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**IMPACT OF MERGERS ON STOCK RETURNS: A STUDY WITH REFERENCE TO MERGERS IN INDIA**

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**ABSTRACT**

*The practice of mergers and acquisitions has attained considerable significance in the contemporary corporate scenario which is broadly used for reorganizing the business entities. Indian industries were exposed to plethora of challenges both nationally and internationally, since the introduction of Indian economic reform in 1991. The cut-throat competition in international market compelled the Indian firms to opt for mergers and acquisitions strategies, making it a vital premeditated option. It is believed that mergers and acquisitions are strategic decisions leading to the maximization of a company's growth by enhancing its production and marketing operations. They have become popular in the recent years because of the enhanced competition, breaking of trade barriers, free flow of capital across countries and globalization of business as a number of economies are being deregulated and integrated with other economies. Research on mergers has made considerable progress over the last 50 years and has produced a vast body of literature, especially in the developed markets of the world. Target shareholders usually gain when a merger, acquisition or tender offer is announced. Research in the area of mergers has more than kept pace with the increasing number of mergers in the economy, investigating the motivation, cyclical nature, profitability, and determination of the negotiated exchange ratios for mergers. This study identifies whether the industries will benefit from the mergers and acquisitions. This in turn will benefit the stakeholders in the companies, i.e. shareholders. This study basically focuses on the shareholders reactions to the merger announcement. The core objective of this study is to evaluate the impact of mergers on stock returns. The study examines the returns to the shareholders in case of mergers and acquisitions in India during the period, 2009 and 2011. The study contributes to understand the effect of the mergers on the industries during the different peaks and troughs. The study covers merged companies of different sectors like; financial companies, non-financial companies, construction and real estate and electricity sector.*

**KEYWORDS**

Acquisition, abnormal returns, derivatives, merger.

**INTRODUCTION**

The practice of mergers and acquisitions has attained considerable significance in the contemporary corporate scenario which is broadly used for reorganizing the business entities. Indian industries were exposed to plethora of challenges both nationally and internationally, since the introduction of Indian economic reform in 1991. The cut-throat competition in international market compelled the Indian firms to opt for mergers and acquisitions strategies, making it a vital premeditated option. It is believed that mergers and acquisitions are strategic decisions leading to the maximization of a company's growth by enhancing its production and marketing operations. They have become popular in the recent years because of the enhanced competition, breaking of trade barriers, free flow of capital across countries and globalization of business as a number of economies are being deregulated and integrated with other economies.

Research on mergers has made considerable progress over the last 50 years and has produced a vast body of literature, especially in the developed markets of the world. Target shareholders usually gain when a merger, acquisition or tender offer is announced. Research in the area of mergers has more than kept pace with the increasing number of mergers in the economy, investigating the motivation, cyclical nature, profitability, and determination of the negotiated exchange ratios for mergers.

Since India is a fast developing economy and the industries in India are also developing, they are trying to compete with the global giants like Wal-Mart, IBM, for recognition in the world market. One of the methods in which the Indian industries can cope with the foreign market leaders is mergers and acquisitions. This study identifies whether the industries will benefit from the mergers and acquisitions. This in turn will benefit the stakeholders in the companies, i.e. shareholders. This study basically focuses on the shareholders reactions to the merger announcements.

**OBJECTIVES**

The core objective of this study is to evaluate the impact of mergers on stock returns. However in order to achieve the main objective, the following subsidiary objectives have been framed:

- To study the behavior of stock returns before the merger and after the merger.
- To find out the correlation between the pre-merger stock returns and post-merger returns.

**SCOPE OF THE STUDY**

The study examines the returns to the shareholders in case of mergers and acquisitions in India during the period, 2009 and 2011. The study contributes to understand the effect of the mergers on the industries during the different peaks and troughs. The study covers merged companies of different sectors like; financial companies, non-financial companies, construction and real estate and electricity sector.

**METHODOLOGY**

In this study the researchers have taken the merger announcements made by acquiring companies included in the BSE SENSEX index from 1-1-2009 to 19-10-2011. The effects of merger announcements of the companies on equity share prices was examined by taking daily adjusted market price data for the sample stocks 15 days before and 15 days after the merger announcement date. BSE SENSEX is used as the surrogate for the market portfolio. The merger dates of companies which are announced in the various media is collected from the CMIE Prowess database. Also the share prices as well as the SENSEX values of acquiring companies were collected from the former.

