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# A COMPREHENSIVE ANALYSIS ON MERGER PERFORMANCE IN INDIAN BANKING INDUSTRY

**Chaitanya V Sharaff Khana[1], Jeevan Nagarkar[2]**

[1,2]Symbiosis Institute of International Business,
Symbiosis International (Deemed University), Pune, India
[2] jeevan.nagarkar@siib.ac.in

**Abstract**

Financial performance of any country, generally depends on the efficacy of its banking industry. Especially, in an emerging country like India, there is an intense competition from multinational banks, along with domestic banks (both public and private) to gain competitive advantage over others. Hence, in order to sustain in this competitive world, mergers in the banking industry has become the utmost need of the hour. The Indian commercial banking industry is currently passing through a challenging but an exciting phase. It was the Narasimhan committee that proposed the idea of merger of public sector banks, way back in 1991. The committee proposed a 3-tier model where, the top tier includes 3 major internationally recognized banks, the middle tier comprises 8 to 10 banks at national level, and the lower tier consists of an umpteen number of banks at local and regional level. Banking industry has seen tremendous mergers since then.

This study tries to understand the motives of banks towards mergers and to figure out if they were fruitful. This paper focuses on the recent merger of State Bank of India and its Associates, and ING-Vysya with Kotak Mahindra Bank

**Key words:** Commercial Banking, Mergers, Company Valuation

**Introduction**

The performance banking system is important for an economy to prosper. The competition among various banks can be helpful in customer satisfaction. Indian banks are largely divided in three categories. Government owned banks have large portion of the banking business but the competition from private sector banks has been intensified in last one decade. This has forced the government to rethink their strategy on banks owned by them. The competition among public sector banks render hindrance in the development of banks, from this point of view merger in banking system was implemented. There has been consolidation happening in private banking space as well. There is a need for pan India banks competing with each other rather than having too many regional banks. In the digitized business of commercial banking the need of region specific banks has reduced to a large extent. What could be a better example than China, which was the world's 10$^{th}$ largest economy during the early 90s but then rose to be the 2$^{nd}$ biggest economy in the next two decades. The mainland's growth has been fueled by the presence of some giant-sized banks. China has 18 banks (in terms of assets size) in the list of top 100 global banks. While, India is represented by just one - SBI. So, mergers are treated as a matter of prime importance in this industry.

**Significance of study:**

Thisstudytries to understand the motives of banks towards mergers and to figure out if they were fruitful. This paper focuses on the recent merger of State Bank of India and its Associates,and ING-Vysya with Kotak Mahindra Bank.

This study helps in estimating the prospects of Bank of Baroda's merger where it absorbed Dena Bank and Vijaya Bank,and also the mergers of 10 PSU banks into 4 inthe year 2020.

*Key Index:This paper would henceforth consider the below keywords going forward.*

- *State Bank of India – B1*
- *Kotak Mahindra Bank – B2*
- *Bank of Baroda – B3*
- *Null Hypothesis – H0*
- *Alternate Hypothesis – H1*

**Objectives:**

This paper aims to analyze the following, for the selected banks:

- Performance of important parameters
- Per branch productivity
- Profitability
- Post-merger performance

**Problem Statement:**

- Can the merger of NPA-hit banks help India leapfrog to the global big league?
- Has the merger of B1 associates with B1 and ING-Vysya with B2given positive results?
- Has the productivityincreased after these mergers?
- Is there any considerable difference between mergers inB1 (a public bank) and B2 (a private bank)?
- Havebank mergers given a positive result for the government which is planning for further bank mergers?

**Research Question:**

- How the merger effected the balance sheets of B1 and B2?
- Has these selected banks' performance improved after mergers?
- How the NPA portfolio of the select banks and asset quality got affected?
- What impact select banks have on their share price after the merger?
- Is the merger a boon or a bane to the banks? What signals this merger send to government which has planned for further mergers of PSBs?

**Methodology:**

The study will be based on the secondary sources such as these banks' year-end reports, various journals and databaseof RBI etc.

**Period of analysis:**

This study is drafted on the basis of performance comparison of B1 before merger (2015-17) and after merger (2018-20), and that of B2before merger (2011-15) and after merger(2016-20).

The data of select parameters for B3 which got merged with Vijaya Bank and Dena Bank recently (2019)has also been collected. However, this paper does not analyze this merger's performance as the data available for post-merger period is limited only to one year.

**Sample:**

The samples taken to understand the mergersare the merger of Associates of B1 with B1and the merger of ING-Vysya with B2. Agovernment owned bank and a Private Sector bank are chosen so as to understand the difference in financial performances (if any) between the two.

Considering the fact that, the effectsof B3's merger andrecent merger of 10 PSBs into 4 big bankscan be analyzed only after taking into accountthe financial statements of at least2-3years. The mergers w.r.t B1 and B2 can give an idea and reference for the subsequent mergers in the days to come.

**Literature Review:**

To analyze whether a consolidation move to create a few mega banks will actually be beneficial for the Indian Banking industry, the research started by looking at the international evidence on the success of consolidation moves. The results found have been mixed and varied from country to country.

**International Experience:**

A study by Humphrey D, Akhavein J and Berger A on "The effects of megamergers on efficiency and prices" finds that, studies on American bank mergers point to gains from mergers. The US Market had seen around 1500 mergers in the mid 1900s alone. The success of mergers in US Banking industry is attributed to relaxation of historical restrictions on interstate banking and on banks' entry into security activities. The opening up of securities market allowed commercial banks to widen the range of their offerings.

Studies from Humphrey, Akhavein and Berger (1997) compared merger's pre and post ratios of profitability such as ROE and ROA, and found no improvement in them.

