Will Mergers and Acquisition Vacillate the Performance of Banks? A Case Study of Public Sector Banks in India

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ABSTRACT

The recent change that the banking sector sees is the mergers and acquisitions occurring among the public sector banks. Merger and acquisition in the banking sector are part of the reform strategies to improve financial stability and gain smooth operational flow and synergy advantages. The research focused on the aspects of the banks' profitability, solvency, investment, and liquidity in the pre-and post-merger period. The research attempted to understand the varied reasons behind their mergers, acquisition, and success rate. The main objective was to understand the impact of synergy on the performance and profitability of banks. It was an exploratory research to understand the various objectives of mergers and to map the outcome of those objectives. The analysis was done through ratio analysis and paired t-test to gauge the impact of the pre-and post-merger scenario. The results find that the merger and acquisition are a positive move for some banks. However, there are certain banks which are coping at a slow pace with the synergy. The research also discovers that the synergy amongst the banks reacts in a varied way based on the objective of the mergers. The results indicate that the banks cope with the merger and acquisition at a varied pace due to various factors like Non-Performing Asset (NPA), debts, assets, and market share variabilities amongst the banks. The recent pandemic that the world faces can also be considered a factor for slower coping.

Keywords: bank mergers, bank acquisition, bank performance, public sector banks

INTRODUCTION

Banks play a major role in the development of the country's economy. In India, the banking sector plays a crucial role in every aspect like Gross Domestic Product (GDP), Development Finance Institution (DFI), import and export, and mobilization of wealth in the country. When the banking sector plays such propelling role in the making of an economy, it becomes essential for them to perform well. The banks need to have a stable financial performance to provide better support to a growing economy like India. In the cases where the financial performances of the banks are not up to the mark, it becomes essential for the authorities to gear a reform process to forestall the banks which are in distress. The most common efforts to help the banks which are in the distress situation are

mergers and acquisitions (Carletti, Ongena, Siedlarek, & Spagnolo, 2019). The merger scenario intends to build a strong financial backup by grouping the weaker banks with the relatively stronger ones in the sector (Arnold, 1998; Manufacturing Close-Up, 2019a). There are several criteria which are analyzed before the merger decision, such as the Non-Performing Asset (NPA) of the banks, profitability aspect of the banks, liquidity of the banks, and other aspects (Chiu, Lin, Chang, Lin, & Chiu, 2021; Jensen, 1988).

There are several reasons for the mergers in the banking sector. First, it is for better financial hold. In the case of merger and acquisition, there is a synergy between the financial resources of two or more banks (Nguyen, Ha, & Nguyen, 2021). The synergy gives an upper hand to the banks in terms of financial elements. According to Kwan and Eisenbeis (1999) and

Ramaswamy (1997), there is a positive relationship between the cost and profitability in the case of merger and acquisition banks. In the post-merger scenario, the banks have shown a better performance as there is a better production and increased capacity to lend loans (Laeven & Levine, 2007). The post-merger period also shows better financial stability amongst the banks than the pre-merger period (Joshua, 2011).

Second, the major contributor to mergers and acquisitions in the public sector is NPA (Owolabi & Ogunlalu, 2013). The NPA affects the public sector drastically (Nguyen et al., 2021). Third, there is increased competition. In the globalized era, the competition is not only between the Indian banks but also the presence of global players (Figueiras, Gardó, Grodzicki, Klaus, & Lebastard, 2021). In scenarios where the domestic banks compete with the larger players, it becomes essential for the banks to have a better financial standing. It can be acquired with the help of merger and acquisition.

Fourth, it is caused by the economies of scale. According to Valverde and Fernández (2007) and Krishnan and Yakimenko (2022), higher productivity and better outcome in the case of merger and acquisition as the resources of two or more concerns will be gathered and utilized during the operation. Fifth, it lacks talent. The non-performing or unhealthy banks will suffer from a lack of talent in the case of human resources. In such scenarios, merger and acquisition turn out to be a great deal as there will be better-talented individuals from the acquiring company to make better decisions (Vyas, Narayanan, & Ramanathan, 2012). Sixth, there is an increased market share. In most scenarios of merger and acquisition, the acquiring banks will get a chance to tap new or untouched markets by acquiring an unhealthy bank with a branch. In such cases, there will not be extra cost spent on the set-up expenditures (Manufacturing Close-Up, 2019b).