**TECHNIQUES OF ANALYSIS**

Daily returns for each sample company has been computed for the estimation period and also for the event period as

$$R_{it} = \frac{MP_{it} - MP_{i(t-1)}}{MP_{i(t-1)}}$$

Where,  $MP_{it}$  = Market price (closing) of security 'i' on day t and  $MP_{i(t-1)}$  = Market price of security on day (t-1). Comparatively, the actual returns for the market are also computed as :

$$R_{mt} = \frac{I_{it} - I_{i(t-1)}}{I_{i(t-1)}}$$

Where  $I_{it}$  and  $I_{i(t-1)}$  are daily BSE index values at time t and t-1 respectively

In the next step the market model has been utilized to calculate the expected returns on the stock.

**Daily expected return**

$$E(R_{it}) = \alpha + \beta \times R_m + \epsilon_t$$

In the Equation  $E(R)$  is the expected return of a particular company on day t,

$\alpha$  and  $\beta$  are calculated as follows

$$\beta = \frac{n \sum xy - \sum x \sum y}{n \sum x^2 - (\sum x)^2}$$

$$\alpha = y - \beta x$$

$R(m)$  = Return on the market

Then the abnormal return on day t is calculated as

**Abnormal returns**

Daily abnormal return on a particular day t is the excess of the actual return on the day t over the expected return on that day.

$$AR = R_{it} - E(R_{it})$$

Where,  $R_{it}$  is the actual daily return for the share of a company i at time t, &  $E(R_{it})$  is the expected return on the same day in the absence of an acquisition.

The study period used in this analysis is a 31 working days. In this, the day on which a merger announcement appears in the press is designated as 0. Trading days prior to the merger announcement are numbered event days -1, -2 and so on. The event days following the merger are numbered +1, +2 and so on. The maximum time involved in this study is -15 days to +15 days. First, the average excess returns (AAR) for each relative day t are calculated across the securities. Daily average cumulative abnormal returns (CAAR) are the sum of the average excess returns over event time. In other words, CAAR is defined as the sum of previous daily average residuals for each trading day.

**Average abnormal return (AAR's)** for each relative day is calculated by

$$AAR_t = \frac{\sum_{i=1}^n AR_{it}}{N}$$

Where, i = the number of securities in the study

N = Total number of securities

t = the days surrounding the event study.

**Cumulative Average Abnormal Returns (CAARs)** are derived by summing the AARs over various time intervals. For Example, CAARs for a time interval  $t_n$  to  $t_1$ , are derived as follows

$$CAARs = \sum_{t=1}^n AAR_t$$

Where t = -15, ..., 0, ..., +15

The data which is collected after the calculations which are explained above is a representation of the period Jan 2009 to Oct 2011. This data is then further segregated into sectors, namely Construction and Real estate, Power, Non-Financial, and Financial Services.

In addition to the above techniques other statistical tools such as averages, and correlation coefficients have been used to make the analysis more effective.

**LIMITATIONS**

Every research has its own limitations. The following are the limitations of this study.

- The study covers only few sectors which are taken for studying the impact of merger.
- This study is restricted only to Indian companies.

**ANALYSIS AND INTERPRETATION**

This part of the study deals with the analysis of the study. For the purpose of analysis the companies taken for the study are categorized into sectors. The sectors taken for the study is Construction and Real Estate, Power, Financial and Non-Financial. The returns of each company under each sector are shown in the annexure. Sector wise analysis is being made and then correlation between pre-merger Average Abnormal Return (AAR) and post-merger AAR is calculated for each company and then for each sector. For the above purpose, statistical tools, like, mean, and correlation has been used.

