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An Evaluation of State Bank of India's Risk Profile and Financial Performance in the Pre and Post-Merger Era

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Abstract
In the preceding decade, the banking sector in India has undergone considerable advancements. This progression is attributed to the confluence of liberalisation, globalization, and technological innovations within the sector. PSBs find themselves confronted with formidable competition emanating from both private and foreign sector banks. Consequently, to endure and thrive within the market, banking entities have resorted to the adoption of diverse strategic measures. One such strategic approach entails the consolidation of banks through mergers. Thus, the present discourse seeks to underscore the imperative of scrutinizing the SBI merger in 2017—a seminal event representing the most substantial merger within the Indian banking industry to date.
This research endeavour is characterized by its profound nature, encompassing a comprehensive examination and comparison of the risk profiles of SBI and merged banks before the merger. Furthermore, the investigation extends to assessing the impact of the merger on the risk profile of SBI after the merger. The analytical process involved the meticulous examination of secondary data of SBI and merged banks, facilitated by the application of three pivotal financial ratios. The findings disclosed the subpar performance and elevated risk exposure of certain associate banks, thereby substantiating the imperative nature of their amalgamation with SBI. The outcomes of paired T-Test analyses divulged that a significant disparity was observed in CAR, credit deposit ratio, and the Net NPA to Net Advances Ratio (NNPP to NAR), indicative of the discernible impact of the merger.
In culmination, regression analysis was performed to appraise the influence of NNPP to NAR on the management efficiency and earning capability of SBI before and after the merger. The results unveiled a significant and adverse correlation between the NNPP to NAR and the Return on Average Assets Ratio, persisting across both periods. Conversely, concerning earning efficiency ratios, it was discerned that the RER and NPMR, before and after the merger were adversely and significantly affected by the NNPP to NAR.

Keywords- Merger & Acquisitions, Risk assessment, Capital adequacy Ratio, Credit-Deposit Ratio, Net NPA to Net Advances Ratio

1. Introduction

Since the mid-1990s, significant global transformations have unfolded within the financial services sector, notably in the banking domain, propelled by technological advancements, deregulation, and the forces of globalization. In India, pivotal regulatory actions undertaken by the Finance Ministry and RBI, the primary overseers of the national banking sector, facilitated industry deregulation and the admission of foreign banks into the domestic market. Concurrently, a noteworthy phenomenon of bank consolidation emerged, characterized by mergers, amalgamations, and restructuring endeavours. This consolidation process, precipitated by macroeconomic exigencies and banking crises, compelled a recalibration of business strategies within the banking sector. After these developments, intensified competitive dynamics reshaped the industry landscape, prompting privatization initiatives and further consolidation through bank mergers.

In India, governmental financial institutions encountered formidable competition from private international counterparts, resulting in a diminution of profitability. In response to this declining trend in profitability, mergers occurred both among banks and between banks and non-banking entities, aiming to capitalize on the benefits of economies of scale and scope. Such mergers were frequently instigated by the government as a strategic measure to reconfigure the banking landscape following a crisis or in anticipation of heightened future risks. The Indian banking sector could not remain sequestered from the global competitive forces and brought out a comprehensive transformation in the business strategy and resorted to M&As to improve size and efficacy to gain competitive strength.

The merger of SBI with SBT, SBBJ, SBH, SBM, and SBP (associate banks) on 1st October 2017 was also the biggest merger to date. These M&As were necessary not only to remain competitive in the industry but also for efficiency, credit flows, economic stability and financial policy.

The dynamic characteristics of the Indian banking sector, especially of SBI, attracted the knowledge quest of researchers, academicians and policymakers to analyse the causes and impact of M&As. Various researchers have highlighted the motives behind undertaking the strategy of mergers in the banking sector such as increased ranking (Lakshminarayana, 2005), more value (McClure, 2010), stronger alliances (Smirnova Y.V., (2014), risk modification (Renaud R, 2016), new opportunities (P. Sarika and S. Vasantha, 2018), maximise shareholder value (P. Sarika and S. Vasantha, 2018). The motives of mergers depended on the firm's size or structure (BIS, 2001).

