Mergers in Banking Sector in India: An Analysis of Pre & Post Merger Performance of sbi & HDFC Bank

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Abstract: *Banking sector occupies a very important place in every economy and is one of the fastest growing sectors in India. The competition is intense and irrespective of the challenge from the multinational players, domestic banks - both public and private are also seen rigorous in their pursuit of gaining competitive edge by acquiring or merging with potential opportunities as present today. As a result, Mergers and acquisitions are the order of the day. Indian commercial banks are witnessing sweeping changes in the regulatory environment, huge growth in off balance sheet risk management financial instruments, the introduction of e-commerce and online banking, and significant financial industry consolidation. All of these forces have made the Indian banking industry highly competitive. In this context, the study of performance of the banks after the merger assumes importance.*
The objectives of the Study are
1. To analyse the performance of key parameters of Select Banks
2. To analyse the Employee Productivity of Select Banks
3. To analyse the Branch Productivity of Select Banks
4. To analyse the Profitability of Select Banks
The study is based on secondary data. CAGR; T test; Correlation and Regression are employed for analysing the data.
KeyWords: *Banking Sector; Mergers; Public Sector; Private Sector; CAGR; Employee Productivity; Branch Productivity*

I. Introduction

Banking sector occupies a very important place in every economy and is one of the fastest growing sectors in India. The competition is intense and irrespective of the challenge from the multinational players, domestic banks - both public and private are also seen rigorous in their pursuit of gaining competitive edge by opting for mergers and acquisitions. As a result, Mergers and acquisitions are the order of the day. Indian commercial banks are witnessing sweeping changes in the regulatory environment, huge growth in off balance sheet risk management financial instruments, the introduction of e-commerce and online banking, and significant financial industry consolidation. All of these forces have made the Indian banking industry highly competitive[1]. Mergers and acquisition in banks are very common all over the globe. These trends were seen in the early 50's in the countries like USA, United Kingdom, Japan, and European countries.

II. Mergers in India

Mergers in India in general have experienced an increased number in various sectors especially after the New Economic Policy in the year 1991 which has opened the doors for global markets. Banking Sector in India has witnessed many Mergers during the years for various reasons such as Restructuring of Weak Banks; Economies of Scale; Expansion of Market; Business Consolidation etc. Looking into the history of Mergers in Banking Sector in India, initially they have taken place as a measure to protect the interests of the customers of the weak banks but subsequently a few Mergers also have take place voluntarily in the Post Liberalisation Period between various banks for several reasons**.** The Indian economy, which is one of the fastest growing economies in the world, is poised to maintain its leading position, despite the global financial crisis and economic slowdown. India has managed to beat the global financial turmoil due to sound regulation, prudent financial supervision and proactive policies. India's growth is driven predominantly by domestic consumption and investment and the Indian banking system had no direct exposure to the US sub-prime mortgage assets or to the failed institutions. During this period two mergers have taken place in Indian Banking Sector one between two profit making Public Sector Banks in the lines of consolidation and the other one was between two profit-making Private Sector Banks for the synergies of merger. In this context, the study of performance of the banks that have merged voluntarily assumes importance.

III. Review of Literature

A. Kaleichelvan[1] has looked at the M&A activity in the banking industry during the period 1993-94 – 2004-05. Subramanya Prasad[2], has evaluated the post-merger efficiencies of Indian commercial banks (acquiring banks) which have undergone mergers during the post-reform period and analyzed the factors influencing the commercial bank efficiency in the Indian context and concluded with a positive note stating that the select banks' efficiency improved post mergerAnand Manoj & Singh Jagandeep (2008)[3] studied the impact of merger on the share holders of five banks Times Bank with the HDFC Bank, the Bank of Madurai with the ICICI Bank, the ICICI Ltd with the ICICI Bank, the Global Trust Bank with the Oriental Bank of commerce and the Bank of Punjab with the Centurion Bank. The study revealed that the announcement of merger of Banks had positive and significant impact on share holder's wealthKuriakose Sony & Gireesh Kumar G. S (2010)[4] analyzed the strategic and financial similarities of merged Banks, and relevant financial variables of respective banks and found that only private sector banks were in favour of the voluntary mergers.

Azeem Ahmed Khan (2011)[5] explored various motivations of Merger and Acquisitions in the Indian banking sector. The result of the study indicated that the banks have been positively affected by the event of Merger and acquisitions. These results also suggested that merged banks could obtain efficiency and gains through Merger and Acquisitions and could pass the benefits to the equity share holders' in the form of dividend.

Devarajappa S, (2012)[6] explored various motives of merger in Indian banking industry. It also compared pre and post merger financial performance of merged banks with the help of financial parameters like, Gross Profit margin, Net Profit margin, operating Profit margin, Return on Capital Employed, Return on Equity, and Debt Equity Ratio. Finally the study indicates that the banks have been positively affected by the event of merger.

