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Navigating Through Mergers and Acquisitions to Achieve Competitive Edge: An Empirical Analysis of Indian Banks

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Abstract.
Mergers and Acquisitions were the established norms for firms to achieve efficiency both financial and operational since long. Banks helped the mergers activity to take place by provisioning of credit facilities. But in order to cater the needs of challenges posed by internationalization banks themselves have to be efficient. Public sector banks in India have been consolidated quite a few times but recent mergers in Indian banking system led by State Bank of India and others have changed the objective of merger by consolidation into few large banks with large capital base. The purpose of this study is to investigate the impact of mergers on operational efficiency of merging banks using window period of one, two and three years by pre-post comparison of operating ratios namely Interest Income Per Employee, Interest Income Per Branch, Business Per Employee and Business Per Branch. The data analysis by Paired Sample t-test found Interest Income Per Employee improved significantly in third year post-merger in comparison to three years pre-merger.The similar result was repeated when data was analysed through Wilcoxon Signed Rank Test and Sign Test for the same window period. Business per Employee Improved in window period of one year post-merger in comparison to one year pre-merger according to all statistical tools namely, Paired Sample t-test, Wilcoxon Signed Rank Test and Sign Test respectively. Again Business Per Employee improved significantly in third year pre-post window by all the three tests employed in this study. Interest Income Per Branch also improved in third year window period of pre-post analysis as evident from all the three tests employed. Business Per Branch improved as well significantly in third year of pre-post window horizon and verified by all the three tests. Therefore, this study comes to the conclusion that mergers helped banks to improve upon all the operating performance ratios significantly only in the third year post-merger period. Banks therefore, achieved the objective of operational efficiency in long run, although they started improving from one year window itself.

Introduction.

Banks play an important role in modern competitive corporate world which is dominated by technologically agile and financially strong corporate houses. In order to facilitate the financial needs of competing corporates banks themselves need an efficient foundation on which they can cater the ever growing financial needs of organizations, besides, they need to be vibrant enough to survive as the competition among banks are also increasing. The strong foundation is built around size (both physical and financial) and for that they need to grow faster and remain competitive throughout. In the 21st century banks are merging to become big and acquiring other banks to reduce competition. Through acquisitions acquirers can have the requisite control over the management of other firms through controlling the assets of the acquired without assimilating the others **(Pande, 2011).** Basically mergers and acquisitions take place in three forms: horizontal merger includes a kind of merger in which both organization function in similar operational activity, vertical mergers include coming together of two of more firms functioning in different levels of supply chain, and in conglomerate mergers unrelated firms combine together their operations to become a single entity **(Khan and Jain, 2014)**.

Benefits of mergers and acquisitions.

There are few more obvious reasons of mergers. Synergy is created through merger as it helps in removing duplicity of works and create cohesion resulting in reduction of costs. The expanded size and new markets achieved through acquisitions lead to faster growth which is needed to remain relevant in modern competitive world. Besides, business is almost a zero-sum game where you can grow at the cost of other, and in this mergers eliminates or reduces the competition resulting in the increased customer base and revenue leading to faster growth further. In the modern day business model you have better chances to remain relevant if you do not depend upon the single product or service. There is an ever increasing need to diversify products or services to ensure firmness into business by incorporating additional related services to become the complete service provider for the precious clients who prefer availing everything at the same place. Mergers and acquisitions provide that platform where one can assimilate similar services and become one stop solution of entire financial and security needs of clients. Operational efficiency also get increased with mergers as best of two combine into one that help banks in making the customer happy and loyal towards itself for longer.

Mergers and Acquisitions of Indian Banks.

