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# Effect of Mergers and Acquisitions on Shareholders Wealth: Evidence from Indian Stock Market

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*The global business scenario is undergoing a period of economic slowdown. In this scenario while mergers and acquisitions (M&A) activity in emerging economies like India and China remains a major source of growth, it also involves risk. The present paper examines the impact of mergers and acquisitions on shareholders' value of acquiring companies in Indian Corporate Sector. By using the event study approach, we calculate the impact of media announcement on shareholders wealth during the period 1991-2008. This study also analyzes the pre-merger and post-merger scenario of acquiring companies in terms of their risk-return characteristic. The result of the study indicate that M&A cases in India show insignificant impact on return for acquiring firms but it has significant impact in terms of risk characteristic.*

*Key Words: Mergers and Acquisitions, Corporate Performance, India, Event Study, Risk-Return Characteristic, Manufacturing Sector, Shareholders Wealth, Indian Stock Market, Emerging Economy*

## INTRODUCTION

Mergers & Acquisitions have been a key strategy to consolidate business. They provide solution to reduce costs, reach global size, take benefit of economies of scale, increase investment in technology for strategic gains, desire to expand business into new areas and improve shareholder value. Yet a good number of mergers and acquisitions fail because of various factors including cultural differences and flawed intentions. Very often companies sign the agreement with the hope of higher capital gains due to synergetic effect of combination of two organizations. This

belief is not always true as conditions in the market and economy often rules the operation and functioning of any company. Due to increased competition and globalization the economic environment has changed in recent years, and in light of this, the challenges a company faces have become larger and more demanding. While M&A activity in emerging economies like India and China remains a major source of growth, it also remains a major source of anxiety for many, who are all too aware of the risks involved. A large number of analysts remain convinced that M&A in emerging market is the best route to growth for companies in developed economies. The outlook in the EU still

looks volatile, with the official line even suggesting the Eurozone region is currently going through a mild recession. The US economy continues to remain subdued. Although indicators suggest things are picking up, organizations in USA are finding little opportunity for organic growth.

As regards India, the growth of M&A is consistent. M&A also determined, to a large extent, the volume of foreign investment in the country during this period. During the first wave (i.e., 1990-95), the corporate houses braced up to face foreign competition with the second wave (i.e., 1995-2000) bringing in even a larger presence of multinational firms through this route (Beena 2000). The third wave of M&As in India (2000-till date) is evident of Indian companies venturing abroad and making acquisitions in developed and developing countries and gaining entry abroad. The relative size of target and acquiring firm has also increased. The size differences between the bidder and target firms influence acquisition performance and large acquisitions would have a greater combination potential (Kitching 1967).

M&A comes in all shapes and sizes, and investors need to consider the complex issues involved in M&A. One of the most important motivation for merger is that the company after merger should improve its performance in terms of its risk and return characteristics. Any kind of agreement based completely on the optimistic stock market condition can also lead to failure as stock market is an uncertain entity. This has become the focus of many researchers and lots of studies are being conducted pertaining to different issues. Yet the literature on the business value of manufacturing firms has largely ignored issues related to event risk - this despite the fact that the tradeoff between risk and return is a central concept in economics and finance.

With this as a background the present study is an attempt to examine whether mergers have an impact on the risk and return position of the merged companies. The aim of this study is to analyze the pre-merger and post-merger scenario of merged

companies in terms of their risk-return characteristic, particularly in relation to Indian organizations in the manufacturing sector. The rest of the paper is organized as follows. Section 2 elaborates the related literature and develops the hypothesis. Section 3 describes the research design. Section 4 discusses the impact of value creation for the merged or acquiring firms before and after merger. Section 5 concludes with a road map for future research.

## LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Extensive research is available in context to M&A. It has been observed that they primarily cover nature of mergers in terms of their management, profitability and efficiency of merging companies, operating and financial synergies, post-merger operating performance of acquiring firms and comparison of pre- and post merger financial ratios in India. Mergers and acquisitions (M&A) represent a prevalent strategy in expanding distribution channels, or entering new markets across most industries. The impact of mergers on the market value of merging firms has been widely discussed in the literature of economics and finance, and numerous studies have examined the impact of merger announcements on the prices of the stocks of the bidding and target firms. Studies indicate that M&A events might actually be value and performance preserving for the firms (Franks, Harris and Titman, 1991; Healy, Palepu and Ruback, 1992). Under the assumption of efficient capital markets that reflect all available information, event studies of M&A announcements indicate that there can be significant loss of wealth of shareholders of predator firms both in the short and in the long runs (Asquith, 1983; Agarwal, Jaffe and Mandelker, 1992). The central results of these studies find support in the research that compares pre- and post- M&A accounting performance of the firms (Ravenscraft and Scherer, 1989). Brown and Warner (1980), Davidson, Dutia and Cheng (1989),

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Mitchell, Pulvino and Stafford (2002) each utilize event study approach to examine stock market reactions to acquisition announcements.

In general, most studies on the short-term returns apply an event-study framework, or residual analysis. Some recorded significant positive gains to the acquiring firms, (Dodd and Ruback, 1977; Asquith et al., 1983; Canina, 2001) due to the effect of merger announcement while others indicated significant negative losses (Dodd, 1980; Asquith, 1983; Sheel and Nagpal, 2000; Hsu and Jang, 2007). Ng and Yuce (2003) examine the merger announcements of Canadian companies between 1994 and 2000 during an exceptional merger boom. The results show that both target companies and the acquirer companies obtain significant positive abnormal returns at this time period. However, in the long run, abnormal returns diminish to become significant and negative for acquiring companies and diminish to be non-significant and positive for target

companies. Duso et al (2006) studied a sample of 167 mergers during the period 1990-2002. The study contrasts a measure of the merger's profitability based on event studies and accounting data. They find positive and significant correlations between them when using a long window around the announcement date and, for rivals, in case of anticompetitive mergers. Few other researchers who studied the concept of abnormal return are depicted in table 1.