Seventh, there are strategic level reasons. Better management of power and resources is possible with the help of merger and acquisition (Feinberg, 1985; Chiu et al., 2021). Then, increased financial resources provide a better chance for survival in the long run and expand the business over the different market horizons (Brown & Warner, 1985). The political factors or macro-environmental factors also influence the decisions made regarding the merger and acquisition (Eiya & Okafor, 2005). Eighth, there are tactical-level reasons. Human resources are needed to acquire better conditions on the horizon of profitability and to be a global player (not just a domestic name). It is a stepping-stone to enhance the production capacity of the banks to be more competent in the market (Banerjee & Eckard, 1998) and to gain access to the new markets.

Ninth, it is because of the structure of the Indian banking sector overview. The entire banking sector is managed and controlled by the Reserve Bank of India (RBI). It is the ultimate monetary and banking authority of the country. It oversees the flow of money in the economy and acts as the policy maker for financial institutions and government in financial matters. RBI also contributes to certain promotional and developmental activities to keep the economy floating. The banking sector in India contributes around 7,9% to the country's GDP. Recently, banks have ventured into adopting new technologies to gather better market share in the global scenario. Hence, banks constantly focus on adopting an integrated approach to manage the risks. There has been stable development in the financial sector to promote banking technologies and expansion of the banking activities to the unbanked regions. The government is taking necessary actions to achieve the target of introducing the whole banking procedure to the digital platform. Over the period, there has been a significant increase in the number of digital footprints as the numbers increase in the National Electronic Fund Transfer (NEFT) and Real-Time Gross Settlement (RTGS) transactions. In 2019, RBI introduced an electronic trading platform to trade foreign exchanges. Banks' customers were given access to indulge in trading the international securities (IrfanShakoor, Nawaz, ZulqarnainAsab, & Khan, 2014).

There are several studies regarding merger and acquisition in banks. First, Kaur and Kaur (2013) studied the cost efficiency of Indian commercial banks using a non-parametric data envelopment analysis technique. The objective was to measure the cost efficiency of the individual banks and analyze the post-merger scenario. Second, Boehmer, Masumeci, and Poulsen (1991) revealed that the concept of bank mergers succeeded in India to a certain level. However, the suggestions stated that merging well-performing banks with distressed banks was not feasible as it negatively impacted the stronger banks' asset quality. Third, Kumar and Bansal (2008) conducted a study to understand the performance pattern of mergers and acquisitions in India in the long run. The studied parameters were considered: liquidity position, operating efficiency, overall efficiency, return to equity shareholders, and financing compositions. It revealed that the acquiring firms could attain better synergy in the areas like cash flow, diversification, and cost reduction.

Fourth, IrfanShakoor et al. (2014) showed that the impact of the mergers and acquisitions was not favorable in the short run but positive during the long run. They mentioned the positive results only in the case of the liquidity position of the firm in the short run, whereas the rest of the ratios were negative. Fifth, Joshua (2011) and Sreemathi and Tharmalingam (2018) conducted a comparative analysis to understand the impact of merger and acquisition on the financial efficiency of the banks in Nigeria. The study stated that the financial stability of the banks was better in the post-merger scenario. The banks were advised to be more aggressive in their profit drive and extract more benefits from the merger and acquisition.

Sixth, Jayaraman, Srinivasan, and Arunachalam (2014) revealed that the technical efficiency of the merged banks deteriorated immediately and required

at least three years of a time gap to return to normal. It was also stated that the profitability and operational cost of the merged banks were not up to the mark in the initial years. Seventh, Al-Sharkas, Hassan, and Lawrence (2008) stated that merged banks enjoyed improved cost and profit efficiency. Then, with respect to the technical and allocative efficiency, the merged banks performed better than non-merged banks in the United States. It also revealed a great scope for the merged banks due to the improved technology and other resources.

Eighth, Berger and Humphrey (n.d.) studied the various banking mergers that took place in the US between 1981−1989. They stated two main findings. If the higher efficient banks took over the lower efficient ones, there would have been better efficiency gains. Then, there were no positive results in cost efficiency due to the merger. According to their study, there was a creation of diseconomies due to the mergers. However, it could be tackled with the X-Efficiency theory, resulting in the banks' cost-efficiency decline. Ninth, Kemal (2011) conducted research to find out the profitability of the mergers of Royal Banks of Scotland. The highlights of the merger were a failure to pull up the banks' profitability. Tenth, Goyal and Joshi (2011) applied a qualitative study to dissect the motives of merger and acquisition with reference to the Indian banking sector. The study mainly concentrated on the human resource aspects which were affected due to the mergers. The research stated that mergers were essential for the survival of the local and small banks in the global market. There was a great scope for the larger banks to expand their horizon in the rural areas which were not yet tapped. The mergers came with the growing issues relating to human resources, such as perception differences, cultural changes, and other aspects. Last, Gomes, Angwin, Weber, and Tarba (2013) studied the merger and acquisition scenarios in Africa and explored human resource management practices throughout the merger process. They revealed that communication in the post-merger phase played a vital role in managing the firms. The regional differences contribute to the merger and acquisition outcome in their way. It became essential to link the pre-and post-merger acquisition phase with experienced management. Walkner and Raes (2005), Dunn, Intintoli, and McNutt (2015), Ekkayokkaya, Holmes, and Paudyal (2009) mentioned that the concept of 'familiarity illusion' highlighted in the research became an essential contributor to the success or failure of the mergers.