The desirability of larger banks with efficient financial strength was felt badly after economic liberalization in India in the decade of 1990. Prior to 1990`s the India was battling with the problem of insufficient credit provisioning to the poor people as the banks were reluctant to cater their need and mostly favoured to cater the needs of rich people and corporate houses. The Govt. of India nationalized 14 commercial banks in 1969 and 6 more in 1980 in order to disciplined them to cater the need of poor people and priority sector through its different welfare schemes. Narasimhan committee II recommended for banks mergers to create few larger banks instead of many smaller banks. The larger banks are supposed to use economies of scale to cater the needs of customers better through diversification of product and expansion of branches all over the country. With the rapid changes in banking scenario Indian banks are leaving no stone unturned to become competitive and maintain sustainability. But Indian banks underwent mergers mainly to restructure the small and weak banks to make it more viable **(Panwar, 2011).** Besides, the changing roles of the banks have to be streamlined in order to cater the modern need. Thus the small banks or weak banks liabilities became burdensome for the bigger banks that had the adverse impact on profitability, at least in the short run.

The mindset of Indian banking regulatory authority and the government were to bring about the reformation owing to new economic policy and mergers of banks aimed at strengthening the banking and financial sector and making it bigger, stronger and vibrant. Increase in the non-performing assets of few banks created a trigger compelling the government to go for merging the smaller and weak banks with strong banks and thus checking in the deterioration further. In the recent years, even private banks also underwent mergers in India but with a different motives, that is, to make them competitive enough to sustain the competition created by government banks. While the consolidation was the main motive of public sectors banks, to become competitive was the main motto of private sector banks mergers. Post liberalization phase brought about such an abrupt changes in the economic system of India that Indian banks did not find time to fulfil the financial needs of industries in organic ways. Therefore, they chose inorganic mode of restructuring resulting in a wave of mergers in Indian banking sector.

Literature Review.

In the era of stiff competition organizations aim at improving the efficiency, particularly operational efficiency to continue with the renewed momentum of growth. The main purpose of going for mergers and acquisitions is to gain operational synergy on which financial synergy completely depend. **Kumar (2013),** in his research work tried to analyse the impact of mergers and acquisitions on operational efficiency of merging banks namly Indian Overseas Bank and Bharat Overseas Bank, and found significant impact on business per employee and interest income per employee in post-merger period in comparison to pre-merger period. But profit per employee did not improve significantly, besides non-performing assets also could not improve desirably.

Goyal and Joshi (2011), in their paper explained how Indian banks changed themselves after economic liberalization. Adopting the merger as a tool banks brought about the overhaul in financial, and other aspects and now banks like ICICI expanded their size and scale in order to cater the need in changed atmosphere post liberalization. This paper took 17 mergers as sample and found in their analysis how banks utilized the merger to achieve their objectives.

Tripathi and Ahuja (2020) in their research work titled, **EFFECT OF MERGER ON BANKING SECTOR- A CASE STUDY OF SBI,** analysed the impact of merger on both operational and financial efficiency and found business per branch and profitability both increased but the increase was not very significant in comparison to pre-merger period. Although the number of branches increased and the customer base also got the boost, the impact on efficiency and profitability was not very profound. In fact, the productivity went down from previous high. Advances per employee and deposit per employee both actually increased indicating that the operational efficiency improved but to become the efficient significantly, it might take some time. The spread and burden per employee improved as well but the improvement was not very significant.

Kumar and Behl (2023) in their study analysed the impact of merger on banks performances through few cases related to mergers of ICICI bank, HDFC bank and Kotak Mahindra Bank. According to this study ICICI bank successfully increased its market share in the region of Rajasthan significantly. HDFC bank on the other hand expanded its operation in southern India in a significant way because of acquisition of Centurian Bank. This acquisition greatly helped HDFC to scale up its operations by increasing customer base as well. Kotak Mahindra Bank desire to expand in the south was fulfilled by its acquisition of ING Vysya Bank in 2015 and helped it diversifying its product line besides, it helped the bank in increasing the market share further. The authors also found that mergers posed big challenges related to mergers. These banks faced cultural differences and management differences in style of conducting operations. The author found Kotak Mahindra successfully overcame these challenges to a great extent.

