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Run-up in Stock Prices Prior to Merger & Acquisitions Announcements: Evidence from India

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Abstract

Based on the monthly returns data of 145 mergers and 131 acquisitions that took place in India between 1998 and 2010, the authors find that mostly poor performing companies go for mergers and acquisitions. Before acquisition, the acquiring companies generated about 1.33% lower returns per month compared to a group of benchmark companies that share the same risk parameters as the acquiring companies.

However, their financial performance improved substantially after the merger. These companies generated more than 0.5% excess returns per month compared to the returns generated by these benchmark companies. This shows that the Indian acquiring companies have been able to realize synergy from the mergers.

JEL Classification: G34

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1 Introduction

The effect of mergers and acquisitions (M&A) on the shareholders' wealth has been extensively studied in the finance and strategy literature. While most researchers agree that the shareholders of the target companies generally benefitted immensely from a merger (Jensen and Ruback, 1983; Betton et al., 2008), no consensus exists about the benefits that the shareholders of the acquiring companies obtained from such transactions. While most agree that the shareholders of the acquiring companies did not lose out in the transactions (Jensen and Ruback, 1983; Bruner, 2002, 2004; Healy et al., 1997; Haleblian et al., 2009), there are a few who disagree. For example, Moeller et al. (2005) and Mantecon (2009) reported significant value loss to the shareholders of the acquiring companies.

It is possible that the management teams of the acquiring companies were affected by hubris and overstated the benefits from the mergers and acquisitions (Roll, 1986). It is also possible that prior studies underestimated the true benefits of mergers and acquisitions to the shareholders of the acquiring companies. Most of the studies used the event study methodology[1] to estimate the benefits to the shareholders. However, one faces the standard 'joint hypothesis testing' problem (Jensen and Ruback, 1983) in event studies. If the normal returns are not obtained correctly, the abnormal returns cannot be estimated correctly.

For instance, if large companies with negative exposure to size risk premium (Fama and French, 1993) make acquisitions and the return-generating equation does not explicitly adjust for size risk, then the normal returns would be overestimated and the abnormal returns of the large acquirers would be underestimated. If the event being analysed led to a decrease (increase) in leverage and if we used the pre-event period to estimate the event study parameters, then we would be more likely to underestimate (overestimate) the abnormal returns of the acquiring companies (Eckbo, 1986; Mikkelson and Partch, 1986). If the stocks of the acquirers were overvalued (Rhodes-Kropf et al., 2005) and the management of such companies used this overvalued equity, the market may react negatively (Myers and Majluf, 1984). Stock prices capture the cumulative reaction to the likely synergy present in the merger and to the fact that the management of the company (with presumably better information about the stocks) believes the stocks to be overvalued.

If the market has already anticipated the event or if insiders already knew of the transaction before it was actually announced, then the excess returns that are observed just around the event announcement may not capture the actual effect of the event. The stock prices of the acquiring companies, for example, were found to increase at least three weeks before the actual announcement of the merger (Asquith et al., 1983; Schwert, 1996). Since most event studies ignore this run-up in stock prices prior to the event, they actually underestimate the effect of the acquisition on the shareholders' wealth.

[1] See Betton et al. (2008) and Bruner (2004) for a review.

Our objective in this paper is two-fold. We first examined whether there was any run-up in the stock prices that the acquiring companies experienced in India. Secondly, we computed the excess returns that the acquiring companies experienced in the 36-month period following the acquisition. We analysed the monthly returns behaviour of 145 mergers and 131 acquisitions that took place in India between 1998 and 2010.[2] In particular, we computed the returns over a 6-year horizon—starting three years before the announcement of the acquisition and ending three years after the announcement of the acquisition—for the acquiring companies and the benchmark companies that shared similar risk characteristics—in terms of size, market-to-book, and prior returns—as the acquiring companies.

We found that the acquiring companies in both cash-financed as well as stock-financed acquisitions had underperformed returns compared to what was generated by the benchmark portfolio. This poor performance was largely due to the underperformance by the large companies. While the cash-financed acquirers experienced negative 1.63% excess returns in the 36-month period prior to the announcement of the acquisition, the stock-financed acquirers experienced statistically insignificant (but economically significant) negative 1.07% excess returns in the same time period. We also found that the stock-financed acquirers started outperforming the benchmark portfolio almost 12 months before the merger announcement, by around 2.13% per month.

This return behaviour, however, changed after the announcement of the M&A. The acquiring companies in the cash-financed mergers experienced average excess returns of 1.01% per month in the 36-month period following the acquisition. However, the acquiring companies in the stock-financed mergers experienced insignificant excess returns of 0.90% per month in the same time period.

We found significant size effects in our results. The large acquirers in both cash-financed as well as stock-financed mergers performed poorly in the pre-merger time period. However, their performance improved after the merger. The value-weighted excess return for the acquiring companies was 1.01% per month, whereas the equally-weighted excess return was only 0.34% per month in the same time period. Our results for India were similar to what was reported in Rau and Vermaelen (1998) as far as acquisitions are concerned. However, while Rau and Vemlaelen (1998) reported that stock-financed acquirers underperformed in the U.S., we found that the stock-financed acquirers in India outperformed the benchmark portfolio, although this was statistically insignificant.

The rest of the paper is organised as follows. In section 2 of the paper, we discuss the data and the methodology followed in this study. Section 3 discusses the results of our study. Finally, section 4 concludes the paper.

2 Data Description and Methodology

We collected the list of companies that announced acquisitions in the sample period 1998–2011 from the CMIE's Prowess database. We obtained relevant data for 131 acquisitions (all cash-

[2] All the stock-financed acquisitions in our sample were mergers. All the cash-financed acquisitions were takeovers, where a change in management took place after the acquisition. We have, therefore, used the terms 'merged companies' and 'stock-financed acquirers' interchangeably in this paper.

financed) and 145 mergers (all stock-financed). We did not include any acquisitions in our sample where the acquiring companies' promoters increased their stake in the same company or where they made creeping acquisitions of shares. We only included those acquisitions where the acquiring companies acquired companies belonging to a different group of shareholders, and which resulted in a change in control after the acquisition.