Considerable knowledge on M&As concepts has been contributed by scholars but bulk of research has been in the context of U.S and European industries. At this juncture, it is pointed out that it is important to also study industries in context to India. In this paper we find out the impact of mergers and acquisitions on corporate performance in Indian context particularly in relation to manufacturing companies. Studies by Surjit, 2002; Swaminathan, 2002; Arora, 2003 have guided the methodology employed in the paper. Surjit, 2002 carried out an

**Table 1: A Summary of Studies that have used event study methodology to Ascertain Post-merger Performance**

Study	Sample Size	Event	Model	Event Window	Estimation Period
Laabs, J.P. & Schiereck, D., (2010)	230	Takeover announcement	buy-and hold- return and Fama-French-3-Factor model	-20, +20	-250, +250
Gopalswamy, Acharya and Malik (2008)	25	Target and acquiring companies due to merger announcements	Market	-10,+5; -15, +10; -25, +15	Not Available
Gersdorff and Bacon (2007)	20	Market efficiency with respect to M&A announcements	Market	-30 to +30	-181 to +30
Rhe'aume and Bhabra (2008)	2421	Acquisition announcements	Market	-1 to +1	-90 to-30
Capron, Laurence. and Pistre, Nathalie. (2002)	101	Transfers of the target's resources to the acquirer	Market	-20, +1	
Oler, Harrison, and Allen (2008)	2500	Acquisition announcement	buy-and-hold abnormal return (BHAR)	-2 to +2,	
Anand & Singh (2008)	5	Merger announcement	Market	Different Event windows- 1, 2, 5, 10, 15, 20, and 40.	-120, +120

Source: Compiled by Authors



analysis of 20 merging firms to compare the pre and post takeover performance, applying a set of eight financial ratios. He found that profitability and efficiency of merging companies declined in the post takeover period. Swaminathan, 2002 studied the sample of five companies and found that four of the five acquiring firms improved operating and financial synergies (measured through financial ratios). In a recent survey article, Bruner (2002) summarizes the findings of 130 studies conducted during 1971-2001. The results of the studies that focused on short-term returns suggest that target shareholders earn significantly positive abnormal returns and that bidders earn zero risk-adjusted returns. The combined returns of bidders and targets are positive. Arora, 2003 examined the post merger performance of merged companies using the value added metrics of corporate performance such as EVA, MVA and RONW. It is found that there is a gap in theoretical concepts and the research done by scholars and issue of relating returns to the risk factor is limited. Drawing on the existing evidence we thus state our hypotheses as:

1. **H<sub>0</sub>:** Mergers and acquisitions do not create positive and significant abnormal returns for acquiring company shareholders that is **H<sub>0</sub>:  $\mu = 0$ .**
2. **H<sub>0</sub>:** There is no significant difference between the return of the companies before and after the merger that is **H<sub>0</sub>:  $\mu = 0$ .**
3. **H<sub>0</sub>:** There is no significant difference between the risk of the companies before and after the merger that is **H<sub>0</sub>:  $\mu = 0$ .**

## DATA AND METHODOLOGY

### *(a) Sample Selection and Period of Study*

This study began with the universe of all companies which had undergone mergers in India. To meet the objectives of the study, the data was collected for all the companies that are listed on Bombay stock exchange (BSE) and which have merged into another company in the

decade of 1991-2007. Further, the sample is based on mergers, for which the first media announcement date was available. The data on stock prices of the sample for the entire period of study are extracted from CMIE (Centre for Monitoring Indian Economy) database Prowess. The announcement date is identified as the day when the acquiring company first publishes/disclosed information about the merger. This is specified as day zero in the event time of the study. Instances where there has been no media announcement for the mergers and stock prices data for ten or more than ten days was unavailable, are excluded from this study. A total of 49 firms met the above criteria and hence form the final sample in the study.

### *(b) Event study methodology*

Event study methodology (Brown and Warner, 1980 and 1985; MacKinlay, 1997) is used to measure the stock performance and to determine whether the announcement of a merger resulted in abnormal returns for the periods prior to, surrounding, and after an announcement. The traditional market model with value weighted market index (BSE SENSEX) has been used to estimate abnormal return. Bombay Stock Exchange Ltd. (BSE Ltd.) is Asia's first Stock Exchange and one of India's leading exchange groups. To perform an event study the first thing is to determine the event day, the event window and the estimation period.

### *Event Day, Event Window and Estimation Period*

In this study, the first date of media announcement of the merger is taken as event date ( $t=0$ ). The benefits of the merger to acquiring firms are likely to be reflected in stock values around the time when an acquisition programme is initiated (Schipper and Thompson. 1983). For a stronger test of market efficiency, the first news of merger made public is used.

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Seiler (2004) explained that event study is composed of three frames.

- Estimation Window (-240 to -41): The estimation window is also used to determine the normal behaviour of stock's return with respect to market index.
- The Event Window (-40 to +40): The event window often starts a few days before the actual event day. The length of the event window is centered on the announcement and is normally one, three, five, ten, fifteen, twenty-five and forty days. Brown and Warner, 1980 and 1985; Pruitt and Peterson, 1986; Etebari, Horrigan and Landwehr, 1987; MacKinlay, 1997; and McWilliams and Siegel, 1997; estimated cumulative abnormal returns (CAR) in 1-day, 2-day, 5-day, 10-day, 15-day, 20-day, and 40-day window period. This procedure enables to

investigate leakage of the information. These window periods are followed by many studies like by Chan-Lau (2001), Anand and singh (2008), Ramakrishnan (2008).

- Post Event Window (41 to 240): The post event window can be as short as one month and as long as several years depending on the event.

The event window in the research has been taken from -40 days from the date of announcement to 40 days after the date of announcement. The clean period data for the merged company has been taken as 200 days before -40 days window and 200 days after the 40 days window period. The share price data and market index (BSE) has been taken from Prowess 3.1 the database Software developed by CMIE. Table 2 depicts date of announcement of the acquiring companies for the merged companies.