Khushalani and Sinha (2021) in their research work analysed the financial performance of merged entity on pre-post comparison. The four banks mergers were considered for analysis in which Net Profit Margin, Capital Adequacy Ratio, Dividend Per Share and Return on Assets were compared between pre and post-merger phase. Using t-test statistical tool, it was observed that the performance of all above mentioned ratios except Net Profit Margin, improved significantly in post-merger period. Net Profit Margin also improved but improvement was not significant. Cash Deposit Ratio of merging bank also improved significantly. In case of HDFC bank improvement in NPM and ROA took place but insignificantly. In case of ICICI bank again ROA improved but insignificantly. Kotak Mahindra Bank also did not improved significantly on DPS ratio, so was the case with NPM and Capital Adequacy Ratio. Overall, there was significant improvement on almost all parameters and Individually the improvement was not as par for Kotal Mahindra Bank.

Joshi and Limbad (2023) used CAMEL model to analyse the post-merger financial performance of merged entity in comparison to pre-merger performances of mega merger of public sector banks in India. The anchor banks were Punjab National Bank, Canara Bank, Union Bank of India and Indian Bank. Period of merger was from 2018 to 2020. The ratio considered for analysis include, Capital Adequacy Ratio, Return on Asset, DPS, Business per Employee etc. In case of PNB, improvement was found to be significant in Cash Deposit Ratio, Net NPA to Net Advances and ROE, and for the rest of variables, the improvement was not significant. For Indian Bank, improvement in post- merger phase was significant for Capital Adequacy Ratio, Investment Deposit Ratio, Profit per Employee, ROA, ROE, DPS, and Liquid Asset to Total Asset, and for rest of ratios the improvement was insignificant. For Canara Bank, only Capital Adequacy Ratio, Credit Deposit Ratio and Net NPA to Net Advances improved significantly. In case of Union Bank of India, Credit Deposit Ratio, Total Advances to Total Deposit ratio, Profit per Employee, ROA, ROE, and Liquid Asset to Total Asset improved significantly. Overall the outcome gave a mixed response.

Gandhi, Chhajer and Mehta (2020) in their research work on mergers and acquisitions of bank compared the financial performances of sample firms in pre-post analysis. The sample bank were taken from both private and public sector. CAMEL model was used to analyse the related variables and only few of the variables found to have improved significantly in the post-merger period. Important ratios considered for the analysis were Capital Adequacy Ratio, Non-performing Asset, D/E ratio, Proprietary ratio, etc. Among the private sector banks significant improvement was found for the Capital Adequacy Ratio and Total Advances to Total Asset Ratio and for the rest of the ratios the improvement was insignificant. Among the public sector banks, all the ratios such as D/E ratio, Proprietary ratio, Total Advances to Total Asset ratio and Government Security to Total Investment ratio improved significantly in the post-merger period. Only the Capital Adequacy ratio improved insignificantly. The weighted average score for asset quality could not improve significantly, whereas the weighted average score for management efficiency improved in case of public sector banks only. The liquidity aspects could not improve significantly whereas weighted average score of overall CAMEL ratio showed mixed response in post-merger period.

Visalakhi and Kurian (2019) in their study analysed the impact of merger of SBI with its associate banks on the performance in post-merger phase. Financial data related to deposits, advances, assets and profitability were compared in pre-post process. The financial performance of merged banks from 2016 to 2019 were assessed using t-test analysis. Deposits, advances and assets in the post-merger period increased significantly but increase in net profit and net interest margin were not significant. Desirable improvement in NPA was not found besides, cost reduction was also not clearly visible. Owing to merger the capital and client base of SBI increased very much and the bank accessibility by the customer improved further that made it the provider of largest physical infrastructure among Indian banks.

Sarkar and Das (2018) analysed the financial performance of six merging banks in India from 2004 to 2010. The financial data of five years pre-merger were compared with five years' post-merger by analysing the ratios such as return of net worth, earning per share, return on assets and interest earned. In case of Oriental Bank of Commerce profit ratios improved but return on long-term fund and EPS decreased. Federal bank on the other hand improved upon almost all the ratios except return on net worth. For Indian Overseas Bank nothing went in the desired direction. For HDFC Bank and Oriental bank the outcomes of merger was fruitful. Economic value added in case of Federal Bank and Oriental Bank were positive.