We defined the event date as the date on which the board accepted the mergers (for stock-financed mergers) and the date on which the acquiring company made the first public announcement of a tender offer of the shares of the target company. Whenever, we did not get the event data from the Prowess database, we obtained it from the India Business Insight Database (IBID). Then, we collected the monthly returns data for 73 months for each of these 276 companies from the Prowess database.

In addition, we collected the monthly returns data of all the listed companies (see Table 1) from the Prowess database for finding the monthly returns of the benchmark portfolios. In Table 2, we show some descriptive statistics of these companies. These descriptive statistics are for the cross-section of firms in the month (or fiscal year, where appropriate) before the announcement of the merger or acquisition. The Prowess database provided relevant data for a total of 5177 companies. However, the data suffered from the missing-data problem and we were able to obtain data for an average of 4133 companies per year (average across the period 1998–2013).

Table 1: Number of Listed Companies with Monthly Returns Data Available (1994–2013)

Year	BSE Only	BSE & NSE	NSE Only	Total
1994	643	885	0	1528
1995	1135	1073	167	2375
1996	1927	1210	336	3473
1997	1816	1215	374	3405
1998	1138	1169	300	2607
1999	1215	1184	268	2667
2000	1565	1250	218	3033
2001	1065	1172	171	2408
2002	929	1148	143	2220
2003	882	1160	112	2154
2004	1054	1200	99	2353
2005	1201	1248	94	2543
2006	1226	1328	86	2640
2007	1268	1439	70	2777
2008	1327	1527	58	2912
2009	1338	1575	59	2972
2010	1463	1627	51	3141
2011	1559	1701	40	3300
2012	1676	1748	41	3465
2013	1746	1753	31	3530

Table 2: Descriptive Statistics of Acquiring Companies and all Listed Companies in India

Variables	Merged Companies	Acquiring Companies	Average Indian Listed Company
Assets, Rs. Millions	36,547.63***	45,072.68***	13,207.78***
	13,683.44	13,854.02	2584.540
Liquid Assets, Rs. Millions	5,526.36	10,677.32***	1,186.69***
	3,633.30	86.350	86.351
Debt-Equity Ratio	1.115***	0.923***	1.228***
	0.297	0.097	0.027
Free Cash Flow/Total Assets	-0.272***	-0.178***	-0.085***
	0.042	0.034	-0.085
Return on Assets	0.113***	0.113***	0.063***
	0.023	0.011	0.002
Log (Market Cap, Rs. Millions)	6.905***	8.829***	3.387***
	0.256	0.167	1.020
Market-to-Book	2.709***	3.190***	0.540***
	0.578	0.449	0.062
Price-Earnings	15.330***	21.025***	NA
	3.925	2.605	NA
No of Firms	145	131	4,133

*,**, and *** refer to significance levels at 10%, 5%, and 1%, respectively.

Here, liquid assets included cash as well as bank and short-term investments. Debt-to-Equity ratio was computed by taking the ratio of the book value of interest-bearing liabilities with the net worth of the company. Free Cash Flow was computed as: EBIT × (1-t) – Capital expenditure – Increase in working capital. Return on assets was computed as the ratio of EBIT × (1-t) and the average total operating assets. We do not report the PE ratio of the average listed companies as the data suffered from outlier problem. The PE ratio varied from -776 to +3343. The median PE ratio was 3.13.

As can be seen from Table 2, the acquiring companies (for both mergers as well as acquisitions) were large in size and traded at a higher market-to-book ratio. These results were similar to the results reported in international studies. International research papers found that acquiring companies were large in size (Asquith et al., 1983) and traded at a higher market-to-book ratio (Moeller et al., 2005; Rhodes-Kropf et al., 2005) compared to the target companies. Table 2 shows that the acquiring companies were larger than an average Indian company as well (and not just the target companies).

It can also be observed that the companies that financed the acquisitions with cash generated higher free cash flow and were more profitable compared to the other companies (including those who financed the acquisitions with stock). The cash-financed acquirers also had higher liquid assets (cash and marketable securities) compared to the other companies.

2.1 Benchmark Portfolio

In order to understand the exact effect of mergers and acquisitions on the shareholders' wealth, we need an estimate of the normal returns that the acquiring companies would have generated without the event. As Fama (1998) reported, long-run event studies suffer from the 'bad model' problem. Instead of using any asset pricing model, we followed Daniel et al. (1997) and created portfolios based on the characteristic-based benchmark model (CBBM) for each event in our sample. In this method, we created a portfolio of the companies that shared the same size-sorted portfolio, the same market-to-book sorted portfolio, and the same prior-return-sorted portfolio as the acquiring company in the sample. Ahern (2009) showed that when the sample of firms announcing an event is non-random in nature, using the CBBM to compute the abnormal returns (using daily returns) would remove most of the bias present in the study.

We collected the monthly returns data of all the companies that were listed either on the BSE or the NSE from January 1994 to March 2013 from CMIE's Prowess database. Though the actual number of companies listed in these two stock exchanges was much higher (7106 in 2013), the monthly returns data was available for only about half of these stocks because of the illiquidity of some of these stocks. The sample size varied from 1528 in 1994 to 3530 in 2013. Table 1 shows the year-wise distribution of the number of listed companies for which monthly returns data was available. We then removed the monthly returns of the 276 companies (the sample of merged and acquiring companies) from this set of listed companies. Next, we independently sorted these companies into five groups each, based on their size, their market-to-book ratios, and their prior returns. We computed the market capitalisation (proxy for size) by multiplying the number of shares outstanding at the end of the previous fiscal year with the closing stock price of the stock prevailing in the month before the event announcement. Similarly, we computed the market-to-book ratio by dividing the previous month-end's price with the book value per share prevailing at the end of the previous fiscal year. Finally, we computed the prior returns by comparing the previous month-end's price with the closing price prevailing exactly 12 months ago.

