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# Impacts of bank mergers on shareholder's wealth: An event study on Indian public sector banks

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## Abstract

*We examine the effect of the news about the merger of six banks into four major banks, employing the standard event study method with the market model on a sample of four bidders and six target banks. We find a significant impact of merger announcement on both the bidder and target banks. While the bidder banks are negatively impacted, the target banks experience positive impacts on the event day and day after, followed by negative results later on. No previous study is found to have addressed this research question on how the merger announcements impact the bidder and target bank's stock returns in India.*

**Keywords:** Merger, event study, market model, banks, abnormal returns.

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## **1. Introduction**

The merger of banks is not a new phenomenon for the Indian banking sector. Since the implementation of the liberalization policy in 1991, many private sector banks and public sector banks (PSBs) have been merged. Pandey & Kumari (2020a) examine eight such merger announcements in India. Coming to the PSBs, the merger of the New Bank of India into the Punjab National Bank (PNB) took place on 04 September 1993. While the five associate banks of the State Bank of India (SBI) and Bhartiya Mahila Bank were merged in SBI on 01 April 2017, and the merger of Vijaya Bank and Dena Bank in the Bank of Baroda took place on 01 April 2019. The mega-merger of ten PSBs was announced on 30 August 2019, resulting in the merger of six PSBs into four major PSBs on 01 April 2020. As of now, only 12 PSBs exist. After the merger, the PNB is now the second-largest PSB; Canara bank has become the fourth-largest; the Union Bank of India (UBI) has become the fifth-largest, and the Indian Bank has become the seventh-largest PSB. However, the Government has decided to privatize the four banks from which two banks have to be privatized by the financial year 2021-22 (Rai & Pandey, 2021).

In an efficient market, any event affects the stock returns significantly. Many studies



have recently been conducted to test the impact of different events on the stock market (Alam et al., 2020; Chhetri & Baral, 2018; He et al., 2020; Pandey & Jaiswal, 2017; Pandey & Kumari, 2020a, 2020b, 2021a, 2021b; Rai & Pandey, 2021; Ullah et al., 2021). In the same way announcement of a merger directly or indirectly affects the investors. If investors have optimistic hope about the merger of banks, then the share prices of the bank will jump upward and increase the shareholders' wealth. If investors negatively react to the merger, then share prices slope downward and negatively impact the returns to shareholders. An event study approach is used to analyze the impacts of the merger announcement. Some recent event studies also found the impact of the merger announcements on banks' stock returns. While a few studies provide evidence of negative impacts of merger announcements of banks in emerging nations, for example, (Rahman et al., 2018) in Pakistan and (Pandey & Kumari, 2020a) in India; a few studies support positive impacts on the event dates, for example, (Diaw, 2011) in London, and (Antoniadis et al., 2014) in Greece. In light of these previous findings, we aim to examine how the merger announcements of the PSBs impact the shareholders' wealth in India. With this intention, we test the two hypotheses that "merger announcement of banks have no significant effect on bidder bank's stock return" and "merger announcement of banks have no significant effect on target bank's stock return".

## 2. Data and Methodology

The daily closing prices of the NIFTY PSU Bank index and the bidder and target banks are collected from the National Stock Exchange (NSE), India. The (Brown & Warner, 1980, 1985) standard event study methodology (SESM) is used to examine the impact of the merger announcements. The specific event in this study is when the merger announcements are made. Hence, the event date is 30 August 2019. The list of sample banks is provided in Table 1.

**Table 1: List of sample banks**

| S.No. | Bidder Bank           | Target Bank   |
|-------|-----------------------|---|
| 1.    | Punjab National Banks | United Bank of India, and Oriental Bank of Commerce |
| 2.    | Union Banks of India  | Corporation Bank, and Andhra Bank                   |
| 3.    | Canara Banks          | Syndicate Bank                                      |
| 4.    | Indian Banks.         | Allahabad Bank                                      |

Source: Prepared by the authors based on the information available in daily newspapers

The market model gives better results than others (Dyckman et al., 1984). Hence, we use the market model to estimate the normal/expected returns using a 90-day estimation window ranging from  $t_{-97}$  to  $t_{-8}$ . We use a 15-day event window ranging from  $t_{-7}$  to  $t_{+7}$ , where ' $t_0$ ' is the event date. Smaller event windows are suggested and used in (Gong, 2007; Gong et al., 2006; Mackinlay, 1997; Pandey & Kumari, 2021c). We also use different shorter event windows for analyzing the cumulative impact of the event.

We calculate the normal/expected return (NR) as in eq. 1:

$$NR_{pt} = \alpha + \beta(R_{mt}) \quad 1$$

where,  $(NR_{pt})$  is the normal return of stock 'p' on day 't';  $\alpha$  is the intercept, and  $\beta$  is the slope of the regression run between the stock returns and the index returns during the estimation window; and  $(R_{mt})$  is the return on the market index on day 't'.

