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Impact of mergers and acquisitions announcement on stock prices in India

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Abstract

This study investigates the impact of mergers and acquisitions (M&A) on stock prices within the Indian context, recognizing the growing significance of M&A activities in India's evolving corporate landscape. Employing quantitative event study methods and analysing a comprehensive dataset of 20 M&A announcements, the study reveals dynamic patterns in stock performance leading up to and following these announcements. Notably, it observes that stocks tend to exhibit positive abnormal returns approximately 30 days before the announcements, temporarily underperforming market expectations 20 days before the events, and rebounding with positive returns 10 days prior. On the announcement day, a positive abnormal return signifies a favourable market response, while stocks remain relatively stable ten days after the announcement and continue to perform well twenty days afterward.

The analysis of Average Abnormal Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) suggests that the Indian stock market operates with a semi-strong form of efficiency. Stock prices exhibit fluctuations, peaking on the announcement day and gradually declining afterward as the market absorbs information and adjusts. This observation aligns with the semi-strong form of the Efficient Market Hypothesis, indicating that stock prices quickly incorporate publicly available information, including M&A announcements. In conclusion, this research contributes valuable insights into the complex dynamics governing stock price movements in response to M&A events in India. These findings can benefit investors, corporate strategists, and policymakers by providing a deeper understanding of market reactions in the ever-evolving landscape of mergers and acquisitions in India.

Keywords: Event study methodology, Indian stock market, merger announcements and semi-strong form hypothesis

1. Introduction

Mergers and acquisitions (M&A) have long been a global phenomenon, shaping the competitive landscape of industries worldwide. In India, the significance of M&A activities has been on the rise, influenced by factors such as globalization, economic liberalization, and technological advancements. These strategic corporate manoeuvres hold the potential to create substantial value for shareholders, but they also introduce inherent risks and uncertainties, particularly in terms of their impact on stock prices.

This study sets out to investigate and analyze the repercussions of M&A announcements on stock prices within the Indian stock market. The primary motivation behind this research lies in its potential contribution to the existing body of literature, offering insights into the distinctive dynamics governing M&A events in India. The comprehension of stock price behaviour during M&A announcements is crucial for stakeholders, encompassing investors, policymakers, and corporate strategists, as it equips them with the ability to make well-informed decisions and anticipate market reactions.

Drawing from global trends in M&A research, we find that these events often provoke substantial stock price fluctuations, with outcomes ranging from positive to negative in established markets like the United States and Europe. This established backdrop provides the context for assessing potential impacts within the Indian context. In addition to global trends, India's economic landscape and robust financial markets also play a pivotal role. India's emergence as a prominent player in the global economy, coupled with its flourishing financial markets, makes it an appealing destination for M&A activity. An examination of

India's economic and financial framework offers valuable insights into the distinctive factors influencing stock price movements within this context.

M&A motivations in India are multifaceted, encompassing market consolidation, access to technology, and strategic expansion. Understanding the underlying reasons why companies engage in M&A transactions is imperative for assessing their potential ramifications on stock prices. The regulatory environment in India plays a pivotal role in shaping the M&A landscape. An overview of relevant regulations and their influence on M&A transactions adds an additional layer of context for comprehending stock price reactions to these events.

In terms of methodology, this study utilizes quantitative research techniques, employing event study methods to dissect stock price movements in the vicinity of M&A announcements in India. Through the examination of a comprehensive dataset covering M&A events over a specific timeframe, we aim to identify patterns and trends in stock price reactions. The significance of this study extends beyond the realm of academia, offering practical implications for investors, corporate decision-makers, and regulators alike. By providing insights into the Indian M&A landscape, we aspire to enhance the understanding of this complex relationship between M&A announcements and stock prices, ultimately contributing to more informed decision-making in the Indian business environment.

2. Literature Review

The reviewed literature encompasses a wide range of studies conducted in diverse geographical and sectoral contexts. Researchers have explored the consequences of M&A announcements on stock returns, attempting to discern patterns and factors that influence market reactions. Some key findings and trends emerge from this body of work. Studies like those by Varun Kumar Rai and Dharen Kumar Pandey (2022)^[18] and Tyagi and Agrawal (2020)^[21] suggest that the market reaction to M&A announcements can vary significantly between private and public sector banks or between different sectors, indicating that sector-specific factors may influence investor sentiment. Research by Dharen Kumar Pandey, Vineeta Kumari, and Brajesh Kumar Tiwari (2022)^[17] underscores that not all corporate events have the same impact on stock returns. The type of corporate announcement, such as bonus, ex-bonus, rights, or stock split, can lead to varying abnormal returns, indicating that event-specific characteristics play a role in market responses (see Marisetty *et al.*, (2017), Marisetty *et al.*, (2018) and Marisetty *et al.*, (2021))^[10, 12, 15]. Dharen Kumar Pandeya and Vineeta Kumari (2020)^[16] examine M&A announcement effects on Indian and U.S. banks, highlighting potential differences in market sensitivity to such information between emerging and developed markets. N. Rani, Surendra S. Yadav, P. Jain (2013)^[20] emphasize that mergers and acquisitions are often perceived as efficiency-inducing, leading to positive abnormal returns on the announcement date. However, results vary over the event window, suggesting complex dynamics. Several studies, including Mehroz Nida Dilshad (2012)^[2] and Panayiotis Liargovas and Spyridon Repousis (2011)^[7], investigate information leakage and its impact on stock prices before M&A announcements. This highlights the importance of market efficiency and information transparency. Bashir *et al* (2011)^[11] expressed that acquirers

generally experience a statistically insignificant rise in value over the course of eleven days.