IV. Research Gap

The above review of literature points to the fact that, studies have been made on Mergers relating mainly to the performance of select banks; analyse the problems of mergers; benefits to the stakeholders; Financial performance of the transferee bank after the merger. However an analysis relating to certain key parameters; Employee Productivity; Branch Productivity and the Profitability of the select Transferee Banks before and after the Merger till 31st March 2017 has not been done in the recent past. Hence, the study is undertaken to fill the research gap.

V. Objectives Of The Study

The objectives of the Study are
1. To analyse the performance of key parameters of Select Banks
2. To analyse the Employee Productivity of Select Banks
3. To analyse the Branch Productivity of Select Banks
4. To analyse the Post Merger performance of Select Banks

VI. Methodology

6.1 Sources of Data: The study is based on Secondary Sources which includes the Annual Reports of the Select Banks; RBI Database- Profile of Banks –various issues; research publications etc.

6.2 Period of Study: The Period of the Study is the Post Liberalisation Period i.e., from 1991 to 31st March 2017.

6.3 Sample Selection: During the Post Liberalisation Period i.e., from 1991 to 31st March 2017, 22 Mergers have taken place in the Banking Sector in India between various Banks. Some of them were forced mergers (Private Sector Bank merged with Public Sector Bank) and a few were voluntary in nature. SBI & HDFC Banks took the first step to move on with merger for several reasons during the period of global financial crisis. Therefore, the study is undertaken to analyse the performance of the select Banks that have participated in the merger activity voluntarily. Incidentally, these two are the leading banks in Public and Private Sectors in Indian Banking Sector respectively in India.Deposits and Advances represent the volume of the business of the banks. These two parameters will have an impact on the profits of the bank. Therefore, the following hypothesis are framed and tested.

VII. Hypothesis

1. Ho: There is no significant difference in the Deposits per Employee and per Branch of the Select Banks before
2. and after Merger
   H1: There is a significant difference in the Deposits per Employee and per Branch of the Select Banks before and after Merger
3. Ho: There is no significant difference in the Advances per Employee and per Branch of the Select Banks before and after Merger
   H1: There is a significant difference in the Advances per Employee and per Branch of the Select Banks before and after Merger

4. Ho: There is no significant difference in the Profits per Employee and per Branch of the Select Banks before and after Merger

    H1: There is a significant difference in the Profits per Employee and per Branch of the Select Banks before and after Merger

5. Ho: There is no significant difference in the Productivity ratios of both the banks during the post merger period

    H1: There is a significant difference in the Productivity ratios of both the banks during the post merger period

7.1 Tools for Analysis: The following tools are used for the analysis of the data apart from Percentages and Averages.

7.2 Employee & Branch Productivity ratios for evaluating the employee efficiency and branch efficiency

7.3 CAGR: to analyse the growth in Deposits; Advances and Profits of the select Banks

7.4 T test: to test the Hypothesis as to whether there is any significant difference in the performance of the select Banks before and after the Merger.

7.5 Pearson's Multiple Correlation: to test the measure of the strength of the association between the dependent and independent variables

7.6 Regression Analysis: is used to understand which among the independent variables are related to the dependent variable.
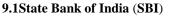
VIII. Mergers In Banking Sector

The Government announced a New Economic Policy on July 24, 1991. The new policy deregulated industrial economy in a substantial manner. One of the steps taken to liberalize and globalize Indian economy were the wide-ranging Financial Sector Reforms in the Banking, Capital Markets, and Insurance Sectors, including the deregulation of interest rates, strong regulation and supervisory systems, and the introduction of foreign/private sector competition (www.iasscore.in). This period has witnessed the increased participation of Indian Private Sector Banks. The bank mergers in India during the Post Liberalisation Period are presented in table 1.

Table 1: Mergers in Banking Sector in India (1st April 1991-31st March 2017)

Sl. No	Transferor Bank	Transferee Bank	Date of Merger	No
1.	New Bank of India	Punjab National Bank	04-09-1993	1
2.	Bank of Karada Ltd.	Bank of India	1993-1994	1
3.	Kashinath Seth Bank	State Bank of India	1995-1996	1
4.	Punjab Co-op. Bank Ltd	Oriental Bank of Commerce	1996-1997	2
5.	Bari Doab Bank Ltd	Oriental Bank of Commerce	1996-1997	
6.	Bareilly Corp. Bank Ltd	Bank of Baroda	03-06-1999	2
7.	Sikkim Bank Ltd	Union Bank of India	22-12-1999	
8.	Times Bank	HDFC Bank Ltd	26-02-2000	1
9.	Bank of Madura	ICICI Bank	Mar-2001	1
10.	Benares State Bank Ltd	Bank of Baroda	20-07-2002	1
11.	Nedungadi Bank Ltd	Punjab National Bank	01-02-2003	1
12.	South Gujarat Local Area Bank	Bank of Baroda	2004	2
13.	Global Trust Bank	Oriental Bank of Commerce	24-07-2004	
14.	Bank of Punjab	Centurion Bank of Punjab	Oct-2005	1
15.	Ganesha Bank of Kurundward	Federal Bank Ltd	Jan – 2006	4
16.	United Western Bank	IDBI	2006	
17.	Lord Krishna Bank	Centurion Bank of Punjab	2006	
18.	Sangli Bank	ICICI Bank	2006	
19.	**Centurion Bank of Punjab**	**HDFC Bank**	**25-02-2008**	2
20.	**State Bank of Sourastra**	**State Bank of India**	**Aug-2008**	
21.	Bank of Rajasthan	ICICI Bank Ltd	13-08-2010	1
22.	ING Vysya Bank	Kotak Mahindra Bank	01-04-2015	1
Total				**22**