**Table 2: Event Date of Acquiring Companies**

Sr. No.	Company Name	Abbreviation	First Media Announcement Date
1	Ador Welding Ltd.	ADOR	31-Mar-98
2	Balrampur Chini Mills Ltd.	BALRAM	21-May-99
3	Dr. Reddy'S Laboratories Ltd.	REDDY	14-Dec-99
4	Finolex Cables Ltd.	FINOLEX	03-May-99
5	G H C L Ltd.	GHCL	28-Jul-99
6	H B L Power Systems Ltd.	HBL	30-Mar-99
7	Siemens Ltd.	SIEMENS	22-Mar-99
8	Steel Authority Of India Ltd.	SAIL	03-Jan-99
9	Wipro Ltd.	WIPRO	30-Oct-99
10	Zee Entertainment Enterprises Ltd.	ZEE	01-May-99
11	Zenith Computers Ltd.	ZENITH	02-Jul-99
12	Aurobindo Pharma Ltd.	AURO	23-Oct-00
13	Hindustan Organic Chemicals Ltd.	HINDUSTAN	10-Jan-00
14	India Cements Ltd.	INDIACE	16-Dec-00
15	Indian Oil Corpn. Ltd.	IOCL	13-Apr-00
16	National Aluminium Co. Ltd.	NATIONAL	15-Apr-00
17	Raymond Ltd.	RAYMD	03-Aug-00
18	Saregama India Ltd.	SAREGA	18-Apr-00
19	Tata Power Co. Ltd.	TATAPO	09-Jun-00

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Sr. No.	Company Name	Abbreviation	First Media Announcement Date
20	A B B Ltd.	ABB	17-Jul-01
21	Aventis Pharma Ltd.	AVENTIS	13-Oct-01
22	Castrol India Ltd.	CASTROL	21-Sep-01
23	G T L Ltd.	GTL	04-Jan-01
24	Glaxosmithkline Pharmaceuticals Ltd.	GLAXO	24-Feb-01
25	I T C Ltd.	ITC	06-Sep-01
26	Kesoram Industries Ltd.	KESORAM	17-Apr-01
27	Piramal Healthcare Ltd.	PIRAMAL	13-Apr-01
28	Sun Pharmaceutical Inds. Ltd.	SUN	11-Feb-01
29	Tata Tea Ltd.	TATAT	22-Sep-01
30	Voltas Ltd.	VOLTAS	11-Apr-01
31	Apollo Hospitals Enterprise Ltd.	APOLLO	02-Jan-02
32	Excel Industries Ltd.	EXCEL	22-Mar-02
33	Hindalco Industries Ltd.	HIND	18-Jul-02
34	Infomedia 18 Ltd.	INFO	28-Aug-02
35	Pfizer Ltd.	PFIZER	25-Jun-02
36	Wyeth Ltd.	WYETH	10-Jul-02
37	Aarti Industries Ltd.	AARTI	29-Dec-04
38	Aplab Ltd.	APLAB	01-Oct-04
39	Banswara Syntex Ltd.	BANSWARA	14-Dec-04
40	Bharat Petroleum Corpn. Ltd.	BPCL	01-Sep-04
41	D C M Shriram Consolidated Ltd.	DCM	24-Nov-04
42	Hotel Leelaventure Ltd.	LEELA	25-Oct-04
43	Mahanagar Telephone Nigam Ltd.	MTNL	11-Nov-04
44	Tata Coffee Ltd.	TATACO	17-Dec-04
45	Welspun India Ltd.	WELSP	01-Nov-04
46	Strides Arcolab Ltd.	STRIDE	02-Jun-05
47	Punjab Chemicals & Crop Protection Ltd.	PUNJAB	25-Oct-05
48	Matrix Laboratories Ltd.	MATRIX	02-Jun-05
49	Amforge Industries Ltd.	AMFORGE	20-Feb-05

### *Estimating CAR Using the Market Model*

Fama and Miller (1972) market model assumes that all interrelationships among the returns on individual assets arise from a common market factor that affects the return on all assets. Residual analysis essentially tests whether the return to the common

stock of individual firms or groups of firms is greater or less than that predicted by general market relationships between return and risk. Thus, the market model is a statistical model that relates returns for a given security to the return of the market portfolio. The calculation of the impact of an event on a firm requires the calculation of what the



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price of the firm's stock would have been if there had been no event. To do this, and to control for overall market effects, the price of the stock is regressed against a market index. Thereafter, the abnormal return for stock during the event window and the normal return are both calculated. The normal returns ( $R_{jt}$ ) on individual stock  $j$  at time  $t$  are given by regression equation:

$$R_{jt} = \alpha_j + \beta_j * R_{mt} + e_{jt}$$

where,  $R_{mt}$  is the return on the market index for day  $t$ ,  $\beta_j$  measures the ordinary least squares (OLS) estimate of the coefficient in the market model regression,  $\alpha_j$  measures the ordinary least squares (OLS) estimate of the intercept of the market model regression,  $e_{jt}$  is a statistical error.

The daily abnormal (residual) returns ( $AR_{jt}$ ) are estimated for each firm in a 40-day window under the single-factor market model as follows:

$$AR_{jt} = r_{jt} - (\alpha_j + \beta_j * R_{mt})$$

where,  $r_{jt}$  is the actual return for stock  $j$  at time  $t$ .

The daily average abnormal returns ( $AR_t$ ) of merger announcement in a 40-day (-40, +40) window are estimated for merged companies by taking arithmetic average of the residual returns.

$$AR_t = \sum AR_{jt} / N$$

Where,  $AR_t$  = Average abnormal returns of merger announcement,  $N$  = Number of firms in the sample.