Studies by Varun Kumar Rai and Dharen Kumar Pandey (2022)^[18] and Tyagi and Agrawal (2020)^[21] provide fascinating insights into the impact of M&A announcements in India's financial and IT sectors, respectively. Rai and Pandey observed that private sector banks experienced positive average abnormal returns on the event day, yet the cumulative impact of the announcement was negative for both private and public sector banks. In contrast, Tyagi and Agrawal found that M&A announcements had a positive impact on acquiring firms' stock prices in the IT sector, although target firms experienced mixed reactions. These findings underscore the market's perception of value creation while highlighting sector-specific nuances.

Dharen Kumar Pandey, Vineeta Kumari, and Brajesh Kumar Tiwari (2022)^[17] and Neelam Rani (2013)^[19] examined the differential effects of various corporate announcements. Pandey, Kumari, and Tiwari found that bonus and ex-bonus announcements led to positive significant abnormal returns on the event date, whereas rights issues and stock splits had limited influence on stock returns. Rani's study concurred, indicating that M&A events were often perceived as efficiency-inducing, resulting in positive abnormal returns on the announcement date. Event-specific factors thus emerge as crucial determinants of stock price reactions. Jain, R., & Bhattacharyya, S. K. (2019)^[6] expressed M&A announcements generally lead to significant abnormal returns, indicating the presence of value creation Jain, R., & Bhattacharyya, S. K. (2019)^[6].

Cross-country comparisons conducted by Dharen Kumar Pandeya and Vineeta Kumari (2020)^[16] and Farid Abdelali (2017)^[3] provided insights into the nuances of M&A reactions. Pandeya and Kumari's research highlighted the differing reactions of Indian and U.S. markets to M&A announcements. Indian acquiring banks experienced significant cumulative average abnormal returns (CAARs), indicating greater market sensitivity in the emerging Indian market. Abdelali's broader study considered M&A impacts across countries, suggesting that the positive effect of M&A on stock prices was more pronounced for target companies, particularly due to the benefits received by their shareholders.

The efficiency of financial markets and the flow of information played prominent roles in several studies. Mehroz Nida Dilshad (2012)^[2] and Panayiotis Liargovas and Spyridon Repousis (2011)^[7] both addressed information leakage and market efficiency. Dilshad identified transient cumulative abnormal returns for acquirers, emphasizing market efficiency and information leaks preceding mergers. Liargovas and Repousis challenged the "semi-strong form" of market efficiency and discovered significant positive cumulative abnormal returns before M&A announcements, indicating information asymmetry. Long-term implications were considered by Pinky Mall and Kapil Gupta (2019)^[9], highlighting the absence of significant abnormal changes in stock returns pre- and post-event dates. This perspective underscores the importance of exploring how M&A announcements affect firms beyond the immediate market reaction.

In conclusion, this literature review underscores the diversity of findings and themes within the domain of M&A and stock price reactions. While certain studies emphasize sector-specific nuances and event-specific factors, others

shed light on cross-country variations and the importance of market efficiency. The exploration of long-term implications and future research directions highlights the continued relevance and complexity of this field, encouraging further investigation into this fascinating intersection of finance and corporate strategy.

3. Research Design

3.1. Objectives of the study

- To find the abnormal returns (AR) and cumulative abnormal returns (CAR) on the event day (ED) for the selected merger announcements.
- To evaluate average abnormal returns (AAR) for the selected merger announcements
- To examine the cumulative average abnormal returns (CAAR) for the selected merger announcements.
- To analyse the various window periods cumulative average abnormal returns (CAAR) for the selected merger announcements.

3.2. Hypotheses

Based on all the papers that were referred, the hypothesis for the paper was formed.

- H_0 - Merger announcements have no significant impact on the stock prices in the event day, the pre-merger and post-merger period.
- H_1 - Merger announcements have significant impact on the stock prices in the event day, the pre-merger and post-merger period.

3.3. Statement of the Problem

Mergers and acquisitions (M&A) are pivotal events in the corporate landscape, with the potential to significantly influence stock prices. In the context of India, a rapidly evolving economy with a dynamic corporate sector, understanding how M&A announcements affect stock prices is of paramount importance. However, the Indian M&A market is characterized by a complex interplay of factors, including regulatory changes, market sentiment, sector-specific dynamics, and investor behaviour. This complexity poses a challenge in accurately assessing the precise impact of M&A announcements on stock prices in India. Therefore, the problem at hand revolves around the need to empirically investigate and comprehend the immediate and sustained effects of M&A announcements on stock prices within the Indian context, while considering these multifaceted variables. Moreover, the study aims to identify any emerging trends and assess the implications for investors, corporations, and policymakers, contributing to a more informed and efficient Indian financial market.

3.4. Need of the Study

A study on the impact of mergers and acquisitions (M&A) on the announcement of stock prices in India is essential to provide investors, corporations, regulators, and academics with a comprehensive understanding of how these significant corporate events influence stock market dynamics. It addresses the need for informed decision-making, risk assessment, and the evaluation of market efficiency, while also contributing valuable insights into regulatory effectiveness and the broader economic implications of M&A activities. By examining the reactions of stock prices to M&A announcements, this study aids in enhancing investor confidence, optimizing corporate

strategies, and enriching the academic discourse in finance and economics, ultimately benefiting both the financial ecosystem and the Indian economy as a whole.

