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Merger & Acquisition in Indian Banking Industry: An Event Study Approach

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ABSTRACT

In today's globalised economy, mergers and acquisitions (M&A) are being increasingly used the world over, for improving competitiveness of companies through gaining greater market share, broadening the portfolio to reduce business risk, for entering new markets and geographies, and capitalizing on economies of scale etc. In this paper we have done the research in the field of Mergers and Acquisitions (M&As) in the Indian banking sector. Using a sample of 20 M&As deals in the Indian banking industry during the post-liberalization period 1993-2010, We analyze the impact of M&As on the shareholders return (Average Abnormal Return) of the acquiring banks. For the purpose of my study We used the Event study and checked the significance level. The study has been done for Public & Private Banks, only Private banks, only Public Sector banks (PSBs). We used the Simple T-Test, Paired Sample T-Test, Wilcoxon Sign Rank Test. The findings of the project states that M&A as an event does generate Average Abnormal Return (AAR) for acquirers (nearly 6.5%) for both the private and public banks. It created 3.56% and 10.45% of CAARs for public and private banks individually. As per the Simple T-Test there is some abnormal return to all investors and more to private sector bank investors, whereas the Paired Sample T-Test and Wilcoxon Sign Rank Test suggests there is abnormal return for all bank holders and private bank holders but not to the public bank holders.

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INTRODUCTION

Remaining small may be beautiful but becoming big would make you powerful is the underlying principle behind the Merger & Acquisitions (M&As) business strategy. Every business strives for survival in this growing era of core competence. It is here M&As is looked upon as an immediate mode for external growth. This phenomena has been prevailing both in the developed and developing economies. But it is gaining more prominence in the present globalizing world. The banking sector which plays a very vital role in the economic development of India has been witnessing tremendous change. The various players in the banking arena have already begun to feel the heat of the intense competition M&A is one among the various modes of restructuring restored by banks to ensure a better growth prospect.

Some of the reasons for this growing tendency of adopting M&A tactics are due to

- Increasing needs to achieve economies of large scale,
- Brand building,
- Expanding branch networks over a wider geographical area,
- Mitigate the perils of Non Performing Assets (NPA),
- Acquire synergies of expert management and also to solve the problems associated with capital adequacy norms.
- It is believed that by undergoing such M&A deals banks will enable them to emerge stronger, increase their earning capacity and strengthen their capital base.

The Indian banking industry has been seen steadily shifting away from traditional sources of revenue like loan-making and towards nontraditional activities that generate fee income, service charges, trading revenue, and other types of noninterest income. It is not only the banks in the private sector that are making headway into diversifying their operations; it is also the public sector banks like Punjab National Bank, Bank of Baroda, Canara Bank etc which are aggressively looking for branch expansions in various countries. (Arora and Kaur, 2006).

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Currently foreign banks have also been permitted to buy stakes up to 74% in the Indian banks. This adds more oil to the spreading fire foreign banks would consider M&A as a quick method of inorganic growth. In order to expand their presence in the Indian scenario they would join hands with other Indian banks. (Mathew and Raju, 2002)

1.1 Overview of Indian Banking Industry:

Banks in India may be broadly categorized based on ownership into three tiers as follows: Scheduled commercial Banks (SCBs), Regional Rural Banks (not covered by SCBs) and Cooperative and special purpose Rural Banks.

Private sector banks dominate the Indian Banking System accounting for over 70% of the assets of the SCBs in India (Report on Trends and Progress of Banking in India, 2005). The financial system in India in the first decade following independence in 1947 was a liberal one. However, the first of two waves of nationalization occurred in 1969, and heralded a new system of tight regulatory control. The primary features of this system were high reserve ratios and an administered interest rate regime in which regulations dictated deposit and lending rates. Furthermore, certain economic sectors were designated Priority Sectors and banks were required to lend up to 40% of their total credit to these sectors. These policies were introduced in an effort to facilitate the spread of banking services to rural areas, mobilize savings, and channel credit towards the development of weaker but vital sectors of the economy such as the agricultural sector and the small-scale industry (Bhattacharya, Lovell, and Sahay, 1997).

As a result of the aforementioned policies, the PSBs began to dominate the Indian Banking System. Indeed, prior to economic liberalization in 1991, the PSBs accounted for 90.8% of aggregate deposits of SCBs. The financial system came to be characterized by low profitability, high levels of Non-Performing Assets (NPAs), and A low capital base and high levels of operational inefficiency (Arun & Turner, 2002).