In recent times, there have been multiple mergers which have taken place in the public sector banks. The research attempts to elaborate on the pre-and post-merger and acquisition scenario in the public sector banks using the concept of ratio analysis. It revolves around the impact of mergers and acquisitions on the profitability and performance metrics of the public sector banks. It intends to contribute to the banking literature for further study in this area. The research aims at understanding the complexity and the impact of mergers on the financial elements of the banks.

There are two research questions. Will there be any effect of merger and acquisition on the profitability of commercial banks? What are the changes in the financial ratios due to merger and acquisition? So, the research results are expected to study the impact of the mergers on the bank performances in the profitability aspect and assess whether the results of merger and acquisition are favourable or unfavourable.

METHODS

The research is exploratory, understanding the impact of mergers and acquisitions on public sector banks. It focuses on the aspect of profitability and performance analysis of the merged banks. The research analyzes public sector banks' pre-and post-merger situations from 2015 to 2020. The research is from 2015 but the mergers of most of the banks have happened during 2019. So, there is difference in years. For State Bank of India, the data starts from 2015 as the mergers took place in that year, while the rest of the banks start from 2016. Table 1 shows the list of selected banks.

Table 1 The List of the Public Sector Banks for the Analysis

Interval	Frequency
Indian Bank	Allahabad Bank
Union Bank	Andhra Bank and Corporate Bank
Canara Bank	Syndicate bank
Punjab National Bank	Oriental bank of commerce and United bank of India
Bank of Baroda	Vijaya Bank, Dena Bank
State Bank of India (SBI)	Bhartiya Mahila bank(BMB) State Bank of Bikaner and Jaipur (SBBJ) State Bank of Hyderabad (SBH) State Bank of Mysore (SBM) State Bank of Patiala (SBP) State Bank of Travancore (SBT)

(Source: Equimaster, 2020)

The data are secondary data collected from various sources like annual reports of the public banks, journals and online sources from 2016 to 2020 (5 years). Financial statements are analyzed using the various ratios to understand the banks' performances. The ratios are intended to study the banks' liquidity, profitability, solvency, and investment capability. Table 2 shows the used ratios.

Then, the data are analyzed using paired t-test. Paired t-test is calculated to see the pre-and post-performance metrics of the banks. The test studies whether there is a significant difference in the banks' performances during pre-and post-merger. The test statistic is calculated using Equation 1. Hence, these hypotheses are suggested.

H_0 : There is no significant difference in the profitability and performance metrics in the post-merger

H_1 : There is a significant difference in the profitability and performance metrics in post-merger

$$\text{Paired t-test (t): } \frac{\bar{x} - M_0}{S/\sqrt{N}} \qquad (1)$$

RESULTS AND DISCUSSIONS

The analysis focuses on two areas. First, it is to understand the financial performances of the selected public sector banks with ratio analysis. Second, the ratios are analyzed using paired t-test to understand the relationship between performance metrics and mergers. The public sector banks which have undergone the mergers have been taken for the analysis. The banks have been chosen based on the time frame from 2015 to 2020 (except State Bank of India, all other banks' data are from 2016).

Table 3 shows the analysis of Punjab National Bank. The ratios of the post-merger period suggest a positive trend. The post-merger ratios indicate that the selected banks' profitability and liquidity positions have shown a positive trend. Although the results are not drastic, the synergy seems to be going in the right direction.