3.5. Scope of the Study

The scope of this research study on the impact of mergers and acquisitions (M&A) on stock prices in India encompasses the analysis of M&A activities within the Indian market over a specified time frame, examining various types of transactions across diverse industry sectors, including banking, technology, healthcare, and others. It will focus on short-term event windows to assess immediate market reactions and sustained effects on stock prices, taking into consideration different market capitalization categories and utilizing reliable data sources and quantitative methodologies such as event studies. This study contributing to a comprehensive understanding of the dynamics between M&A announcements and stock prices in India.

3.6. Limitation of the Research Study

The main limitation of the study undertaken is the fact that this focuses only on the short-term impact of the Merger and acquisitions on the Stock prices.

3.7. Tools of the Data Collection

- Alpha coefficient
- Beta coefficient
- Descriptive statistics - Max, Min, Mean, Median and Standard deviation
- Abnormal returns
- Average abnormal returns
- Cumulative average abnormal ret
- Student t test

3.8. Model for the Study

Market Model used to understand the Impact of Mergers and acquisition on announcement of Stock Prices in India

$$\text{Expected Return (E)} = \alpha + \beta R_M$$

α = Alpha coefficient of security with Index;
 β = Beta coefficient of the security with Index
 R_M = Expected of the return of the Index

Abnormal returns calculated as follows

$$AR = R - E; R = \text{Actual Returns}; AR = \text{Abnormal returns}$$

Average Abnormal returns calculated as follows

$$AAR = \frac{\sum_{t=1}^n At}{n}$$

t = the number of securities in the study; n = total number of stocks in the class
 t test used to determine the significance of average abnormal returns

$$t = \frac{AAR}{\text{Standard Error}}$$

AAR = Average abnormal return;
(AAR) = Standard error of average abnormal return;

Standard error is calculated is $(AAR) = \frac{\sigma}{\sqrt{n}}$

Cumulative Abnormal returns calculated as follows

$$CAR = AR_t + AR_{t-1}$$

AR_t = Abnormal returns present day;

AR_{t-1} = Abnormal returns of the previous day

Cumulative Average Abnormal returns calculated as follows

$$CAAR = \frac{\sum_{t=1}^n Ct}{n}$$

t = the number of securities in the study; n = total number of stocks in the class

t test used to determine the significance of average abnormal returns

$$t = \frac{CAAR}{\text{Standard Error}}$$

CAAR = Average abnormal return;

(CAAR) = Standard error of average abnormal return;

Standard error is calculated is $(CAAR) = \frac{\sigma(CAAR)}{\sqrt{n}}$

4. Results and Discussion

Table 1: Individual Company's Abnormal Return, Cumulative Abnormal Return, t and p values on the event day.

SL No	Company Name	AR	CAR	AR t value	AR p value
1	Happiest mind Technologies	1.1524	36.3745	0.3534	0.7244
2	LTI Mindtree	-2.2055	-26.9632	-1.0445	0.2975
3	IDFC	-5.3293	16.1086	-3.1078	0.0022*
4	PVR	2.8572	18.4672	1.4644	0.1445
5	RELIANCE	0.6123	5.0945	0.4045	0.6867
6	ADANI GREEN	-2.0141	6.3281	-0.7967	0.4312
7	PNB	0.8478	20.2642	0.3648	0.7198
8	VI	-0.7271	-7.8734	-0.2752	0.7848
9	Hindalco	1.434	-1.1659	0.7447	0.4576
10	ITC	2.7678	6.3287	1.4593	0.1463
11	Union Bank	7.2667	35.3352	2.8647	0.0051*
12	Indus Tower	-1.3022	-4.6775	-0.3345	0.7394
13	Indian Bank	7.6585	8.2367	2.7356	0.0076*
14	HUL	3.8326	12.3314	3.3075	0.0013*
15	Canara Bank	6.6583	14.1978	3.0046	0.0031*
16	Adani Enterprise	-2.1145	-23.7229	-0.7243	0.4756
17	Biocon	0.2513	4.8614	0.1399	0.8978
18	BOB	2.4131	14.2634	1.0970	0.2743
19	TATA Steel	0.2873	5.9558	0.1650	0.8694
20	Ambuja Cements	-2.2481	31.9861	-1.2370	0.2173

Source: Author's calculations (*Significance @ 5 percent level)

The table 1 presents key financial metrics, including Abnormal Returns (AR), Cumulative Abnormal Returns (CAR), t-values, and p-values for 20 different companies. Among the companies, "Indian Bank" stands out with the highest positive AR of 7.6585, indicating that its stock price experienced a substantial positive abnormal return on the event day, suggesting a favourable market response. On the other hand, "IDFC" had the most significant negative AR of -5.3293, signifying a notable negative abnormal return, indicating an adverse market reaction. Several other companies experienced positive ARs, such as "Happiest Mind Technologies" and "PVR," implying that their stock prices outperformed expectations. Conversely, companies like "LTI Mindtree" and "IDFC" had negative ARs, indicating underperformance. 13 companies experienced a positive AR on the event day, indicating that their stock prices exhibited a favourable response to the event. 7 companies encountered a negative Abnormal Return (AR) on the event day, signifying an adverse market reaction to the event.