While the banking system was successful in mobilizing savings, it failed in efficient resource allocation. The reasons for this failure are not far to seek. In a market-oriented framework, banks would only undertake those loans which met stringent credit risk standards. Thus, scant regard to fundamental financial performance coupled with a rigid desire to meet quantitative objectives led to the permeation of operational inefficiency in the banking system triggering the need for economic reforms in 1991 to improve its strength, profitability, and efficiency (Mistry, 1995).

The recommendations of the Committee on Financial System and the Committee on Banking Sector Reforms (Narasimham Committees on Banking Sector Reforms I and II) formed the foundations of the economic reforms undertaken. The economic reforms brought about a comprehensive change in the competitive landscape of the Indian Banking System forcing many of the incumbent banks to adopt Mergers and Acquisitions with the objective of restructuring themselves in order to enhance their efficiency, profitability and competitive strength.

In addition, the Government introduced policy initiatives aimed at deregulation and encouragement of mergers with a view to increasing the size, profitability, and financial strength of Indian Banks thereby enhancing their capability to compete globally. This climate of relaxed merger regulations fostered an increase in the number of merger deals among Indian firms (Beena, 2000).

2. Literature Review:

2.1 Global Literature:

There have been numerous studies on mergers and acquisitions abroad, in the last four decades, and several theories have been proposed and tested for empirical validation. Researchers have studied the economic impact of mergers and acquisitions on

- ◆ industry consolidation,
- ◆ returns to shareholders following mergers and acquisitions and
- ◆ The post-merger performance of companies.

Mantravadi and Reddy, (2008) states whether or not a merged company achieves the expected performance is the critical question that has been examined by most researchers. Several measures have been postulated for analyzing the success of mergers. A number of studies were done in developed capital markets of Europe, Australia, and the USA, on evaluation of corporate financial performance following mergers

Caruso and Palmucci, (2008), performs an event study on mergers and acquisitions between publicly listed Italian banks. The study shows that previous literature may have only partially captured the market reaction by choosing the announcement date as the event date. In less efficient markets that date is not sufficiently accurate to capture all the market reaction because of the leakage of information. Using the rumors date instead, they find that in our sample the overall market value creation can even become from negative to positive. Moreover, they also find evidence that in Italy private benefits are more likely to drive the bidders' decisions rather than value creation goals.

Mathew, Hartzell and Rosenberg, (2003), studied the qualitative factor of CEO turnover which effect the price movement. In this paper “The impact of CEO Turnover on Equity volatility” investigates an important consequence of a CEO turnover on equity volatility. The paper develops three hypotheses about how changes in CEO might affect stock price volatility, and test these hypotheses using a sample of 872 CEO turnovers over the 1979-95 periods. According to the study Volatility increases following a CEO turnover, even when the CEO leaves voluntarily and is replaced by someone from inside the firm.

Gorton, Kahl and Rosen, (2005), concluded that mergers occur in waves and the reasons behind it can be traced to 2 scenarios. The first scenario is, only profitable acquisitions occur and the second scenario is that unprofitable acquisitions that pre-empt some profitable acquisitions occur. .

Which scenario arises depend on the incentives of the managers to make defensive acquisitions. If managers are less interested in remaining independent (and gaining the associated private benefits) than in maximizing shareholder value (because their compensation depends on it), there is no defensive merger pressure.

Shleife and Vishny, (2001), focus on M&A based on stock market mi-valuations of the combining firms. The main idea of the paper is the relative valuations of the merging firms and the market's perception of the synergies from the combination. The paper explains who acquires whom, the choice of the medium of payment, the valuation consequences of mergers and merger waves.

Duso, Gugler, and Yurtoglu, (2007), used a sample of 167 mergers during the period 1990-2002 involving 544 firms either as merging firms or competitors, he presented a contrast a measure of the merger's profitability based on event studies with one based on accounting data. They find positive and significant correlations between them when using a long window around the announcement date.

Mylonidis and Kelnikola, (2005), assesses the overall financial performance and value implications of recent mergers and acquisitions in the Greek banking system. The operating performance (OP) methodology is based on accounting data and observes the pre- and post-merger financial performance of banks. The event study approach utilizes stock returns of acquiring and target banks around the announcement date of the merger to determine the presence of abnormal returns. Consistent with the international literature, OP results do not provide much evidence of performance gains resulting from bank mergers. Nevertheless, merged banks seem to outperform the group of non-merging banks. The event study approach indicates that mergers create value on a net aggregate basis.

2.2. Research on post-merger performance in India:

The research on post-merger performance following mergers and acquisitions in India thus far has been limited.