IX. Source: K. Srinivas, Mergers And Acquisitions In Indian Banking Sector- A Study Of Selected Banks.

It is seen in table 1, that, in total twenty two mergers have taken place during the Post Liberalisation Period from 1991 to 2017. Out of these, two mergers have taken place between the Public Sector banks; eleven between Private Sector Banks and Public Sector Banks; nine amongst the Private Sector Banks. Out of these twenty two, twelve mergers were forced mergers because of the financial sickness of the banks; eight have taken place voluntarily; and two were in the lines of consolidation.

9.1State Bank of India (SBI)

Is an Indian multinational, public sector banking and financial services company. It is a government-owned corporation with its headquarters in Mumbai, Maharashtra. On 1st April, 2017, State Bank of India, which is India's largest Bank merged five of its Associate Banks (State Bank of Bikaner & Jaipur, State Bank of Hyderabad, State Bank of Mysore, State Bank of Patiala and State Bank of Travancore) and Bharatiya Mahila Bank with itself. This is the first ever large scale consolidation in the Indian Banking Industry. With the merger, SBI will enter the league of top 50 global banks with a balance sheet size of 33 trillion, 278,000 employees, 420 million customers, and more than 24,000 branches and 59,000 ATMs. SBI's market share will increase to 22 percent from 17 per cent. It has 198 offices in 37 countries; 301 correspondents in 72 countries. The first step towards unification occurred on 13 August 2008 when State Bank of Saurashtra merged with SBI, reducing the number of associate state banks from seven to six. An attempt is therefore, made to study the impact of the merger on the performance of the bank, for the purposes of which certain parameters are identified and discussed in the following tables. Pre and post merger Key parameters such as Deposits; Advances; Profits; Number of Employees and Number of Branches of SBI are presented in table 2.

X. Pre & Post Merger Key Parameters Of SBI
Table 2Pre Merger Key Parameters of State Bank of India

Years	Deposits	Advances	Net Profit	No of Employees	No of Branches
2000-01	242828	113590	1604	214845	9078
2001-02	270560	120806	2433	209462	9102
2002-03	296123	137758	3105	208998	9088
2003-04	318619	157934	3681	207039	9107
2004-05	367048	202374	4304	205515	9161
2005-06	380046	261801	4407	198774	9468
2006-07	435521	337336	4541	185388	9679
2007-08	537404	416768	6729	179205	10683
Base Year	742073	542503	9121	205896	12022
CAGR	**13.22 %**	**18.97%**	**21.30%**	**-0.47%**	**3.17%**
Mean	356018.63	218545.86	3850.5	201153.3	9420.75
Median	342833.5	180154	3992.5	206277	9134
SD	96378.54	111037.3	1554.646	12579.1	555.2234
Kurtosis	0.484581	-0.35464	0.901001	-0.25621	4.457196
Skewness	0.881675	0.932432	0.49884	-1.01389	2.081629

Note: Base year is 2008-09.

XI. Source: Compiled by the Authors
Table 3Post Merger Key Parameters of State Bank of India

Years	Deposits	Advances	Net Profit	No of Employees	No of Branches
Base Year	742073	542503	9121	205896	12022
2009-10	804116	631914	9166	200299	13039
2010-11	933933	756719	7370	222933	14350
2011-12	1043647	867579	11686	215481	14902
2012-13	1202740	1045617	14839	228296	15564
2013-14	1394409	1209829	10,891	222033	16059
2014-15	1576793	1300026	13,102	213238	16333
2015-16	1730722	1463700	9,951	207739	16784
2016-17	2044751	1571078	10484	209567	17170
CAGR	**11.92%**	**12.54%**	**1.56%**	**.20%**	**4.04%**
Mean	**1341388.923**	**1105807.851**	**10936.09**	**214948.3**	**15525.13**
Median	1298574	1127723	10687.64	214359.5	15811.5
SD	425454.7	338044.6	2314.978	9187.357661	1372.151
Kurtosis	-0.81987	-1.39946	0.196524	-0.668664275	-0.00617
Skewness	0.416457	-0.03792	0.277795	-0.107177778	-0.7451