In this way, we created 125 portfolios for each event-month in our sample and tracked the monthly returns of these portfolios for a total period of 73 months (starting 36 months before the portfolio creation and ending 36 months after the portfolio creation). Using this methodology, we computed the size (market capitalisation), market-to-book ratio, and prior returns of each acquirer in our sample in the month preceding the event announcement date. For example, for any event that was announced in January 2008, we computed the size, market-to-book ratio, and prior returns for the acquiring company using the stock price data for December 2007. We then identified the portfolio group (out of the 125 portfolios) that the acquiring company belonged to. Subsequently, we compared the 73 months' returns of the acquiring companies with the 73 months' returns of this benchmark portfolio. If the monthly returns data of any of the companies in the benchmark portfolio was missing, we replaced the missing returns data with the average return of the portfolio. This process was repeated for each of the acquiring companies in our sample.

Barber and Lyon (1997) measured long-term abnormal performance using Buy-and-Hold Returns. Buy-and-hold abnormal returns (BHAR) for each company was computed using the formula given in Equation (1).

$$BHAR_i = \prod_{t=1}^{T}(1+R_{i,t}) - \prod_{t=1}^{T}(1+R_{B.t}) \quad (1)$$

Then, we computed the weighted average BHAR for the sample using Equation (2).

$$\overline{BHAR} = \sum_{i=1}^{N} w_i \times BHAR_i \quad (2)$$

We also computed the cumulative abnormal returns (CAR) generated by the stocks of the acquiring and merged companies over the 73-month interval. In order to compute the CAR, we first computed the abnormal return of each stock for each month (Equation 3).

$$AR_{i,t} = R_{i,t} - R_{B,t} \quad (3)$$

Then, we computed the average abnormal return (AAR) generated by all the stocks in each month (Equation 4).

$$AAR_t = \sum_{i=1}^{N} AR_{i,t} \tag{4}$$

Finally, we computed the CAR by adding up all the abnormal returns.

$$CAR_{t1} = \sum_{t=1}^{t1} AAR_t \tag{5}$$

Following Barber and Lyon (1997), we computed the *t*-statistics of the cumulative abnormal returns and BHAR using Equations (6) and (7), respectively.

$$t_{BHAR} = \frac{\overline{BHAR}_{i,t}}{\sigma(BHAR_{i,t}) / \sqrt{n}} \tag{6}$$

$$t_{CAR} = \frac{\overline{CAR}_{i,t}}{\sigma(CAR_{i,t}) / \sqrt{n}} \tag{7}$$

3 Discussion of Results

Using Equation (2), we first computed the BHAR of the event firms over different time horizons. The BHAR figures for both the acquiring companies as well as the merged companies are presented in Table 3.

Some interesting trends emerge from Table 3. The BHAR figures of the stock-financed companies were positive in both the pre-merger period as well as the post-merger period. The post-merger BHAR was positive and economically significant, although it was statistically insignificant. The BHAR figures for the acquiring companies were negative in the pre-merger period. The value-weighted BHAR was lower (higher in absolute value) compared to the equally-weighted BHAR. This shows that that the large acquirers did poorly compared to the smaller acquirers prior to the acquisition. However, the acquiring companies reported positive BHAR—although it was statistically insignificant—after the acquisition. It is possible that the acquisition was undertaken to prevent the decline in financial performance prior to the acquisition.

The BHAR figures get affected by what is known as the 'compounding effect' (Mitchell and Stafford, 2000). If the BHAR is positive in the first few months and zero in the subsequent months, then the BHAR will keep increasing for the entire sample period due to this compounding effect. In order to see the effect of this compounding effect, let us assume that the portfolio of acquiring companies generated returns of r_1 and the benchmark portfolio generated returns of r_2 in the first month. Further, let us assume that the returns generated by both the portfolios equal r in all the subsequent months. Thus, the acquiring companies' portfolio generated excess returns of $r_1 - r_2$ in in the first month. The excess returns are all zero in the subsequent months. The BHAR computed at the end of period t will equal:

$$BHAR_t = (1+r)^{t-1} \times (r_1 - r_2) \tag{8}$$

Table 3: BHAR Figures for the Study Sample

		BHAR			
Days		Merger		Acquisitions	
From	To	EW	VW	EW	VW
-36	-24	12.19%	13.70%	-2.76%	-41.19%
-36	-12	46.55%**	77.13%**	-2.28%	-164.37%***
-36	-1	122.66%***	211.23%***	-52.38%	-368.95%***
-24	-1	82.07%***	133.44%***	-62.63%	-185.45%***
-12	-1	26.95%	62.13%*	-7.74%	-33.63%
0	12	79.36%***	35.36%	133.43%	6.84%
0	24	150.88%***	6.31%	117.44%	20.94%
0	35	283.65%***	27.54%	104.05%	29.35%
12	35	102.89%***	13.91%	6.87%	21.95%
24	35	18.73%	38.00%	-3.28%	-14.75%

Note: ***, **, and * refer to significance levels at 0.1%, 1%, and 5%, respectively.

As can be seen from Equation (5), the BHAR will keep increasing at the end of every time period after the first period by a factor of , even if the excess returns are all zero after the first month. We show this using a simple numerical example and present the results in Table 4.