Table 2 Ratio Used in the Research

No	Nature	Ratio
1.	Liquidity Ratio (L)	Current Ratio (CR)
		Quick Asset (QR) Ratio
2.	Profitability Ratios/Performance Ratio (P)	Return on Asset (ROA) Ratio
		Return on Equity (ROE) Ratio
		Net Profit Margin (NPM) Ratio
		Operating Profit Margin (OPM) Ratio
		Return on Capital Employed (ROCE) Ratio
3.	Investment/ Operational Ratio (I)	Dividend per Share (DPS) Ratio
		Earnings Yield (EY) Ratio
		Earnings per Share (EPS) Ratio
		Net Interest Margin (NIM) Ratio
		Interest income Total Assets (IITA)
4.	Solvency Ratio (S)	Debt Equity (DE) Ratio
		Current Account Saving Account (CASA) Ratio

Table 3 Ratio Analysis of Punjab National Bank

Category	Ratios	2020	2019	2018	2017	2016
		Post		Pre		
P	NPM	0,62	-19,44	-25,59	2,8	-8,38
	OPM	-16,61	-33,81	-44,09	-16,13	-22,88
	ROA	0,04	-1,28	-1,6	0,18	-0,59
	ROE	0,58	-24,2	-32,85	3,47	-11,2
	ROCE	1,8	1,7	1,38	2,06	1,87
L	CR	0,34	0,3	0,31	0,3	0,29
	QR	7,14	5,82	9,47	6,56	10,8
I	EPS	0,62	-30,94	-55,39	6,45	-20,82
	DPS	0	0	0	0	0
	EY	0,02	-0,23	-0,47	0,04	-0,24
	NIM	2,09	2,21	1,94	2,08	2,29
	IIT	6,47	6,62	6,26	6,56	7,1
S	DE	0,05	0,05	0,04	0,04	0,05
	CASA	42,97	42,16	40,98	41,82	37,17

The performance of Union bank is affected by the mergers. The ratios of the Union bank show a positive trend compared to the prior merger (see Table 4). The results indicate that the bank's liquidity has been in a better condition compared to the pre-merger state. Even though the EY ratio seems volatile, the volatility rate is lower than in the pre-synergy phase. In 2020, the performance was affected partly due to the global pandemic. The moratorium effect can be seen in the same.

In Table 5, the post-merger financial ratios show a positive response to the synergy except for the OPM ratio. It still functions in the negative range. It indicates that the merger has benefited in improving the areas like liquidity, investment, and solvency of the Bank of Baroda.

As seen in Table 6, the bank seems to have a negative impact on the operating profits. EPS and EY lean towards a negative side even in the second year of post synergy. The results state that the merger does not favor the bank's liquidity position in the short run.

Table 7 shows the ratio analysis of Canara Bank. The bank has a negative impact on OPM, ROA, and ROE and a major negative impact on the EPS in the post-merger period. It indicates that the merger is not in favor of the financial situation of the bank in the short run due to the heavy amount of the NPA of the merged banks.

Table 4 Ratio Analysis of Union Bank

Category	Ratios	2020	2019	2018	2017	2016
		Post			Pre	
	NPM	-7,78	-8,65	-16,02	1,69	4,19
	OPM	-21,91	-21,78	-31,26	-13,5	-7,08
P	ROA	-0,52	-0,59	-1,07	0,12	0,33
	ROE	-9,46	-12,15	-20,9	2,36	6,65
	ROCE	1,7	1,54	1,57	1,67	1,42
L	CR	0,34	0,3	0,3	0,3	0,26
	QR	11,65	10,31	11,18	10,97	9,03
	EPS	-12,49	-25,08	-69,45	8,08	20,42
	DPS	0	0	0	0	1,95
I	EY	-0,29	-0,18	-0,48	0,05	0,15
	NIM	2,07	2,06	1,9	1,96	2,05
	IIT	6,76	6,89	6,71	7,21	7,95
S	DE	0,04	0,05	0,05	0,04	0,05
	CASA	35,58	36,09	34,08	34,43	32,35

Table 5 Ratio analysis of Bank of Baroda

Category	Ratios	2020	2019	2018	2017	2016
		Post			Pre	
	NPM	0,71	0,87	-5,57	3,27	-12,24
	OPM	-12,85	-11,77	-20,82	-12,73	-23,59
P	ROA	0,04	0,05	-0,33	0,19	-0,8
	ROE	0,76	0,94	-5,6	3,43	-13,42
	ROCE	1,77	1,78	1,72	1,63	1,36
L	CR	0,29	0,29	0,28	0,22	0,21
	QR	9,84	10,52	10,58	5,09	5,83
	EPS	1,36	1,64	-10,53	6	-23,89
	DPS	0	0	0	2,6	2,6
I	EY	0,02	0,01	-0,06	0,03	-0,16
	NIM	2,37	2,36	2,15	1,94	1,89
	IIT	6,56	6,37	6,06	6,07	6,56
S	DE	0,04	0,04	0,04	0,04	0,04
	CASA	35,02	34,6	35,62	32,08	26,41

In Table 8, apart from the OPM, the rest of the ratios show a positive movement. It is an indicator that the synergy is in favor of the bank in terms of liquidity, investment, and solvency position. The result states that the bank recovers in terms of liquidity and solvency positions in gradual manner as there is a positive trend in the ratios.