In light of the foregoing discussion, it can be stated that the rationale for the merger of the five associate banks with the SBI may have varied, but this has not yet been thoroughly investigated. The present study filled this gap by analyzing the risk profile of selected banks. The results are of paramount importance, as they shed light on the financial performance of the associate banks in the pre-merger era in comparison to SBI so that the step of the merger can be analysed empirically. The rationale behind the merger can be understood based on the parameters of risk assessment taken under the study. In addition, the assessment of CAR, liquidity and asset quality of SBI gave a comprehensive understanding of the risk profile of SBI in the PPMP. Thus, the present study aims to

- To study the risk profile of the selected banks in the pre-merger period.
- To study the difference in the risk profile of SBI in the PPMP.
- To study the impact of the NNPP to NAR on the management efficiency and earning efficiency ratios of SBI in the pre and post-merger period of the bank as taken in the study.

The statutory regulations require banks to keep their CAR at a minimum certain level as under BASEL III norms the banks have to maintain capital to risk-weighted assets and liabilities ratio at 10.5% (Nickolas. S 2021). Not meeting this minimum criterion will eventually jeopardise the weaker or sick banks therefore merger also serves as a saviour for such banks (Cigola M., Modesti P., 2008).

2. Literature Review

2.1 Relationship between CAR and Risk in Banks

The aggregation of risks is identified as one of the most formidable challenges encountered in the development of risk capital models within banking institutions as per the Basel III accord, (Markowitz, 1952). Moreover, regulatory capital standards serve to exacerbate the risk within bank portfolios (Kahane, 1971; Koehn & Santomero, 1980; Kim & Santomero, 1988). The propensity of banks to engage in risk-taking behaviour is inversely associated with regulatory capital requirements. Rochet (1992) posits that undercapitalized banks ought to limit themselves to investments with lower risk profiles, particularly when the calculation of CAR is contingent upon risk-weighted assets that reflect market risk proportions.

The solvency of the bank appears to be directly impacted by the connection between capital and risk, according to Chakroun. F. and Abid. F. (2016). The need for a comprehensive risk measure necessitates the development of risk aggregation procedures and analytical tools for performance evaluation, risk and capital management. Changes in capital could potentially exert a mitigating influence on portfolio risk, as suggested by Furlong (1989) and Keeley (1990). They posit that an increase in the capital might diminish the option value by diminishing inducements for undertaking excessive risk. This line of argumentation finds reinforcement in the findings of Blum (1999), who elucidated the temporal dynamics of capital control. Moreover, several other studies (Basak and Shapiro, 2001; Cuoco and Liu, 2006; and Leippold et al.) have employed dynamic optimization techniques to scrutinize banks' CAR requirements concerning market risk. In the light of the above discussion, the following hypothesis was formulated- *H0: There is no difference in Capital Adequacy Ratio (CAR) between the pre-and Post-merger period of SBI.*

2.2 Impact of NPAs

The concept of NPAs was introduced by the Narasimhan Committee in 1991 (Hazarika and Dharmaraj, 2019). NPAs denote assets or accounts held by borrowers that have been classified as unsatisfactory, dubious, or lost by any bank, as per the RBI circular issued on July 1, 2005. A loan or advance becomes a non-performing asset when the principal amount remains unpaid for a period exceeding 90 days. Additionally, a sum is deemed "past due" if it remains unpaid beyond 30 days from the due date. When a borrower fails to repay the loan balance, it is labelled as a non-performing asset. The

absence of interest payments on such assets renders them unproductive for the bank, consequently leading to their categorization as being in arrears (Hazarika and Dharmaraj, 2019).