Studies by Berger (1998) suggests that, mergers could increase profits by appropriately exercising an increased market power in setting prices. However, mergers among banks in various regions usually don't impactthe structure of local market much and could probably contribute to a lower increase in market power.

Referring to the European context of Bank mergers, Rudi Vander Vennet's (1996) report on "Endogenous Bank mergers and their impact on banking performance" states that, mergers among banks of similar size would have an optimistic impact on the banks' profitability that are emerging from operating efficiency.

A study on bank mergers (Resti 1997), analyzed nine mergers which were chosen for analysis. The common observation is that, the targets were more efficient than acquirers and the acquirers were more devout towards cost cutting. The study also shows that, all mergers haven't resulted in profitable and efficientimprovements, in spite ofhavingan advantageous environment.

Another research study by N K AvKiran on "The Role of Mergers and Benefits to the public", found similar proof of gains in the profit efficiency in the Australian context.

A cross country study published by the Bank for International Settlements in 2001 showed that, post-merger results on Return on Assets declined along with Net interest margin for most of the countries.

A study on "Mergers and Acquisitions in Indian Banking Sector-A Study of Selected Banks" by Kamatam Srinivas analyzed the impact of Financial and Physical Performance of Merged Banks and concluded that, no significant difference in progress of the banks after mergers.

Research on "Trends in Mergers in Banking Sector in India, An Analysis" by Mrs.A.Bhavani and Dr. PrashantaAthmahas revealed that, the merger scenario was dominated by public banks with a greater no. of mergers to their merit. It has been observed that later during the period of Post Liberalization,many private banks also started participating in merger activity.

D. Subramanya Prasad researched on commercial banks in India and analyzed their efficiency during the reform period. He concluded affirmatively that mergers have improved their performance on the whole. With change in time, the size of banks gradually increased. This increase in size comes with need for additional capital. And hence, they were required to publish their financial statements so as to gain investor confidence. The report observed that, ROA showed a decreasing trend post merger significantly, while the average ROE raised slightly.

K. Anthony (2011) in his paper researched on the benefits from consolidation w.r.t bank's profitability. He analyzed that, consolidation has helped the banks to improve their profitability, due to reduced expenses for operations and increasedemployee-turnover.

A research report by Mr. Jagandeep Singh and Manoj Anand on "Impact of Merger announcements on shareholders' wealth-considering the mergers" in India's Private sector banks analyzed that, bidder banks' average CAR (Cumulative Abnormal Return) is substantial and positive. The announcements on mergers in our Indian banking industry have significant and positive shareholder wealth impact on both target banksas well as the bidder banks.

It has also being observed that commercial bank's financial performance varies according to business cycles and private sector banks are observed to be doing well during all possible economic scenarios (Nagarkar 2015)

Research by Kumar and Kuriakose (2010) analyzed on "The strategic and financial similarities of merged banks". The findings from the study state that, in our Indian banking industry, mostly private banks voluntarily favor merger activity while public banks actresistant towards mergers. The reason for this being, private sector banks undertake mergers as a part of business expansion, while, PSU banks are merged under the guidance of RBI and the government in order to prevent failures of financially distressed banks.

**Study based on Literature review:**

Most economic studies followed one of the below two methods to analyze and understand the advantages of mergers.

The first method uses accounting data where the institution's performancesin merger's pre and post scenariosare compared. This method aims to check if the merger leads to any changes in the institution's income, profits and costs. Sincethe accounting results are directly measured and as the data is accessibleeasily, this method has become widely popular.

The second method uses stock market reaction. The proponents here believe that, market response to any merger related announcement indicates the real economic effects in a better manner.

**Research Gap:**

The above review of literature mostly focused on profitability of the banks, and impact onbank's performance and benefits to public after mergers. However, no recent analysis has been performedw.r.t certain key parameters like: Capital Adequacy, Gross Deposits, Advances, Net Interest Income, Net NPA/Net Advances (%),Per Branch contribution andMarket performance. This study is thus an attempt for the research gap to be replenished.

**Methodology:**

The following cases will be analyzed to understand the effects of merger in the Pre and Post Scenario. t - Tests are conducted on the following cases to find if there is any considerable difference between the key parameter valuesin merger's Pre and Postscenarios. The tests are conducted at a 95% confidence interval (i.e. 0.05 level of significance).

**Case 1:**

H0: No statistical significance exists for B1 and B2 w.r.t parameters such as the Capital Adequacy Ratio (CAR), Deposits, Advances and Number of bank branches, prior to merger and after merger.

H1: Statisticalsignificanceexists for B1 and B2 w.r.t parameters such as the Capital Adequacy Ratio (CAR), Deposits, Advances and Number of bank branches, in merger's Pre and Post scenarios.

**Case 2:**

H0: No statisticalsignificanceexists for B1 and B2 w.r.t parameters likeNet Profits, NII, Net NPA/Net Advances (%)and ROA (%), in merger's Pre and Post scenarios.

H1: Statisticalsignificance existsfor B1 and B2 w.r.t parameters like Net Profits, NII, Net NPA/Net Advances (%) and ROA (%), in merger's Pre and Post scenarios.

**Case 3:**

H0: No statisticalsignificanceexists for B1 and B2 w.r.t parameters such as theDeposits, Advances and Net Profitson a Per-branch basis, prior to merger and after merger.

H1:Statisticalsignificanceexists for B1 and B2 w.r.t parameters such as the Deposits, Advances and Net Profits on aPer-branch basis,prior to merger and after merger.

**Case 4:**

H0: No statisticalsignificanceexists for B1 and B2 w.r.t parameters such as the Price/Book ratio and EPS,prior to merger and after merger.

H1: Statisticalsignificanceexists for B1 and B2 w.r.t parameters such as the Price/Book ratioand EPS,prior to merger and after merger.