Agrawal and Jaffe, (2000), state that long run performance is negative following mergers, though performance is non-negative and perhaps even positive following tender offers.

There may be several explanations for such under performance following a merger like

- 1) Speed and price adjustment
- 2) Short-run focus on EPS
- 3) Method of payment
- 4) Estimating performance

Two explanations of underperformance (speed of price adjustment and short-term EPS focus) are not supported by the data, while two other explanations (Method of payment and Estimating performance) received greater support.

Kropf and Viswanathan, (2004), state that private information on acquiring and target firms leads to increased stock merger activity that is correlated with market valuation. Managers of bidding firms have private information about the stand-alone value of their firms and the potential value of merging with a target firm. Both bidders and targets have market values that may not reflect the true value of their companies which leads to mergers and acquisitions. The target has limited information about the components of the misevaluation, and therefore has difficulty in assessing the synergies. The rational target knows whether their own firm is overvalued or undervalued, so they are not easily fooled, but they cannot determine whether this misevaluation is a market effect, a sector effect, or a firm effect.

Vijh and Yang, (2007), compared the acquisition performance of S&P 500 and non S&P 500 firms after controlling for differences in the firm characteristics. During 1980-2004, S&P 500 firms made a greater number and dollar value of acquisitions.

- 1) They more often used cash payment and tender offers
- 2) The market reacted less negatively (more favorably) to the announcement of their acquisitions.
- 3) They were more likely to complete their deals.

The target shareholders seemed to attach incremental value to joining with an S&P 500 firm and accepted a lower premium in stock deals. The S&P 500 acquirers also had stronger pre-acquisition operating performance, chose targets with stronger pre-acquisition performance, and realized significant gains in post-acquisition

performance. We interpret the combined evidence as consistent with the efficiency hypotheses, which suggests that S&P 500 firms are more efficiently managed firms and make better acquirers.

Bharat and Wu, (2005), in their paper they studied the changes in volatility and risk of acquirers around M&A and seek to understand the determinants of those changes. We find that there is a strong run-up in volatility and risk beginning four years before the merger. This pre-merger run up is consistent with the hypotheses that M&As are a response to industry shocks. We find that for a period of one year after the merger the average volatility measures continue to increase. Beyond that the systematic volatility and beta began to decline. However, market specific volatility continues to increase for the next two years. The volatility pattern is consistent with the risk of the post-merger integration of the acquirer and the target firms that gets resolved slowly over time. The announcement effect of mergers, the diversification discount, and the long run underperformance of acquirers in M&A transactions. The key insight is that as we understand the volatility and risk dynamics better, we will be able to compute risk adjusted return more accurately.

Zhu, and Malhotra, (2008), examined the short term stock performance of a sample of Indian firms acquiring US firms in the period 1999-2005. The study showed that Indian market reacted positively to the acquisition announcement. The positive return lasted for only three days, after which return became negative. The study used mean adjusted method to calculate abnormal return on and around the announcement. The study also did cross sectional analysis using CAR as the dependent variable and cash, Size, private Vs public & related companies as independent variables. The study concluded the announcement effect in Indian cross border M&A were mainly due to price pressure effect rather than informational effect.

Nagar, (2008), studied the effect of a merger or acquisition by Indian companies on the returns generated to their shareholders. This is done by calculating the abnormal returns that shareholders earn around the time of the merger. It also highlights the M&A scenario in India by evaluating the short term abnormal returns and its significance to the event of merger. He has used Event Study to evaluate the effect of the announcement of the merger on the share price of that company. All calculations are proved statistically to provide robustness to my findings.

Ghosh, Harding and Phani, (2006), analyses the impact of the RBI policy of liberalization facilitating acquisition of private sector banks in India by foreign entities. Portfolios of private sector and nationalized banks posted significant value gains in the days surrounding the announcement. The gains by private sector banks were almost double those of nationalized banks. They further analyze the firm specific abnormal returns using cross-sectional regressions and find a significant relation between firm-specific abnormal returns and factors typically associated with a bank's potential for takeover. These results provide the first empirical support for Stutz's hypothesis that one cause of the valuation gains associated with liberalization is the expected gain from a reduction of agency costs.

3. Objective of the study:

The objective of this paper is to determine whether Mergers and Acquisitions (M&As) create any value for shareholders of the acquiring firm in the Indian banking sector market through Studying the stock price impact of M&A transactions on both target and acquiring firms through event study methodology (Campbell, Lo and MacKinlay, 2007).