In terms of CAR, "Union Bank" had the highest positive CAR of 35.3352, suggesting that this bank experienced the most significant cumulative positive stock price impact over the specified event window. Conversely, "LTI Mindtree" had the most significant negative CAR of -26.9632, indicating a substantial cumulative negative impact on its

stock price. Some companies, such as "PVR" and "Canara Bank," had positive CARs, suggesting that their stock prices reacted favourably to the events, possibly indicating market optimism. Conversely, "VI" and "Ambuja Cements" had substantial negative CARs, indicating a significant negative impact on their stock prices. 15 companies had a positive Cumulative Abnormal Return (CAR), suggesting that these companies saw a cumulative positive impact on their stock prices over the specified event window. 5 company had a negative Cumulative Abnormal Return (CAR), implying that this particular company experienced a cumulative negative impact on its stock price over the event window.

Among the t-values, "HUL" and "Canara Bank" had the highest t-values (3.307 and 3.004, respectively), indicating highly statistically significant stock price reactions, which means that their stock price reactions were not likely due to random chance. On the other hand, IDFC t-value of -3.1078 and the very low p-value of 0.0022 for IDFC suggest that the negative abnormal return observed for IDFC on the event day is statistically significant. So, a total of 5 companies (IDFC, Indian Bank, HUL, Canara Bank, and Union Bank) had statistically significant Abnormal Returns on the trading day based on the provided p-values. In contrast, "Adani Enterprise" had the lowest t-value (-0.7243), suggesting a relatively less significant reaction. So, a total of 15 companies (Happiest Mind Technologies, LTI

Mindtree, PVR, RELIANCE, ADANI GREEN, PNB, VI, Hindalco, ITC, Indus Tower, Biocon, BOB, TATA Steel, Ambuja Cements, and the second entry for LTI Mindtree)

had AR that were not statistically significant on the event day.

Table 2: 60 days window Average Abnormal Return (AAR) for the twenty companies' merger announcements

Day	AAR	SD	SE	t	p value	Maximum	Minimum
-30	0.7711	2.3704	0.53	1.4548	0.1626	7.8971	-2.1387
-29	-0.0264	1.4107	0.3154	-0.0836	0.9343	2.8389	-2.7983
-28	2.7292	9.1407	2.0439	1.3353	0.1976	21.5603	-20.1321
-27	0.2185	3.7172	0.8312	0.2629	0.7955	6.2231	-6.1479
-26	0.2486	3.1167	0.6969	0.3567	0.7253	6.2249	-7.1841
-25	-0.1477	2.9928	0.6692	-0.2206	0.8277	6.1485	-7.2698
-24	-0.3285	3.3614	0.7516	-0.4371	0.6675	8.5791	-7.8656
-23	-1.1714	2.2247	0.4975	-2.3547	0.0294*	1.7146	-7.3481
-22	0.4767	2.5131	0.5619	0.8483	0.4068	4.7714	-6.7894
-21	0.2356	2.5962	0.5805	0.4058	0.6894	5.1667	-5.0082
-20	-0.3495	2.0132	0.4502	-0.7763	0.4471	2.7318	-5.3019
-19	0.2351	2.4265	0.5426	0.4333	0.6697	5.2939	-5.2615
-18	1.2138	2.4566	0.5493	2.2098	0.0396*	8.5828	-2.9783
-17	-0.0097	1.8127	0.4053	-0.0245	0.9811	4.2338	-2.1604
-16	-0.0713	1.8567	0.4152	-0.1718	0.8654	2.8141	-3.5583
-15	-0.4509	1.5885	0.3552	-1.2695	0.2196	1.8116	-3.4917
-14	0.1302	1.9788	0.4425	0.2942	0.7718	4.7231	-4.8442
-13	0.1856	2.8162	0.6297	0.2948	0.7713	5.4003	-6.2499
-12	0.6331	3.481	0.7784	0.8133	0.4261	7.1936	-7.3205
-11	-0.0125	2.7417	0.6131	-0.0205	0.9839	4.4301	-6.6583
-10	0.9773	4.5203	1.0108	0.9668	0.3458	11.7802	-9.6907
-9	0.7475	6.1672	1.3794	0.542	0.5941	12.3625	-13.3688
-8	-1.4296	3.6563	0.8176	-1.7486	0.0965	4.5186	-13.5822
-7	0.8108	3.6234	0.8095	1.0017	0.3291	8.8263	-6.8153
-6	0.2841	3.1027	0.6938	0.4094	0.6869	6.9382	-7.7896
-5	0.5573	4.3892	0.9815	0.5678	0.5768	11.0415	-7.6944
-4	-0.1736	2.0741	0.4638	-0.3744	0.7123	4.1885	-4.4683
-3	-0.1534	3.9021	0.8725	-0.1719	0.8654	7.3837	-9.8363
-2	2.2222	3.4984	0.7823	2.8407	0.0105*	8.2322	-6.5439
-1	-0.2988	1.8399	0.4114	-0.7262	0.4766	3.2992	-4.2491
ED 0	0.4468	3.4734	0.7767	0.5752	0.5719	7.6579	-5.3713
1	1.6184	6.9621	1.5568	1.0396	0.3116	17.0996	-14.1671
2	-0.054	4.5411	1.0154	-0.0532	0.9581	5.8444	-12.2899
3	0.4189	3.8842	0.8685	0.4823	0.6351	7.8651	-8.8765
4	-0.4658	2.2473	0.5025	-0.9276	0.3655	4.2806	-4.4187
5	-0.3703	1.5481	0.3462	-1.0696	0.2982	2.7412	-3.0741
6	-0.6861	1.1718	0.262	-2.6184	0.0169*	1.2296	-3.0951
7	-0.7002	4.5561	1.0188	-0.6873	0.5002	10.7026	-10.7067
8	-0.2155	2.0349	0.4555	-0.4736	0.6412	3.9194	-4.1691
9	1.0718	4.3951	0.9828	1.0905	0.2891	16.8722	-3.1067
10	-0.0528	2.1272	0.4757	-0.1112	0.9128	4.6548	-4.5517
11	-0.5017	4.1068	0.9183	-0.5463	0.5912	8.5746	-8.6294
12	-0.2658	2.2373	0.5003	-0.5312	0.6014	4.9622	-5.5229
13	-0.2753	2.2503	0.5032	-0.5475	0.5907	4.3239	-5.8665
14	0.0468	2.1195	0.4739	0.0988	0.9223	4.0022	-2.8102
15	0.4758	1.7057	0.3814	1.2475	0.2274	4.4665	-2.0167
16	0.4639	2.4658	0.5514	0.8414	0.4106	6.8876	-3.5215
17	0.0644	2.4457	0.5469	0.1178	0.9074	4.1257	-4.8809
18	0.5446	4.1037	0.9176	0.5935	0.5599	9.3361	-8.2736
19	0.1706	1.4672	0.3281	0.5246	0.6097	3.8254	-1.9687
20	0.5335	2.8122	0.6288	0.8484	0.4068	5.6774	-4.9063
21	0.0973	2.0622	0.4611	0.2113	0.8351	4.3744	-3.7732
22	-0.1918	2.1005	0.4697	-0.4083	0.6876	5.4916	-5.1604
23	1.1463	4.2415	0.9484	1.2087	0.2416	9.7256	-8.5355
24	0.5132	1.5194	0.3398	1.5105	0.1474	3.1025	-2.6461
25	0.6764	2.4331	0.544	1.2433	0.2289	7.5387	-3.4818
26	-0.3068	2.5743	0.5756	-0.5335	0.6002	3.6873	-4.8872
27	-0.3628	2.8778	0.6435	-0.5639	0.5794	6.1033	-6.6058
28	-0.5804	4.3316	0.9686	-0.5993	0.5561	9.2654	-9.6747
29	0.1675	1.9909	0.4452	0.3762	0.7109	4.6788	-4.4965
30	-0.0258	1.3832	0.3093	-0.0834	0.9344	2.3398	-2.9336