The reason for averaging across firms is that stock returns are noisy but the noise tends to cancel out when averaged across a large number of firms. Therefore, more firms in the sample, the better is the ability to distinguish the effect of an event. The cumulative average returns (CAR) of merger announcement in a 40 days window are estimated for merging companies by summation of the average abnormal returns ( $AR_t$ ) in the respective window:

$$CAR_j(t_1, t_2) = \sum_{t=t_1}^t AR_{jt}$$

The null hypothesis that there are no abnormal

returns associated with the merger announcement needs to be statistically tested. This is examined by using t-statistic, given by:

$$t\text{-Statistics of Abnormal Returns} = AR_{jt} / \hat{S}(AR_{jt})$$

Where,  $\hat{S}(AR_{jt})$  = Standard deviation of residual of company  $j$  for the clean period.

$$t\text{-Statistics of Abnormal Returns} = AR_t / \hat{S}(AR_t)$$

Where,  $\hat{S}(AR_t)$  = Standard deviation of average abnormal returns of merged company during clean period.

$$t\text{-Statistics of CAR} = CAR_t / \hat{S}(CAR_t) \sqrt{t}$$

Where,  $t$  = respective window period.

### Statistical Significance of Event Returns

The statistical significance of the daily residual returns of each company ( $r_{jt}$ ), daily average abnormal returns ( $AR_t$ ) of merging and cumulative abnormal return (CAR), has been examined using the t-statistics. If the estimated value of t-statistics is greater than 1.64 but less than 1.96, it is significant at 10 per cent level. If estimated value of t-statistics is greater than 1.96 and less than 2.58, it is significant at 5 per cent level. If its value exceeds 2.58, it is significant at 1 per cent level. In the event of the t-statistics being significant, it implies that there are abnormal returns associated with the merger announcements in India.

### (c) Analyzing risk-return position

Further the present study analyzes the risk-return position of the merged firms. The data of share prices have been collected for two different time periods, namely, before merger and after merger to analyze the effect of merger on risk and return of the selected companies. The said analysis is based on the returns calculated with the help of adjusted closing price of selected companies.

Return is the motivating force that induces the investor to postpone his consumption. In the present study we have calculated continuous

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return. So the return is calculated using log normal of current market price divided by previous day market price of the merged company using following formula:

$$\text{Log Normal } (P_1 / P_0)$$

Returns have been calculated in respect of 49 selected companies on continuous basis using log normal (LN) function of Excel. The total time period is divided into two parts before and after merger. The period has been taken is 200 days before (-) 40th day and 200 days after 40th day is known as estimation window or clean period and post estimation window or clean period. The estimation window or clean period is also used to determine the normal behaviour of stock's return with respect to a market of industry index. This estimation window is used to calculate risk and return of merged companies. The statistical tool to empirically ascertain the effect of merger on average return is t-test. It is used to examine that is the merger really added any wealth to the shareholders.

Risk is calculated by taking the standard deviation of the returns calculated on continuous basis using log normal (LN) function of Microsoft excel. Risk refers to the dispersion of returns around an expected value. The most common statistical measure of risk of an asset is the standard deviation from the mean or expected value of the return. The greater is the  $\sigma$  of returns, the greater the variability or dispersion of returns and greater the risk of the investment. Coefficient of variation is the measure of relative dispersion (risk) or a measure of risk per unit of expected return. It converts standard deviation of expected values into relative value to enable comparison of risks associated with assets having different expected values. The coefficient of variation (CV) is computed by dividing standard deviation ( $\sigma$ ) by the expected value of average return.

$$C V = \sigma / \bar{x}$$

The higher the CV, the larger the relative risk of an asset. As a rule, the coefficient of variation is most

appropriate for comparing asset risk since it considers the relative size of assets. The statistical tool F test is used to examine the risk factor involved in merger for the company and shareholder.

## RESULT OF THE STUDY

### *Comparative analysis of CAR in various windows*

The estimates of cumulative average abnormal returns (CAAR) of the merged companies in the different windows are reported in Table 3.

**Table 3: Cumulative Average Abnormal Return (CAAR) all selected merged firms**

Window	CAAR	Days	t-statistics
CAR 1 DAY WINDOW	0.0125	03	1.5151
CAR 2 DAY WINDOW	0.0154	05	1.4493
CAR 5 DAY WINDOW	0.0229	11	1.4491
CAR 10 DAY WINDOW	0.0125	21	0.5736
CAR 15 DAY WINDOW	-0.0032	31	-0.1195
CAR 25 DAY WINDOW	-0.0503	51	-1.4789
CAR 40 DAY WINDOW	-0.1238	81	-2.8906***
Run up window			
(-1 DAY)	0.0058	01	1.2187
(-2 TO - 1 DAY)	0.0083	02	1.2355
(-5 TO - 1 DAY)	0.0210	05	1.9744**
(-10 TO - 1 DAY)	0.0161	10	1.0714
(-15 TO - 1 DAY)	0.0037	15	0.2010
(-25 to - 1 DAY)	-0.0063	25	-0.2636
(-40 to - 1 DAY)	-0.0338	40	-1.1224
After announcement			
(+1 DAY)	-0.0025	01	-0.5164
(+2 TO + 1 DAY)	-0.0020	02	-0.3029
(+5 TO + 1 DAY)	-0.0073	05	-0.6845
(+10 TO + 1 DAY)	-0.0128	10	-0.8479
(+15 TO 1 + 1 DAY)	-0.0160	15	-0.8690
+25 TO + 1 DAY)	-0.0531	25	-2.2331**
+40 TO + 1 DAY)	-0.0992	40	-3.2949***

\*\*\*denotes Significant at 1per cent level, \*\* denotes Significant at 5 percent,\* denotes Significant at 10 percent



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It is observed that CAAR of forty nine companies is positive but non-significant in one-day (-1, +1), two-day (-2, +2), five-day (-5, +5) and ten-day (-10, +10) event window. The CAAR is registered to be negatively significant in forty-day (-40, +40) event window. During run-up window, before the merger announcement CAAR is registered to be positive and significant in five-day (-5, -1) window. During post merger announcement the CAAR remains negative and insignificant in all run-up windows except twenty- five day (+25, +1) and forty- day (+40, +1) where CAAR is registered to be significantly negative. Therefore it can be said that mergers has not created shareholders wealth.