**Mergers in Banking sector from the period 1991-2020**

Table 1:Banking Mergers in India (1st April 1991–31st March 2020)

| S.no. | Amalgamating Bank | Anchor Bank | Effective From |
|---|---|---|---|
| i | New Bank of India | Punjab National Bank | 04-Sep-93 |
| ii | Bank of Karada Ltd | Bank of India | 1993-94 |
| iii | Kashinath Seth Bank | State Bank of India | 1995-96 |
| iv | Punjab co-op Bank Ltd | Oriental Bank of Commerce | 1996-97 |
| v | Bari Doab Bank Ltd | Oriental Bank of Commerce | 1996-97 |
| vi | Bareilly Corp. Bank Ltd | Bank of Baroda | 03-Jun-99 |
| vii | Sikkim Bank Ltd | Union Bank of India | 22-Dec-99 |
| viii | Times Bank | HDFC Bank Ltd | 26-Feb-00 |
| ix | Bank of Madura | ICICI Bank | 01-Feb-01 |
| x | Benares State Bank Ltd | Bank of Baroda | 20-Jul-02 |
| xi | Nedungadi Bank Ltd | Punjab National Bank | 01-Feb-03 |
| xii | South Gujarat Local Area Bank | Bank of Baroda | 25-Jun-04 |
| xiii | Global Trust Bank | Oriental Bank of Commerce | 24-Jul-04 |
| xiv | Bank of Punjab | Centurion Bank | 29-Jun-05 |
| xv | Ganesha Bank of Kurundward | Federal Bank Ltd | 2006 |
| xvi | United Western Bank | IDBI | 03-Oct-06 |
| xvii | Sangli Bank | ICICI Bank | 19-Apr-07 |

| | | | |
|---|---|---|---|
| xviii | Lord Krishna Bank | Centurion Bank of Punjab | 29-Aug-07 |
| xix | Centurion Bank of Punjab | HDFC Bank | 25-Feb-08 |
| xx | State Bank of Saurashtra | State Bank of India | 13-Aug-08 |
| xxi | Bank of Rajasthan | ICICI Bank Ltd | 13-Aug-10 |
| xxii | ING Vysya Bank | Kotak Mahindra Bank | 01-Apr-15 |
| xxiii | State Bank Associates & BMB | State Bank of India | 01-Apr-17 |
| xxiv | Dena Bank & Vijaya Bank | Bank of Baroda | 01-Apr-19 |
| xxv | Oriental Bank of Commerce & United Bank of India | Punjab National Bank | 01-Apr-20 |
| xxvi | Syndicate Bank | Canara Bank | 01-Apr-20 |
| xxvii | Allahabad Bank | Indian Bank | 01-Apr-20 |

**Source:** Compiled and edited by the Author

**State Bank of India**

SBBJ, SBH, SBM, SBP, SBT and BharatiyaMahila Bank merged intoB1w.e.f 1st April 2017. This merger has made B1, as one of the 50 biggest banks inthe world.

**Capital Adequacy Ratio Performance:**

Table 2: Capital Adequacy Ratio

| Year | CAR (Tier1) | CAR(Tier 2) | Total CAR |
|---|---|---|---|
| **2014-15** | 9.60% | 2.40% | 12.00% |
| **2015-16** | 9.92% | 3.20% | 13.12% |
| **2016-17** | 10.35% | 2.76% | 13.11% |
| **CAGR** | 3.83% | 7.24% | 4.52% |
| | | | |
| **2017-18** | 10.36% | 2.24% | 12.60% |
| **2018-19** | 10.65% | 2.07% | 12.72% |
| **2019-20** | 11.00% | 2.06% | 13.06% |
| **CAGR** | 3.00% | -4.00% | 1.81% |

**Source:** Compiled by the Author

It is observed that, the increase in CAR before merger is higher than the post-merger scenario. In order to check if this difference is significant, t - Test has been conducted whose findings are as under.

Table 3:t - Test Results of CAR

| | CAR |
|---|---|
| **Pre-merger mean value** | 12.74% |
| **Post-merger mean value** | 12.79% |
| **Absolute t-stat** | 0.126139 |
| **t critical two tail** | 3.182446 |
| **P two tail** | 0.907600 |
| **Result** | Donot Reject H0 |

**Source:** Computedfrom the values in Table 2

It is observed that the absolute t - stat is less than t - critical two tail and also, p - value is more than 0.05. H0cannot be rejected which means, no statistical significance exists for the parameter CAR before and after merger.

**Data Pertaining to key parameters of merger's Pre and Post scenarios:**

Table 4: Key Parameters

| **Pre-merger** | | | | | | | |
|---|---|---|---|---|---|---|---|
| Year | Deposits (in Cr) | Advances (in Cr) | Net Profit (in Cr) | Net Interest Income (in Cr) | Net NPA/Net Adv(%) | ROA (%) | No. of Branches |
| **2014-15** | 1576793.00 | 1300026.00 | 13101.00 | 55015.00 | 2.12 | 0.68 | 16333 |
| **2015-16** | 1730722.00 | 1463700.00 | 9951.00 | 56882.00 | 3.81 | 0.46 | 16784 |
| **2016-17** | 2044751.00 | 1571078.00 | 10484.00 | 61860.00 | 3.71 | 0.41 | 17170 |
| **CAGR(%)** | 13.87 | 9.93 | -10.54 | 6.03 | 32.20 | -22.30 | 2.53 |
| **Mean** | 1784088.67 | 1444934.67 | 11178.67 | 57919.00 | 3.21 | 0.52 | 16762 |
| **Median** | 1730722.00 | 1463700.00 | 10484.00 | 56882.00 | 3.71 | 0.46 | 16784 |
| **Post-merger** | | | | | | | |
| Year | Deposits (in Cr) | Advances (in Cr) | Net Profit (in Cr) | Net Interest Income (in Cr) | Net NPA/ Net Adv(%) | ROA (%) | No.of Branches |
| **2017-18** | 2706344.00 | 1934880.00 | -6547.00 | 74854.00 | 5.73 | -0.18 | 22414 |
| **2018-19** | 2911386.00 | 2185877.00 | 862.00 | 88349.00 | 3.01 | 0.02 | 22010 |
| **2019-20** | 3241621.00 | 2325290.00 | 14488.00 | 98085.00 | 2.23 | 0.36 | 22141 |
| **CAGR(%)** | 9.44 | 9.62 | 15.80 | 14.47 | -37.61 | 17.00 | 0.50 |
| **Mean** | 2953117.00 | 2148682.33 | 2934.33 | 87096.00 | 3.66 | 0.07 | 22188 |
| **Median** | 2911386.00 | 2185877.00 | 862.00 | 88349.00 | 3.01 | 0.02 | 22141 |