Source: Compiled by the Authors

Deposits; Advances; Net Profit; Number of Employees & Branches of SBI eight years before the merger and eight years after the merger of State Bank of Sourashtra with itself in the year 2008-09 are presented in Tables 2 & 3. The year of merger 2008-09 is taken as a base year for calculating CAGR. The Deposits and Advances of State Bank of Sourashtra at the time of the merger were Rs. 419425 and Rs. 12309.29 crores; Net Profit Rs. 35.45crores; Employees 7399 and the Bank had a network of 460 branches against that of SBI which had Deposits of Rs. 7, 42,073 crores and Advances of Rs. 5, 42,503 crores; 2, 05,896 crores of Profits; had 12,022 Employees and a branch network of 9,121. The Deposits and Advances of SBI, post merger grew by 11.92 % and 12.54% as against 13.22% and 18.97 % during the pre merger period; Profits have recorded a CAGR of 1.56 % as against pre merger CAGR of 21.30%; Number of Employees increased by .20% during the post merger period and its CAGR was in negative

during the pre merger period and the Number of Branches increased by 4.04% as against 3.17 % during the pre merger period.

It is evident from the above tables that, there has been an increase in the two parameters Deposits; Advances all through; there is increase in the profits year after year excepting in the years 2013-14 and 2015-16; Number of Branches increased during the overall study period excepting in the year 2002-03 during the premerger period; in case of Employees it is observed that from the year 1999-2000 there has been a consistent fall year after year in the number of Employees during the pre and post merger periods with an exception to the years 2010-11 and 2012-13 and recorded a lowest growth rate of .20 % during the post merger period against a negative growth rate of -3.00% during the pre merger period.

The Average increase during the Pre and Post Merger Period in Deposits was Rs. 356018.63 Crores and Rs. 1341388.923 Crores; Advances Rs. 218545.86 Crores and Rs. 1105807.851 Crores; Net Profits Rs. 3850.5 Crores and Rs. 10936.09 Crores; Number of Employees 201153.3 and 214948.3; Number of Branches 9420.75 and 15525.13. These figures only indicate the fact that, the Bank has been doing well, by generating increased amounts of Deposits and disbursing increased amount of Advances. T test is employed to see whether the difference in the key parameters before and after the merger is significant or not and the results are presented in table 4..

Table 4T Test Results Of Key Parameters Of State Bank Of India

	Deposits	Advances	Net Profits	Employees	Branches
Pre Merger mean value	356018.625	218545.875	3850.5	201153.25	9420.75
Post Merger mean value	1341388.923	1105808	10936.09	214948.25	15525.125
t Stat	-8.42931042	-10.6346894	-8.34173232	-2.89905605	-16.2606474
t critical two tail	2.36462425	2.36462425	2.36462425	2.36462425	2.36462425
P two tail value	0.00006519	0.0000142	0.00006972	0.023016899	0.0000008
Result	**Reject Ho**	**Reject Ho**	**Reject Ho**	**Reject Ho**	**Reject Ho**

Source: Calculated on values in tables 2 & 3

T test is employed to see whether the difference in the Key Parameters is significant or not for Pre and Post Merger Periods. The t stat values as per 't' test at 5% significance level in case of all the Parameters is less than the t critical two tail value; p value less than .05, indicating that there is a significant difference in their performance, rejecting the null hypothesis.

As seen in the above tables over a period of sixteen years, eight years before the merger and eight years after the merger, changes were witnessed in the parameters and the t test results indicated that the change is significant. To know the direction of the change and the relationship among the parameters of the bank, regression analysis is run. For the purposes of the analysis, profit is considered as a dependent variable and other variables viz., deposits, advances, number of employees and number of branches are taken as independent variables.

Table 5Regression Analysis of Key Parameters of SBI

	Coefficients	Standard Error	t Stat	P-value
Intercept	-5188.41	8308.268	-0.62449	0.543998641
Deposits	-0.00881	0.008808	-0.99998	0.337057829
Advances	0.004699	0.013651	0.34425	0.736615377
No of Employees	-0.03721	0.047835	-0.77796	0.45165897
No of Branches	1.989482	0.939418	2.117781	0.0557547
Multiple R 0.924761; R Square 0.855183				

Source: Calculated on tables 2 & 3 values

The absolute values do not provide us meaningful values until and unless they are related to some other relevant information, therefore, the Branch level efficiency in terms of Business per Branch and Business per Employee and Profit per Branch and Profit per Employee of the selected banks is studied.

Human resource is the most important asset of an organization and banking business is no exception to it. In the present study, employee productivity has been evaluated by taking three ratios, viz., Deposits per Employee; Advances per Employee and Profits per Employee.