Source: Author's calculations (*Significance @ 5 percent level)

The 2 provides a 60-day window analysis of the Average Abnormal Return (AAR) for a portfolio of twenty different companies with respect to an event day (ED). The results for the Average Abnormal Returns (AARs) on various event days reveal a mix of positive and negative trends among the companies. On the positive side, several event days, including D -2, D -28, D 1, D 23, and D 9, displayed notable positive AARs, with the highest AAR observed on D -28, reaching 2.7292. Conversely, there were negative AARs on multiple event days, such as D -8, D -23, D 7, and D 6, with the lowest AAR recorded on D -8 at -1.4296. Overall, these results suggest a diverse range of market responses to the events, with some days experiencing significant positive abnormal returns and others witnessing negative returns, indicating variations in investor sentiment and company performance during these periods.

The AAR values fluctuate over the observed period, reflecting the collective performance of the portfolio. Statistically significant AAR values are indicated by low p-values (Typically below 0.05). For example, on D -23, the portfolio's AAR is statistically significant with a p-value of 0.0294, indicating a significant decrease in the combined stock values on that day. Similarly, on D -18, the portfolio's AAR is statistically significant with a p-value of 0.0396, suggesting a significant increase in the combined stock values. Most of the other days exhibit statistically insignificant AAR.

On the event day (ED 0), the portfolio of twenty companies had an Average Abnormal Return (AAR) of 0.4468. This value suggests that, on average, the combined stock values of these companies experienced a slight positive abnormal return on the event day. However, it is important to note that this AAR value is relatively low, and its statistical significance should be considered. The Standard Deviation (SD) for ED 0 is 3.4734, indicating the variability or dispersion of the individual abnormal returns within the portfolio on that day. The Standard Error (SE) is 0.7767, representing the standard deviation of the AAR. The t-value for ED 0 is 0.5752, and the associated p-value is 0.5719.

Values indicate that the AAR for the portfolio on the event day is not statistically significant at a conventional significance level (Usually $p < 0.05$). Additionally, the Maximum AAR observed in the 60-day window for this portfolio was 7.6579 on a different day, and the Minimum AAR was -5.3713, also on a different day. In summary, on the event day (ED 0), the portfolio of twenty companies had

a slightly positive average abnormal return, but this return was not statistically significant. The relatively low AAR and the non-significant p-value suggest that the observed abnormal return on this specific day may not be attributed to the event but could be due to random fluctuations in stock prices.

The table 3 provides a 60-day window analysis of the Cumulative Average Abnormal Return (CAAR) for a portfolio of twenty different companies with respect to an event day (ED). The results for the Cumulative Average Abnormal Returns (CAARs) over a 60-day window surrounding the event day (ED) exhibit interesting patterns. The CAARs consistently rise from D -30 to D -2, with positive values indicating that, on average, the companies experience cumulative positive abnormal returns during this period. However, the CAARs turn negative on D -1 and continue to decrease until D 3, implying that, on average, the companies tend to underperform the market in the days immediately following the event.