Table 4: Buy-and-Hold Portfolio Return Computation Bias

Month	Portfolio Return	Benchmark-Return	B&H-M&A	B&H-Benchmark	Difference
1	10%	0%	1.1000	1.0000	10.00%
2	5%	5%	1.1550	1.0500	10.50%
3	5%	5%	1.2128	1.1025	11.03%
4	5%	5%	1.2734	1.1576	11.58%
5	5%	5%	1.3371	1.2155	12.16%
6	5%	5%	1.4039	1.2763	12.76%
7	5%	5%	1.4741	1.3401	13.40%

As shown in Table 4, the BHAR returns increased from 10% to 13.4% by the end of the seventh month even if the actual excess returns was 10% (realised in the first month). Similarly, we would have found a persistent negative trend in the BHAR figures if the initial excess returns were negative. In order to understand the impact of the compounding effect, we show the difference between the monthly returns of the acquiring and the benchmark companies in the 73-month period surrounding the event in Figures 1 and 2.

Figure 2 shows that the acquiring companies generated very high negative returns about 30 months before the acquisition, which accentuated the BHAR figures even in subsequent years. This is one of the reasons why we observed very high but negative BHAR figures when we started computing BHAR from month -36. Similarly, we observed very high negative excess returns generated by the merged companies around 24 months before the merger. However, this negative performance came after the positive excess returns generated by the merged companies around months -33 to -30.

Figure 1: Monthly Excess Returns of the Merged Companies (Simple and Weighted Average)

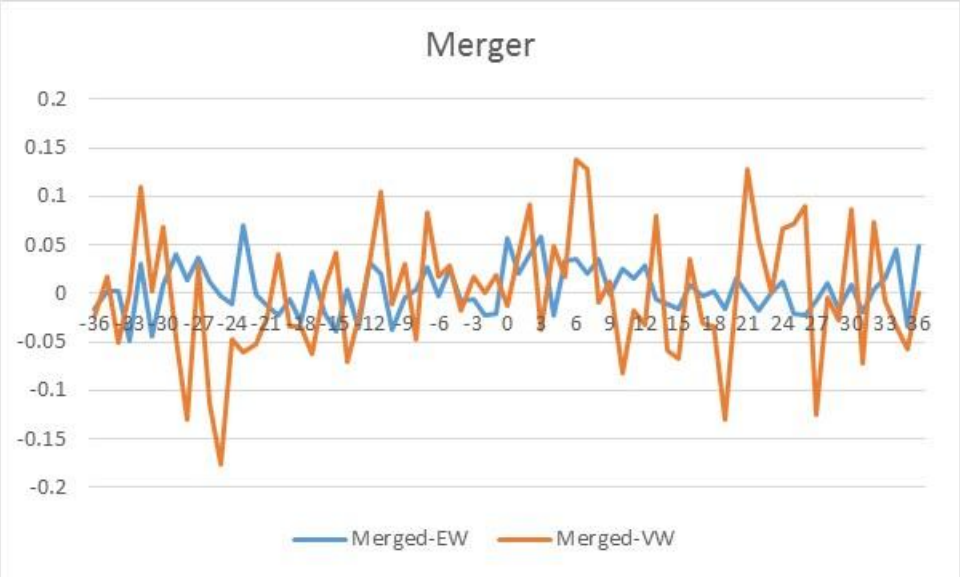
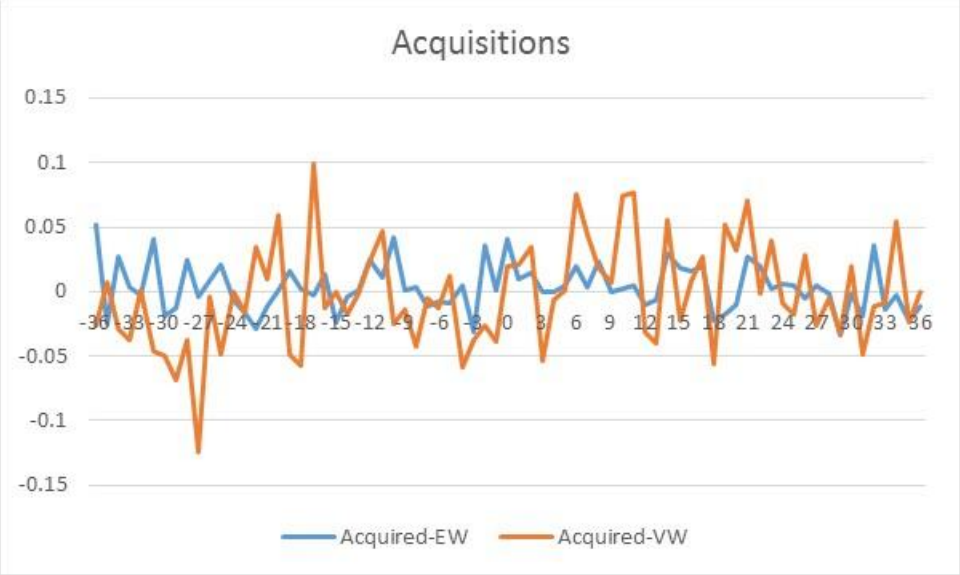


Figure 2: Monthly Excess Returns of the Acquiring Companies (Simple and Weighted Average)



Secondly, the weighted average excess returns were more volatile compared to the equally-weighted excess returns. This partly explains why we observed economically significant but statistically insignificant BHAR figures in Table 4.

We computed the abnormal returns for each acquiring company in our sample for each of the 73 months by taking the simple difference between the actual returns of the acquiring company and the returns of the benchmark portfolio. Table 5 presents the average returns generated by the acquiring and merged companies and the returns generated by the corresponding benchmark portfolios.