Next, the data are analyzed using paired t-test. The hypotheses used are that there is no significant difference in the profitability and performance metrics in the post-merger (H_0), and there is a significant difference in the profitability and performance metrics in the post-merger (H_1). Tables 9 to 14 show the results. NS is not significant, while S is significant.

Table 9 in Appendices shows the results of Punjab National Bank. As the P-value of the NIM ratio is < 0,05, there is a significant difference in the profitability and performance metrics in post-merger. It highlights that the merger affects the operating income. Hence, it indirectly indicates that there is improvement in the primary business of the merged bank. In the rest of the ratios, the P-value is > 0,05, so the null hypothesis is accepted.

Table 6 Ratio Analysis of State Bank of India

Category	Ratios	2019	2018	2017	2016	2015
		Post			Pre	
P	NPM	-2,96	5,97	6,06	8,59	7,98
	OPM	-23,19	-14,23	-10,91	-6,21	-5,61
	ROA	-0,18	0,38	0,42	0,63	0,6
	ROE	-3,37	6,69	6,89	10,2	9,2
	ROCE	1,81	1,99	1,96	2,06	1,89
L	CR	0,33	0,39	0,37	0,33	0,31
	QR	13,84	13,38	15,54	18,68	13,01
	EPS	-7,67	13,43	12,98	17,55	15,68
	DPS	0	6	1,5	3,5	3
I	EY	-0,03	0,04	0,07	0,07	0,01
	NIM	2,16	2,28	2,42	2,68	2,74
	IIT	6,38	6,48	6,95	7,44	7,6
S	DE	0,06	0,06	0,06	0,07	0,07
	CASA	0	44,48	44,57	42,61	41,34

Table 7 Ratio Analysis of Canara Bank

Category	Ratios	2020	2019	2018	2017	2016
		Post			Pre	
P	NPM	-4,56	0,74	-10,23	2,71	-6,38
	OPM	-20,53	-13,3	-27,06	-15,54	-17,46
	ROA	-0,3	0,04	-0,68	0,19	-0,5
	ROE	-6,78	1,16	-14,51	3,96	-10,75
	ROCE	1,32	1,56	1,59	1,56	1,32
L	CR	0,28	0,27	0,3	0,3	0,3
	QR	6,84	7,4	7,98	5,6	5,42
	EPS	-26,5	4,71	-70,47	20,63	-53,61
	DPS	0	0	0	1	0
I	EY	-0,24	0,02	-0,22	0,06	-0,27
	NIM	1,81	2,08	1,97	1,69	1,76
	IIT	6,76	6,73	6,68	7,09	7,96
S	DE	0,04	0,04	0,04	0,04	0,05
	CASA	0	31,37	29,18	31,82	30,23

In Table 10 (see Appendices), as the P-value of the CASA ratio is < 0,05, there is a significant difference in the profitability and performance metrics in post-merger. There is a significant difference in the ratio of current and savings deposits to total deposits. It indicates that there is a change in cost fund, which will definitely have a positive impact on profitability. In the rest of the ratios, the P-value is > 0,05, so the null hypothesis is accepted.

As seen in Table 11 (see Appendices), the P-value of all the ratios is > 0,05. The null hypothesis is accepted. It is proven that in the Bank of Baroda, there is no significant difference in the profitability and performance metrics in post-merger. Actually, the financial condition of the bank whose identity is retained after the merger, is not so impressive before the merger. Vijaya Bank is the sole exception among the other two banks whose balance sheets show profit/surplus prior to the merger. However, it is not enough to make good of loss. It will take time to reap the benefits of the merger.

In Table 12 (see Appendices), the P-value of all the ratios is > 0,05. So, the null hypothesis is accepted. It is proven that in the State Bank of India, there is no significant difference in the profitability and performance metrics in post-merge. Except for scalability, all of its subsidiaries use to follow the same policies, rules, and regulations prior to the merger. So, test results in insignificant changes in profitability and operating performance.

Table 13 (see Appendices) shows the result of Canara Bank. The P-value of all the ratios is > 0.05, so the null hypothesis is also accepted. It is proven that there is no significant difference in the profitability and performance metrics in post-merger.In the long run, synergy effect will definitely get reflected in performance and work of the bank as it is more related to fundamental factors.