(For the post-mergerscenario, the CAGR for Net Profit and ROA(%) has been calculated for the years 2018-19 and 2019-20 only)

**Source:** Compiled by the Author

The CAGR, Mean, Median for Pre-merger and Post-merger scenario has been calculated. It is observed that, there is a decrease in the CAGR for Deposits from the Pre-merger scenario. Also, there is a slight decrease in the CAGR for Advances from the period before merger. However, in the period after merger the CAGR for Net-Profit and Net Interest Income has increased. It is clear from the above table, that the Net Profit has notably increased and the Net NPA/Net Advances has gradually decreased in the merger's post scenario.

The mean increase in the duration prior to merger and after merger in Deposits was Rs.1784088 Cr & Rs.2953117 Cr; in Advances it was Rs.1444934.67 Cr & Rs.2148682.33 Cr; in Net Profit it was Rs.11178.67 Cr& Rs.2934.33 Cr; and in Net Interest Income it was Rs.57919 Cr & Rs.87096 Cr.

To find if there is any notable difference or not, t - Test has been conducted whose findings are as under.

Table 5: Test Results of Key Parameters

| | Deposits | Advances | Net Profit | NII | Net NPA/Net Adv(%) | ROA(%) | No. of Branches |
|---|---|---|---|---|---|---|---|
| **Pre-merger mean value** | 1784088.70 | 1444934.67 | 11178.67 | 57919.00 | 3.21 | 0.52 | 16762.33 |
| **Post-merger mean value** | 2953117.00 | 2148682.33 | 2934.33 | 87096.00 | 3.66 | 0.07 | 22188.33 |
| **Absolute t-stat** | 5.619000 | 5.070000 | 1.321952 | 4.140000 | 0.370000 | 2.520000 | 20.120000 |
| **t critical two tail** | 2.770000 | 2.770000 | 4.300000 | 4.300000 | 3.180000 | 3.180000 | 3.180000 |
| **P two tail** | 0.004929 | 0.007124 | 0.317125 | 0.053000 | 0.730000 | 0.080000 | 0.000268 |
| **Result** | Reject H0 | Reject H0 | Donot Reject H0 | Donot Reject H0 | Donot Reject H0 | Donot Reject H0 | Reject H0 |

**Source:** Computed from the values in Table 4

It is observed that, for depositsthe absolute value of t - stat is more than t - critical two tail value and also, p - value is less than 0.05. The results reject H0,indicatingexistence of significant difference in Deposits before and after the merger.

For Advances, the absolute value of t - stat is more than t - critical two tail value. Also, p - value is less than 0.05.This rejects H0, and indicates that, significant difference exists in Advances in merger's pre and post scenarios.

However, the absolute value of t - stat is less than t - critical two tail value for Net Profit.The p - value is more than 0.05, at 5% significance level. Hence, H0 cannot be rejected.

The same analysis has been followed for Net Interest Income, Net NPA/Net Advances, ROA and Number of branches. In spite of a considerable difference in quantity of deposits, advances and no. of branches Pre and Post mergers, H0 cannot be rejected w.r.t other parameters like Net Income, Net Interest Income, Net NPA/Net Advances(%) and ROA(%). Hence, statisticalsignificance doesn't exist in these parameters. The resultsfrom Table 5 show that, the operational performance hasn't shown much difference in these parameters.

To understand the relationship among these parameters, Regression analysis has been done. For this, as a dependent variable Net Profit is taken,whilefor independent variables, Advances, Deposits, Net NPA/Net Advances (%) and No. of Branches are taken.

Table 6: Test Results for Regression Analysis

| | Coefficients | Standard Error | t Stat | P-value |
|---|---|---|---|---|
| Intercept | 81316.43282 | 34808.28652 | 2.33612283 | 0.257486832 |
| Deposits | 0.029402079 | 0.033721341 | 0.871913087 | 0.543493341 |
| Advances | -0.019743881 | 0.051372772 | -0.384325776 | 0.766410504 |
| Net NPA/Net Adv(%) | -2803.648627 | 2443.323455 | -1.147473381 | 0.456349959 |
| No of Branches | -5.072841241 | 3.263555964 | -1.554390762 | 0.363941689 |
| Multiple R : 0.9609 | R Square : 0.9234 | | | |

**Source:** Computedfrom the values inTable 4

It is seen that the parameters Deposits, Advances, Net NPA/Net Advances(%) and No. of branches are a good fit as $R^2$ is obtained as 0.92. This means, 92% of the independent variables explains dependent variable, Net Profit.

Table 7, reflects Per-Branch data for B1.This is calculated inorder to have a Per-Branch comparison of performance in merger's pre and post scenarios.