11.1 Deposits per Employee: This ratio has been computed by dividing the amount of total deposits by the number of employees in the bank. This ratio reveals the deposit-collection capacity of an employee; Higher the deposit per employee ratio, higher the productivity per employee.

11.2 Advances per Employee: This ratio has been computed by dividing the amount of total Advances by the number of employees in the bank;

11.3 Profits per Employee: This ratio has been computed by dividing the amount of Net Profit by the number of employees in the bank.

Branch Productivity is measured by taking three ratios, viz., Deposits per Branch; Advances per Branch and Profits per Branch.

11.4 Deposits per Branch: This ratio has been computed by dividing the amount of total deposits by the number of branches in the bank;

11.5 Advances per Branch: This ratio has been computed by dividing the amount of total advances by the number of branches in the bank;

11.6 Net Profit per Branch: This ratio has been computed by dividing the amount of total Net Profit by the number of Branches in the Bank.

The Branch level efficiency in terms of Business per Employee, Business per Branch, Profit per Branch and Profit per Employee of the SBI are presented in table 6.

Table 6Pre & Post Merger Productivity Ratios of SBI Bank

Years	D/E	A/E	P/E	D/B	A/B	P/B
2000-01	1.13025	0.52871	0.00747	26.74906	12.51267	0.17669
2001-02	1.29169	0.57674	0.01162	29.72534	13.27247	0.26730
2002-03	1.41687	0.65914	0.01486	32.58396	15.15823	0.34166
2003-04	1.53893	0.76282	0.01778	34.98616	17.34204	0.40419
2004-05	1.78599	0.98472	0.02094	40.06637	22.09082	0.46982
2005-06	1.91195	1.31708	0.02217	40.14005	27.65114	0.46546
2006-07	2.34924	1.81962	0.02449	44.99649	34.85236	0.46916
2007-08	2.99882	2.32565	0.03755	50.30460	39.01226	0.62988
Average	**1.76989**	**1.08646**	**0.01914**	**37.79090**	**23.19835**	**0.40873**
Base Year	3.60412	2.63484	0.04430	61.72625	45.12585	0.75869
2009-10	4.01458	3.15485	0.04576	61.67007	48.46338	0.70297
2010-11	4.18930	3.39438	0.03306	65.08243	52.73306	0.51359
2011-12	4.84334	4.02624	0.05423	70.03405	58.21896	0.78419
2012-13	5.26833	4.58009	0.06500	77.27702	67.18174	0.95343
2013-14	6.28019	5.44887	0.04905	86.83034	75.33649	0.67820
2014-15	7.39452	6.09660	0.06144	96.54033	79.59508	0.80215
2015-16	8.33124	7.04586	0.04790	103.11740	87.20808	0.59287
2016-17	9.75703	7.49678	0.05003	119.08861	91.50136	0.61061
Average	**6.24052**	**5.14453**	**0.05088**	**86.40117**	**71.22699**	**0.70441**

Note: Base year is 2008-09.

Source: Calculated on values from tables 2 & 3

In table 6, from the eight years Pre Merger and eight years Post Merger Employee Productivity ratios and Branch Productivity ratios, it is clear that, throughout the sixteen year period the productivity ratios have exhibited an increasing trend, due to the fact that the percentage increase in the numbers of all the Parameters matched with the percentage increase in the number of Employees and Branches. Only exception is the Profit per Employee and Profit per Branch ratios in the years 2010-11; 2013-14 and 2015-16, as, profits during these years have recorded a decrease. The eight year average of Deposits per employee before and after the Merger is 1.76989 and 6.24052 with an increase; Advances per Employee 1.08646 and 5.14453 with an increase; Profits per Employee 0.01914 and 0.05088 with a minor increase.

The eight year average of Deposits per Branch before and after the Merger is 37.79090 and 86.40117 with an increase; Advances 23.19835 and 71.22699 with an increase; and Profits 0.40873 and 0.70441 with an increase. Tremendous increase is seen in all the ratios, therefore, T test is employed to see whether the difference in the performance of these ratios between the Pre Merger and Post Merger period is significant or not.

Table 7T Test Results of Productivity Ratios of SBI

	D/E	A/E	P/E	D/B	A/B	P/B
Pre Merger mean value	1.8029675	1.12181	0.01961	37.44400375	22.73649875	0.40302
Post Merger mean value	6.25981625	5.15545875	0.05080875	84.95503125	70.02976875	0.70475125
t Stat	-8.562850399	-11.08976441	-7.556059357	-10.8218153	-19.65901803	-4.272845457
t critical two tail	2.364624251	2.364624251	2.364624251	2.364624251	2.364624251	2.364624251
P two tail value	0.000058902	0.0000107766	0.000130997	0.0000126820	0.0000002201	0.003687725
Result	**Reject Ho**	**Reject Ho**	**Reject Ho**	**Reject Ho**	**Reject Ho**	**Reject Ho**

Source: Calculated on values in table 6.