**TABLE 1: AAR BEFORE AND AFTER MERGER AND CORRELATION & STANDARD DEVIATION BETWEEN PRE-MERGER AND POST-MERGER AAR**

Company	Pre-merger AAR	Post-merger AAR	Correlation between pre and post merger AAR	Standard Deviation
Nila Infrastructures Ltd.	0.386	-0.64867	0.30398	4.321693
I V R C L Assets & Holdings Ltd.	-0.26067	0.620667	-0.31651	4.275105
Unitech Ltd.	1.108667	0.038667	-0.49102	1.996009
Ashiana Housing Ltd.	-0.144	0.137333	-0.11156	2.386286
<b>Correlation between pre-merger and post-merger AAR</b>			<b>-0.43821</b>	
<b>Standard Deviation between pre and post merger AAR</b>				<b>0.547391</b>

From Table 1 it is clear that only in case of Unitech Ltd. the AAR is positive under both pre-merger and post-merger period. In all other cases the returns are reverse to each other under pre and post-merger period. Except in Nila Infrastructure Ltd, in all other cases the correlation between pre-merger and post-merger AAR is negative and the correlation between pre-merger and post-merger AAR is also negative.



TABLE 2: AVERAGE ABNORMAL RETURNS AND CUMULATIVE AVERAGE ABNORMAL RETURNS FOR CONSTRUCTION INDUSTRY

DAYS	AAR	CAAR	DAYS	AAR	CAAR
-15	2.021466	2.021466	1	3.115191	7.468374
-14	0.829841	2.851307	2	-1.12171	6.346665
-13	0.367391	3.218698	3	0.985341	7.332006
-12	-1.62693	1.591765	4	1.172716	8.504723
-11	-1.76346	-0.17169	5	3.817666	12.32239
-10	0.576141	0.404447	6	1.302466	13.62485
-9	0.315616	0.720063	7	-3.00491	10.61995
-8	2.684541	3.404604	8	-0.82746	9.792487
-7	1.310741	4.715345	9	0.419816	10.2123
-6	-0.02168	4.693661	10	-1.59193	8.620369
-5	0.510191	5.203852	11	0.084341	8.70471
-4	-1.19143	4.012419	12	-1.46638	7.238327
-3	0.312916	4.325335	13	-1.37278	5.865543
-2	0.961091	5.286426	14	-0.61606	5.249484
-1	-1.20838	4.078042	15	-0.33461	4.914875
0	0.275141	4.353183			
<b>Average</b>	<b>0.27187</b>			<b>0.03745</b>	

As per the Table 2, it is understood that the AAR before the merger is higher than AAR after merger.

TABLE 3: CORRELATION &amp; STANDARD DEVIATION BEFORE AND AFTER MERGER AND AAR OF POWER SECTOR

Company	Pre-merger AAR	Post-merger AAR	Correlation between pre and post merger AAR	Standard Deviation
Jaiprakash Power Ventures Ltd.	1.100667	-1.53267	-0.13688	5.16401
Energy Development Co. Ltd.	-0.05	-0.136	0.288952	3.922375
Maximaa Systems Ltd.	-1.314	0.024	-0.16001	4.755289
U T V Software Communications	-0.64533	1.266	-0.19687	2.563297
B F Utilities Ltd.	0.882	-0.086	0.103975	3.382348
<b>Correlation Between Pre-Merger and Post merger AAR</b>			<b>-0.6463</b>	
<b>Standard Deviation between pre and post merger AAR</b>				<b>0.948045</b>

It is crystal clear from the above table that Energy Development Co. Ltd. has positive AAR under pre and post merger period. In all other cases AAR is reverse to each other under pre and post-merger period. It is also clear that in case of Energy Development Co. Ltd. and B.F Utilities Ltd, the correlation between pre-merger and post-merger AAR is positive. In all other cases it is negative.

TABLE 4: AVERAGE ABNORMAL RETURNS AND CUMULATIVE AVERAGE ABNORMAL RETURNS FOR POWER SECTOR

Days	AAR	CAAR	Days	AAR	CAAR
-15	4.413018	4.413018	1	0.667781	4.95191
-14	0.485268	4.898285	2	-0.51278	4.439131
-13	0.478801	5.377086	3	-3.5635	0.875633
-12	2.248984	7.62607	4	1.801181	2.676814
-11	-2.70222	4.923855	5	0.757741	3.434556
-10	0.063751	4.987605	6	0.940941	4.375497
-9	-0.56917	4.41844	7	-0.03298	4.342519
-8	-1.50715	2.911291	8	-0.92454	3.41798
-7	2.241518	5.152808	9	0.479541	3.897522
-6	-2.50955	2.643259	10	0.051941	3.949463
-5	-1.59528	1.047977	11	-2.55686	1.392605
-4	1.287701	2.335678	12	-1.23322	0.159386
-3	-0.51493	1.820745	13	0.091741	0.251128
-2	-0.44992	1.370829	14	1.768981	2.020109
-1	-0.46748	0.903347	15	0.975381	2.995491
0	3.380781	4.284128			
<b>Average</b>	<b>0.060223</b>			<b>0.08591</b>	

As shown in the above table it is clear that the AAR after merger is higher than AAR before merger in power sector and on the date of merger announcement the AAR is much higher than the post-merger and pre-merger AARs.