Comparing the present results to the other studies in the context of acquiring firms, the trend is mixed. Anand & Singh (2008) have studied the effect of five specific mergers in the Indian banking sector on the shareholders wealth. The merger announcement in the study has positive and significant shareholder wealth effect both for bidder and target banks. The market value weighted CAR of the combined bank portfolio as a result of merger announcement is 4.29 per cent in a three day period (-1, 1) window and 9.71 per cent in a 11-day period (-5, 5) event window. Kale, Kini & Ryan (2003) show CAR 1.71 percent for the Indian bidding firms. Schiereck & Oelger (2011) shows significant positive CAR for the event window (-10, +10) of 3.35 percent.

Few of the studies that actually found that the mergers created wealth and are contrary to the present study included the one conducted by Cybo-Ottone & Murgia (2000) in the context of European banking. In fact the results of studies in the European context are contrary with the results of the present study. Most of the event studies on mergers and acquisitions in Europe report minimal or close to zero CARs to acquirers. Martynova and Renneboog (2006) report 0.5% statistically significant positive

CAR for bidders' share price on the announcement day. This result is also supported by the research conducted by Goergen and Renneborg (2003) who find that the share price of the bidding firms in Europe reacts positively with a statistically significant announcement effect of 0.7%. Ng et al., (2010) investigate the valuation effect on acquiring banks during the period of 2004 through 2010 and report positive value effect to the acquiring bank, on average, 0.3% and 0.8% in USA and in Europe, respectively.

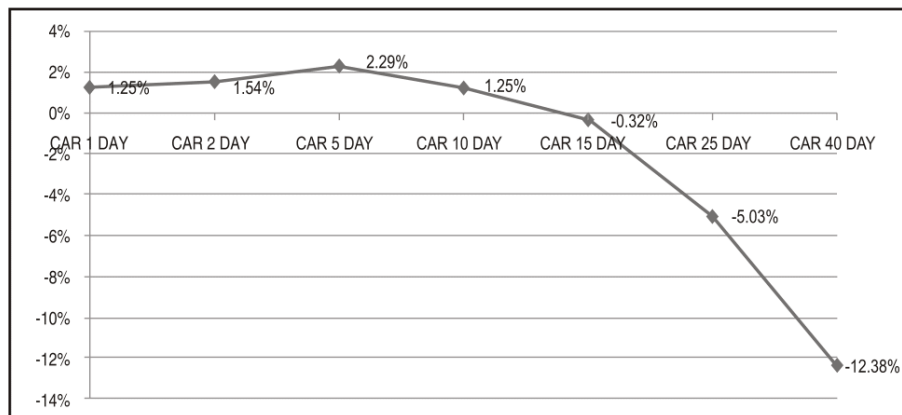
The results of the study that are found consistent with the present study are conducted by Rani, Yadav & Jain (2008). They reported negative CAR for India based mergers. Draper and Krishna (2006) reports that UK bidder shareholder returns drop by a significant amount of 0.4% if a public target announcement is done within the period 1981-2001. Loughran and Vijh (1997) examined the long-term abnormal return and concluded a loss in value seen from the perspective of the acquiring company. Both Agrawal et al. (1992) and Loderer and Martin (1992) also documented negative abnormal performance in relation to the acquiring company concerning the long-term abnormal performance. A graphical presentation of cumulative average abnormal return of all the companies under different event windows is captured in Figure 1.

The CAAR in various run-up windows before and after the merger announcement are depicted in Figure 2 and Figure 3 respectively.

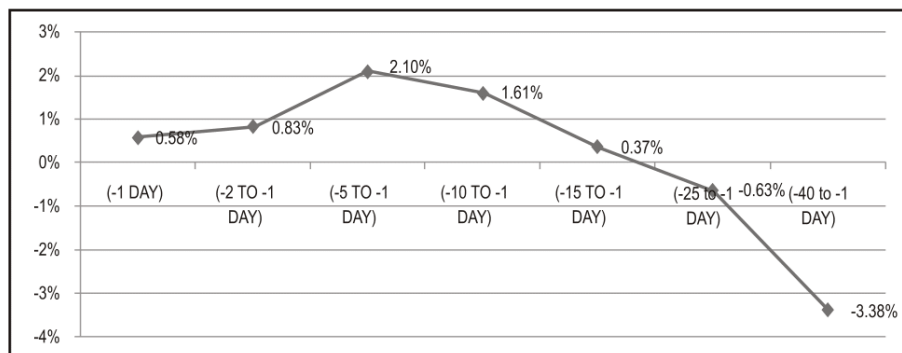
### *Statistical Significance of Cumulative Average Abnormal Returns*

The statistical significance of CAAR in Single factor model is given in Table 4.

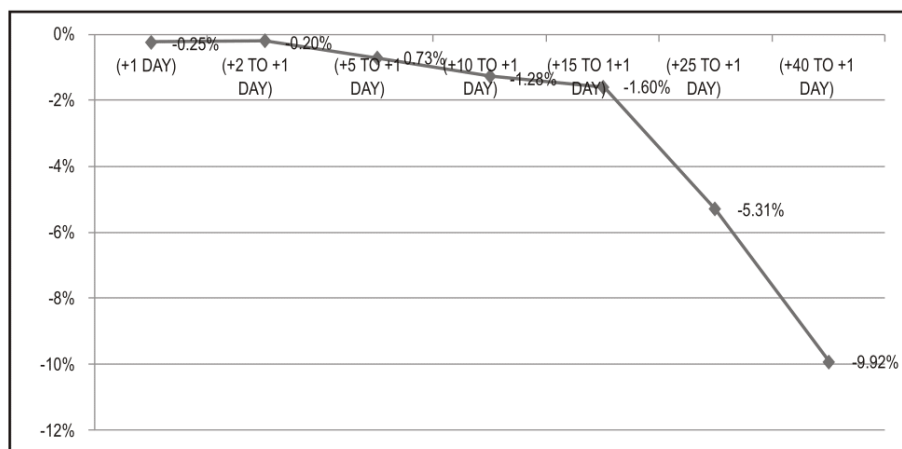
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**Figure 1: CAAR event window**