Table 7: Per Branch data for Key Parameters(Data in Cr.)

| Year | D/B | A/B | NP/B |
|---|---|---|---|
| **2014-15** | 96.54 | 79.60 | 0.80 |
| **2015-16** | 103.12 | 87.21 | 0.59 |
| **2016-17** | 119.09 | 91.50 | 0.61 |
| **Average** | **106.25** | **86.10** | **0.67** |
| | | | |
| **2017-18** | 120.74 | 86.32 | -0.29 |
| **2018-19** | 132.28 | 99.31 | 0.04 |
| **2019-20** | 146.41 | 105.02 | 0.65 |
| **Average** | **133.14** | **96.89** | **0.13** |

(D/B-Deposits per Branch, A/B-Advances per Branch, NP/B-Net Profit per Branch)

**Source:** Computed from the values in Table 4

From table 7, it is observed that, there is increase in Deposits and Advances per branch from the Pre-merger to Post-merger period. However, the Net Profit per Branch has decreased from the merger's pre scenarioto its postone. The decrease is due to the expenses incurredin the year of merger.

To understand if the differences are significant, t - Test has been conducted w.r.tPer Branch performance.

Table 8:t - Test Results of Key ParametersPer Branch

| | D/B | A/B | NP/B |
|---|---|---|---|
| **Pre-merger mean value** | 106.25 | 86.10 | 0.67 |
| **Post-merger mean value** | 133.14 | 96.89 | 0.13 |
| **Absolute t-stat** | 2.690700 | 1.650000 | 1.900916 |
| **t critical two tail** | 2.776440 | 3.182446 | 4.302652 |
| **P two tail** | 0.054615 | 0.197505 | 0.197680 |
| **Result** | Donot Reject H0 | Donot Reject H0 | Donot Reject H0 |

**Source:** Computed from the values in Table 7

In table 8, it is seen that absolute t - stat value is less than the t - critical two tail and the p - value is more than 0.05. Hence H0 cannot be rejected. This means nostatistical significanceexists between the Deposits, Advances and Net Profit per Branch between the merger's pre and post scenarios.

**Market Performance:**

Table 9: Key Market Indicators

| Year | Book Value/share | Share Value | P/B | EPS |
|---|---|---|---|---|
| **2014-15** | 172.03 | 267.05 | 1.55 | 17.55 |
| **2015-16** | 185.85 | 194.25 | 1.05 | 12.81 |
| **2016-17** | 236.11 | 293.40 | 1.24 | 13.14 |
| | | | | |
| **2017-18** | 244.53 | 249.90 | 1.02 | -7.67 |
| **2018-19** | 246.53 | 320.75 | 1.30 | 0.97 |
| **2019-20** | 258.96 | 196.85 | 0.76 | 16.23 |

**Source:** Compiled by the Author

Table 9, shows the market performance of the stock over the period before and after merger. The Book Value/Share has shown an increasing trend. However, the share price is volatile. The Earnings per Share has decreased over the years especially in the year 2017-18, the year of merger. Post-merger EPS has shown an increasing trend.

t - Test has been conducted to check if the change in the Price to Book Value and EPS, before and after merger is significant.

Table 10:t - TestResults for Market Performance

| | P/B | EPS |
|---|---|---|
| **Pre-merger mean value** | 1.27 | 14.50 |
| **Post-merger mean value** | 1.02 | 3.17 |
| **Absolute t-stat** | 1.172760 | 1.583212 |
| **t critical two tail** | 2.776445 | 4.302652 |
| **P two tail** | 0.305966 | 0.254210 |
| **Result** | Donot Reject H0 | Donot Reject H0 |

**Source:** Computed from the values in Table 9

Table 10, depicts that the absolute t - stat for both P/B and EPS is less than t - critical value. The p - value is more than 0.05 indicating that H0 cannot be rejected.

The tests conducted above, signify that merger of Associate banks withB1 has not shown a significant improvement in the bank's performance except in terms of increase in Deposits and Advances.

**Kotak Mahindra Bank**

ING-Vysya has merged with B2w.e.f 1st April 2015. This merged entity has built a strong position as one of India's leading private banks.

**Capital Adequacy Ratio Performance:**

Table 11: Capital Adequacy Ratio

| Year | CAR (Tier1) | CAR(Tier 2) | Total CAR |
|---|---|---|---|
| **2010-11** | 18.00% | 2.00% | 20.00% |
| **2011-12** | 16.00% | 2.00% | 18.00% |
| **2012-13** | 15.00% | 1.00% | 16.00% |
| **2013-14** | 17.80% | 1.00% | 18.80% |
| **2014-15** | 16.20% | 1.00% | 17.20% |
| **CAGR** | -2.60% | -15.91% | -3.70% |
| | | | |
| **2015-16** | 15.30% | 1.00% | 16.30% |
| **2016-17** | 15.90% | 1.00% | 16.90% |
| **2017-18** | 17.60% | 2.20% | 19.80% |
| **2018-19** | 16.93% | 0.52% | 17.45% |
| **2019-20** | 17.27% | 0.62% | 17.89% |
| **CAGR** | 3.07% | -11.26% | 2.35% |

**Source:** Compiled by the Author

Table 11, reflects the CAGR of Capital Adequacy Ratio for the bank before and after merger. It is observed that, in the Pre-merger scenario the CAR has a negative growth rate, while post the merger the CAR has a positive growth rate. In order to find if this difference in CAR is significant, t - Test has been conducted and the findings are as under.

Table 12:t - Test Results of CAR

| | CAR |
|---|---|
| **Pre-merger mean value** | 14.38% |
| **Post-merger mean value** | 17.66% |
| **Absolute t-stat** | 0.885979 |
| **t critical two tail** | 2.570000 |
| **P two tail** | 0.416200 |
| **Result** | Donot Reject H0 |

**Source:** Computedfrom the values in Table 11

It is observed that absolute t - stat of0.88 is lesser than t critical two tail which is 2.57 and also, p - value is greater than 0.05. H0 cannot be rejected which means that, no notable difference exists for the parameter CAR before and after the merger.