TABLE 5: PRE-MERGER AAR POST-MERGER AAR AND CORRELATION & STANDARD DEVIATION BETWEEN POST-MERGER AND PRE-MERGER AAR FOR FINANCE SECTOR

Company	Pre merger average return	Post merger average return	Correlation between post- merger and pre-merger AAR	Standard Deviation
State Bank Of India	-0.274	-0.158	-0.3839	3.565618
Rane Holdings Ltd.	-0.38067	-0.184	-0.1781	5.075748
Walchand Peoplefirst Ltd.	0.112	0.339333	0.162484	6.164923
Federal Bank Ltd.	0.516667	-0.056	-0.06461	1.936642
Delta Corp Ltd.	-1.19667	-0.03067	0.349828	3.692445
Intec Capital Ltd.	2.689333	-1.60067	0.034451	3.434422
S R E I Infrastructure Finance	-0.18067	-1.11667	-0.02306	2.294617
India Lease Devp. Ltd.	0.986667	-0.156	0.32626	3.852637
I C I C I Bank Ltd.	-0.022	-0.16333	-0.02266	4.211378
Kama Holdings Ltd.	0.420667	-0.724	0.090697	4.023519
India Securities Ltd.	-0.424	0.516667	-0.66391	4.00805
Clarus Infrastructure Realities	3.638667	0.138667	-0.1265	3.785194
I D B I Bank Ltd.	0.288667	-0.034	-0.0266	0.92728
<b>Correlation between Pre-merger and Post-merger AAR</b>			<b>-0.28142</b>	
<b>Standard Deviation between pre and post merger AAR</b>				<b>1.065204</b>

From Table 5 it is found that in case of Walchand Peoplefirst Ltd. and Clarus Infrastructure Realities the correlation between post-merger AAR and pre-merger AAR is positive and State Bank of India, Rane Holdings Ltd., Delta Corp Ltd., SREI infrastructure finance and ICICI Bank Ltd. the AAR is negative under both the situations and in all other cases the AAR is reverse to each other during these situations. There is a positive correlation between pre-merger and post-merger AAR in case of Walchand Peoplefirst Ltd, Delta Corp Ltd, Intec Capital Ltd., India Lease Devp. Ltd.and Kama Holdings Ltd. But in all other cases it is negative. The correlation between the post-merger and pre-merger AAR of the sector is positive.

TABLE 6: AVERAGE ABNORMAL RETURNS AND CUMULATIVE AVERAGE ABNORMAL RETURNS FOR FINANCIAL SERVICE INDUSTRY

Days	AAR	CAAR	Days	AAR	CAAR
-15	-0.61778	-0.61778	1	-0.13051	6.391433
-14	0.924365	0.306581	2	-1.63661	4.754826
-13	1.027899	1.33448	3	-0.58195	4.172875
-12	-0.29811	1.036367	4	-0.87234	3.300535
-11	0.726877	1.763244	5	0.579032	3.879567
-10	0.086193	1.849437	6	0.34176	4.221327
-9	-0.70941	1.140025	7	-0.22355	3.997781
-8	0.470032	1.610057	8	0.944654	4.942436
-7	-0.06024	1.549817	9	0.307865	5.250301
-6	0.853815	2.403632	10	0.154349	5.40465
-5	0.404415	2.808048	11	-0.66262	4.742032
-4	1.335665	4.143713	12	-0.42915	4.312881
-3	0.876615	5.020329	13	0.369054	4.681935
-2	0.17341	5.193739	14	-0.10928	4.572651
-1	-0.13631	5.057432	15	0.465365	5.038016
0	1.464508	6.52194			
<b>Average</b>	<b>0.337162</b>			<b>0.09893</b>	

It is crystal clear from the above table that pre-merger AAR is higher than post-merger AAR on the date of merger announcement the AAR is quite higher than both the averages.