4. Methodology

4.1 Data

4.1.1 Data Collection & description:

The research report has used a sample of 20 mergers and acquisition deals took place in the banking sector of India in the post liberalization period (i.e. after 1991). We measure the abnormal returns for three portfolios of bank stocks:

- ◆ Nationalized banks (7)
- ◆ Private banks and (13)
- ◆ Combined portfolio of all banks (20)

The sample considered for the study confirms following criteria:

- ◆ All the M&A event related to time frame of Jan 1993 to Dec 2010.
- ◆ The acquiring firm is publicly listed in S&P 500 Nifty (for event study).
- ◆ The M&A should take place between two banks.

4.1.2 Market index:

The S&P CNX Nifty is used as the market index. We exclude a firm if it has less than 240 days of data during the estimation period or less than thirty days of data during the event period.

4.2 Models considered - Event study:

The occurrence of economic event has shown to have a considerable impact on the value of the firm to which the event is related to. Considering that the financial markets are efficient, such an impact can be studied.

Efficiency of financial markets signifies that the markets behave rationally and that the effect of the event will be echoed in the company's share price. Thus share prices are used to evaluate the reaction of financial markets, of whether there was a statistically significant change to past occurrence of a given type of an event and the change in return to the shareholders in the period surrounding the announcement of an event (Campbell, Lo and MacKinlay, 2007).

4.2.1. *Abnormal Return: We used Market Model (Ma, Pagan and Chu, 2009):*

The market model assumes that there is a linear relationship between market return and the security price. It tests if M&A as an event can generate abnormal returns for the shareholders. In order to quantify the effects, it calculates abnormal returns i.e., the differences between the actual stock return and a benchmark.

$$AR_{jt} = R_{jt} - E(R_{jt}) \quad (1)$$

Where, AR_{jt} stands for Abnormal Return of stock j at time t , R_{jt} stands for actual return of stock j at time t and $E(R_{jt})$ stands for expected normal return of stock j at time t

To calculate AR_{jt} we first need to estimate the alpha (α) and beta (β) coefficient for individuals stocks (j) based on market model.

$$R_{jt} = \alpha_j + \beta_j * R_{Mt} + \varepsilon_{jt} \quad (2)$$

Where the estimation period is event days (-30, -240). Based on the alpha (α_j) and beta (β_j) estimated obtained from equation 2, the expected return during the event window period (-15, +15) of the acquiring firms are calculated below:

$$E(R_{jt}) = \alpha_j + \beta_j(R_{Mt})$$

Where, $E(R_{jt})$ stands for expected return of stock j during event window (-15, +15), α_j is for intercept of stock return and market return during the estimation window (-30, -240 days), β_j stands for coefficient of stock return and market return during the estimation window (-30, -240 days) and R_{Mt} = market return during event window (-15, +15).

4.2.2 *Event Date:*

The date on which the company announces the merger is the event date. This date can be any day of the week. The event date has been extracted from the company press release.

4.2.3 *p Date:*

Trade day is the trading day of the stock after the announcement date. The event date and trading day will be same, if the occurrence of the event is announced during the market hours of the trading sessions (i.e. between 10 am to 4 pm IST). If the event is announced after the trading hours (i.e. after 4 pm IST) the trade date will be the next immediate trading day.

4.2.4 *Estimating event window:*

The length of the window has not been clearly defined in any of the research papers (studied above). A period of 15 days preceding and following the event day (i.e., -15, +15) has been taken for the study period. Also, a combination of window size has been computed to see the change in the AAR.

4.2.5. *Evaluating Estimation Period:*

Estimation period is the period where we measure the relationship between the stock and the variables. Here the estimation period has been selected in such a way that it does not overlap with the event window to prevent the effect of the event to influence the "normal" performance of the stock. Considering this fact the estimation period for the project is taken as (Day -30 to -240).

4.3 *Statistical Tests:*

The abnormal returns calculated show that there are gains to the shareholder specific to the event of merger. However, the impact of the merger on these abnormal returns needs to be statistically proven to be significant. Thereby, the relevant test statistic is conducted for each time period in the event window. If it is proved different, then the acquiring firm's shareholders do realize abnormal returns at the time of announcement of M&A. This is done using.