**Data Pertaining to key parameters in merger's pre and post scenarios:**

Table 13**:**Key Parameters

| **Pre-Merger** | | | | | | | |
|---|---|---|---|---|---|---|---|
| Year | Deposits (in Cr) | Advances (in Cr) | Net Profit (in Cr) | Net Interest Income (in Cr) | Net NPA/Net Adv (%) | ROA (%) | No. of Branches |
| **2010-11** | 29260.97 | 29329.31 | 818.18 | 2098.00 | 0.72 | 1.60 | 321 |
| **2011-12** | 38536.52 | 39079.23 | 1085.05 | 2513.00 | 0.61 | 1.65 | 355 |
| **2012-13** | 51028.77 | 48468.98 | 1360.72 | 3205.00 | 0.64 | 1.62 | 437 |
| **2013-14** | 59072.33 | 53027.63 | 1502.52 | 3720.00 | 1.08 | 1.80 | 605 |
| **2014-15** | 74860.31 | 66160.71 | 1865.98 | 4224.00 | 0.92 | 2.06 | 684 |
| **CAGR(%)** | 26.47 | 22.53 | 22.88 | 19.11 | 6.30 | 6.52 | 20.81 |
| **Mean** | 50551.78 | 47213.17 | 1326.49 | 3152.00 | 0.01 | 0.02 | 480.40 |
| **Median** | 51028.77 | 48468.98 | 1360.72 | 3205.00 | 0.01 | 0.02 | 437.00 |

| **Post-Merger** | | | | | | | |
|---|---|---|---|---|---|---|---|
| Year | Deposits (in Cr) | Advances (in Cr) | Net Profit (in Cr) | Net Interest Income (in Cr) | Net NPA/Net Adv (%) | ROA (%) | No. of Branches |
| **2015-16** | 138643.00 | 118665.00 | 2089.78 | 6900.00 | 1.10 | 1.20 | 1333 |
| **2016-17** | 157425.00 | 136082.00 | 3411.50 | 8126.00 | 1.30 | 1.70 | 1369 |
| **2017-18** | 192643.00 | 169717.00 | 4084.30 | 9532.00 | 1.00 | 1.70 | 1388 |
| **2018-19** | 225880.00 | 205694.00 | 4865.00 | 11205.00 | 0.75 | 1.69 | 1500 |
| **2019-20** | 262820.00 | 219748.00 | 5947.00 | 13499.00 | 0.71 | 1.87 | 1600 |
| **CAGR(%)** | 17.33 | 16.65 | 29.88 | 18.26 | -10.36 | 11.72 | 4.67 |
| **Mean** | 195482.20 | 169981.20 | 4079.52 | 9852.40 | 0.01 | 0.02 | 1438 |
| **Median** | 192643.00 | 169717.00 | 4084.30 | 9532.00 | 0.01 | 0.02 | 1388 |

**Source:** Compiled by the Author

The CAGR for key parameters has been calculated in table 13 above. It can be observed that, there was a decrease in growth rate for Deposits, Advances, NII and in Number of branches from the Pre-merger scenario. At the same time, the Net NPA/Net Advances (%) has come down and Net Profit and ROA has increased.

To find if any notable difference exists in merger's pre and post scenarios, t- Test has been conducted and the findings are as under.

Table 14:t - Test Results of Key Parameters

| | Deposits | Advances | Net Profit | NII | Net NPA/Net Adv(%) | ROA(%) | No. of Branches |
|---|---|---|---|---|---|---|---|
| **Pre-merger mean value** | 50551.78 | 47213.17 | 1326.49 | 3152.00 | 0.01 | 0.02 | 480 |
| **Post-merger mean value** | 195482.20 | 169981.20 | 4079.52 | 9852.40 | 0.01 | 0.02 | 1438 |
| **Absolute t-stat** | 6.060000 | 6.020000 | 4.070000 | 5.470000 | 1.250000 | 0.800000 | 11.110000 |
| **t critical two tail** | 2.570000 | 2.570000 | 2.570000 | 2.570000 | 2.300000 | 2.360000 | 2.360000 |
| **P two tail** | 0.001750 | 0.001810 | 0.009600 | 0.002700 | 0.240000 | 0.440000 | 0.007000 |
| **Result** | Reject H0 | Reject H0 | Reject H0 | Reject H0 | Donot Reject H0 | Donot Reject H0 | Reject H0 |

**Source:** Computed from the values in Table 13

It is observed that for Deposits, Advances, Net Profit, NII and No. of branches, the absolute t - statistic is greater than t - critical two tail, hence H0which states that, statistical significance does not exist between the mean value of the parameters between merger's Pre and Post scenarios, do not hold. Also, p - value is less than 0.05 in all these cases.

However, t - statistic is less than t - critical two tail and p - value is greater than 0.05 for Net NPA/Net Advances (%) and ROA (%). So H0 cannot be rejected. Though there are improvements in performance for Net NPA/Net Advances (%) and ROA(%), the difference is not significant.

To understand the relationship among these parameters, Regression analysis was performed. Here, for dependent variable Net Profit is taken, while for independent variables Advances, Deposits, Net NPA/Net Advances (%) and No. of Branches are taken.