Once the normal return is calculated, we calculate the abnormal return (AR) as in eq. 2:

$$AR_{pt} = R_{pt} - NR_{pt} \quad 2$$

where,  $AR_{pt}$  is the abnormal return of the stock 'p' on day 't',  $R_{pt}$  is the actual return of stock 'p' on day 't'; and  $(NR_{pt})$  is as per eq. 1.

Once the abnormal returns are calculated, we aggregate them for the entire sample to generalize the event's impacts. For this, we calculate the average abnormal returns (AAR) as in eq. 3:

$$AAR_t = \frac{1}{N} \sum_{t=1}^N AR_{pt} \quad 3$$

where,  $AAR_t$  is the average AR on day 't';  $AR_{pt}$  is as per eq. 2; and  $N$  is the number of banks in each sample.

The AARs are then aggregated across time by calculating the cumulative average abnormal return (CAAR) as in eq. 4:

$$CAAR_{p,q} = \sum_{t=p}^q AAR_t \quad 4$$

where,  $CAAR_{p,q}$  is the cumulative AAR for the shorter event window ranging from 'p' to 'q'.

To test the significance of the aggregated abnormal returns, we calculate the test statistics as in eq. 5 & eq. 6:

$$AAR_t t = \frac{AAR_t}{\sigma_{N,et}} \quad 5$$

$$CAAR_t t = \frac{CAAR_t}{\sigma_{N,et} \sqrt{N_{t+1}}} \quad 6$$

where,  $N_{t+1}$  is the absolute value of 't' plus 1;  $\sigma_{N,et}$  is the estimation window aggregate standard deviation of daily abnormal return, calculated as  $\sigma_{N,et} = \sqrt{\frac{\sum_{p=1}^N \sigma_{p,et}^2}{N^2}}$ ;  $\sigma_{p,et}$  is the estimation window standard deviation of the stock 'p' calculated as  $\sigma_{p,et} = \sqrt{\frac{\sum_{-97}^{-8} (AR_{pt} - AAR_{et})^2}{n}}$ ; and  $AAR_{et}$  is the estimation period AARs of stock 'p'; and 'n' is the number of abnormal returns in the estimation period.

The calculated test statistics are compared with the critical limits provided in Table 2.

**Table 2: Critical t-statistics**

| Banks        | N  | Degree of freedom | t-statistics at 10% significance level | t-statistics at 5% significance level |
|--------------|----|-------------------|--|---------------------------------------|
| All Banks    | 10 | 9                 | ± 1.833                                | ±2.262                                |
| Bidder Banks | 4  | 3                 | ± 2.353                                | ±3.182                                |
| Target Banks | 6  | 5                 | ± 2.015                                | ±2.571                                |

### 3. Quantitative analysis

This section analyzes the abnormal returns as aggregated across banks and time to answer our research questions. We begin our analysis with the AARs and CAARs of the bidder and target banks. Table 3 presents the results of the 15-day event window. While the AAR of the bidder banks on  $t_{-4}$  is positive and significant, the AAR on  $t_{+1}$  is significantly negative. The AAR on the event day is insignificant. However, the CAARs from day  $t_{+1}$  to  $t_{+4}$  are significantly negative, which signifies that the merger announcement has negatively impacted the wealth of the shareholders of the bidder banks.

On the contrary, while the AARs of the target banks are negative and significant on  $t_{-7}$  and  $t_{+2}$ , the AARs on  $t_{-4}$  and  $t_{-3}$  are significantly positive. The event day AAR is also positive

and significant. However, the CAAR on t-5 is significantly negative, and those on t, t+1 and t+2 are significantly positive, signifying that the merger announcement positively impacted the wealth of the shareholders of the target banks. The results are similar to (Campa & Hernando, 2006; Diaw, 2011).