According to Deshmukh, Mohnani, P, and Monal (2013), a bank's effectiveness is defined by how well its assets are performing, and they said that increasing NPAs impact banks' reputation and profitability, negatively. Increased NPAs had a negative impact on PSBs' capital structures and raised depositors' distrust. Due to depositors' lack of faith and confidence in the bank, they withhold their money, which causes the banking system to collapse. NPAs attack the banks' viability and stability in this way. Deshmukh, Mohnani, P, and Monal (2013) claimed that when NPAs rise, banks are compelled to lower interest rates to maintain bank profitability. The lack of funding brought on by NPAs caused the banks to invest less in the industrial sector, which has an impact on the expansion of the industry and the nation's economy.

According to Singh, Rajbahadur. V., (2016), the addition of NPAs to the calculation affects the adequate ratio of capital and reduces the return on assets, limits the recycling of funds, negatively impacts bank profitability, and decreases loan availability (Rani. S, 2020). Singh, Rajbahadur. V., (2016) added that a rise in NPAs causes a decline in bank income, an imbalance between assets and liabilities, and a decline in banks' economic value additions. Additionally, NPA causes a decline in share value and has an impact on banks' ability to manage risk.

2.3 Impact of Credit Deposit Ratio (CDR)

As per Sharifi O., & Akhter J. (2016), the CDR has a positive effect on the financial performance of PSBs. Pandya, B. (2015) came up with the conclusion that there is a significant statistical relationship between PSATA and ROI, ROA, OPTA, and INTTA, but not with ROE.

According to research by Biswal B. P. and Gopalakrishna R. (2014), banks with high CDR and banks with low CDR have statistical averages for Net Interest Margin (NIM) and Incremental CDR that are significantly different from one another. The research also demonstrated that there are no appreciable differences between the cost of funds of banks with low and high CDR categories and showed that banks with large CDR were able to report high profitability as measured by NIM. Swamy (2013) concluded that priority sector financing had no discernible impact on NPAs, in addition, capital adequacy and investment had a considerable impact on the profitability of commercial banks. Verma, P., and Kumar, N. (2008) found that private banks exhibited a better CDR than PSBs. Therefore, the following hypothesis was formulated- *H0: There is no difference in the Credit Deposit Ratio between the pre-and Post-merger period of SBI.*

3. Research Methodology

The current investigation relies on secondary data sourced from the financial reports of SBI and merged banks. The ratio analysis was performed through CAR, CDR, and Net NNPP to NAR. These chosen ratios respectively signify the bank's capital sufficiency, liquidity, and asset quality, collectively offering insights into its risk profile. Initially, the ratio analysis was conducted to evaluate the risk positioning of SBI and its amalgamated entities before the merger. The findings of this analysis were depicted graphically using histograms. Subsequently, the same ratios were reevaluated to discern any discrepancies during the Post-merger Period of SBI. The study period encompassed four years pre-merger (spanning from the fiscal year 2013-14 to 2016-17) and four years post-merger (2018-19 to 2021-22), with the merger occurring in 2017 when SBI assimilated its associate banks. Furthermore, to ascertain statistical significance, a Paired T-test was employed to compare the ratios before and after the merger. Additionally, the regression analysis extended to examining the impact of NNPP on NAR concerning SBI's management and earning efficiency ratios within the PPMP, aiming to delineate the bank's risk profile comprehensively. The sections under the dimensions of management efficiency and earning efficiency considered in the analysis are delineated as follows:

Impact of NET NPA to NET Advances Ratio on below-selected Management Efficiency Ratios in Pre & Post Merger to assess the risk profile of SBI	**Impact of NET NPA to NET Advances Ratio on following below-selected Earnings Efficiency Ratios in Pre & Post Merger to assess the risk profile of SBI**
Expenses to Income Ratio, Cost to Assets Ratio, Operating Profit to Income Ratio & Return on Average Assets Ratio.	RER, GPMR, NPMR and NIMR.