TABLE 7: PRE-MERGER AAR, POST-MERGER AAR, AND CORRELATION & STANDARD DEVIATION BETWEEN PRE AND POST MERGER AAR OF NON-FINANCIAL SECTOR

Company	Pre merger AAR	Post merger ARR	Correlation between AARs	Standard Deviation
H C L Infosystems Ltd.	0.716667	-0.71933	-0.01381	3.453658
My Fair Lady Ltd.	-1.52867	0.272	-0.03542	4.114891
Entegra Ltd.	2.843333	-0.718	-0.04972	6.816974
3I Infotech Ltd.	2.734667	3.090667	0.583089	5.717312
Pyramid Saimira Theatre Ltd.	2.786	1.633333	0.360445	7.274553
Trent Ltd.	-0.08533	-0.052	-0.02453	1.99583
Wipro Ltd.	0.34	0.408667	-0.22779	1.626487
Zensar Technologies Ltd.	0.986667	1.268667	-0.29129	3.701165
Modern India Ltd.	-0.37267	1.916667	0.198199	2.967677
Aptech Ltd.	0.009333	-0.88267	-0.11277	2.925301
Visesh Infotecnics Ltd.	-1.64733	0.008	-0.51153	2.44662
Glodyne Technoserve Ltd.	-0.86733	-0.82067	-0.09315	3.299867
Taneja Aerospace & Aviation Ltd.	0.273333	-0.60867	0.170335	2.504303
Vishal Retail Ltd.	0.322	-0.51867	-0.13879	5.010084
Era E-Zone (India) Ltd.	-0.166	3.988	-0.01998	4.464879
Mphasis Ltd.	-0.85867	-0.654	0.23574	2.467089
Shirpur Global Refinery Ltd.	-0.902	1.482667	-0.1513	3.50768
E T C Networks Ltd. (1999)	1.697333	0.442667	0.224544	3.90509
Zee Entertainment Enterprises Ltd.	0.075333	0.149333	-0.17276	2.251551
H C L Technologies Ltd.	-0.31533	-0.03	0.267065	2.574015
Allcargo Global Logistics Ltd.	-0.26267	-0.36667	0.042754	1.323099
N R International Ltd.	0.378667	-0.506	0.131082	3.827924
Eco Recycling Ltd.	-0.53933	-0.882	0.362638	4.468197
Varun Industries Ltd.	0.808667	-0.488	-0.25752	4.451825
Weizmann Ltd.	1.148	0.942667	-0.07224	3.418569
Accentia Technologies Ltd.	-0.572	-0.91067	0.153438	2.529002
Adani Enterprises Ltd.	1.099333	0.727333	-0.25377	1.730888
New Delhi Television Ltd.	-0.10867	-0.46467	-0.25847	1.202444
K P I T Cummins Infosystems Ltd.	-0.10467	-1.66333	0.351485	2.434599
D M C Education Ltd.	-2.17867	-1.44733	-0.22447	4.383398
Hinduja Ventures Ltd.	-0.65333	0.318	0.512791	2.879935
S Kumars Unitexx Ltd.	0.431333	-0.38333	0.034785	3.645752
Essar Shipping Ports & Logistics	2.914667	-1.294	0.400459	5.226097
Genesys International Corpn. Ltd.	1.231333	0.042	-0.4016	2.903055
<b>Correlation between Pre-Merger AAR and Post-Merger AAR of the sector</b>			<b>0.218052</b>	
<b>Standard Deviation between pre and post merger AAR</b>				<b>1.238967</b>

It is clear from the Table 7 that correlation coefficient between pre-merger and post-merger AAR of 19 companies are negative remaining 15 companies have positive correlation between pre-merger and post-merger AAR.