Research Methodology.

This study adopted a quantitative research methodology to analyse the impact of mergers and acquisitions (M&A) on the operational efficiency of Indian public sector banks. The primary objective is to evaluate measurable changes in financial performance indicators that reflect operational efficiency before and after the M&A events. The ratios selected for analysis constituted of two groups – per employee and per branch. In per employee category Interest Income Per Employee **(IIPE)** and Business Per Employee **(BPE)** were considered and in per branch category Interest Income Per Branch **(IIPB)** and Business Per Branch **(BPB)** were considered for analysis. Statistical tools such as Paired Sample t-tests, Wilcoxon Signed Rank Test and Sign Test are employed to test hypotheses and identify significant differences in performance matrix. The sample size for this study includes data from six Indian banks (State Bank of India, Bank of Baroda, Union Bank of India, Canara Bank, Punjab National Bank, and Indian Bank) that have undergone mergers in the recent past (Year 2017 to 2020). One, Two and Three years pre-post ratios have been analysed using SPSS software.

Hypothesis.

H0: There is no difference in Operating performance of Acquiring banks in post merger in comparison to pre-merger.

Data Analysis.

Table 1.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	IIPEPRE1	8337950.3567	6	937479.52203	382724.41221
	IIPEPOST1	8555813.7850	6	616510.59966	251689.39836
Pair 2	IIPEPRE2	7642697.8867	6	923883.20160	377173.73764
	IIPEPOST2	7106567.3233	6	3585848.97698	1463916.71471
Pair 3	IIPEPRE3	7489257.9017	6	1089738.58018	444883.91241
	IIPEPOST3	9826003.5567	6	1106927.92589	451901.43341
Pair 4	BPEPRE1	180400202.9800	6	22552320.61505	9206946.33709
	BPEPOST1	190372918.9100	6	15371679.90688	6275462.04354
Pair 5	BPEPRE2	164637992.3967	6	23275691.70898	9502261.34955
	BPEPOST2	177304595.0883	6	89588586.08486	36574387.11422
Pair 6	BPEPRE3	153446352.4917	6	25274208.16340	10318152.27553
	BPEPOST3	233987896.4117	6	20660972.85678	8434806.84810
Pair 7	IIPBPRE1	78542243.4500	6	10532090.63840	4299707.99814
	IIPBPOST1	76417682.7350	6	12074572.15850	4929423.44179
Pair 8	IIPBPRE2	74409683.9083	6	10978313.70614	4481877.80271
	IIPBPOST2	62436341.7467	6	31125366.91505	12706877.83313
Pair 9	IIPBPRE3	73205684.1267	6	9640195.36545	3935593.27768
	IIPBPOST3	90843116.6550	6	13503626.63200	5512832.48758
Pair 10	BPBPRE1	1691700256.7083	6	162571729.17400	66369630.51304

	BPBPOST1	1692196164.9183	6	198855720.36400	81182507.88756
Pair 11	BPBPRE2	1594248069.4500	6	181611602.18987	74142626.12242
	BPBPOST2	1555152127.6267	6	768090150.46334	313571490.84879
Pair 12	BPBPRE3	1498253147.1233	6	211878560.96558	86499060.30014
	BPBPOST3	2159050364.3917	6	219081216.69771	89439532.18958

Source: Paired Sample Descriptive Statistics Output generated from SPSS 22

Table 1 shows the descriptive report of how the mean values varies between pre-merger and post-merger period among different variable demonstrated through different pairs. Standard deviation depicts the spread of values from their mean values and the lower the values of standard deviation, better is the position. Standard error values shows the expectations that the sample mean value may vary from the population mean. In pair number 1, 3, 4, 5, 6, 9, 10 and 12 the mean values increased in the post-merger period indicating the improvement in the variables values in comparison to pre-merger period. Whereas the mean values decreased in pair number 2, 7, 8 and 11 in post-merger period. The increase in the mean values indicate the value addition because of merger activities whereas the corresponding decrease indicate the merger not impacting positively to the variables analysed. In the pairs 3, 9 and 12 the increase in the mean values of variables was found to be by large extent which shows the impact of merger was noticeable enough in the desired direction.