The t stat values for all the ratios are less than the t critical two tail value; and the p values as per 't' test at 5% significance level in case of all the ratios is less than .05, indicating that there is a significant difference in their performance during the pre and post merger periods, therefore null hypothesis is rejected.

XII. HDFC Bank

HDFC bank is one of the leading Private Sector Banks in India. The bank was established in the year 1994, with its registered office in Mumbai, India; commenced operations as a Scheduled Commercial Bank in January 1995. HDFC bank acquired two major private sector banks viz, Times Bank and Centurion Bank of Punjab to expand its business and to reap the benefits of merger.

Table 8Pre Merger Key Parameters of HDFC Bank

Year	Deposits	Advances	No of Employees	No of Branches	Net Profits
1998-99	2915	1401	827	57	82
1999-00	8428	3362	1250	111	120
2000-01	11658	4637	2751	131	210
2001-02	17654	6814	3742	166	365
2002-03	22376	11755	4791	215	483
2003-04	30409	17745	5673	295	510
2004-05	36354	25566	9030	446	666
2005-06	55797	35061	14878	516	871
2006-07	68298	46945	21477	666	1141
Base Year	100769	63427	37386	745	1590
CAGR	**42.52%**	**46.41%**	**46.39%**	**29.31%**	**34.51%**
Mean	**28209.87**	**17031.69**	**7157.67**	**289.22**	**494.31**
Median	22376	11755	4791	215	483.41
SD	22050.70	15851.96935	6910.329117	208.9914937	353.0616222
Kurtosis	-0.24644	-0.153225218	1.182157596	-0.611008957	-0.24259873
Skewness	.084143672	0.958533314	1.364159308	0.784882031	0.66286897

Note: Base year is 2007-08.

Source: Compiled by the Authors

Table 9Post Merger Key Parameters of HDFC Bank

Year	Deposits	Advances	No of Employees	No of Branches	Net Profits
Base Year	100769	63427	37386	745	1590
2008-09	142812	98883	52687	1422	2245
2009-10	167404	125831	51888	1729	2949
2010-11	208586	159983	55752	1999	3926
2011-12	246706	195420	66076	2553	5167
2012-13	296247	239721	69401	3046	6726
2013-14	3,67,337	3,03,000	68,165	3,403	8,478
2014-15	4,50,796	3,65,495	76,286	4,014	10,216
2015-16	5,46,424	4,64,594	87,555	4,520	12,296
2016-17	6,43,640	5,54,568	84,325	4,715	14,550
CAGR	**20.37%**	**24.21%**	**8.47%**	**20.26%**	**24.78%**
Mean	**341105.8633**	**278610.5289**	**68015**	**3044.55556**	**7394.79444**
Median	296247	239720.6	68165	3046	6726
SD	174778.4441	156937.6749	13073.58616	1211.084959	4302.280739
Kurtosis	-0.797402245	-0.646143947	-1.209148551	-1.50787773	-1.032842803
Skewness	0.643765192	0.68367377	0.195689107	0.092288212	0.464593731

Source: Compiled by the Authors

Deposits; Advances; Net Profit; Number of Employees & Branches of HDFC Bank nine years before its merger and nine years after the merger with Centurion Bank of Punjab in the year 2007-08 are presented in Tables 8 & 9. The year of merger 2007-08 is taken as a base year for calculating CAGR. The Deposits and Advances of Centurion Bank of Punjab at the time of the merger were Rs. 14863.72 and Rs. 11221.35crores; Net Profit Rs. 121.38 crores; Employees 7500 and the Bank had a net work of 394 branches against that of HDFC Bank, which had Deposits of Rs. 100769 crores and Advances of Rs. 63427 crores; 1590 crores of Profits; had 37386 Employees and a branch network of 745. The Deposits and Advances of HDFC Bank, post merger grew by 20.37 % and 24.21% as against 42.52 % and 46.41 % during the pre merger period; Profits have recorded a CAGR of 24.78 % as against pre merger CAGR of 34.51 %; though the number of Employees increased by 8.47 % during the post merger period and its CAGR is very less when compared with that of pre merger period's second highest CAGR next only to deposits;

and the Number of Branches increased by 20.26 % as against 29.31 % during the pre merger period. It is evident from the above tables that, there has been an increase in all the parameters all through study period excepting for the year 2016-17, during which year, number of Employees have recorded a decrease because of superannuation.

The Average increase during the Pre and Post Merger Period in Deposits was Rs. 28209.87 Crores and Rs. 341105.86 Crores; Advances Rs. 17031.69 Crores and Rs. 278610.53 Crores; Net Profits Rs. 494.31 Crores and Rs. 7394.74 Crores; Number of Employees 7157.67 and 68015; Number of Branches 289 and 304456. These figures only indicate the fact that, the Bank has been doing well with respect to all the parameters; therefore T test is employed to see whether the difference in the key parameters before and after the merger is significant or not and the results are presented in table 10.