Table 5: Average Monthly Returns of Acquiring and Benchmark Companies

	Acquisitions						Mergers					
	Acquirers		Benchmark		Difference		Acquirers		Benchmark		Difference	
	EW	VW	EW	VW	EW	VW	EW	VW	EW	VW	EW	VW
Mean	0.0301***	0.0311***	0.0267***	0.0337***	0.0033***	-0.0026***	0.0299***	0.0260***	0.0261***	0.0265***	0.0038***	-0.0005
Std. Error	0.0026	0.0043	0.0018	0.0034	0.0004	0.0006	0.0039	0.0074	0.0025	0.0046	0.0005	0.0010
Skewness	0.2866	-0.1762	0.0021	0.3518			0.2157	-0.0932	0.3496	0.7167		
Kurtosis	0.0586	-0.1004	0.1545	0.3640			1.3548	0.1747	0.5142	0.3232		

Note: ***, **, and * refer to significance levels at 0.1%, 1%, and 5%, respectively. EW refers to equally-weighted excess returns and VW refers to value-weighted excess returns.

We found that the large acquiring companies underperformed when compared to the benchmark companies by about 0.03% per month over the entire 73-month period. Although we found a similar trend for the merged companies, the difference was not statistically significant.

Figures 3 and 4 show the cumulative average abnormal returns generated by the merged companies and the acquiring companies, respectively, in both mergers as well as acquisitions. Contrary to what was observed from the BHAR statistics, we observe a different phenomenon here. Both the merged as well as the acquiring companies underperformed vis-à-vis the benchmark companies prior to the merger. The fortunes of the merged companies were reversed about 12 months before the merger. The acquiring companies started realising positive excess returns around the date of the announcement of the acquisition. This shows that the stock prices of the acquiring companies did not exhibit any run-up in the prices. However, the stock prices of the merged companies exhibited significant run-ups about 12 months before the merger announcement.

Another interesting trend emerges from Figures 3 and 4. The good performance exhibited by the merged companies was largely due to the larger merged companies. While the equally-weighted cumulative abnormal returns (EW-CAR) remained almost flat in the 12-month period preceding the merger, the value-weighted CAR (VW-CAR) chart showed an upward trend. Further, the superior performance continued till about month 6 for the merged companies.

Figure 3 shows that there was a steep hike in both the CAR curves around the month of the merger announcement. In order to examine whether this hike was due to outliers present in the sample, we looked at the abnormal returns generated by all the merged companies in the 5-month period starting from month -1 and ending with month 3. Some of the key statistics are presented in Table 6. Table 6 shows that even if we removed the top and bottom 10% of the extreme data points, the merged companies exhibited abnormal returns in the 5-month period.

The positive trend exhibited by the acquiring companies after the acquisition announcement continued till month 24 and the trend was uniform for both the large as well as the small acquirers. The EW-CAR as well as the VW-CAR exhibited an upward trend after month 0 in the case of cash-financed acquisitions.

Figure 3: Cumulative Average Abnormal Returns for Merged Companies

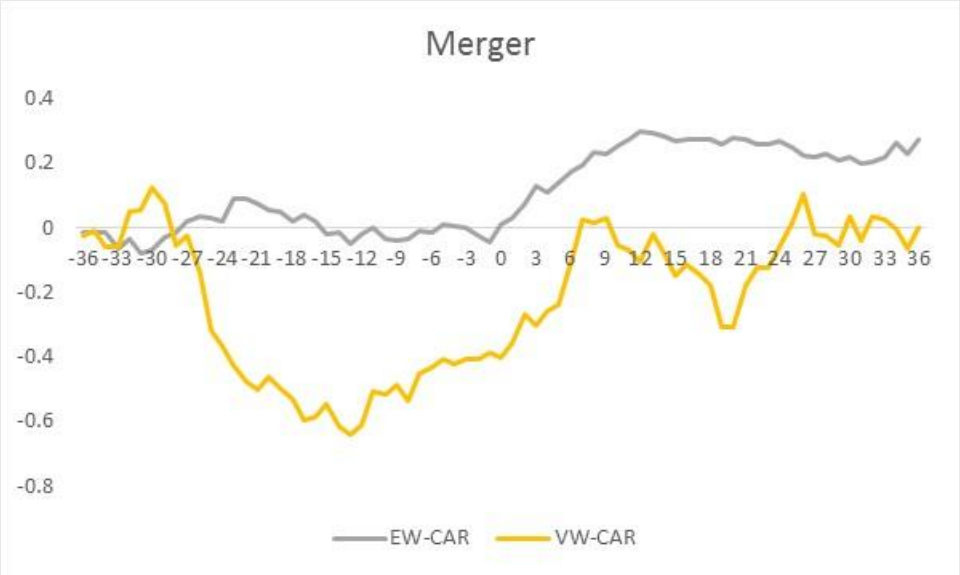


Figure 4: Cumulative Average Abnormal Returns for Acquiring Companies

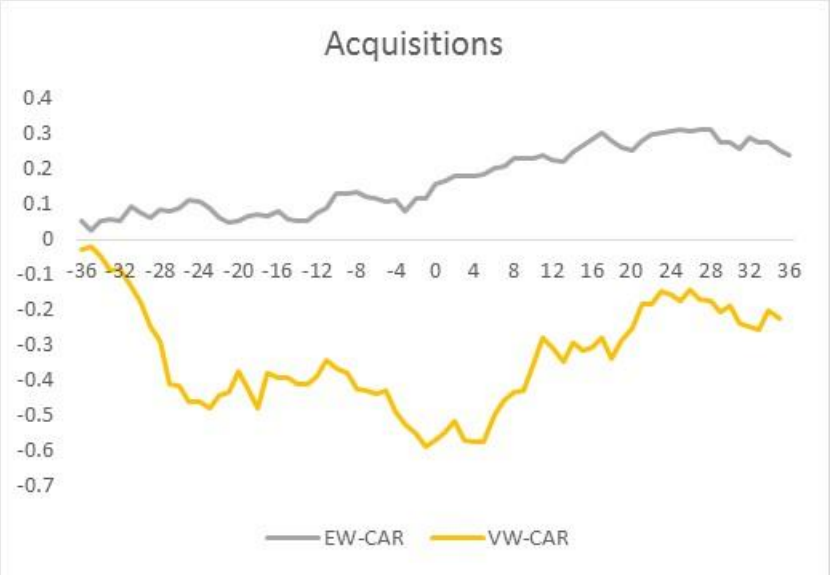


Table 6: Steep Hike in CAR in Month 0: Outlier effect?