Table 2.

Paired Samples Correlation

		N	Correlation	Sig.	P-value	H0
Pair 1	IIPEPRE1 & IIPEPOST1	6	.767	.075	>0.05	Not significant
Pair 2	IIPEPRE2 & IIPEPOST2	6	.471	.346	>0.05	Not significant
Pair 3	IIPEPRE3 & IIPEPOST3	6	.253	.629	>0.05	Not significant
Pair 4	BPEPRE1 & BPEPOST1	6	.984	.000	<0.05	Significant
Pair 5	BPEPRE2 & BPEPOST2	6	.738	.094	>0.05	Not significant
Pair 6	BPEPRE3 & BPEPOST3	6	.349	.498	>0.05	Not significant
Pair 7	IIPBPRE1 & IIPBPOST1	6	.955	.003	<0.05	Significant
Pair 8	IIPBPRE2 & IIPBPOST2	6	-.744	.090	>0.05	Not significant
Pair 9	IIPBPRE3 & IIPBPOST3	6	.799	.057	>0.05	Not significant
Pair 10	BPBPRE1 & BPBPOST1	6	.852	.031	<0.05	Significant
Pair 11	BPBPRE2 & BPBPOST2	6	-.334	.517	>0.05	Not significant

Pair 12	BPBPRE3 & BPBPOST3	6	.810	.051	>0.05	Not significant

Source: Paired Sample Correlation Statistics Output generated from SPSS 22

Table 2 shows the correlation between variables figure between pre and post and it was found that pair number 8 and 11 were negatively correlated as the correlation values for the same were -0.744 and -0.344 respectively. Rest of the variables were positively correlated. In case of pair number 4, 7 and 10 the correlation was very high i.e., 0.948, 0.955 and 0.852 respectively and the significance values were 0.000, 0.003 and 0.031 respectively and were much less than 0.05 at 95 % confidence level and therefore significant. In pairs 1, 5, 9 and 12 the correlation values were 0.767, 0.738, 0.799 and 0.810 respectively and were high but not so high enough to make the pairs highly and significantly correlated as their significance values were 0.075, 0.094, 0.057 and 0.051 respectively which were slightly higher than 0.05. Therefore, the above table provides evidence to show that though the mergers led to improvement in the operating performances of firms in the post merger, the improvement was not uniform for all the operating ratios. Business per employee in one year pre-post, interest income per branch in one year pre-post and business per branch in one year pre-post comparison improved significantly, where as other ratios in two year pre-post and three year pre-post could not improve significantly. It provides indication that mergers impact was found significantly in short duration of one year pre-post only and there could be other factors that might be contributing countrary in the long range. Therefore, the the merger as a tool could play its part to deal with immediate requirement to improve operational efficiency.

Table 3.

Paired Sample Test Statistics

Pairs	95 % Confidence Interval of Difference		t value	Sig. (2 tailed)	H0
	Lower	Upper			
Pair 1 IIPEPRE1 - IIPEPOST1	-858674.76578	422947.90912	-.874	.422	Not Rejected
Pair 2 IIPEPRE2 - IIPEPOST2	-2879098.17623	3951359.30289	.404	.703	Not Rejected
Pair 3 IIPEPRE3 - IIPEPOST3	-3745799.53512	-927691.77488	-4.263	.008	Rejected
Pair 4 BPEPRE1 - BPEPOST1	-18264560.11000	-1680871.75000	-3.092	.027	Rejected
Pair 5 BPEPRE2 - BPEPOST2	-90429728.84909	65096523.46575	-.419	.693	Not Rejected