The statistical analysis shows that the CAARs on D -2, D -1, and ED 0 are statistically significant, as indicated by p-values less than 0.05. This suggests that there are significant market reactions to the events occurring on these days, with ED 0 having the highest CAAR, indicating the strongest cumulative positive abnormal returns. Overall, the CAAR results reveal that the events have a notable impact on the companies' stock performance, with a buildup of positive abnormal returns leading up to the events and a subsequent decline in performance in the days following the events. This suggests that investors react positively to the anticipation of these events but may adjust their positions afterward.

The SD values range from approximately 2.46 to 25.34. The SE values range from about 0.55 to 5.67. These values represent the degree of variability or dispersion in the Cumulative Average Abnormal Returns (CAARs) for the 60-day window around each event day. The Maximum CAAR value is approximately 84.41 on the D 25. This value indicates the highest point reached by the cumulative abnormal returns within the 60-day window around any event day. The Minimum CAAR value is approximately -43.12 on the D 26. These values represent the highest and lowest point observed in the cumulative abnormal returns within the 60-day window around any event day for the 20 companies.

Table 3: 60 days window Cumulative Average Abnormal Return (CAAR) for the twenty companies

Day	CAAR	SD	SE	t Stat	p value	Maximum	Minimum
-30	0.3426	2.4623	0.5506	0.6222	0.5412	7.8971	-3.6608
-29	0.2618	3.0498	0.6821	0.3839	0.7053	8.4193	-6.2896
-28	1.7244	6.2296	1.3935	1.2379	0.2308	20.8539	-6.5376
-27	1.8987	6.9183	1.5473	1.2273	0.2347	27.077	-7.3991
-26	2.3697	7.9442	1.7764	1.334	0.1981	32.6734	-6.0452
-25	1.9491	8.9469	2.0006	0.9743	0.3422	37.7465	-5.4902
-24	1.7081	8.4514	1.8898	0.9038	0.3774	34.2674	-5.1135
-23	0.3516	6.9494	1.5539	0.2263	0.8234	26.9189	-5.8292
-22	1.2434	7.6328	1.7067	0.7285	0.4752	29.6864	-6.3345
-21	0.4075	8.6605	1.9364	0.2104	0.8356	33.5937	-8.1867
-20	-0.1112	8.8669	1.9827	-0.0561	0.9559	31.8079	-10.0941
-19	0.3392	9.1452	2.0449	0.1659	0.8724	31.6276	-12.1348
-18	1.7411	9.0848	2.0314	0.8571	0.4021	35.4046	-8.8778
-17	1.7519	9.2164	2.0609	0.8501	0.4059	35.8534	-10.3992
-16	2.0612	8.4554	1.8907	1.0902	0.2893	32.9919	-7.6231
-15	1.0518	9.2295	2.0638	0.5097	0.6162	33.8423	-11.1148
-14	1.8053	8.5713	1.9165	0.9419	0.3581	31.4419	-9.8551
-13	1.6716	9.5702	2.1434	0.7812	0.4443	33.5372	-12.5964
-12	2.9716	10.6641	2.3845	1.2462	0.2278	33.6399	-13.6387
-11	3.2872	11.9803	2.6789	1.2271	0.2348	33.0051	-18.2453
-10	4.7264	15.7104	3.5133	1.3454	0.1943	38.5189	-21.3509
-9	6.6932	17.0075	3.8031	1.7625	0.0945	39.7529	-20.2652
-8	4.7203	15.3734	3.4376	1.3731	0.1857	33.9096	-23.6933
-7	7.0334	19.2853	4.3122	1.6318	0.1193	50.0487	-26.0484
-6	7.0114	19.0178	4.2525	1.6488	0.1156	48.6676	-25.2196
-5	5.5874	16.0679	3.5929	1.5551	0.1364	36.5831	-24.9707
-4	5.0105	14.4834	3.2386	1.5471	0.1383	36.6493	-25.1277
-3	5.4498	15.1832	3.3944	1.6055	0.1249	33.5565	-27.5845
-2	8.0188	16.5617	3.7033	2.1653	0.0433*	33.8454	-25.2895
-1	7.4844	15.7872	3.5301	2.1252	0.0474*	35.2173	-24.7579
0	8.5865	16.6956	3.7332	2.2999	0.0330*	36.3696	-26.9636
1	10.4203	18.3221	4.0972	2.5434	0.0198*	45.5956	-29.2514
2	8.5085	18.4006	4.1145	2.0678	0.0526	50.6245	-31.1779
3	8.4648	19.4269	4.3443	1.9486	0.0663	58.4891	-32.6123
4	7.1645	19.4883	4.3577	1.6441	0.1166	58.4309	-32.7385
5	6.7733	19.7062	4.4065	1.5371	0.1407	57.0758	-34.2335
6	6.5896	19.2974	4.3152	1.5272	0.1432	54.5598	-35.4041
7	6.1126	19.2468	4.3037	1.4203	0.1717	53.3358	-33.144
8	5.4562	19.7434	4.4141	1.2361	0.2315	55.1612	-34.8956
9	6.7332	19.9959	4.4712	1.5059	0.1485	53.6817	-38.0024
10	7.0407	20.1935	4.5154	1.5593	0.1354	55.7238	-39.0343
11	6.9309	19.7486	4.4159	1.5695	0.1330	55.3505	-36.1309
12	6.0037	20.2553	4.5292	1.3255	0.2007	56.8124	-38.9621
13	5.8739	21.0355	4.7037	1.2488	0.2269	57.4607	-42.7639
14	5.1938	21.6025	4.8305	1.0752	0.2957	57.1967	-42.5927
15	5.0989	21.5108	4.8134	1.0601	0.3024	56.4263	-40.336
16	5.3174	20.0745	4.4878	1.1848	0.2507	56.4375	-37.4823
17	4.8652	21.2142	4.7436	1.0256	0.3180	57.9199	-35.8999
18	5.4675	21.9846	4.9159	1.1121	0.2821	64.0206	-36.8267
19	5.5474	22.4358	5.0168	1.1057	0.2827	67.8464	-35.2886
20	5.1502	23.4061	5.2337	0.9843	0.3375	71.5388	-36.5253
21	5.4321	23.5565	5.2673	1.0313	0.3154	71.7854	-38.6734
22	5.4459	23.6391	5.2859	1.0303	0.3158	70.8917	-39.8045
23	5.8736	25.0129	5.5931	1.0502	0.3068	79.1576	-40.1609
24	6.8471	24.8956	5.5667	1.2314	0.2337	81.6343	-39.3035
25	7.9234	24.9891	5.5877	1.4183	0.1724	84.4064	-40.4345
26	7.8696	25.3445	5.6672	1.3886	0.1815	82.5359	-43.1172
27	7.9598	24.3679	5.4488	1.4608	0.1604	77.4129	-42.3203
28	8.1583	23.0553	5.1553	1.5825	0.1342	69.6227	-40.6875
29	7.8778	24.0196	5.3716	1.4667	0.1588	70.8993	-41.3432
30	7.5782	24.2513	5.4228	1.3975	0.1784	70.5766	-40.8557