Day	Mean	StdDevn	75th percentile	25th percentile	Mean (Trimming top and bottom 5%)	Mean (Trimming top and bottom 10%)
-1	0.43%	19.18%	8.73%	-7.45%	0.40%	0.67%
0	7.95%	32.89%	15.44%	-8.24%	5.32%	4.49%
1	3.17%	20.58%	9.41%	-8.96%	2.42%	1.69%
2	5.29%	23.09%	14.28%	-8.74%	4.58%	3.95%
3	7.08%	35.51%	15.18%	-7.40%	5.39%	4.52%

Table 7 shows the cumulative average abnormal returns for different time periods.

Table 7: Cumulative Average Abnormal Returns for Different Periods

		CAR			
Days		Merger		Acquisitions	
From	To	EW	VW	EW	VW
-36	-24	1.92%***	-36.48%***	10.75%***	-46.23%***
-36	-12	-1.86%***	-61.03%***	7.84%***	-38.87%***
-36	-1	-4.54%***	-38.68%***	11.73%	-58.86%***
-24	-1	-7.57%*	-6.93%***	0.40%	-12.63%***
-12	-1	0.54%***	25.55%***	6.35%***	-17.67%***
0	12	34.51%***	28.50%***	11.08%***	28.11%***
0	24	31.38%***	32.92%***	19.26%***	43.43%***
0	35	27.21%***	32.31%	13.58%*	36.52%***
12	35	-4.42%***	0.62%*	1.48%***	5.31%***
24	35	-2.99%***	5.99%***	-5.13%***	-7.84%***

Note: ***, **, and * refer to significance levels at 0.1%, 1%, and 5%, respectively.

An examination of the pre-event period shows that the large acquirers and merged companies performed poorly vis-à-vis the smaller acquirers and merged companies, respectively. The VW-CAR figures were lower for the merged as well as the acquiring companies. However, the EW-CAR figures for the acquiring companies were positive in the 36-month period before the acquisition. This shows that the large acquirers underperformed vis-à-vis the small acquirers in the period before the acquisition. The post-event period exhibited an almost similar trend for both EW-CAR as well as VW-CAR for the acquiring companies. The merged companies realised the entire excess returns in the 12-month period after the merger. The benefits of an acquisition seemed to last longer over the 24-month period following the acquisition.

Rau and Vermaelen (1998) reported that stock-financed acquirers underperform whereas cash-financed acquirers outperform in the three years following an acquisition. However, in the present study, we found that both types of acquirers outperformed the benchmark portfolio in the post-merger period. One of the reasons for this could be that Indian firms undertake mergers and acquisitions only for realising potential synergy. Secondly, mergers are undertaken by the various business groups as part of corporate restructuring (Barai and Mohanty, forthcoming). Therefore, the stock-financed mergers outperformed due to the synergy that was present as well as the benefits that resulted from corporate restructuring.

Morck et al. (1990) found that bad managers are bad acquirers. However, we found that this is not the case in India. In our sample, companies that underperformed in comparison to the benchmark portfolio in the period preceding the merger turned out to be good acquirers after the merger.

Our CAR results seem to contradict what was reported in Table 2. The acquiring companies were more profitable. However, they underperformed in comparison to the benchmark portfolios in the 3-year period prior to the acquisition. Table 2 provided the equally-weighted average of the returns on assets. The EW-CAR chart in Figure 6 shows that the average acquirer did not underperform in comparison to the benchmark portfolio. Some of the large acquirers did underperform, which is why the VW-CAR chart shows a declining trend in the 36-month period before the acquisition.

Long-term returns have been found to be skewed. Therefore, Ikenberry et al. (1995) introduced a bootstrapping procedure to generate the null distribution of the estimator. Mitchell and Stafford (2000) used the bootstrapping method to report the *p*-values. As can be seen from Table 5, we did not find significant skewness in our data. Therefore, we did not resort to the bootstrapping method to find the level of significance of the BHAR figures and the average abnormal returns.

Fama (1998) argued that long-term event studies get affected by the so-called bad-model problem. The bad-model problem does not affect short-term event studies because the expected daily return of a stock is close to zero anyway. However, in long-term event studies, the computation of excess returns and BHAR do get affected by the return-generating process used in the model. The bad model can generate spurious excess returns that are statistically significant (Fama, 1998).

Clustering of events—which is more serious in long-term event studies—could also affect the testing of the significance of BHAR (Brav, 1997; Fama, 1998). Fama (1998) recommended computing the abnormal returns using the calendar-month approach. In each calendar month, the abnormal returns of those stocks that had an event (acquired or merged) in the last five years are estimated. Then, the abnormal returns for each month are averaged and these monthly returns are regressed on the three factors proposed by Fama and French (1993) to test the significance of the abnormal returns. Fama (1998) showed that when the monthly returns of stocks get regressed against these three factors, most of the abnormal returns reported as anomalies in the literature disappear.

However, Loughran and Ritter (2000) argued that the use of size and price-to-book as factors in the multiple regression used in Fama (1998) would have low power to detect abnormal returns if the event happened as a response to misvaluations by the market. For instance, if small companies are more likely to be misvalued compared to large companies, the method suggested by Fama (1998) would not be able to detect the abnormal returns generated by the small firms.

Therefore, in this paper, we used a novel method to avoid the problems discussed by Loughran and Ritter (2000). We regressed the monthly returns of the three portfolios containing the returns of the acquiring companies, the merged companies, and all the companies on the monthly returns of the benchmark portfolio. Firstly, while forming the benchmark portfolio, we did not consider the returns on any market portfolio. Most market proxies are value-weighted indices and acquiring companies are usually large in nature. Therefore, including a value-weighted market proxy would understate the excess returns generated by large acquirers (Loughran and Ritter, 2000).