In Table 14 (see Appendices), the P-value of all the ratios is > 0,05. Hence, the null hypothesis is accepted. In Indian Bank, there is no significant difference in post-merger profitability and performance metrics. Fundamental factors always take long time to bring significant changes in its operation.

The moratorium effect affects the banks' financial performance in the post-merger scenarios due to the waiver of interest that was announced from March to August 2020. The performance of the banks in 2020 was stagnant, and in some circumstances, there was even a decline in the performance due to the global pandemic that struck the economy.

Even though the intention of merger and acquisition in some banks is to reduce the burden of NPA, in the initial period of the synergy, there will always be chaos in managing the NPA and stabilizing the situation. The increase in the NPA affects the assets of the banks, which is related to profitability. The same can be seen in the merger and acquisition of Indian public sector banks. There is volatility in the profitability ratios and a negative impact on banks like Union, State Bank of India, and Canara.

In 2016, the introduction of Goods and Service Tax (GST) took place. The same effect could be seen in the ratios of the banks in 2017. Most banks had shown a positive trend during 2017 as the flow of money into the bank was higher. Then, the income sources were recorded in a prominent way from thereon.

Table 8 Ratio Analysis of Indian Bank

Category	Ratios	2020	2019	2018	2017	2016
		Post			Pre	
P	NPM	3,51	1,67	7,35	8,76	4,37
	OPM	-11,95	-8,13	-6,7	-5,02	-6,58
	ROA	0,24	0,11	0,49	0,64	0,34
	ROE	3,94	1,97	7,95	9,72	5,27
	ROCE	2,14	1,78	2,02	1,88	1,53
L	CR	0,05	0,27	0,34	0,37	0,3
	QR	34,19	31,38	28,24	24,1	25,51
I	EPS	14,33	6,7	26,21	29,27	14,81
	DPS	0	0	0	1,2	0
	EY	0,29	0,02	0,09	0,1	0,14
	NIM	2,45	2,5	2,47	2,35	2,18
	IIT	6,91	6,85	6,77	7,34	7,97
S	DE	0,042	0,05	0,05	0,03	0,05
	CASA	0	34,64	34,7	36,95	37,08

There is also chaotic synergy. The whole merger and acquisition process, starting from the decision of synergy to the implementation phase, will have plenty of chaotic scenarios. The whole initial period of the synergy is the most challenging part as there are tons of work to be done by the management. In this period, it is common to have low performance as the synergy is just in the initial phase. Most of the banks considered for the research are in the initial phases of synergy. So, the lower financial performance can be justified.

The mergers and acquisition process has no significant impact on the financial performance and profitability of the selected banks, looking critically at the results of the paired t-test. It may be due to the unprecedented scenarios that the country has faced from 2020 (the global pandemic). The pandemic has impacted the performances and profitability of the banks in its initial period of synergy.

CONCLUSIONS

The research attempts to make a comparative analysis of the selected public sector banks on their profitability and performance parameters which go under the process of merger and acquisition from 2015 to 2020. The ratio analysis shows a positive trend in the movement of the performances and profitability of the banks. Moreover, the results of the paired t-test state that there are no significant changes in the performance and profitability in the post-merger of the public sector banks. However, the results of the t-test are not highly significant due to the pandemic, moratorium decision after the pandemic, and the initial hiccups after the merger and acquisition. There is a mixed response to the merger and acquisition in the various banks like State Bank of India, Canara, and Union. They tend to have a negative effect on performance. Meanwhile, Bank of Baroda, Punjab National Bank, and Indian Bank have positive impacts. Although the positive impact does not have a great margin, it indicates the future positive trend that the banks will have.

The research also has limitations. It is not possible to state whether the financial synergy between these banks is a good move or a stale one. It is soon to be judged, and with the outbreak of the COVID-19, it is even harder for the banks to showcase their newly established potential. The research concludes by stating that even though the test proves that there are no significant variations between pre-and post-merger and acquisition, the ratio shows that the banks perform better in the post-merger scenarios. Future research can concentrate on a greater number of years compared to the present research to understand the long-term impact of mergers and acquisitions on the public sector banks.