4.3.1. A Simple One-Sample T-Test:

It verifies whether the abnormal return is statistically different from zero or not [Ma, Pagan and Chu, (2009) & Nagar, (2008)]. It compares the mean of a sample to a hypothesized value of the population (Siougle, Spyrou and Tsekrikos, 2010). This value is generally the mean of the population. The one-sample t-test assumes that the dependant variable is normally distributed (Siougle, Spyrou and Tsekrikos, 2010). In the study, the sample is the event window (D -15 to D +15) while the population is considered as the estimation window (-240 to -30). Since the population mean is 0.00, the sample mean, in my study is compared to zero. The null hypothesis, thus, is

H_0 : Average Abnormal Return (AAR) of the event window is equal to the Average Abnormal Return (AAR) of the estimation window (i.e. = 0)

H_1 : Average Abnormal Return (AAR) of the event window is not equal to the Average Abnormal Return (AAR) of the estimation window)

4.3.2. Paired Sample T Test:

It checks if there was any significant change in abnormal return before and after the announcement of the M&A event. The hypotheses for the test is stated below (Bhaumik and Selarka, 2008).

H_0 : There is no significant difference in abnormal return due to the occurrence of the event.

H_1 : There is a significant difference in abnormal return due to the occurrence of the event

4.3.3. Wilcoxon Signed-Ranks Test:

It is the non-parametric version of a paired samples t-test. It is used when the difference between the two variables is interval and normally distributed. Here it is used to find the significance of the share price increase or decrease. It analyses the difference between the paired observations, taking into account the magnitude of the differences (Kang, Kim and Ahn, 2001). In this study the magnitude of difference is defined as greater than 0 (for a price increase) and less than 0 (for a decrease in price). Thus we analyze the abnormal returns with an observation of 0. This will give the significance of all the Positive Values that have been calculated in the study.

4.4 Tools:

➤ **SPSS 16.0:** All statistical calculations are done using SPSS software version 16.0.

➤ **Excel:** Calculations of AAR, CAAR are done using Excel.

5. Findings & Conclusion:

5.1 Return during Estimation Period:

To estimate the value of normal return of a security (j), we regress the security returns against the returns on market index. The alpha and beta has been calculated during estimation period (-30 to -240 days). The normal return is given by the relation:

$$R_{j,t} = \alpha_j + \beta_j * R_{m,t}$$

$R_{j,t}$ denotes the normal return on the jth stock in the period t. (-15, +15 event window)

$R_{m,t}$ denotes the normal return on the market in the period t (-15, +15 event window)

α_j denotes the regression constant (calculated in the -30, -240 event window)

β_j denotes the slope of the characteristic line (calculated in the -30, -240 event window)

Return	Relationship between the stock return ($r_{j,t}$) and the market return ($r_{m,t}$)
$r_{Sbi,t}$	$.079 + 1.277 r_{m,t}$
$r_{obe1,t}$	$.052 + 0.941 r_{m,t}$
$r_{bob1,t}$	$-.170 + .971 r_{m,t}$
$r_{hdfc,t}$	$.502 + 0.722 r_{m,t}$
$r_{icici1,t}$	$.086 + 0.721 r_{m,t}$
$r_{bob2,t}$	$-.029 + .508 r_{m,t}$
$r_{pnb,t}$	$.439 + 0.898 r_{m,t}$
$r_{bob3,t}$	$.047 + 1.240 r_{m,t}$
$r_{obe2,t}$	$.113 + 1.164 r_{m,t}$
$r_{fed,t}$	$-.047 + .594 r_{m,t}$
$r_{job,t}$	$-.033 + .897 r_{m,t}$
$r_{icici2,t}$	$.149 + 0.690 r_{m,t}$

Analysis:

The alpha and beta values have been calculated by running OLS regression model.

5.2 Average Abnormal Returns (AARs):

5.2.1 Total Sample:

The result (figure 4) shows that AAR at day 0 i.e. on announcement date has been increased. The acquirer bank gain on an average 0.35% return, to check the significance of this AAR; a T-Test was performed (at 99%, 95% and 90% confidence level) on a sample of 22 banks (both public and private). From the table 1 (below) we see that the abnormal return at day T was insignificant at all the confidence level (99%, 95% and 90%) used for the study.

The sample also shows a polynomial trend of AAR during the event window. From the table 1 below, we see that an investor can earn a maximum AAR of 2.81% on T+3 day which is statistically proved (table 1) significant at 95% confidence level.

Hence, we can conclude that there is some abnormal return to the investors due to merger as an event.

Statistical Test:

Table 1: One Sample T-Test of Total Sample.