Secondly, we did not include the size risk premium—the difference in returns between a small-sized and a large-sized portfolio—directly in the regression. Instead, we obtained the benchmark portfolio by matching all the three characteristics, namely, size, market-to-book ratio, and prior returns, and we then directly computed the returns of this benchmark portfolio. Ahern (2009) found that most of the biases in abnormal returns that were found when the acquiring companies are large in size or have higher prior returns disappeared when the CBBM portfolio was used as the benchmark portfolio. Since we computed the benchmark portfolio returns using the methodology suggested by Daniel et al. (1997), we expected our regression results to give us unbiased estimates of the abnormal returns.

We regressed the monthly returns of the three acquiring portfolios on the monthly returns of the benchmark portfolio using data from both the pre-event as well as the post-event period. We used weighted returns only in Table 8. Table 8 shows the main results.

Table 8: Regression using Data from the Pre-event Period

	Before		After	
	Merger	Acquisition	Merger	Acquisition
Intercept	0.0179	0.0149	0.0111	0.0218*
	0.0119	0.0109	0.0127	0.0080
Slope	0.2862	0.2859	0.8333*	0.5068*
	0.2013	0.2112	0.4133	0.2254
R-squared	0.0561	0.0512	0.1068	0.1294
Adjusted R-squared	0.0284	0.0233	0.0805	0.1038
F-statistic	2.0218	1.8335	4.0643	5.0553

Note: ***, **, and * refer to significance levels at 0.1%, 1%, and 5%, respectively.

The regression results reported in Table 8 throw additional insights into the long-run performance of merged and acquiring companies. If we considered the 36-month period before the announcement of the event, there was no run-up in the stock returns. From our CAR results, we noted earlier that the merged companies exhibited a significant run-up in stock returns 12 months before the announcement of the merger. However, since this run-up in stock returns was preceded by a significant decrease in stock returns, the regression results did not show any evidence of the run-up in stock returns.

Secondly, Table 8 shows that only the acquiring companies reported excess returns after the effect of the benchmark portfolio was taken into consideration. Though the merged companies also reported excess returns of 1.11% per month, the difference was not statistically significant at the standard significance levels.

Although Table 8 reports positive run-up figures for both the merged as well as the acquired companies, these figures were statistically insignificant. Even if the average run-up figure was insignificant, it would be interesting to identify which types of firms exhibited significant run-up. We regressed the run-up figures on the different firm-specific characteristics to know which companies experienced a run-up. Table 9 shows the list of variables that were included in our regression. Table 10 presents the regression output.

Table 9: Description of the Independent Variables in the Run-up Regression

	Variable	Definition
1	Promoter's Stake	We computed the monthly average of the promoters' stake in the 36-month period prior to the event announcement.
2	Institutional Investors' Stake	We computed the monthly average of the institutional investors' stake in the 36-month period prior to the event announcement.
3	Return on Assets	Computed as the ratio of EBIT × (1 - tax rate) and the average total assets.
4	Market-to-Book Ratio	Computed as the ratio of the closing stock price in the month before the acquisition announcement and the book value per share in the previous fiscal year.
5	Price-Earnings Ratio	Computed as the ratio of the closing stock price in the month before the

	Variable	Definition
		acquisition announcement and the earnings per share reported for the previous fiscal year.
6	Size	Computed as the logarithm of the market capitalisation. We stated the market capitalisation figures in INR million.
7	Assets	Computed as the logarithm of the book value of the assets reported on the balance sheet reporting date for the previous fiscal year. We stated the book value of assets in INR million.
8	Liquid Assets	Computed as the logarithm of cash and marketable securities reported on the balance sheet reporting date for the previous fiscal year. We stated the liquid assets in INR million.
9	Debt-Equity Ratio	Computed as the ratio of the book value of debt and the book value of equity. Both the figures were obtained from the balance sheet of the previous fiscal year.
10	Free Cash Flow	Computed as the ratio of free cash flow and the average book value of assets. The free cash flow was computed as EBIT × (1 - tax rate) - net investments.
11	M/A	Defined as a dummy variable that takes a value of 1 for acquisitions and 0 for mergers.

Table 10: Regression Results of Run-up on Other Variables

	Estimate	Std. Error	t-stat	p-value	
(Intercept)	0.0177	0.0147	1.202	0.231	
Promoter Stake	0.0001	0.0002	0.279	0.7804	
Institutional Investors' Stake	-0.0002	0.0004	-0.581	0.5623	
ROA	0.0691	0.0170	4.075	7.13E-05	***
Mkt-to-Book	-0.0002	0.0007	-0.228	0.8202	
PE	0.0004	0.0001	2.546	0.0118	*
MktCap	0.0000	0.0000	-0.761	0.4476	
log(assets)	-0.0004	0.0045	-0.082	0.9349	
Log-Liquid Assets	-0.0081	0.0057	-1.415	0.159	
Debt-Equity	0.0000	0.0015	-0.012	0.9903	
FCF/Total Assets	-0.0023	0.0164	-0.144	0.886	
MA Dummy	-0.0051	0.0232	-0.218	0.8275	

Note: ***, **, and * refer to significance levels at 0.1%, 1%, and 5%, respectively.

We found that only two of the variables—return on assets and the price-earnings ratio—were statistically significant. Such companies experienced an increase in stock prices prior to the announcement of the event. It is possible that this increase was due to the higher return on assets. It is also possible that the market expected the event, and hence, the stock price increased before the event announcement itself. In such cases, the reaction of the market to the actual event announcement would not correctly reflect the effect of the event. Schwert (1996) reported the pre-bid run-up to be about as large as the post-announcement markup in the price.