Source: Author's calculations (*Significance @ 5 percent level)



Chart 1: Abnormal Average Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) for 60-days window period for 20 merger announcements

Chart 1 illustrates the Average Abnormal Return (AAR) and Cumulative Average Abnormal Return (CAAR) for a 60-day window period surrounding M&A announcements in the Indian stock market. The chart reveals several key insights about the market's reaction to these events.

The AAR values fluctuate between positive and negative throughout the 60-day window. This fluctuation indicates that, on average, stocks experience periods of both positive and negative abnormal returns leading up to and following the M&A announcements. The CAAR, which represents the cumulative impact of abnormal returns over the 60-day period, initially shows an upward trend. This suggests that, on average, stocks tend to exhibit positive cumulative abnormal returns as the M&A announcement date approaches.

The CAAR reaches its peak on the event day (ED 0), indicating that the market's cumulative reaction is most positive on the announcement day. After the event day, the CAAR starts to decline slightly but remains positive. This decline suggests that while the market initially reacts positively to the M&A news, there is some correction or adjustment in stock prices in the days immediately following the announcement.

Semi-Strong Form of Efficiency: The chart's pattern, where the CAAR increases leading up to the event and then gradually decreases afterward, is consistent with the semi-strong form of market efficiency. This form of efficiency posits that all publicly available information, including past stock prices, is reflected in current stock prices. The chart's behaviour suggests that market participants incorporate information about the upcoming M&A event as it approaches, leading to the gradual buildup of positive abnormal returns and a subsequent decline as the event becomes part of historical data. Overall, Chart 1 provides evidence of the Indian stock market's reaction to M&A announcements, demonstrating that stock prices fluctuate in response to these events. The semi-strong form of efficiency observed in the chart indicates that market participants process and incorporate new information into stock prices, leading to shifts in abnormal returns over time. This information can be valuable for investors and researchers studying market reactions to M&A events in India.

The table 4 provides the Average Abnormal Return (AAR) and different windows (60-days CAAR, 40-days CAAR, and 20-days CAAR) for the Cumulative Average Abnormal Return (CAAR) of 20 M&A announcements. The analysis of the AAR (Abnormal Average Return) values around a series of 20 M&A (Mergers and Acquisitions) announcements reveals interesting patterns in stock performance leading up to and following these events. Notably, 30 days before the announcements, stocks exhibited a positive abnormal return, indicating that they were performing better than market expectations. However, 20 days before the announcements, stocks experienced a negative abnormal return, suggesting underperformance compared to market expectations. As the announcements approached, 10 days prior, stocks rebounded with a positive abnormal return, surpassing market expectations on average. On the day of the M&A announcement, there was a positive abnormal return, signifying a positive market reaction to the news. Ten days after the announcement, stocks exhibited a slightly negative abnormal return but remained relatively stable. Twenty days after the announcement, stocks continued to perform well with a positive abnormal return. This analysis underscores the dynamic nature of stock performance in response to M&A announcements, highlighting the importance of considering both short-term and long-term effects when evaluating market reactions to such events. 60-days CAAR window provides a longer-term view of the cumulative average abnormal return around M&A announcements. It starts showing positive abnormal returns around day -20 and continues to increase, peaking around day 2 with a CAAR of 10.12. It then gradually declines but remains positive even after the announcement. 40-days CAAR window covers a shorter period compared to the 60-days CAAR. It also starts showing positive abnormal returns around day -20 and peaks around day 2 with a CAAR of 7.12. It declines after the announcement but stays positive. 20-days CAAR window provides the shortest-term view of the cumulative average abnormal return. It starts showing positive abnormal returns around day -10, peaks around day 2 with a CAAR of 5.61, and then declines after the announcement.

The 60-days CAAR provides the longest view and captures the gradual buildup and decline of abnormal returns. It

reaches the highest peak. The 40-days CAAR also captures the positive abnormal returns but over a shorter period. The

20-days CAAR provides the shortest-term view and captures the immediate impact of the announcement.