**Figure 2: CAAR run-up window before merger announcement**



**Figure 3: CAAR run-up window post merger announcement**

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TABLE 4: Statistical significance of cumulative average abnormal returns			
Window	CAAR	%of CAAR	t-statistics
Day before announcement (-1)	0.0058	0.58	1.2187
Day of merger announcement (0)	0.0091	0.91	1.9219*
Day after merger announcement (+1)	-0.0025	0.25	-0.5164
Day before merger announcement to the day of announcement (-1 to 0)	0.0149	1.49	2.2207**
Day before merger announcement to the day after announcement (-1 to +1)	0.0125	1.25	1.5151

\*\*\*denotes Significant at 1per cent level, \*\* denotes Significant at 5 percent,\* denotes Significant at 10 percent

CAAR of all merged companies is positive and significant in short window. One day CAAR before announcement is 0.58 percent that is not statistically significant. On announcement day it is 0.91 percent, which is statistically significant at 10 percent level of significance. One day after merger it is 0.25 percent, which is not statistically significant. CAAR in day before announcement to the day of announcement (-1, 0) is 1.49 percent and significant at 5 percent level. Its value on the day before announcement to the day after announcement (-1, +1) is 1.25 percent that is not statistically significant. In nutshell merger has not created shareholders wealth after merger because CAAR after announcement of merger is positive but not statistically significant.

### Analyzing return

Table 5 and table 6 depict effect of merger on returns and the significance respectively.

It is observed that average return has increased in respect of 25 companies (51%) and in respect of 24 companies (49%) it has decreased. The increase of returns is statistically insignificant. Other 24 companies (49%) have shown decrease in average returns. Only one company Zee Entertainment Enterprises Ltd. has shown a significant increase in expected return after merger. Also two companies, H B L Power Systems Ltd. and Saregama India Ltd. have shown significant decrease at 1 percent level and two companies, Dr. Reddy'S Laboratories Ltd.

and Aurobindo Pharma Ltd. have shown significant decrease at 10 percent level in expected return after merger.

It is observed that 51% companies are giving positive return to the shareholders yet the result is statistically insignificant and 49% companies are giving a negative return which is also statistically insignificant. On the whole merger has no significant effect on return.

### Analyzing Risk

Risk in its simplest form may be stated as the variability of actual return from expected returns associated with a given investment. The greater the variability, the riskier the security (i.e. share) is said to be. The more certain the return from asset, the less is the variability and, therefore, the risk is less. Assessing risk and incorporating the same in the final decision is an integral part of financial analysis. The results related to risk are presented in Table 7 (Standard deviation before and after and their difference) and Table 8 depicts the effect as classified on the basis of significance level of the increased and decreased Standard deviation of the selected companies. It is observed that standard deviation has increased in 45% cases and decreased in 55% cases. Decrease of 74% and 19% companies is significant at 1% and 5% level of significance respectively. Out of increased standard deviation 41% companies are significant at 1% level of significance. REDDY Ltd, GHCL Ltd, SAIL Ltd,



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Wipro Ltd, IOC Ltd, Tata Power Ltd, Castrol Ltd, GTL Ltd, Aplab Ltd, have shown a significant increase in the risk position while HBL Ltd, Hindustan Ltd, National Ltd, Raymond Ltd, Aventis Ltd, Kesoram Ltd, Sun Ltd, TataT Ltd, Voltas Ltd, Apollo Ltd, Excel Ltd, Hind Ltd, Info Ltd, Wyeth Ltd, BPCL Ltd, DCM Ltd, Leela Ltd, Mtnl Ltd, Tataco Ltd, Welsp Ltd have shown a significant decrease in risk position after merger.

Coefficient of variation is the measure of relative dispersion (risk) or a measure of risk per unit of

expected return. It converts standard deviation of expected values into relative value to enable comparison of risks associated with assets having different expected values (Table 9). Coefficient of variation has increased in 41% cases and decreased in 59% cases. On the whole mergers have significant effect on the risk position of the firm. Therefore it can be inferred that after merger there is insignificant effect on the return of merged companies but significant effect on risk position of merged companies.

**Table 5: The Effect of Merger on Return of Selected Companies**

Sr. No.	Co. Name	Average Return before Merger	Average Return after Merger	Increase / Decrease	t-Value	p-Value
1	ADOR	-0.0018	-0.0004	0.0013	-0.3771	0.7063
2	BALRAM	-0.0033	-0.0005	0.0027	-0.7885	0.4309
3	REDDY	0.0060	-0.0002	-0.0062	1.7265	0.0850*
4	FINOLEX	0.0009	0.0019	0.0010	-0.2696	0.7876
5	GHCL	-0.0011	-0.0022	-0.0011	0.3282	0.7430
6	HBL	0.0115	-0.0029	-0.0144	2.6717	0.0079***
7	SIEMENS	-0.0006	0.0030	0.0036	-0.9099	0.3634
8	SAIL	-0.0037	0.0037	0.0074	-1.3013	0.1940
9	WIPRO	0.0053	-0.0013	-0.0066	1.3462	0.1790
10	ZEE	0.0016	0.0098	0.0082	-1.7776	0.0762*
11	ZENITH	0.0049	0.0006	-0.0044	0.7835	0.4338
12	AURO	0.0019	-0.0059	-0.0078	1.8664	0.0627*
13	HINDUSTAN	0.0043	-0.0001	-0.0044	0.6649	0.5065
14	INDIAC	-0.0045	-0.0016	0.0029	-0.7120	0.4769
15	IOCL	-0.0016	-0.0080	-0.0063	0.5139	0.6076
16	NATIONAL	0.0042	0.0014	-0.0028	0.7255	0.4687
17	RAYMD	-0.0010	-0.0006	0.0005	-0.1282	0.8980
18	SAREGA	0.0170	-0.0044	-0.0214	4.2382	0.0000***
19	TATAPO	-0.0011	0.0031	0.0042	-1.1494	0.2511
20	ABB	0.0010	0.0012	0.0002	-0.0840	0.9331
21	AVENTIS	-0.0008	-0.0005	0.0003	-0.1680	0.8667
22	CASTROL	-0.0004	-0.0035	-0.0030	0.7630	0.4461
23	GTL	0.0002	-0.0054	-0.0056	0.7952	0.4270
24	GLAXO	0.0001	-0.0007	-0.0008	0.2981	0.7658
25	ITC	-0.0001	0.0003	0.0004	-0.1939	0.8463