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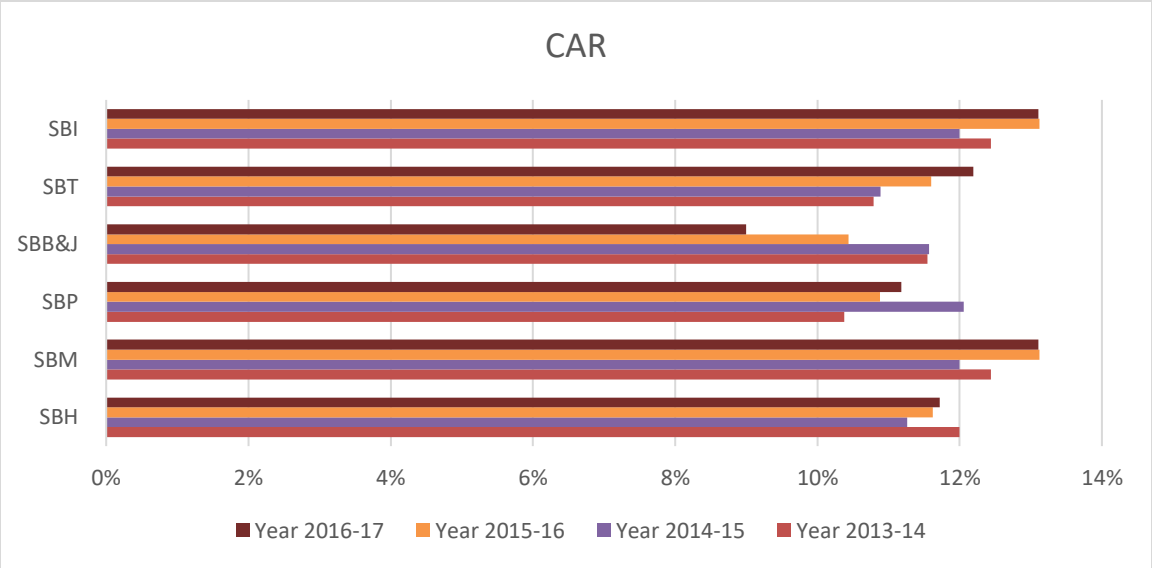
4. Data Analysis and Interpretation

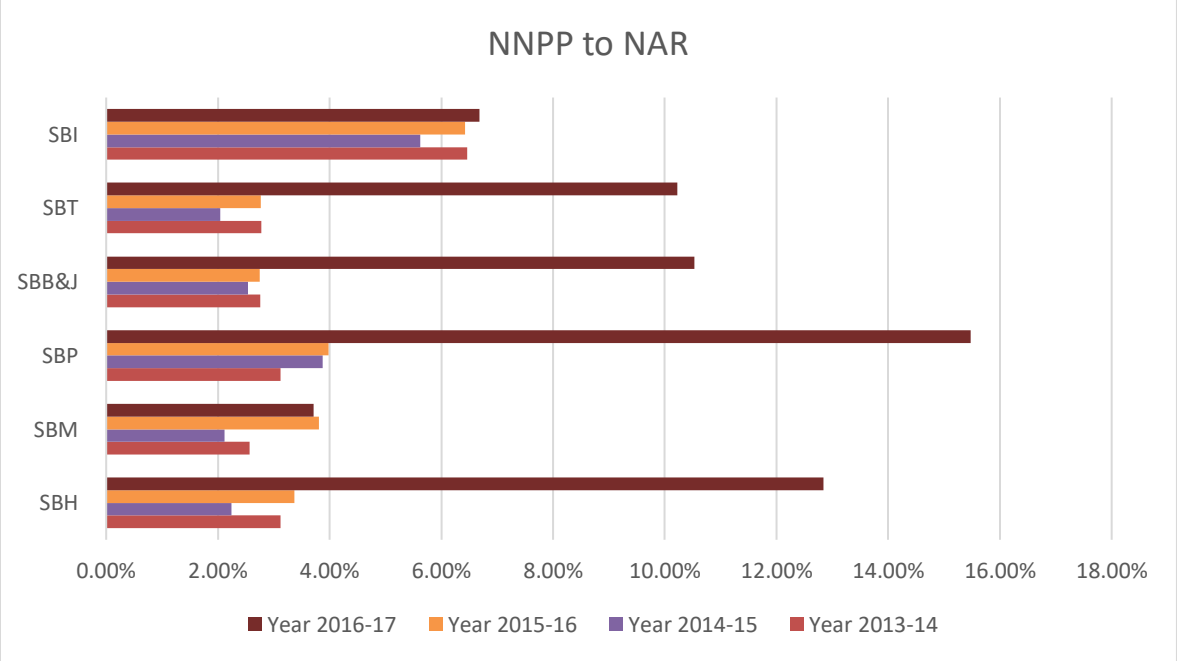
4.1 Comparative risk assessment of SBI & its 5 Associate Banks before Merger