Table 10T test Values of Key Parameters of HDFC Bank

	Deposits	**Advances**	**Net Profits**	**Employees**	**Branches**
Pre Merger mean value	28209.87	17031.6911	494.3122	7157.666667	289.2222
Post Merger mean value	341105.8633	278610.5	7394.794	68015	3044.556
t Stat	-6.14006466	-5.5582219	-5.23728	-24.32525934	-8.17812185
t critical two tail	2.306004133	2.306004133	2.306004133	2.306004133	2.306004133
P two tail value	0.000276997	0.00053578	0.000786	0.00000001	0.00003725
Result	**Reject Ho**	**Reject Ho**	**Reject Ho**	**Reject Ho**	**Reject Ho**

Source: Calculated on the values from tables 8 & 9.

T test is employed to see whether the difference in the Key Parameters is significant or not for Pre and Post Merger Periods. From table 10, it is evident that, the t stat values as per 't' test at 5% significance level in case of all the Parameters is less than the t critical two tail value; p value less than .05, indicating that there is a significant difference in their performance before and after the merger, therefore null hypothesis is rejected. Regression analysis of HDFC Bank is presented in table 11.

Table 11 Regression Analysis of Key Parameters of HDFC Bank

	Coefficients	**Standard Error**	**t Stat**	**P-value**
Intercept	-33.995	56.1679	-0.60524	0.55543873
Deposits	0.004286	0.006608	0.648545	0.52792320
Advances	0.014035	0.006905	2.032652	0.06303579
No of Employees	-0.03836	0.004946	-7.75605	0.00000313
No of Branches	1.532389	0.185567	8.257875	0.00000158
Multiple R 0.999564186				

Source: Calculated on the values from table 7

The Branch level efficiency in terms of Business per Employee, Business per Branch, Profit per Branch and Profit per Employee of HDFC Bank are presented in table 12.

Table 12Pre & Post Merger Productivity Ratios of HDFC Bank

Year	**D/E**	**A/E**	**P/E**	**D/B**	**A/B**	**P/B**
1998-99	3.5248	1.6935	0.0996	51.1404	24.5712	1.4456
1999-00	6.7422	2.6896	0.0960	75.9254	30.2883	1.0814
2000-01	4.2378	1.6854	0.0764	88.9932	35.3944	1.6040
2001-02	4.7178	1.8210	0.0975	106.3494	41.0482	2.1978
2002-03	4.6704	2.4536	0.1009	104.0744	54.6744	2.2484
2003-04	5.3603	3.1280	0.0899	103.0814	60.1525	1.7288
2004-05	4.0259	2.8312	0.0738	81.5112	57.3229	1.4933
2005-06	3.7503	2.3566	0.0585	108.1337	67.9477	1.6880
2006-07	3.1801	2.1858	0.0531	102.5495	70.4880	1.7132
Average	**3.9412**	**2.3795**	**0.0691**	**97.5370**	**58.8879**	**1.7091**
Base Year	2.6954	1.6965	0.0425	135.2604	85.1369	2.1342
2008-09	2.7106	1.8768	0.0426	100.4304	69.5380	1.5788
2009-10	3.2263	2.4251	0.0568	96.8213	72.7767	1.7056
2010-11	3.7413	2.8695	0.0704	104.3454	80.0314	1.9640
2011-12	3.7337	2.9575	0.0782	96.6339	76.5452	2.0239
2012-13	4.2686	3.4541	0.0969	97.2577	78.7001	2.2081
2013-14	5.3889	4.4451	0.1244	107.9452	89.0392	2.4914
2014-15	5.9093	4.7911	0.1339	112.3058	91.0551	2.5451
2015-16	6.2409	5.3063	0.1404	120.8903	102.7863	2.7204
2016-17	7.6328	6.5766	0.1725	136.5089	117.6179	3.0858
Average	**5.0152**	**4.0963**	**0.1087**	**112.0380**	**91.5111**	**2.4289**

Source: Calculated on the values from table 7

In table 12, from the nine years Pre Merger and nine years Post Merger Employee Productivity ratios and Branch Productivity ratios, it is clear that, during the pre merger period the productivity ratios have exhibited an asymmetrical pattern, due to the fact that the percentage increase in the numbers of the Parameters did not match with the percentage increase in the number of Employees and Branches, though the absolute figures exhibited an increasing trend. Interestingly, during the post merger period the ratios, viz., Deposits per Employee; Advances per Employee; Profits per Employee and Profits per Branch have recorded a continuous increasing trend.