Periods	AAR	STD	STD error	T-value	P-value	sig
T-15	0.38	3.374	0.974	0.388	0.713	IS
T-14	-0.34	3.042	0.878	-0.383	0.743	IS
T-13	0.26	2.279	0.658	0.396	0.799	IS
T-12	0.42	2.831	0.817	0.516	0.681	IS
T-11	-1.33	3.248	0.938	-1.415	0.211	IS
T-10	0.39	1.624	0.469	0.838	0.702	IS
T-9	0.94	2.448	0.707	1.335	0.366	IS
T-8	-0.16	3.251	0.939	-0.170	0.876	IS
T-7	2.25	2.369	0.684	3.296	0.046	S**
T-6	1.44	5.597	1.616	0.891	0.178	IS
T-5	-1.10	3.595	1.038	-1.059	0.295	IS
T-4	-1.82	3.446	0.995	-1.833	0.095	S***
T-3	1.06	3.871	1.117	0.948	0.312	IS
T-2	-0.52	1.773	0.512	-1.010	0.615	IS
T-1	-0.53	2.928	0.845	-0.629	0.606	IS
T	0.35	1.882	0.543	0.651	0.730	IS
T+1	0.90	3.827	1.105	0.819	0.385	IS
T+2	-0.84	2.445	0.706	-1.189	0.419	IS
T+3	2.81	4.825	1.393	2.021	0.017	S**
T+4	0.84	3.428	0.990	0.850	0.418	IS
T+5	-0.64	2.905	0.839	-0.764	0.535	IS
T+6	-1.15	1.840	0.531	-2.173	0.273	IS
T+7	-0.16	4.109	1.186	-0.134	0.877	IS
T+8	-1.65	2.402	0.694	-2.376	0.128	IS
T+9	0.35	1.982	0.572	0.611	0.733	IS
T+10	0.99	3.534	1.020	0.969	0.344	IS
T+11	0.62	2.438	0.704	0.883	0.547	IS
T+12	-0.08	2.301	0.664	-0.124	0.936	IS
T+13	1.78	3.076	0.888	2.010	0.102	IS
T+14	0.13	1.665	0.481	0.276	0.897	IS
T+15	0.81	2.126	0.614	1.314	0.437	IS

5.2.2 Public sector banks:

The result shows that AAR at day 0 i.e. on announcement date has been increased. The acquirer bank on an average gains 0.92%, but statistically it is insignificant.

On day T+13 shareholders earn a maximum return of 2.32% which is also significant at 90% confidence level.

The sample also shows a polynomial trend of AAR during the event window. From the table 2 below, we can see that the AAR is rising after merger event creating a small positive Abnormal Return for the shareholders of the acquiring banks.

Statistical Test:

Table 2: One Sample T-Tests of Public Sector Banks:

Periods	AAR	STD	STD error	T-value	P-value	Sig
T-15	0.41	3.409	1.288	0.317	0.697	IS
T-14	0.10	3.358	1.269	0.082	0.920	IS
T-13	-0.18	2.225	0.841	-0.208	0.867	IS
T-12	-0.23	3.202	1.210	-0.186	0.829	IS
T-11	-0.01	2.170	0.820	-0.017	0.989	IS

T-10	0.20	1.158	0.438	0.446	0.852	IS
T-9	-0.38	1.411	0.533	-0.718	0.715	IS
T-8	-0.39	3.896	1.472	-0.263	0.712	IS
T-7	2.33	2.747	1.038	2.241	0.059	S***
T-6	0.84	1.625	0.614	1.375	0.431	IS
T-5	-0.30	4.074	1.540	-0.195	0.774	IS
T-4	-1.95	3.745	1.415	-1.381	0.098	S***
T-3	1.76	4.461	1.686	1.046	0.128	IS
T-2	0.22	1.216	0.460	0.471	0.836	IS
T-1	-0.52	2.585	0.977	-0.536	0.619	IS
T	0.92	1.266	0.479	1.928	0.392	IS
T+1	-0.02	1.791	0.677	-0.032	0.984	IS
T+2	0.12	2.855	1.079	0.112	0.907	IS
T+3	0.35	3.323	1.256	0.276	0.741	IS
T+4	0.42	1.143	0.432	0.977	0.688	IS
T+5	-0.73	2.928	1.107	-0.659	0.493	IS
T+6	-0.64	1.862	0.704	-0.906	0.547	IS
T+7	-0.77	3.107	1.174	-0.652	0.473	IS
T+8	-1.11	1.640	0.620	-1.787	0.310	IS
T+9	0.87	2.029	0.767	1.134	0.418	IS
T+10	-0.33	3.477	1.314	-0.250	0.753	IS
T+11	-0.19	2.397	0.906	-0.207	0.857	IS
T+12	0.26	1.726	0.652	0.403	0.801	IS
T+13	2.32	3.620	1.368	1.694	0.060	S***
T+14	-0.32	1.628	0.615	-0.526	0.757	IS
T+15	0.50	1.669	0.631	0.795	0.634	IS

5.2.3 Private sector banks:

The result shows that AAR at day 0 i.e. on announcement date has been increased, but statistically it is insignificant. On day 3 shareholders earn a maximum return of 6.27% which is significant at 99% confidence level.