Fig 4.1. CAR (%)



Interpretation- This analysis examines the pre-merger capital adequacy ratios (CAR) of six Indian banks. SBI and SBH exhibited moderate fluctuations, while SBT's CAR steadily increased. SBBJ and SBM displayed a decrease-increase-decrease pattern. SBP's CAR rose significantly in year two but remained volatile.

Fig 4.2. Net NPA to NET Advances Ratio (%)



Interpretation- This analysis reveals a rise in Net NPA to Net Advances ratios for all SBI associate banks (SBT, SBB&J, SBP, SBH) during the pre-merger period (2013-2017). SBI's ratio fluctuated, while SBM's exhibited a decrease-increase-decrease trend. These findings suggest potential asset quality deterioration across the institutions.

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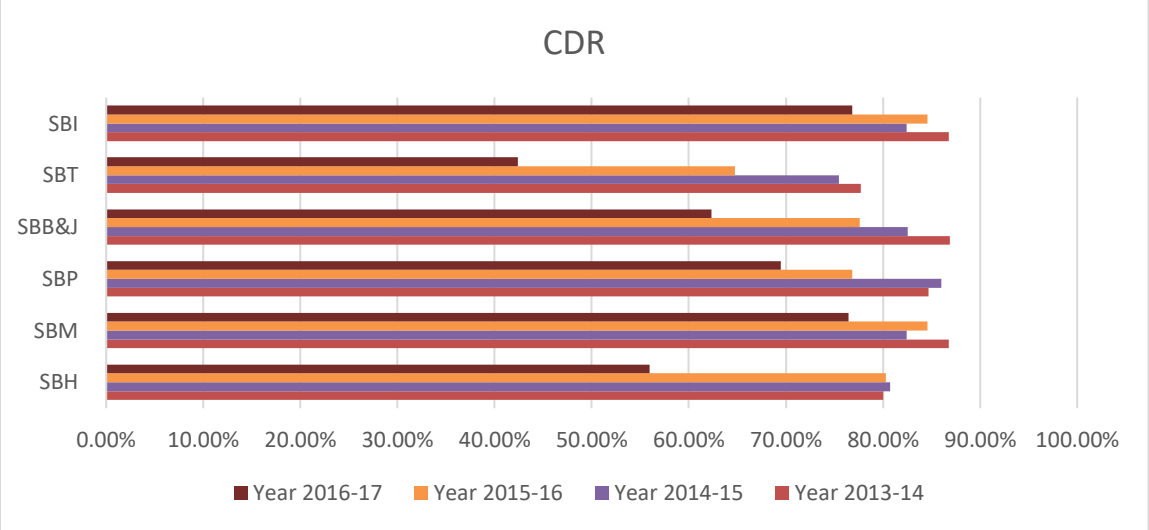
Fig 4.3. Credit Deposit Ratio



Interpretation- All banks exhibited fluctuating CDR, with SBI demonstrating the highest ratio (86.76%) and SBH experiencing the most significant decline (reaching 55.94%).

4.2 Paired T-test: Comparative risk assessment of SBI in pre-merger and post-merger period.

1. CAR

- **H0 1:** There is no difference in CAR between the pre-and Post-merger period of SBI.

Table 4.1- CAR

	Pre-Merger	*Post-merger*	T	*Df*	*P*
Mean	0.126675	0.133375			
Variance	0.00	0.00	-4.173935015	3.00	0.025041199

Interpretation-The p-value comes out to be less than 0.05 therefore, we reject null hypothesis (H0) 1. Hence, it can be concluded that there is a significant difference in the CAR between the pre- and Post-merger periods of SBI.