TABLE 8: AVERAGE ABNORMAL RETURNS AND CUMULATIVE AVERAGE ABNORMAL RETURNS FOR NON-FINANCE SERVICES SECTOR

Days	AAR	CAAR	Days	AAR	CAAR
-15	0.164256	0.164256	1	-0.19339	5.602445
-14	0.482656	0.646911	2	0.722079	6.324524
-13	-0.17803	0.468882	3	0.09832	6.422845
-12	0.348485	0.817367	4	-0.77913	5.643718
-11	-1.33193	-0.51456	5	-0.70146	4.942256
-10	0.347232	-0.16733	6	-0.09646	4.845797
-9	0.596603	0.429275	7	0.22955	5.075347
-8	-0.70063	-0.27135	8	0.803817	5.879164
-7	-0.00623	-0.27758	9	0.428456	6.30762
-6	-0.56974	-0.84731	10	-0.65123	5.656393
-5	1.172717	0.325403	11	-0.43218	5.224213
-4	2.194691	2.520094	12	0.358814	5.583028
-3	0.089482	2.609576	13	0.839106	6.422133
-2	1.109912	3.719488	14	0.584167	7.006301
-1	0.524535	4.244023	15	0.222638	7.228939
0	1.551817	5.79584			
<b>Average</b>	<b>0.282934</b>			<b>0.09554</b>	

As per the above table it is known fact that pre-merger AAR is quite higher than the post-merger AAR and both the AARs are less than the AAR on the date of merger announcement.

TABLE 9: AAR OF EACH SECTOR BEFORE AND AFTER MERGER AND AAR OF ALL THE COMPANIES TAKEN TOGETHER

Sector	Pre-merger AAR	Post-merger AAR
Construction and real estate	0.27817	0.03745
Power	0.060223	0.08591
Finance	0.337162	0.09893
Non-finance	0.282934	0.09554
AAAR	0.239622	0.079458
Correlation coefficient between pre and post merger		-0.01724
Standard Deviation between pre and post merger AAR		0.11137

It is crystal clear from the Table 9 that Post-merger ARR of all the industries under study, except power industry, are more than the Pre-merger ARR. It is also being identified that there is a negative correlation between Post-merger ARR and Pre-merger ARR.

## FINDINGS OF THE STUDY

After analyzing the impact of mergers on the returns of the stocks, the authors have drawn the following findings:

### CONSTRUCTION AND REAL ESTATE

- It is clear from the study that only in construction and real estate, in case of Unitech Ltd. the AAR is positive under both pre-merger and post-merger period. In all other cases the returns are reverse to each other under pre and post-merger period.
- As per the study it is understood that the AAR before the merger is higher than AAR after merger in construction and real estate sector.
- Except in Nila Infrastructure Ltd, in all other cases the correlation between pre-merger and post-merger AAR is negative and also the correlation between pre-merger and post-merger AAR is negative

### POWER SECTOR

- It is crystal clear from the study that in power sector, Energy Development Co. Ltd. has negative AAR under pre and post merger period. In all other cases AAR is reverse to each other under pre and post-merger period. It is also clear that in case of Energy Development Co. Ltd. and BFUtilities Ltd. the correlation between pre-merger and post-merger AAR is positive and in all other cases it is negative.
- The AAR after merger is higher than AAR before merger in power sector and the date of merger announcement the AAR is much higher than the post-merger and pre-merger AARs.

### FINANCE SECTOR

- It is found from the study that in case of finance sector, Walchand Peoplefirst Ltd. and Clarus Infrastructure Realities, the correlation between post-merger AAR and pre-merger AAR is positive and State Bank of India, Rane Holdings Ltd., Delta Corp Ltd., SREI infrastructure finance and ICICI Bank Ltd. the AAR is negative under both the situations and in all other cases the AAR is reverse to each other during these situations.
- There is a positive correlation between pre-merger and post-merger AAR in case of Walchand Peoplefirst Ltd, Delta Corp Ltd, Intec Capital Ltd., India Lease Devp. Ltd. and Kama Holdings Ltd. But in all other cases it is negative.
- The correlation between the post-merger and pre-merger AAR of the finance sector is positive.
- The pre-merger AAR is higher than post-merger AAR on the date of merger announcement the AAR is quite higher than both the averages in this sector.

### NON-FINANCIAL SECTOR

- It is found in the study that in non-financial sector, correlation coefficient between pre-merger and post-merger AAR of 19 companies are negative, remaining 15 companies have positive correlation between pre-merger and post-merger AAR.
- As per the study, it is known fact that pre-merger AAR is quite higher than the post-merger AAR and both the AARs are less than the AAR on the date of merger announcement.
- Finally it is concluded as per the study that mergers have not met the expectations of the investors as the study reveals that the post-merger abnormal returns are less than pre-merger abnormal returns.

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