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Sr. No.	Co. Name	Average Return before Merger	Average Return after Merger	Increase / Decrease	t-Value	p-Value
26	KESORAM	0.0046	0.0002	-0.0044	1.3460	0.1793
27	PIRAMAL	-0.0015	0.0002	0.0017	-0.8693	0.3852
28	SUN	-0.0023	0.0010	0.0033	-0.8984	0.3697
29	TATAT	-0.0012	-0.0007	0.0005	-0.1749	0.8612
30	VOLTAS	0.0019	0.0012	-0.0007	0.2763	0.7824
31	APOLLO	-0.0046	-0.0011	0.0035	-0.8705	0.3846
32	EXCEL	-0.0002	0.0005	0.0008	-0.1838	0.8542
33	HIND	-0.0002	0.0013	0.0014	-0.7958	0.4266
34	INFO	0.0022	0.0040	0.0018	-0.4778	0.6331
35	PFIZER	0.0003	-0.0006	-0.0009	0.6142	0.5395
36	WYETH	0.0023	-0.0005	-0.0029	1.3496	0.1779
37	AARTI	0.0008	0.0015	0.0007	-0.2642	0.7918
38	APLAB	0.0003	0.0070	0.0068	-1.5652	0.1184
39	BANSWARA	0.0017	0.0032	0.0015	-0.3990	0.6901
40	BPCL	0.0005	0.0001	-0.0004	0.1532	0.8784
41	DCM	0.0017	0.0040	0.0023	-0.6701	0.5032
42	LEELA	0.0018	0.0026	0.0008	-0.2290	0.8190
43	MTNL	0.0000	-0.0010	-0.0010	0.3878	0.6984
44	TATACO	-0.0001	-0.0003	-0.0002	0.0703	0.9440
45	WELSP	0.0018	-0.0001	-0.0020	0.6557	0.5124
46	STRIDE	0.0026	-0.0001	-0.0027	0.9085	0.3642
47	PUNJAB	0.0017	-0.0009	-0.0026	0.7191	0.4725
48	MATRIX	0.0013	0.0007	-0.0006	0.2219	0.8245
49	AMFORGE	0.0006	0.0026	0.0021	-0.5642	0.5730

\*\*\*denotes Significant at 1per cent level, \*\* denotes Significant at 5 percent, \* denotes Significant at 10 percent

Table 6: Classification on The Basis of Significance Level of Increased and Decreased Expected Return of Companies				
Level of Significance	Companies indicating an increase in Expected Returns		Companies indicating a decrease in Expected Returns	
	Number of Companies	In percentage terms	Number of Companies	In percentage terms
1%	-	-	2	8
5%	-	-	-	-
10%	1	4	2	8
More than 10%	24	96	20	84
Total	25	100	24	100

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<b>Table 7: F-Test for Analyzing Risk Position of Merged Companies</b>						
Sr. No.	Company's Name	Standard Deviation Before	Standard Deviation After	Increase/ Decrease in $\sigma$	f Value	p Value
1	ADOR	0.0006	0.0006	0.0000	0.9477	0.3527
2	BALRAM	0.0005	0.0007	0.0002	0.7496	0.0213**
3	REDDY	0.0005	0.0008	0.0002	0.6857	0.0040***
4	FINOLEX	0.0006	0.0006	0.0000	1.0529	0.3582
5	GHCL	0.0004	0.0006	0.0002	0.6140	0.0003***
6	HBL	0.0020	0.0009	-0.0011	2.1962	0.0000***
7	SIEMENS	0.0008	0.0008	0.0000	1.0128	0.4642
8	SAIL	0.0011	0.0022	0.0011	0.5028	0.0000***
9	WIPRO	0.0006	0.0018	0.0013	0.3197	0.0000***
10	ZEE	0.0010	0.0012	0.0002	0.8267	0.0902*
11	ZENITH	0.0015	0.0016	0.0001	0.9212	0.2816
12	AURO	0.0010	0.0007	-0.0003	1.3902	0.0103**
13	HINDUSTAN	0.0028	0.0016	-0.0013	1.7972	0.0000***
14	INDIAC	0.0008	0.0009	0.0001	0.9311	0.3077
15	IOCL	0.0005	0.0147	0.0142	0.0327	0.0000***
16	NATIONAL	0.0010	0.0004	-0.0006	2.4160	0.0000***
17	RAYMD	0.0009	0.0004	-0.0005	2.2901	0.0000***
18	SAREGA	0.0015	0.0010	-0.0005	1.4415	0.0051**
19	TATAPO	0.0005	0.0008	0.0003	0.5889	0.0001***
20	ABB	0.0003	0.0003	-0.0001	1.1952	0.1047
21	AVENTIS	0.0002	0.0001	-0.0001	1.5223	0.0016***
22	CASTROL	0.0003	0.0013	0.0010	0.2451	0.0000***
23	GTL	0.0019	0.0031	0.0012	0.6038	0.0002***
24	GLAXO	0.0003	0.0003	-0.0001	1.1745	0.1287
25	ITC	0.0002	0.0002	-0.0001	1.3795	0.0119**
26	KESORAM	0.0008	0.0003	-0.0005	3.0544	0.0000***
27	PIRAMAL	0.0002	0.0002	0.0000	1.2235	0.0779*
28	SUN	0.0011	0.0003	-0.0008	3.7559	0.0000***
29	TATAT	0.0006	0.0002	-0.0003	2.3054	0.0000***
30	VOLTAS	0.0004	0.0003	-0.0001	1.5233	0.0016***
31	APOLLO	0.0011	0.0005	-0.0006	2.2464	0.0000***
32	EXCEL	0.0010	0.0007	-0.0004	1.5235	0.0016***
33	HIND	0.0002	0.0001	-0.0001	2.3518	0.0000***
34	INFO	0.0009	0.0006	-0.0004	1.6732	0.0002***
35	PFIZER	0.0001	0.0001	0.0000	0.9264	0.2950