2. Net NPA to Net Advance Ratio

- **H0 2:** There is no difference in NNPP to NAR between the pre-and Post-merger period of SBI.

Table 4.2- NNPP to NAR

	Pre-Merger	*Post-merger*	T	*Df*	*p*
Mean	3.0525	3.0525			
Variance	0.702825	0.7687	1.378101092	3.00	0.261969782

Interpretation- The obtained p-value exceeds 0.05, indicating acceptance of H0 2. Consequently, it can be inferred that there is no noteworthy distinction in NNPP to NAR between the pre-and post-merger periods of SBI.

3. CDR

- **H0 3:** There is no difference in the CDR between the pre-and Post-merger period of SBI.

Table 4.3- CDR

	Pre-Merger	*Post-merger*	T	*Df*	*p*
Mean	70.20	82.65			

Variance	15.69	18.16	-6.47	3.00	0.01

Interpretation- The obtained p-value is less than 0.05, leading to the rejection of the H0. Consequently, it is inferred that a notable contrast exists in the CDR between the pre- and post-merger.

4.3 Regression Analysis: SBI: Impact of **NET NPA to NET Advances Ratio (NNPP to NAR)** on **Management Efficiency Ratios & Earning Efficiency Ratios** in Pre & Post Merger to assess the risk profile of SBI.

Table-4.4 Hypotheses

Hypotheses **In this section, we will be referring Null Hypothesis as H0, the Independent Variable as IV & Dependent Variable as DV.**
Impact of NNPP to NAR on Management Efficiency Ratios in Pre-Merger to assess the risk profile of SBI.
H01: There is no impact of NNPP to NAR (IV) on Expenses to Income Ratio (DV) before the merger. **H02:** There is no impact of NNPP to NAR (IV) on the Cost to Assets Ratio (DV) before the merger. **H03:** There is no impact of NNPP to NAR (IV) on the Operating Profit to Income Ratio (DV) before the merger. **H04:** There is no impact of NNPP to NAR (IV) on the Return on Average Assets Ratio (DV) before the merger.
Impact of NNPP to NAR on Management Efficiency Ratios in Post-Merger to assess the risk profile of SBI.
H01: There is no impact of NNPP to NAR (IV) on Expenses to Income Ratio (DV) after the merger. **H02:** There is no impact of NNPP to NAR (IV) on the Cost to Assets Ratio (DV) after the merger. **H03:** There is no impact of NNPP to NAR (IV) on the Operating Profit to the profit-to-income ratio (DV) after the merger. **H04:** There is no impact of NNPP to NAR (IV) on Return on Average Assets Ratio (DV) after the merger.
Impact of NET NPA to NET Advances Ratio on Earnings Efficiency Ratios in Pre-Merger to assess the risk profile of SBI.
H01: There is no impact of NNPP to NAR (IV) on the RER (DV) before the merger. **H02:** There is no impact of NNPP to NAR (IV) on the GPMR (DV) before the merger. **H03:** There is no impact of NNPP to NAR (IV) on the NPMR (DV) before the merger. **H04:** There is no impact of NNPP to NAR (IV) on the NIMR (DV) before the merger.
Impact of NET NPA to NET Advances Ratio on Earnings Efficiency Ratios in Post-Merger to assess the risk profile of SBI.
H01: There is no impact of NNPP to NAR (IV) on the RER (DV) after the merger. **H02:** There is no impact of NNPP to NAR (IV) on the GPMR (DV) after the merger. **H03:** There is no impact of NNPP to NAR (IV) on the NPMR (DV) in a post-merger period of SBI. **H04:** There is no impact of NNPP to NAR (IV) on NIMR (DV) after the merger.