The sample also shows an increasing polynomial trend of AAR during the event window. From the table 3 below, we can see that the AAR is rising after merger event creating a positive Abnormal Return for the shareholders of the acquiring banks and it is also statistically significant in most of the days.

Statistical Test:

Table 3: One Sample T-Tests of Private Sector Banks:

Periods	AAR	STD	STD error	T-value	P-value	Sig
T-15	0.34	3.725	1.666	0.201	0.754	IS
T-14	-0.95	2.779	1.243	-0.767	0.395	IS
T-13	0.87	2.463	1.101	0.791	0.433	IS
T-12	1.33	2.213	0.990	1.342	0.255	IS
T-11	-3.17	3.835	1.715	-1.846	0.034	S**
T-10	0.67	2.254	1.008	0.665	0.539	IS
T-9	2.80	2.471	1.105	2.535	0.049	S**
T-8	0.16	2.467	1.103	0.143	0.882	IS
T-7	2.15	2.023	0.905	2.380	0.098	S***
T-6	2.27	8.983	4.018	0.566	0.085	S***
T-5	-2.22	2.823	1.263	-1.757	0.091	S***
T-4	-1.64	3.400	1.520	-1.079	0.176	IS
T-3	0.07	3.045	1.362	0.054	0.945	IS
T-2	-1.54	2.041	0.913	-1.692	0.197	IS
T-1	-0.54	3.681	1.646	-0.330	0.616	IS
T	-0.44	2.445	1.093	-0.404	0.681	IS
T+1	2.20	5.644	2.524	0.872	0.093	S***
T+2	-2.18	0.577	0.258	-8.468	0.094	S***
T+3	6.27	4.676	2.091	2.998	0.003	S*
T+4	1.43	5.443	2.434	0.587	0.226	IS
T+5	-0.52	3.211	1.436	-0.360	0.632	IS
T+6	-1.88	1.729	0.773	-2.427	0.134	IS
T+7	0.69	5.513	2.466	0.280	0.528	IS
T+8	-2.40	3.258	1.457	-1.650	0.074	S***
T+9	-0.38	1.870	0.836	-0.453	0.724	IS
T+10	2.83	2.987	1.336	2.121	0.047	S**
T+11	1.75	2.231	0.998	1.759	0.154	IS
T+12	-0.57	3.096	1.385	-0.409	0.602	IS
T+13	1.04	2.274	1.017	1.020	0.358	IS
T+14	0.77	1.667	0.746	1.035	0.483	IS
T+15	1.23	2.805	1.254	0.984	0.285	IS

5.2.4 Paired Sample T-Test for Abnormal Return for Total Sample:

To check if there was any significant change in the abnormal return pre and post announcement of the merger & acquisition event, a paired sample T-Test was performed in SPSS 13.0. The hypotheses for the test are stated below:

H₀: There is no significant difference in abnormal return due to the occurrence of the event.

H₁: There is a significant difference in abnormal return due to the occurrence of the event

Pre- Post Cumulative Abnormal Return (CAR) analyses of both public and private banks (total sample-12, Table 4).

Event window	Pre –CAR	Post-CAR	Paired sample T-Test (sig)	Wilcoxon sign rank test (sig)
(-15,+15)	0.09	0.31	0.472	0.480
(-10,+10)	0.20	0.15	0.922	0.875
(-10,+5)	0.20	0.62	0.493	0.583
(-5,+10)	-0.58	0.15	0.219	0.410
(-5,+5)	-0.58	0.62	0.086**	.170
(-2,+2)	-0.52	0.03	0.580	0.583
(-1,+1)	-0.53	0.90	0.420	0.117
(0,+1)	0.35	0.90	0.602	0.638
(0,+5)	0.35	0.62	0.715	.0937

Analysis:

The SPSS Output confirms (parametric) that there is a significant change in the abnormal return in (-5, +5) event window at 90% confidence level. Since the significance value is less than 0.1, it can be concluded the average change in the abnormal return due to the occurrence of the event is 0.86%. Hence we reject the null hypothesis that there is no significant difference in abnormal return due to the occurrence of the event.