These results also suggest that whenever an event study is performed where the acquiring company is more profitable or trades at a higher price-earnings ratio, the standard event study

results would understate the true benefits from the event, as these companies would already have experienced an increase in price prior to the event announcement.

We also regressed the markup returns—the abnormal returns experienced in the 36-month period following the event announcement—on the same firm-specific characteristics (as reported in Table 9) to understand the factors that affected the abnormal returns after the announcement of the event. The regression output is presented in Table 11.

Table 11: Regression Results of Markup on Other Variables

	Estimate	Std. Error	t-stat	p-value	
(Intercept)	0.0011	0.0148	0.072	0.943008	
Promoter Stake	0.0003	0.0002	1.372	0.171892	
Institutional Investors' Stake	0.0004	0.0004	1.056	0.292623	
ROA	-0.0156	0.0168	-0.929	0.354198	
Mkt-to-Book	0.0010	0.0007	1.392	0.165902	
PE	0.0001	0.0001	0.785	0.433656	
MktCap	0.0000	0.0000	-0.641	0.522442	
log(assets)	-0.0020	0.0045	-0.443	0.658306	
Log-Liquid Assets	-0.0045	0.0058	-0.785	0.43327	
Debt-Equity	0.0012	0.0015	0.801	0.424011	
FCF/Total Assets	-0.0526	0.0140	-3.757	0.000237	***
MA Dummy	0.0092	0.0232	0.395	0.693248	

Note: ***, **, and * refer to significance levels at 0.1%, 1%, and 5%, respectively.

We found that companies that generated more free cash flows reported lower abnormal returns after the announcement of the event. Since the free cash flow figure was negative for a number of companies, it was difficult to interpret this result. Low free cash flow could mean the company was investing in fixed assets for future profitable expansion, and hence, the stock market reacted positively. However, low free cash flow could also mean poor operating performance. We found that the acquiring companies generated positive excess returns after the merger, at least for the 12-month period following the merger. It is possible that such companies made further investments in assets after the merger in order to take advantage of the synergy present in the merger. We realise that this interpretation of ours is speculative. We leave further analysis and validation of this interpretation to future research.

4 Conclusion

In this paper, we looked at the monthly stock returns behaviour of companies in India that had gone for mergers and acquisitions in the sample period (1998–2010). We looked at the behaviour of companies that went in for cash-financed acquisitions and stock-financed mergers. We compared the monthly returns generated by these companies with a portfolio of companies that shared three risk characteristics. Following Daniel et al. (1997), we computed the monthly returns of the characteristics-based benchmark model (CBBM) portfolio. Each company in the CBBM portfolio had similar risk, similar market-to-book ratio, and similar prior returns as the acquiring companies had.

We computed the average abnormal returns and the buy-and-hold abnormal returns (BHAR) of the acquiring companies. We also regressed the monthly returns of the acquiring companies on the returns of the CBBM portfolios. We computed and reported the equally-weighted averages as well as the value-weighted averages to show the actual value creation in mergers and acquisitions. We found that the companies that went for both cash-financed as well as stock-financed acquisitions underperformed when compared to the benchmark portfolios prior to the merger. Though the merged companies reported positive BHAR in the 36-month period, we noted that this was largely due to the compounding effect. However, we found that these companies outperformed the benchmark portfolios in the period after the acquisition.

The companies that went for stock-based mergers reported more than 2% excess returns per month in the year after the merger. The acquiring companies, however, continued to outperform the benchmark portfolio for 24 months after the acquisition.

We believe the outcome of this research will be useful to both academicians as well as practitioners. The traditional event study methodology assumes that the acquiring company is randomly selected from among all the companies. However, research findings in the U.S. context showed that the acquiring companies have a particular profile—they experienced stock price increases just before the merger announcement; they had higher price-to-book ratio; they belonged to the overvalued sectors, etc. In Table 2, we showed that the sample of firms that went in for mergers and acquisitions did exhibit special characteristics compared to an average Indian firm.

According to Ahern (2009), the event study methodology needs to be modified in case there is selection bias in the sample. Since most research papers on mergers and acquisitions use the event study methodology to determine whether the acquiring and target companies benefitted from mergers, the outcome of this research will help researchers to modify the methodology suitably. In this study, we showed that companies that go for mergers and acquisitions are large in size, i.e., they have higher book assets and higher market capitalisation. These companies also trade at higher market-to-book ratios. Therefore, while performing any event study involving mergers and acquisitions in India, one cannot assume the sample to be a random sample.

We also found that the merged companies experienced a statistically significant run-up in stock prices 12 months prior to the merger announcement. If part of this run-up could be attributed to the market's anticipation of a likely merger, the effect of the actual announcement will always understate the true benefits from the acquisition.

The outcome of this research will help practitioners in a number of ways. First of all, prior research on mergers and acquisitions showed that companies that experienced an increase in stock prices in the recent past went in for mergers and acquisitions (Asquith et al., 1983; Schwert, 1996; Chi et al., 2011). The research results also showed that the shareholders of the acquiring companies rarely benefitted from the merger. This probably indicates the presence of agency issues where companies that have done well in the past (and hence, experienced stock price increases) go for value-destroying (or neutral) acquisitions. Jensen (2004) raised similar concerns; he found that companies with overvalued equity did everything possible to keep the stock prices high. However, our results showed that companies that went in for mergers and acquisitions in India benefitted substantially after the merger. The merged companies reported abnormal returns of 33% in the 24-month period following the merger. The acquiring companies

reported abnormal returns of 43% in the same time period. This shows that the companies that opted for mergers and acquisitions in India benefitted in the long run.

The outcome of this research may be useful to regulatory agencies such as the Securities and Exchange Board of India (SEBI). The increase in stock price witnessed prior to a merger could reflect insider trading of the stocks. It is, however, not very clear why this run-up is witnessed only for the merged companies and not for the acquiring companies.

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