Table 15:Test Results for Regression Analysis

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* |
|---|---|---|---|---|
| Intercept | -232.3211627 | 301.0175354 | -0.771786143 | 0.475117496 |
| Deposits in Cr | 0.040805251 | 0.010683734 | 3.819381138 | 0.012380945 |
| Advances in Cr | 0.003970218 | 0.012282433 | 0.32324359 | 0.759592081 |
| Net NPA/Net Adv(%) | 160786.2561 | 48873.77965 | 3.289826512 | 0.021717675 |
| No of Branches | -4.102702406 | 0.753468681 | -5.445086848 | 0.002837184 |
| Multiple R : 0.99 | R Square : 0.99 | | | |

**Source:** Computed from the values in Table 13

From table 15, it is evident that the independent variables explain 99% of the dependent variable.

The following table reflects Per Branch data for B2. This is calculated in order to have a Per-Branch comparison of merger's performance in pre and post scenarios.

Table 16**:**Per Branch data for Key Parameters (Data in Cr.)

| Year | D/B | A/B | NP/B |
|---|---|---|---|
| **2010-11** | 91.15566978 | 91.36856698 | 2.548847352 |
| **2011-12** | 108.5535775 | 110.082338 | 3.056478873 |
| **2012-13** | 116.7706407 | 110.9129977 | 3.113775744 |
| **2013-14** | 97.64021488 | 87.64897521 | 2.483504132 |
| **2014-15** | 109.4448977 | 96.72618421 | 2.728040936 |
| **Average** | **104.7130001** | **99.34781243** | **2.786129407** |
| | | | |
| **2015-16** | 104.0082521 | 89.02100525 | 1.567726932 |
| **2016-17** | 114.9926954 | 99.40248356 | 2.491964938 |
| **2017-18** | 138.7917867 | 122.2744957 | 2.942579251 |
| **2018-19** | 150.5866667 | 137.1293333 | 3.243333333 |
| **2019-20** | 164.2625 | 137.3425 | 3.716875 |
| **Average** | **134.5283802** | **117.0339636** | **2.792495891** |

(D/B-Deposits per Branch, A/B-Advances per Branch, NP/B-Net Profit per Branch)

**Source:** Computed from the values in Table 13

Table 16 shows that, there was an increase in the Per-Branch Deposits, Advances and Net Profit when compared to the data prior to merger.

To find if the increase in the Per-Branch values are significant, t - Test has been performed. The analysis also helps in understanding the Productivity of the branch w.r.t these parameters.

Table 17**:**t - Test Results of Key Parameters Per Branch

| | D/B | A/B | NP/B |
|---|---|---|---|
| **Pre-merger mean value** | 104.71 | 99.34 | 2.78 |
| **Post-merger mean value** | 134.52 | 117.03 | 2.79 |
| **Absolute t-stat** | 2.480468 | 1.615963 | 0.016431 |
| **t critical two tail** | 2.570581 | 2.446911 | 2.570581 |
| **P two tail** | 0.055809 | 0.157229 | 0.987525 |
| **Result** | Donot Reject H0 | Donot Reject H0 | Donot Reject H0 |

**Source:** Computed from the values in Table 16

The t - Test results show that, the absolute t - stat is lesser than t - critical two tail. The p - value is also greater than 0.05. Hence, H0 cannot be rejected.So, when considering Per Branch scenario, there is no notable difference before and after mergers for Deposits, Advances and Net Profit.

**Market Performance:**

Table 18: Key Market Indicators

| Year | Book Value/share | Share Value | P/B | EPS |
|---|---|---|---|---|
| **2010-11** | 92.74 | 437.07 | 4.93 | 11.35 |
| **2011-12** | 107.75 | 469.24 | 5.03 | 14.69 |
| **2012-13** | 126.77 | 609.59 | 5.14 | 18.31 |
| **2013-14** | 159.46 | 710.33 | 4.88 | 19.62 |
| **2014-15** | 183.13 | 1126.03 | 7.17 | 24.20 |
| | | | | |
| **2015-16** | 130.63 | 665.07 | 5.21 | 11.42 |
| **2016-17** | 150.02 | 772.52 | 5.81 | 18.57 |
| **2017-18** | 196.70 | 1008.92 | 5.33 | 21.54 |
| **2018-19** | 222.14 | 1266.32 | 6.01 | 25.35 |
| **2019-20** | 253.62 | 1543.92 | 5.11 | 30.88 |

**Source:**Compiled by the Author

Table 18, reflects the increase in Book Value and Share Value of the bank over the years both before and after merger. However, there is a decrease in P/B value after the merger. Although the EPS in the year decreased immediately after the merger, itis seen to have an increasing trend in the subsequent years.

t - Test has been conducted to check if the change in the Price to Book Value and EPS, before and after merger is significant.

Table 19**:**t – TestResults for Market Performance

| | P/B | EPS |
|---|---|---|
| **Pre-merger mean value** | 5.43 | 17.63 |
| **Post-merger mean value** | 5.49 | 21.55 |
| **Absolute t-stat** | 0.135751 | 0.997337 |
| **t critical two tail** | 2.570581 | 2.364624 |
| **P two tail** | 0.897314 | 0.351819 |
| **Result** | Donot Reject H0 | Donot Reject H0 |

**Source:** Computed from the values in Table 18

Table 19, depicts that the absolute t - statistic for both P/B and EPS is less than t - critical value. The p - value is also more than 0.05 indicating that, H0 cannot be rejected.

The tests conducted above, signifies that merger of ING Vysya with B2 has shown a statistical significancein the Total Deposits, Total Advances, Net Profit and NII. So, it can be said that the merger has improved the financial performance of the bank to a certain extent. The merger has not resulted in any significant difference in other parameters.

**Bank of Baroda**

Dena Bank and Vijaya Bank have been merged with B3w.e.f 1$^{st}$ April 2019. The combined entity is now the 3$^{rd}$ largest lender in India.