**Table 3: Average ARs, cumulative AARs, and the respective t-values for the bidder and target banks**

| Bidder Bank |         |         |          |         | Target Bank |          |         |          |         |
|-------------|---------|---------|----------|---------|-------------|----------|---------|----------|---------|
| Days        | AAR     | t-value | CAAR     | t-value | Days        | AAR      | t-value | CAAR     | t-value |
| t-7         | -0.010  | -1.416  | -0.005   | -0.501  | t-7         | -0.009** | -2.489  | -0.009   | -0.880  |
| t-6         | -0.010  | -1.872  | -0.013   | -1.243  | t-6         | -0.007   | -1.999  | -0.015   | -1.696  |
| t-5         | 0.000   | 0.609   | -0.010   | -1.094  | t-5         | -0.003   | -0.854  | -0.018** | -2.181  |
| t-4         | 0.010*  | 3.553   | 0.003    | 0.391   | t-4         | 0.010*   | 2.779   | -0.009   | -1.146  |
| t-3         | 0.010   | 1.712   | 0.010    | 1.293   | t-3         | 0.010*   | 2.846   | 0.001    | 0.142   |
| t-2         | 0.000   | 0.794   | 0.007    | 1.035   | t-2         | -0.005   | -1.537  | -0.004   | -0.724  |
| t-1         | 0.000   | 0.480   | 0.005    | 0.929   | t-1         | -0.001   | -0.195  | -0.005   | -1.025  |
| t           | 0.000   | 0.466   | 0.007    | 1.779   | t           | 0.030*   | 8.818   | 0.025*   | 7.368   |
| t+1         | -0.030* | -7.112  | -0.021*  | -3.771  | t+1         | 0.000    | 0.082   | 0.025*   | 5.152   |
| t+2         | -0.010  | -1.642  | -0.027*  | -4.027  | t+2         | -0.009** | -2.552  | 0.016*   | 2.734   |
| t+3         | 0.000   | 0.935   | -0.023** | -3.020  | t+3         | -0.006   | -1.732  | 0.010    | 1.502   |
| t+4         | 0.000   | 0.054   | -0.024** | -2.725  | t+4         | -0.005   | -1.33   | 0.006    | 0.748   |
| t+5         | 0.000   | 0.896   | -0.020   | -2.122  | t+5         | -0.006   | -1.794  | 0.000    | 0.049   |
| t+6         | 0.010   | 1.989   | -0.012   | -1.213  | t+6         | 0.002    | 0.475   | 0.001    | 0.134   |
| t+7         | 0.000   | 0.714   | -0.015   | -1.387  | t+7         | -0.003   | -0.909  | -0.002   | -0.196  |

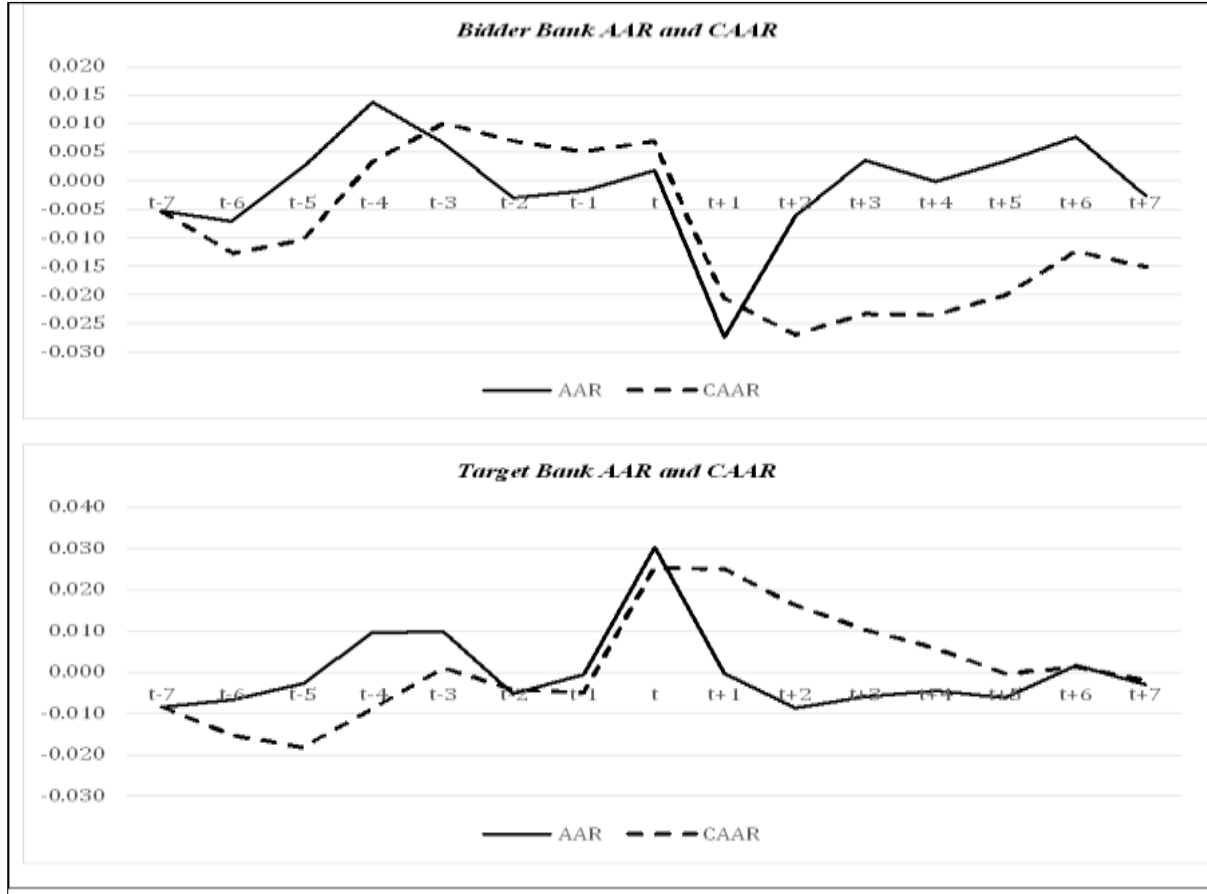
Note: \* & \*\* indicate significant values at 5% and 10% significance level, respectively.