5.2.5 Pre- Post Cumulative Abnormal Return (CAR) analyses of Public Sector banks (total sample-7, Table 5).

Event window	Pre –CAR	Post-CAR	Paired sample T-Test (sig)	Wilcoxon sign rank test (sig)
(-15,+15)	0.09	0.31	0.865	1.00
(-10,+10)	0.20	0.15	0.423	0.310
(-10,+5)	0.20	0.62	0.816	0.499
(-5,+10)	-0.58	0.15	0.948	1.00
(-5,+5)	-0.58	0.62	0.765	.933
(-2,+2)	-0.52	0.03	0.809	1.00
(-1,+1)	-0.53	0.90	0.661	0.237
(0,+1)	0.35	0.90	0.267	0.237
(0,+5)	0.35	0.62	0.101	0.091*

Analysis:

The SPSS Output confirms (both parametric and non-parametric) that there is no significant change in the abnormal return in the entire event windows taken for the study at 90% confidence level. Since the significance value is more than 0.1, we accept the null hypothesis that there is no significant difference in abnormal return of the public sector banks due to the occurrence of the event.

5.2.6 Pre- Post Cumulative Abnormal Return (CAR) analyses of Private Sector Banks (Total sample-5, Table 6)

Event window	Pre –CAR	Post-CAR	Paired sample T-Test (sig)	Wilcoxon sign rank test (sig)
(-15,+15)	0.09	0.31	0.167	0.225
(-10,+10)	0.20	0.15	0.736	0.686
(-10,+5)	0.20	0.62	0.329	0.345
(-5,+10)	-0.58	0.15	0.190	0.225
(-5,+5)	-0.58	0.62	0.064**	.080**
(-2,+2)	-0.52	0.03	0.658	0.686
(-1,+1)	-0.53	0.90	0.484	0.225
(0,+1)	0.35	0.90	0.602	0.638
(0,+5)	0.35	0.62	0.219*	0.138*

Analysis:

The SPSS Output confirms (both parametric and non-parametric) that there is a significant change in the abnormal return in (-5, +5) event window at 90% confidence level. Since the significance value is less than 0.1, it can be concluded the average change in the abnormal return due to the occurrence of the event is 0.62%. Hence we reject the null hypothesis that there is no significant difference in abnormal return due to the occurrence of the event. However there is no significant change in the abnormal return in other event windows taken for the study.

5.3. Conclusion:

The one sample T-Test results for all the banks (Public & Private) taken together shows that the abnormal return at day T was insignificant at all three levels of confidence used for the study. We also find that an investor can earn a maximum AAR (Average Abnormal Return) of 2.81% on the T+3 day which is statistically proved significant at 95% confidence level. Hence we conclude that there is some abnormal return to the investors of all banks due to merger as an event. For the same sample when I made the paired sample T-Test and non parametric Wilcoxon Sign Rank Test, I find significant difference on abnormal return (-5, +5), due to the occurrence of the event and reject the null hypothesis that there is no significant difference in abnormal return due to the occurrence of the event.

When the one sample T-Test has been done for only Public sector banks the AAR on the announcement date has been increased but statistically insignificant. On the 7th and 13th date the AAR is positive and statistically significant. On the 13th day the shareholders earn a maximum return of 2.32%, therefore we can see the AAR is rising after the merger event creating a small positive abnormal return for the shareholders of acquiring banks. The paired sample T-Test and Wilcoxon Sign Rank Test has been done for same public sector banks they show that there is no significant change in the abnormal return at 90% confidence level. Therefore we accept the null hypothesis that there is no significant difference in abnormal return for public sector banks due to the occurrence of the merger event.

For only private sector banks there are maximum days (T - 9, T - 7, T - 6, T + 1, T + 3 & T + 10) when the investors could earn positive abnormal returns and statistically significant. On the day T+3, shareholders earned a maximum return of 6.27% which is significant at 99% confidence level. Also we can conclude here that the AAR is rising after merger event creating positive abnormal returns for shareholders of the acquiring private banks for most of the days. We find in the paired sample T-test and Wilcoxon Sign Rank Test for the same sample that there is significant Abnormal return for the (-5, +5) event window, which rejects the null hypothesis that there is no significant difference in abnormal return due to the occurrence of the event.

Therefore We finally conclude that the simple T-Test suggests that there is some abnormal return to all investors and more to private sector bank investors, whereas the Paired Sample T-Test and Wilcoxon Sign Rank Test suggests there is abnormal return for all bank holders and private bank holders but not to the public bank holders.

Based on the results from the event study it can be concluded that the acquirer company's shareholders gain abnormal returns on an average of 0.62% over a period of 5 days (in short run) but there is no significant change in the long run due to merger as an event.

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