The Capital Adequacy Ratio of B3 is as below:

Table 20: Capital Adequacy Ratio

| Year | CAR (Tier1) | CAR(Tier 2) | Total CAR |
|---|---|---|---|
| 2018-19 | 11.55% | 1.87% | 13.42% |
| 2019-20 | 11.67% | 2.20% | 13.87% |

**Source:**Compiled by the Author

Key Parameters of B3merger's pre and post scenarios:

Table 21: Key Parameters

| Year | Deposits (in Cr) | Advances (in Cr) | Net Profit (in Cr) | Net Interest Income (in Cr) | Net NPA/Net Adv(%) | ROA(%) | No. of Branches |
|---|---|---|---|---|---|---|---|
| **2018-19 (PreMerger)** | 638689.71 | 468818.70 | 433.50 | 18683.80 | 3.30 | 0.06 | 5598 |
| **2019-20 (Post Merger)** | 945984.43 | 690120.73 | 546.18 | 27451.00 | 3.13 | 0.04 | 9445 |
| **CAGR(%)** | 48.11 | 47.20 | 25.99 | 46.92 | -5.15 | -33.33 | 68.72 |

**Source:**Compiled by the Author

Since this merger has come into effect recently, the analysis of this merged entity has been made by considering only past two-year performance (a year each, from before and after the merging activity). It has been observed that, the Deposits have raised by 48.11% and Advances by 47.20%. A 25% increase is seen in Net Profit, while a 47% increase is observed in Net Interest Income. There is a slight decrease in the Net NPA/Net Advances (%) which is a positive sign. The change in ROA (%) is negligible.

Table 22: Per Branch data for Key Parameters (Data in Cr.)

| Year | D/B | A/B | NP/B |
|---|---|---|---|
| **2018-19 (Pre Merger)** | 114.09 | 83.75 | 0.08 |
| **2019-20 (Post Merger)** | 100.16 | 73.07 | 0.06 |

**Source:** Computed from the values in Table 21

It is observed from Table 22, that there is a decrease in Deposits, Advances and Net Profit parameters when considered on a Per Branch basis. However, since the year 2019-20 being only the first year after merger, it is too early to comment upon the performance of the merged entity.

**Findings:**

During the period from 1991-2020(1st April), Indian banking industry has witnessed 27 major mergers on the whole.

The observations from t - Tests show that, Capital Adequacy Ratio doesn't have any statistical significance in performance for these banks between merger's pre and post scenarios.

The t – Tests outcomes indicated that, in spite of having an increased Advances, Deposits and Number of branches for these selected banks, the banks could not able to turn this into their advantage.

The t - Test showed that, there is not much of statistical significance between the scenarios before and after the merger for B1 w.r.t key parameters such as NII and Net Profit. Net NPA/Net Advances (%)and Return on Assets(%) has not shown any notable difference. This shows that, merger has not financially benefittedB1 as on date.

From the t - Test conducted on B2, it is observed that, the performance is similar to that of B1 in most of the key parameters. However, there is a notable difference between the merger's pre and post scenarios w.r.t Net Interest Income and Net Profit. It is evident from the test results that, B2 has performed better in terms of Net Interest Income and Net Profit when compared to B1.This shows that, B2 has a better after merger performance than B1w.r.t these parameters.

It is also evident from the research that, the Per branch performance data in the key parameters such as Deposits, Advances and Net Profit, do not have any considerable differences w.r.t before and after merger scenarios. The reason for this is mainly because of the simultaneous rise in the number of branches, compiling to the existing maintenance costs and expenses.

Stock performance analysis has also been made for these banks. The share performance of B1has shown frequent fluctuations over the years, however the Price/Book ratio has not showed any significant differences before and after merger. The Price/Book ratio for B2 has a better performance as compared to B1. However, there is no statistical significance in the ratio of merger's pre and post scenario. The EPS performance for the B2 also does not have any notable difference between merger's Pre and Post scenarios.

**Other Challenges Faced:**

Work force rationalization is one of the biggest challenges that banks face. The banks should concentrate on realizing cost synergies as they go about restructuring. IT integration will also be a major challenge that banks faces at the time of mergers. However, mergers are generally done among banks which uses similar core banking platforms. Some other challenges faced are as under:

- Integrating Core banking technology platform.
- Integration of HR policies.
- Identifying and retaining the best processes and products.
- Rationalizing branches/staff to achieve economies of scale.
- Divestment of competing subsidiaries.

**Conclusions:**

With the recent amalgamation in 2020, the number of PSU banks in the country has shrink to 12 from 27 in 2017. The move comes amid the ongoing Non-Performing Asset (NPA) crisis. It is expected to have an optimistic impact on the state-owned banks reeling under losses for past several quarters. Also, to support next level of growth, the country needed big banks. But then, it would be too early to say mergers alone could be the panacea for all that ails the PSBs as the sector as a whole, faces a hostile business environment.

Mergers in Banking Industry have always been a major point of discussion in the financial sector. While some banks consider mergers as their business-presence and customer-base increasing strategies, some mergers are forceful in order to prevent the non-performing bank from going into default.

The analysis on select banks has shown that, not much of performance difference in key parameters is observed. However, B2's merger has shown a slightly better performance w.r.t Net Interest Income and Net Profit when compared to that of B1.

Based on the analysis on selected banks, it is evident that, banking mergers will have more of geographical advantages and less of economic advantages. Also, considering the history of banks' mergers, it won't be easy to deliver merger promises in the near term. A section of banking sector experts say, there is no evidence that the mergers resulted into any significant gains for the acquirers.

However, it is important to understand that, though there are no significant changes in the key parameters, all the parameters have shown an improving scenario from the previous years. This is seen as a positive impact in the years to come.

It is fact that, mergers have come to be a way of life in today's fast changing business environment, mostly caused by myriad of consumer-driven technologies. With competition among banking industry, banks lacking scale and market presence could find the going tough and have to either merge with profit making entities or shut down its operations.

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