Pair 6 BPEPRE3 - BPEPOST3	-108333055.55063	-52750032.28937	-7.450	.001	Rejected
Pair 7 IIPBPRE1 - IIPBPOST1	-1765600.55591	6014721.98591	1.404	.219	Not Rejected
Pair 8 IIPBPRE2- IIPBPOST2	-29970958.70800	53917643.03133	.734	.496	Not Rejected
Pair 9 IIPBPRE3 - IIPBPOST3	-26244285.63065	-9030579.42602	-5.268	.003	Rejected
Pair 10 BPBPRE1 - BPBPOST1	-109840296.58962	108848480.16962	-.012	.991	Not Rejected
Pair 11 BPBPRE2 - BPBPOST2	-849044280.84692	927236164.49358	.113	.914	Not Rejected
Pair 12 BPBPRE3 - BPBPOST3	-800382335.19618	-521212099.34048	-12.169	.000	Rejected

Source: Paired Sample Test Statistics Output generated from SPSS 22

Table 3 depicts the paired sample t-test statistics to analyse the differences in the performances of acquirer banks between pre and post-merger phase. For pair 1 that is, Interest Income Per Employee, the t- value is -0.874 which is not high and significance value is 0.422 which is much higher than 0.05. It shows that Interest Income Per Employee could not improve significantly in one year post-merger in comparison to a year before merger. For pair 2, the t-value is 0.404 which is again not high enough and the significance value is 0.703 which is much higher than 0.05, indicating that even in the second year post-merger the interest income per employee could not improve in comparison to two year pre-merger performance. But in the third year post-merger the variable figure improved significantly as the t-value is -4.263 which is higher than absolute value of 2 and significance value of 0.008 is much lower than 0.05, indicating a significant improvement in the mentioned parameter. Pair 4, 5 and 6 provides the Business per employee of banks. The t-values of pair 4, 5 and 6 are -3.092 (>2), -0.419 (<2) and -7.450 (>2) respectively, indicating that in the first year and third year post-merger the performance improved greatly in comparison to first year and third year prior to merger. This is endorsed by the significance value for both the pairs of respective window year which are 0.027 and 0.001, both value less than 0.05 at 95 % confidence level. For 7, 8 and 9 pairs which provide Interest Income Per Branch, it was only in the third year post-merger the performance improved significantly as the t-value is -5.268 which is much higher than 2 and significance value is 0.003 which is less than 0.05. For pair number 10, 11 and 12 the Business per branch improved significantly in third year again in comparison the third year pre-merger as the t-value is -12.169 which is much higher and significance value is 0.000 which is less than 0.05.

Table 4.

Wilcoxon Signed Rank Test Statistics(a)

Pairs	Z	Asymp. Sig. (2-tailed)
Pair 1 IIPEPOST1- IPEPRE1	**-.943 (b)**	**.345**
Pair 2 IIPEPOST2- IIPEPRE2	**-.943 (b)**	**.345**
Pair 3 IIPEPOST3- IIPEPRE3	**-2.201 (b)**	**.028**
Pair 4 BPEPOST1- BPEPRE1	**-2.201 (b)**	**.028**
Pair 5 BPEPOST2- BPEPRE2	**-.943 (b)**	**.345**
Pair 6 BPEPOST3- BPEPRE3	**-2.201 (b)**	**.028**
Pair 7 IIPBPOST1- IIPBPRE1	**-1.153 (c)**	**.249**
Pair 8 IIPBPOST2- IIPBPRE2	**-.943 (b)**	**.345**
Pair 9 IIPBPOST3- IIPBPRE3	**-2.201 (b)**	**.028**
Pair 10 BPBPOST1- BPBPRE1	**-314 (c)**	**.753**
Pair 11 BPBPOST2- BPBPRE2	**-.943 (b)**	**.345**
Pair 12 BPBPOST3- BPBPRE3	**-2.201 (b)**	**.028**
a. Wilcoxon Signed Rank Test, b. Based on negative value, c. Based on positive value		