Table 4.5 Multiple Linear Regression Analysis

		Unstandardised Coefficients					
DV	**IV**	Pre-Merger	Sig.	H0 result	Post-Merger	Sig.	H0 result
Impact of NNPP to NAR on Management Efficiency Ratios in Pre & Post Merger to assess the risk profile of SBI							
Expenses to Income Ratio	NNPP to NAR	-1.559	.369	Accept	.951	.394	Accept
Cost to Assets Ratio	NNPP to NAR	-.118	.202	Accept	.023	.443	Accept
Operating Profit to Income Ratio	NNPP to NAR	-.017	.589	Accept	-.018	.087	Accept
Return on Average Assets Ratio	NNPP to NAR	-.156	.028	Reject	-.304	.023	Reject
Impact of NNPP to NAR on Earnings Efficiency Ratios in Pre & Post Merger to assess the risk profile of SBI							
RER	NNPP to NAR	-2.299	.014	Reject	-6.305	020	Reject
GPMR	NNPP to NAR	.028	.358	Accept	.021	.089	Accept

NPMR	NNPP to NAR	-2.089	.037	Reject	-4.546	.014	Reject
Net Interest Margin Ratio	NNPP to NAR	-.229	.111	Accept	.014	738	Accept

Results & Discussion: From the above table it can be found that in the case of the impact of NNPP to NAR on the management efficiency ratios of SBI, all the ratios were behaving similarly in the pre-merger & post-merger period. Further, except for the ratio- Return on Average Assets, all the other ratios were seen to be insignificantly impacted by the NNPP to NAR both in the pre-merger period and in the post-merger period.

Before the merger, all four management efficiency ratios were seen to be negatively impacted by the dependent variable, however, the level of negative magnitude decreased to some extent in the post-merger period in the case of Expenses to Income Ratio and cost to Assets Ratio. This indicates a somewhat improved performance of SBI in the post-merger period in light of the two ratios. However, the impact was insignificant therefore denying us to conclude resolutely that the post-merger scenario of SBI was improved greatly. The NNPP to NAR was significantly affecting one of the four selected management efficiency ratios i.e. Return on Average Assets Ratio, but in negative terms in both the pre & pots-merger periods. Thus, it can be concluded that if SBI fails to manage its NPAs then it will drastically hamper the average returns from the assets of the banks. It also seems a realistic finding as the rise in NPAs deteriorates the assets of the bank and makes them unproductive that otherwise would have been put to productive purposes to increase the management efficiency in better managing the assets of SBI.

While studying the impact of NNPP to NAR on Earnings Efficiency Ratios in pre- and Post Merger to assess the risk profile of SBI, it was found that RER and NPMR in PPMP have been negative and significantly impacted by NNPP to NAR. It can be concluded that if NPAs increase then it will negatively impact the returns on equity and the net profit of the bank will also be negatively affected. The earnings of SBI are affected considerably and negatively by the NNPP to NAR in both the pre-merger & post-merger periods. It can be also noted that NPAs as their basic characteristics are unfavourable for the bank which might be the possible reason why in both the periods of merger, it was revealed that the NNPP to NAR was causing a negative impact on the earning capacity of SBI. Even the ratios- GPMR and NIMR were found to not be negatively impacted by NNPP to NAR in both PPMP but such an influence was also found to be insignificant. This also signifies that there is no significant role of the NNPP to NAR on the GPMR and NIMR of the State Bank of India in the pre-merger and post-merger periods.

5. Discussion, Conclusion and Suggestions

5.1 Discussion and Conclusion

The present study revealed the risk position of the SBI and its five associate banks before the merger through three metrics- CAR, NNPP NAR and. The study also compared the risk profile of SBI before the merger and after the merger on the same ratios. The chosen ratios depict the capital adequacy, asset quality and liquidity position of the associate banks and the State Bank of India itself respectively.

The results revealed interesting insights into the three risk areas of the bank where the bank needs to focus thoroughly for its survival. The investigation of the capital adequacy of the State Bank of India and its associate banks - SBT, SBBJ, SBH, SBM, and SBP before the merger i.e. from the financial year 2013-14 to 2016-17 revealed that SBH was at more risk than other banks as its CAR was decreasing coming to the last year while SBT was also working on the low level of ratio compared to all other banks. Furthermore, it is imperative to note that during the preceding fiscal year under investigation, the CAR of SBB&J reached its nadir. In stark contrast, both the SBM and the SBI exhibited a notable symmetry in their capital adequacy, which, notably, stood as the highest among all financial institutions considered. From these observations, a compelling inference can be drawn, indicating that the associate banks, except SBM, demonstrated suboptimal or middling performance relative to the benchmark set by the SBI.

