or favorable impact on the profitability ratio on banking industry.

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