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Sr. No.	Company's Name	Standard Deviation Before	Standard Deviation After	Increase/ Decrease in $\sigma$	f Value	p Value
36	WYETH	0.0003	0.0002	-0.0001	1.4528	0.0044***
37	AARTI	0.0004	0.0004	0.0000	1.0217	0.4399
38	APLAB	0.0007	0.0012	0.0005	0.5806	0.0001***
39	BANSWARA	0.0007	0.0007	0.0000	1.0070	0.4803
40	BPCL	0.0005	0.0002	-0.0003	2.4589	0.0000***
41	DCM	0.0008	0.0004	-0.0004	2.2198	0.0000***
42	LEELA	0.0009	0.0003	-0.0006	3.1307	0.0000***
43	MTNL	0.0005	0.0002	-0.0003	2.7352	0.0000***
44	TATACO	0.0004	0.0003	-0.0001	1.4833	0.0028***
45	WELSP	0.0007	0.0002	-0.0004	2.7765	0.0000***
46	STRIDE	0.0004	0.0004	0.0000	0.9781	0.4379
47	PUNJAB	0.0005	0.0008	0.0002	0.6964	0.0055**
48	MATRIX	0.0004	0.0003	-0.0001	1.4253	0.0064**
49	AMFORGE	0.0008	0.0006	-0.0002	1.3392	0.0200**

\*\*\*denotes Significant at 1per cent level, \*\* denotes Significant at 5 percent,\* denotes Significant at 10 percent

<b>Table 8: Classification on The Basis of Significance Level of Increased and Decreased Standard Deviation of Companies</b>				
Level of Significance	Companies indicating an increase in Standard deviation		Companies indicating a decrease in Standard deviation	
	Number of Companies	In percentage terms	Number of Companies	In percentage terms
1%	9	41	20	74
5%	2	9	5	19
10%	2	9	0	0
More than 10%	9	41	2	7
Total	22	100	27	100

<b>Table 9: The Effect of Merger on Risk Based On Coefficient of Variation</b>				
Sr.No.	Company Name	Coefficient of Variation Before merger	Coefficient of Variation after merger	Increase/decrease in Coefficient of Variation
1	ADOR	-34.5873	-148.8185	-114.2312
2	BALRAM	-15.5079	-123.1341	-107.6261
3	REDDY	8.8114	-351.9027	-360.7141
4	FINOLEX	69.5863	32.5924	-36.9939
5	GHCL	-34.7202	-29.2661	5.4542
6	HBL	17.4455	-31.2450	-48.6905
7	SIEMENS	-141.2711	25.4880	166.7591
8	SAIL	-29.5954	57.8404	87.4358

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Sr.No.	Company Name	Coefficient of Variation Before merger	Coefficient of Variation after merger	Increase/decrease in Coefficient of Variation
9	WIPRO	11.1403	-136.5159	-147.6563
10	ZEE	59.7954	11.8216	-47.9738
11	ZENITH	30.2705	287.6078	257.3374
12	AURO	53.4486	-12.4521	-65.9007
13	HINDUSTAN	65.0293	-2501.6297	-2566.6590
14	INDIAC	-17.7475	-53.4019	-35.6544
15	IOCL	-29.3063	-184.1182	-154.8120
16	NATIONAL	24.9170	30.8729	5.9558
17	RAYMD	-83.9631	-65.3664	18.5967
18	SAREGA	8.8950	-23.5820	-32.4770
19	TATAPO	-43.4282	27.3278	70.7560
20	ABB	31.2416	21.8033	-9.4383
21	AVENTIS	-25.4053	-26.6683	-1.2630
22	CASTROL	-69.6691	-36.5468	33.1223
23	GTL	911.7627	-57.7468	-969.5095
24	GLAXO	574.3364	-42.4201	-616.7564
25	ITC	-166.1075	71.0227	237.1303
26	KESORAM	17.6326	154.8270	137.1943
27	PIRAMAL	-13.9086	102.9794	116.8880
28	SUN	-47.3960	27.5708	74.9668
29	TATAT	-46.6536	-34.4577	12.1960
30	VOLTAS	22.2203	23.6266	1.4063
31	APOLLO	-23.7182	-42.3468	-18.6286
32	EXCEL	-471.3193	125.4816	596.8009
33	HIND	-118.9065	7.8770	126.7835
34	INFO	43.0934	13.8857	-29.2077
35	PFIZER	36.5573	-19.1370	-55.6942
36	WYETH	11.3402	-34.9100	-46.2502
37	AARTI	46.9824	23.9195	-23.0630
38	APLAB	271.5054	16.8797	-254.6258
39	BANSWARA	42.5154	22.2229	-20.2925
40	BPCL	92.3779	147.2759	54.8980
41	DCM	45.0615	8.8337	-36.2278
42	LEELA	53.6269	11.7425	-41.8843
43	MTNL	-1152.3293	-16.9219	1135.4074
44	TATACO	-304.5905	-84.7121	219.8785
45	WELSP	35.9167	-169.6415	-205.5583
46	STRIDE	16.5340	-592.3192	-608.8532
47	PUNJAB	32.0558	-83.7636	-115.8194
48	MATRIX	33.5057	43.5119	10.0062
49	AMFORGE	134.5753	21.7901	-112.7851

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### CONCLUSION

This paper analyzes the impact of merger announcement on shareholders' value of merged company in Indian Corporate Sector organizations. From the foregoing analysis it is clear that 82

percent of the sample companies are creating negative CAR. CAAR of all merged companies is negative and insignificant post the merger announcement. Merger has not created shareholders wealth after merger because CAAR after announcement of merger is negative and statistically insignificant. Also, in terms of return merger has not significant impact although there is significant effect on risk position of acquiring companies. The findings of the present study are contrary to most of the cases of European mergers and acquisitions. Despite some success stories of merger, based on findings of this study it cannot be inferred that merger action could improve the ability to accomplish the twin task of higher returns and reduced risk.

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### BIOGRAPHIES

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