The second risk assessment of the bank was the asset quality measures through the NNPP to NAR. The study revealed that each of the associate banks of the SBI had a deteriorated asset quality in the last year. The higher ratio over the past year may be a sign that banks have less money to advance as a result of the increased provisioning they must make, or more specifically, less money on which they may be able to earn interest income. High NPA levels also have the unfavourable effect of increasing provisioning, which has an adverse effect on bank profitability. Increased pressure on Net Interest Margin (NIM) and a compulsive need to lower excessive NPAs must have existed.

The last risk assessment of SBI and its associate banks was by analyzing the liquidity state of the banks before the merger. The CDR or the CD ratio, which helps in assessing a bank's liquidity and indicates its health was used for the purpose. As it was found the CD Ratio of the associate banks was increasing coming to the last years in comparison to the ratio in the initial years– it can be inferred that the CD ratio is increasing, As a result, capital adequacy and asset-liability mismatch may be impacted, and banks may not have enough liquidity to handle any unforeseen financial requirements. SBI, however, was perceived to be operating at its best.

Thus, from the above discussion, it can be concluded that the risk profile of the associate banks was adverse as compared to the SBI based on its asset quality, liquidity position and to an extent capital adequacy. Thus, the associate banks were merged justifiably as they were operating in a risky position. Also, this merger was beneficial for SBI as its capital adequacy improved.

Further, the results of the paired T-test revealed that for CAR and CDR, there was a significant difference between the pre-merger and post-merger periods. While there was no significant difference in the CD Ratio between the pre-merger and post-merger periods of SBI. It can be concluded that SBI was efficient in managing its capital adequacy and liquidity condition despite merging some of the high-risk performing associate banks into it. The asset quality of the bank didn't show any significant change in the PPMP of the State Bank of India.

Lastly, the results of the regression analysis showed that the Net NPA to Net Assets Ratio was significantly and negatively impacting the Return on Average Assets Ratio in both the pre-merger and post-merger period of SBI. It can be concluded that management efficiency is affected significantly in a negative manner if the Net NPAs of SBI increase. However, in the case of earning efficiency ratios, it was revealed that the RER and NPMR before the merger and post-merger period have been negatively and significantly impacted by the NNPP to NAR. So in a nutshell, SBI `s risk increases if it fails to manage its NPAs as the NNPP to NAR is having a negative and significant impact on the SBI `s management efficiency and earning ratios.

5.2 Suggestions

- Efforts should be made to maintain a balance between profitability and liquidity so that both important aspects are met by the bank.
- Before the merger the inefficiency of the associate banks suggests sound management of the liquid assets of the bank in which these associate banks have been merged.
- Measures should be taken to improve the asset quality of the bank.
- Credit policies and terms and conditions should be re-evaluated from time to time so that the assets of the bank do not turn into bad debts.
- Training and developing human resources forms another pillar of a successful bank therefore efforts should be made in this regard from time to time,

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Appendix-1: Abbreviations used in the paper

1. Capital Adequacy Ratio (CAR)
2. Credit Deposit Ratio (CDR)
3. Gross Profit Margin Ratio (GPMR)
4. Net Interest Margin Ratio (NIMR)
5. Net NPA to Net Advance Ratio (NNPP to NAR)
6. Net Profit Margin Ratio (NPMR)

7. Pre-Merger And Post-Merger Periods (PPMP)
8. Public Sector Banks (PSBs)
9. Return on Equity Ratio (RER)
10. State Bank of Bikaner and Jaipur (SBBJ)
11. State Bank of Hyderabad (SBH)
12. State Bank of Mysore (SBM)
13. State Bank of Patiala (SBP)
14. State Bank of Travancore (SBT)