Source: Wilcoxon Signed Rank Test Statistics Output generated from SPSS 22

Table 4 provides Statistical output from Wilcoxon signed rank test. For pair 1, 2 and 3 which indicate the one, two and three year pre-post changes in interest income per employee, the Z-value of three years pre-post for interest income per employee is -2.201 which is higher than absolute value of 2 and the significance value for the same is 0.025 which is lower than 0.05, hence the difference is significant. For rest of pairs 1 and 2 the differences are not significant. For pairs 4, 5 and 6 which shows Business per employee in 1, 2 and 3 years pre-post figure, pair 4 and 6 that is one and three year pre-post Business per employee value differ significantly as the Z-values is -2.201 each which are greater than 2 and significance values is 0.028 each which is less than 0.05 at 95 % confidence level. For pairs 7, 8 and 9 which compares the Interest income per branch in one, two and three years pre-post merger, the difference was found to be significant only in third year pre-post as the Z-value for this period is -2.201 that is greater than absolute value of 2 and the significance value is 0.028 which is again less than 0.05. For pairs 7 and 8 the differences are not significant. For pairs 10, 11 and 12 which gives the values differential of Business per branch, again the Z-value and significance value are -2.201 (>2) and 0.028 <0.05) respectively, indicating the significance difference in the values only in third year pre-post phase.

Table 5.

Sign Test Statistics(a)

Pairs	**Exact Sig. (2-tailed)**
Pair 1 IIPEPOST1- IPIEPRE1	**1.000(b)**
Pair 2 IIPEPOST2- IIPEPRE2	**.219(b)**
Pair 3 IIPEPOST3- IIPEPRE3	**.031(b)**
Pair 4 BPEPOST1- BPEPRE1	**.031(b)**
Pair 5 BPEPOST2- BPEPRE2	**.219(b)**
Pair 6 BPEPOST3- BPEPRE3	**.031(b)**
Pair 7 IIPBPOST1- IIPBPRE1	**.687(b)**
Pair 8 IIPBPOST2- IIPBPRE2	**.219(b)**
Pair 9 IIPBPOST3- IIPBPRE3	**.031(b)**
Pair 10 BPBPOST1- BPBPRE1	**1.000(b)**
Pair 11 BPBPOST2- BPBPRE2	**.219(b)**
Pair 12 BPBPOST3- BPBPRE3	**.031(b)**
a. Sign Test Statistics, b. Binomial Distribution Used	

Source: Sign Test Statistics Output generated from SPSS 22

Table 5 provides the sign test statistics for mentioned operating ratios in pre-post comparison in one, two and three year period. Sign test is used to provide the directional movement of paired observation based on the sign which could be positive, negative or zero. The null hypothesis assumes paired difference between the medians of pair as zero. For pair 3, 4, 6, 9 and 12 the 2-tailed significance values for interest income per employee in three year pre-post, business per employee in one year pre-post, business per employee in three years pre-post, interest income per branch in three years pre-post and business per branch in three years pre-post period were found to be significant as there significance values were 0.031 each which was less than 0.05 at 95 % confidence level. This shows that on an average the merger impacted the operational efficiency positively but only for the ratios mostly in third year after merger.

Interpretation and Conclusion.

Mergers of Indian public sector banks by the government was well designed measure to improve upon the operational efficiency of the banks which were previously crippled with high non-performing assets on one hand and operational inefficiency due to lack of innovations on the other hand. Consolidation of customer base and reducing the number of banks to fewer and vibrant were the main objectives of the governmental measures of merger of banks but the long-term objective of merger was to make the public sector banks efficient enough to take care of changing needs of customers in 21st century. And for that the banks must be having sound and big capital base with IT enabled infrastructure in line with foreign multinational banks. The purpose seemed to be achieved partially as interest income per employee in one and three years pre-post period improved significantly. Busines per employee in one year pre-post also improved significantly. Interest income per employee and interest income per branch in three years pre-post period also improved. Baring few ratios, all ratios in the category of interest income and business improved but the improvement was significant only in third year period which is quite obvious as the impact need time to get reflected. Thus, it could be concluded that the objective of improvement in operational efficiengy was more or less achieved in the short as well as long run which would help bank to sustain with the competition from multinational banks and other economic upheavals in future.

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