The nine year average of Deposits per Employee before and after the Merger is 3.9412 and 5.0152 with an increase; Advances per Employee 2.3795 and 4.0963 with an increase; Profits per Employee 0.0691 and 0.1087 with an increase. The nine year average of Deposits per Branch before and after the Merger is 97.5370 and 112.0380 with an increase; Advances per Branch 58.8879 and 91.5111 with an increase; and Profits per Branch 1.7091 and 2.4289 with an increase.

Tremendous increase is seen in all the, therefore, T test is employed to see whether the difference in the performance of these ratios between the Pre Merger and Post Merger period is significant or not. The t values of Productivity ratios of HDFC Bank are presented in table 13.

Table 13T Test Values Of Productivity Ratios Of HDFC Bank

	D/E	A/E	P/E	D/B	A/B	P/B
Pre Merger mean value	4.467725571	2.316077292	0.082863345	91.30651286	49.09861707	1.688951
Post Merger mean value	4.761384395	3.855790758	0.101806057	108.1265501	86.45442463	2.258125
t Stat	-0.379097119	-3.264432599	-0.964736739	-2.612547979	-14.10295831	-3.1908
t critical two tail	1.859548033	1.859548033	1.859548033	1.859548033	1.859548033	1.859548
P two tail value	0.714479716	0.011451126	0.36292959	0.031007319	0.0000006210	0.012788
Result	**Accept Ho**	**Reject Ho**	**Accept Ho**	**Reject Ho**	**Reject Ho**	**Reject Ho**

Source: Calculated on values in table 12

The t stat values for all the ratios excepting Deposit per Employee and Profit per employee ratio, are less than the t critical two tail value; and the p values as per't' test at 5% significance level is less than .05, indicating that there is a significant difference in their performance during the pre and post merger periods, therefore null hypothesis is rejected in case of Advances per Employee; Deposits per Branch; Advances per Branch and Profits per Branch.

A comparative analysis of post merger performance of both SBI and HDFC banks in terms of the Productivity ratios is made by employing T test and the results are presented in table 14.

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Table 14T Test Values Of Productivity Ratios Of SBI & HDFC Bank

	D/E	A/E	P/E	D/B	A/B	P/B
Mean value of SBI	6.25981625	0.05080875	0.05080875	84.95503125	70.02976875	0.70475125
Mean value of HDFC Bank	4.761377778	3.855788889	0.101788889	108.1265444	86.45443333	2.258122222
t Stat	1.644450881	-7.479365286	-3.419967434	-2.752211329	-2.141083638	-9.049704441
t critical two tail	2.160368652	2.306004133	2.262157158	2.178812827	2.131449536	1.8331129226
P two tail value	0.124034971	0.0000706458	0.007628325	0.017530317	0.049097065	0.0000081617
Result	**Accept Ho**	**Reject Ho**	**Reject Ho**	**Reject Ho**	**Reject Ho**	**Reject Ho**

Source: Calculated on the values from tables 7 & 13

The t stat values for all the ratios excepting Deposit per Employee, are less than the t critical two tail value; and the p values as per't' test at 5% significance level is less than .05, indicating that there is a significant difference in their performance between the banks during the post merger period, therefore null hypothesis is rejected in case of Advances per Employee; Profits per Employee; Deposits per Branch; Advances per Branch and Profits per Branch. As mean values of HDFC Bank are greater than that of SBI, it can be concluded that, the performance of Productivity ratios of HDFC Bank is better than that of SBI.

XIII.   Findings

The following are the findings of the study:
1. During the period between 1991 – 31st march 2017 in total twenty two mergers have taken place in Indian Banking Sector
2. All the key parameters in case of HDFC Bank and SBI recorded increase all through excepting the number of employees in case of SBI during the pre merger period
3. During the post merger period, all the key parameters displayed an increasing trend excepting Number of Employees and Profits in case of SBI and Number of Employees in case of HDFC Bank

4. T test results of both the banks indicated a significant difference in performance during pre merger and post merger periods
5. Results of the regression Analysis indicate that, all the parameters in case of both the banks are associated; none of them are significantly associated with the dependent variable 'Profits' in case of SBI; both Number of Employees and Number of Branches are significant contributors amongst the independent variables in case of HDFC Bank
6. Pre and Post merger Productivity ratios have exhibited an increase in case of both the banks
7. T test results of Productivity ratios of SBI indicated a significant difference in the performance in case of all the ratios; excepting Deposits per Employee and Profits per Employee rest all ratios indicated a significant difference between pre and post merger periods
8. The T test results of the comparative analysis of the performance of the Productivity ratios of both the banks during the post merger period indicated a significant difference between the two banks

XIV.   Conclusion

Merger in general is considered as a strategic tool for the participants in merger activity for gaining certain synergies. The study focused on the pre and post merger performance of SBI and HDFC Banks, who have participated in mergers for different reasons. Overall growth is observed in the performance of both the banks in key parameters, and productivity ratios, and the same is ascertained by employing the statistical tools.

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