Table 4: Comparison of AAR and different window for Cumulative Average Abnormal Return of 20 M&A announcement

Day	AAR	60-days CAAR	40-days CAAR	20 days CAAR
-30	0.7711	0.7711		
-29	-0.0264	0.7447		
-28	2.7292	3.474		
-27	0.2185	3.6925		
-26	0.2486	3.941		
-25	-0.1477	3.7934		
-24	-0.3285	3.4648		
-23	-1.1714	2.2935		
-22	0.4767	2.7702		
-21	0.2356	3.0057		
-20	-0.3495	2.6563	-0.3495	
-19	0.2351	2.8914	-0.1144	
-18	1.2138	4.1052	1.0995	
-17	-0.0097	4.0955	1.0897	
-16	-0.0713	4.0242	1.0184	
-15	-0.4509	3.5733	0.5675	
-14	0.1302	3.7034	0.6977	
-13	0.1856	3.8891	0.8833	
-12	0.6331	4.5221	1.5164	
-11	-0.0125	4.5096	1.5038	
-10	0.9773	5.4868	2.4811	0.9773
-9	0.7475	6.2343	3.2286	1.7247
-8	-1.4296	4.8047	1.7989	0.2951
-7	0.8108	5.6155	2.6098	1.106
-6	0.284	5.8995	2.8938	1.3899
-5	0.5573	6.4568	3.4511	1.9472
-4	-0.1736	6.2832	3.2775	1.7736
-3	-0.1523	6.1333	3.1275	1.6237
-2	2.2222	8.3554	5.3497	3.8459
-1	-0.2988	8.0567	5.0509	3.5471
ED 0	0.4468	8.5035	5.4977	3.9939
1	1.6184	10.1219	7.1162	5.6123
2	-0.0541	10.0679	7.0621	5.5583
3	0.4189	10.4867	7.481	5.9772
4	-0.4658	10.021	7.0152	5.5114
5	-0.3703	9.6507	6.645	5.1411
6	-0.6861	8.9646	5.9589	4.4550
7	-0.7002	8.2644	5.2586	3.7548
8	-0.2155	8.0489	5.0431	3.5393
9	1.0718	9.1206	6.1149	4.6111
10	-0.0528	9.0678	6.0621	4.5582
11	-0.5017	8.5661	5.5604	
12	-0.2658	8.3004	5.2946	
13	-0.2753	8.0251	5.0194	
14	0.0468	8.0719	5.0662	
15	0.4758	8.5477	5.5421	
16	0.4639	9.0116	6.0059	
17	0.0644	9.0761	6.0703	
18	0.5446	9.6206	6.6149	
19	0.1706	9.7912	6.7855	
20	0.5335	10.3247	7.319	
21	0.0973	10.4221		
22	-0.1918	10.2303		
23	1.1463	11.3767		
24	0.5132	11.8899		
25	0.6764	12.5663		
26	-0.3068	12.2595		
27	-0.3628	11.8967		
28	-0.5804	11.3162		
29	0.1675	11.4837		
30	-0.0258	11.4579		

Source: Author's calculations

5. Conclusion

In conclusion, this study delves into the impact of mergers and acquisitions (M&A) on stock prices within the Indian context. It recognizes the rising significance of M&A activities in India's evolving corporate landscape and seeks to shed light on the complex dynamics that govern stock price movements in response to these events. The study utilizes a quantitative approach, employing event study methods to analyze a comprehensive dataset of 20 M&A announcements over a specific time frame.

The findings reveal that stock performance leading up to M&A announcements in India is characterized by fluctuations in abnormal returns (AR) and cumulative abnormal returns (CAR). Notably, stocks tend to exhibit positive abnormal returns approximately 30 days before the announcements, indicating that they often outperform market expectations during this period. However, 20 days before the announcements, a negative abnormal return is observed, suggesting a temporary underperformance compared to market expectations. As the announcements draw nearer, 10 days prior, stocks rebound with positive abnormal returns, surpassing market expectations on average. On the announcement day (ED 0), there is a positive abnormal return, indicating a favourable market response to the news. Ten days after the announcement, stocks exhibit a slightly negative abnormal return but remain relatively stable. Twenty days after the announcement, stocks continue to perform well with a positive abnormal return.

The analysis of AAR and CAAR in the Indian stock market surrounding M&A announcements suggests that the market exhibits a semi-strong form of efficiency. Stock prices fluctuate with positive and negative abnormal returns, peaking on the announcement day and gradually declining afterward, reflecting the assimilation of information and market adjustments. The analysis also includes different windows for cumulative average abnormal return (CAAR), namely 60-days CAAR, 40-days CAAR, and 20-days CAAR. These windows provide insights into the longer-term and shorter-term cumulative effects of M&A announcements on stock prices. The 60-days CAAR window shows a gradual buildup of positive abnormal returns leading up to the announcement, peaking around day 2. It gradually declines but remains positive even after the announcement. The 40-days CAAR window covers a shorter period but still captures positive abnormal returns around the announcement. The 20-days CAAR window provides the shortest-term view and shows the immediate impact of the announcement.

In summary, this study highlights the dynamic nature of stock performance in response to M&A announcements in the Indian stock market. It underscores the importance of considering both short-term and long-term effects when evaluating market reactions to such events. These insights can be valuable for investors, corporate decision-makers, and policymakers, allowing them to make informed decisions and anticipate market responses in the complex world of mergers and acquisitions in India.

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