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APPENDICES

Table 9 Paired T-Test of Punjab National Bank

| | Paired Differences | | | | | | | |
| | | | | 95% Confidence Interval of the Difference | | | | |
	Mean	SD	Std. Error Mean	Lower	Upper	t	Sig. (2-tailed)	Result
CR	-0,01500	0,02121	0,01500	-0,20559	0,17559	-1,000	0,500	NS
QR	1,53500	1,12430	0,79500	-8,56643	11,63643	1,931	0,304	NS
ROCE	-0,03000	0,55154	0,39000	-4,98542	4,92542	-0,077	0,951	NS
ROA	-0,09000	2,19203	1,55000	-19,78462	19,60462	-0,058	0,963	NS
ROE	-2,88000	43,20422	30,55000	-391,05455	385,29455	-0,094	0,940	NS
NPM	-1,98500	34,25932	24,22500	-309,79281	305,82281	-0,082	0,948	NS
OPM	-4,90000	31,93294	22,58000	-291,80610	282,00610	-0,217	0,864	NS
ITA	-0,13500	0,10607	0,07500	-1,08797	0,81797	-1,800	0,323	NS
EPS	-9,31000	66,04377	46,70000	-602,68976	584,06976	-0,199	0,875	NS
EY	-0,11000	0,53740	0,38000	-4,93836	4,71836	-0,289	0,821	NS
NIM	-0,14000	0,01414	0,01000	-0,26706	-0,01294	-14,000	0,045	S
CASA	-1,16500	1,16673	0,82500	-11,64762	9,31762	-1,412	0,392	NS

Table 10 Paired T-Test of Union Bank

| | Paired Differences | | | | | | | |
| | | | | 95% Confidence Interval of the Difference | | | | |
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	Sig. (2-tailed)	Result
CR	-0,02000	0,02828	0,02000	-0,27412	0,23412	-1,000	0,500	NS
QR	0,09500	0,79903	0,56500	-7,08401	7,27401	0,168	0,894	NS
ROCE	0,00000	0,18385	0,13000	-1,65181	1,65181	0,000	1,000	NS
ROA	0,08000	0,89095	0,63000	-7,92491	8,08491	0,127	0,920	NS
ROE	1,53500	18,34942	12,97500	-163,32801	166,39801	0,118	0,925	NS
NPM	1,05000	13,13804	9,29000	-116,99064	119,09064	0,113	0,928	NS
OPM	-0,53500	12,46629	8,81500	-112,54019	111,47019	-0,061	0,961	NS
ITA	0,13500	0,26163	0,18500	-2,21565	2,48565	0,730	0,599	NS
EPS	-11,90000	63,72446	45,06000	-584,44159	560,64159	-0,264	0,836	NS
EY	0,02000	0,29698	0,21000	-2,64830	2,68830	0,095	0,940	NS
NIM	-0,13500	0,04950	0,03500	-0,57972	0,30972	-3,857	0,161	NS
DE	0,00000	0,01414	0,01000	-0,12706	0,12706	0,000	1,000	NS
CASA	-1,58000	0,11314	0,08000	-2,59650	-0,56350	-19,750	0,032	S

Table 11 Paired T-Test of Bank of Baroda

		Paired Differences						
				95% Confidence Interval of the Difference			Sig.	
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	(2-tailed)	Result
CR	-0,04000	0,04243	0,03000	-0,42119	0,34119	-1,333	0,410	NS
QR	-2,34500	4,36285	3,08500	-41,54364	36,85364	-0,760	0,586	NS
ROCE	-0,10000	0,07071	0,05000	-0,73531	0,53531	-2,000	0,295	NS
ROA	-0,11500	0,36062	0,25500	-3,35508	3,12508	-0,451	0,730	NS
ROE	-1,93500	6,25790	4,42500	-58,15996	54,28996	-0,437	0,738	NS
NPM	-1,94000	6,13769	4,34000	-57,08493	53,20493	-0,447	0,732	NS
OPM	-4,46500	4,95682	3,50500	-49,00025	40,07025	-1,274	0,424	NS
ITA	-0,40000	0,14142	0,10000	-1,67062	0,87062	-4,000	0,156	NS
EPS	-3,76500	11,49049	8,12500	-107,00291	99,47291	-0,463	0,724	NS
EY	-0,03000	0,07071	0,05000	-0,66531	0,60531	-0,600	0,656	NS
NIM	-0,32000	0,14142	0,10000	-1,59062	0,95062	-3,200	0,193	NS
DPS	1,30000	1,83848	1,30000	-15,21807	17,81807	1,000	0,500	NS
CASA	-0,96000	2,20617	1,56000	-20,78168	18,86168	-0,615	0,649	NS