The trend of the daily AARs of the bidder and target banks is presented in Figure 1. It is evident that while the bidder banks' AAR and CAAR-lines steeply fall after the event day, those of the target banks move upward on the event day. However, the AAR and CAAR-lines come around the axis within a few days. The results in Table 3, read with Figure 1, conclude that while the shareholders of the bidding banks are adversely impacted, those of the target banks enjoy the value creation initially.

Table 4 presents the results of the shorter event window analysis. Although the shorter window analysis results are similar to that of the 15-day event window for the bidder banks, those for the target banks are different. We find significantly negative AAR during the post-event window (+1,+2) and negatively significant CAARs during the post-event windows (+1,+2) and (+1,+5), signifying the negative impacts of the merger announcement for the bidder banks. The CAARs of the target banks are significantly negative during the shorter event windows (+1,+5) and (+1,+7).

The results signify that the overall cumulative impact of the merger announcements is negative for both bidder and target banks. Initially, the expected value creation by the bidder banks leads to the overreaction of the shareholders of the target. The findings align with (Pandey & Kumari, 2020a; Rahman et al., 2018).

The above analysis and discussions summarily reject the hypotheses that "merger announcement of banks have no significant effect on bidder bank's stock return" and "merger announcement of banks have no significant effect on target bank's stock return."

**Figure 1: AAR and CAAR of bidder and target banks during the event window****Table 4: Shorter window AARs, CAARs, and t-statistics for the bidder and target banks**

| Bidder Bank |        |         |        |          | Target Bank |        |         |        |          |
|-------------|--------|---------|--------|----------|-------------|--------|---------|--------|----------|
| Window      | AAR    | t-stats | CAAR   | t-stats  | Window      | AAR    | t-stats | CAAR   | t-stats  |
| (-2,-1)     | -0.002 | -0.637  | -0.005 | -0.900   | (-2,-1)     | -0.003 | -0.866  | -0.006 | -1.225   |
| (-5,-1)     | 0.004  | 0.920   | 0.018  | 2.058    | (-5,-1)     | 0.002  | 0.608   | 0.01   | 1.359    |
| (-7,-1)     | 0.001  | 0.188   | 0.005  | 0.496    | (-7,-1)     | -0.001 | -0.207  | -0.005 | -0.548   |
| (+1,+2)     | -0.017 | -4.377* | -0.034 | -6.190*  | (+1,+2)     | -0.005 | -1.317  | -0.009 | -1.862   |
| (+1,+5)     | -0.005 | -1.395  | -0.027 | -3.120** | (+1,+5)     | -0.005 | -1.498  | -0.026 | -3.349*  |
| (+1,+7)     | -0.003 | -0.814  | -0.022 | -2.155   | (+1,+7)     | -0.004 | -1.132  | -0.027 | -2.995** |

Note: While (-2,-1), (-5,-1), and (-7,-1) represent the pre-event shorter windows; (+1,+2), (+1,+5), and (+1,+7) represent the post-event shorter windows. \* & \*\* indicate significant values at 5% and 10% significance level, respectively.

#### 4. Conclusions, implications, and future research

With a sample of ten public sector banks, including four bidders and six target banks, and using the SESM with the market model, we find that initially, the target banks experience positive impacts of the merger announcement. However, the impacts on the target and bidder banks become similar within a few days. A few significant figures during the pre-event period do not seem to have been the merger announcement's output. The post-announcement results are consistent with previous studies (Campa & Hernando, 2006; Pandey & Kumari, 2020a; Rahman et al., 2018).

Although many previous studies concentrate on the merger and acquisition of banks, our study focus on the impact of the merger of six Indian nationalized banks into four major banks, which has not been examined before. The findings will give the investors proper insights

into how such events impact the market and what the investors expect. The researchers may extend this paper by adding more such events from India and other emerging nations to conduct a comparative study and strengthen the findings of the previous literature.

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