Table 12 Paired T-Test of State Bank of India

		Paired Differences						
				95% Confidence Interval of the Difference			Sig.	
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	(2-tailed)	Result
CR	-0,01000	0,07071	0,05000	-0,64531	0,62531	-0,200	0,874	NS
QR	3,50000	2,54558	1,80000	-19,37117	26,37117	1,944	0,302	NS
ROCE	0,11000	0,05657	0,04000	-0,39825	0,61825	2,750	0,222	NS
ROA	0,42500	0,24749	0,17500	-1,79859	2,64859	2,429	0,249	NS
ROE	6,88500	4,77297	3,37500	-35,99844	49,76844	2,040	0,290	NS
NPM	5,82000	4,52548	3,20000	-34,83986	46,47986	1,819	0,320	NS
OPM	10,15000	3,01227	2,13000	-16,91422	37,21422	4,765	0,132	NS
ITA	0,76500	0,27577	0,19500	-1,71271	3,24271	3,923	0,159	NS
EPS	12,38500	11,68848	8,26500	-92,63178	117,40178	1,498	0,375	NS
EY	0,06500	0,04950	0,03500	-0,37972	0,50972	1,857	0,314	NS
NIM	0,33000	0,09899	0,07000	-0,55943	1,21943	4,714	0,133	NS
DPS	-0,50000	2,82843	2,00000	-25,91241	24,91241	-0,250	0,844	NS
DE	0,00500	0,00707	0,00500	-0,05853	0,06853	1,000	0,500	NS
CASA	21,35000	32,83804	23,22000	-273,68807	316,38807	0,919	0,527	NS

Table 13 Paired T-Test of Canara Bank

| | Paired Differences | | | | | | | |
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | T | Sig. (2-tailed) | Result |
				Lower	Upper			
CR	0,02500	0,00707	0,00500	-0,03853	0,08853	5,000	0,126	NS
QR	-0,33000	2,07889	1,47000	-19,00812	18,34812	-0,224	0,859	NS
ROCE	0,13500	0,19092	0,13500	-1,58034	1,85034	1,000	0,500	NS
ROA	-0,11500	0,37477	0,26500	-3,48214	3,25214	-0,434	0,739	NS
ROE	-2,46500	7,44583	5,26500	-69,36317	64,43317	-0,468	0,721	NS
NPM	-1,85000	5,40230	3,82000	-50,38770	46,68770	-0,484	0,713	NS
OPM	-4,38500	3,03349	2,14500	-31,63981	22,86981	-2,044	0,290	NS
ITA	0,14000	0,31113	0,22000	-2,65537	2,93537	0,636	0,639	NS
EPS	-14,03000	42,34863	29,94500	-394,51230	366,46230	-0,468	0,721	NS
EY	0,03000	0,01414	0,01000	-0,09706	0,15706	3,000	0,205	NS
NIM	-0,11500	0,38891	0,27500	-3,60921	3,37921	-0,418	0,748	NS
DPS	0,50000	0,70711	0,50000	-5,85310	6,85310	1,000	0,500	NS
CASA	14,81500	20,31518	14,36500	-167,70963	197,33963	1,031	0,490	NS

Table 14 Paired T-Test of Indian Bank

| | Paired Differences | | | | | | | |
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | t | Sig. (2-tailed) | Result |
				Lower	Upper			
CR	0,19500	0,13435	0,09500	-1,01209	1,40209	2,053	0,289	NS
QR	-6,61500	0,94045	0,66500	-15,06463	1,83463	-9,947	0,064	NS
ROCE	-0,01000	0,15556	0,11000	-1,40768	1,38768	-0,091	0,942	NS
ROA	0,39000	0,19799	0,14000	-1,38887	2,16887	2,786	0,219	NS
ROE	5,88000	2,64458	1,87000	-17,88060	29,64060	3,144	0,196	NS
NPM	5,46500	2,29810	1,62500	-15,18258	26,11258	3,363	0,184	NS
OPM	4,18000	1,51321	1,07000	-9,41564	17,77564	3,907	0,160	NS
ITA	0,17500	0,44548	0,31500	-3,82745	4,17745	0,556	0,677	NS
EPS	17,22500	7,55897	5,34500	-50,68966	85,13966	3,223	0,192	NS
EY	-0,06000	0,19799	0,14000	-1,83887	1,71887	-0,429	0,742	NS
NIM	-0,06500	0,12021	0,08500	-1,14503	1,01503	-0,765	0,584	NS
DPS	0,60000	0,84853	0,60000	-7,02372	8,22372	1,000	0,500	NS
DE	-0,00600	0,01980	0,01400	-0,18389	0,17189	-0,429	0,742	NS
CASA	18,50500	22,90319	16,19500	-187,27199	224,28199	1,143	0,458	NS