The Impact of Mergers and Acquisitions on Stock Prices: An Event Study of United States Companies

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MOTIVATION

Mergers and acquisitions (M&A) are significant events in the corporate landscape that often garner substantial attention from market participants and can have profound implications for companies involved. Understanding the impact of these events on stock prices and market behavior is of great importance to investors, analysts, and policymakers. This phase of the research aims to define the specific event (mergers and acquisitions) to be analyzed, provide a brief overview of the results from previous studies, and present the theoretical foundations underlying the research question.

For this study, we focus on mergers and acquisitions as the specific event of interest. By examining the impact of M&A announcements on stock prices, we aim to assess how these events are perceived by the market. The event study is based on an approach that assumes that an M&A announcement brings new information to the market, so that investor expectations about the company's prospects are updated and reflected in prices. Some researchers examine announcement period returns for acquirers and targets. Looking at the announcement period returns on a combined basis is academically important because it can capture market expectations about the future outlook of M&A companies.

LITERATURE

Numerous studies have investigated the relationship between M&A announcements and stock prices, providing insights into the market's reaction and the value implications of these corporate transactions. Some studies have found positive abnormal returns surrounding M&A announcements, suggesting that the market perceives these events as value-enhancing for the involved companies. Conversely, other studies have reported negative abnormal returns, indicating that market participants may view M&A events as value-destructive or uncertain in terms of their outcomes.

Many previous studies report statistically significant positive abnormal ad returns for the combined acquirer and target. For example, Hirshleifer and Noah’s study (2005) report statistically significant positive abnormal announcement returns for the acquirer and target combined. A study by Inoue and Kato (2003) examines 144 transactions between 1990 and 2002 and reports statistically significant and positive announcement period abnormal returns for acquirers and targets.

Satoru Hiruta's study (2012) examined the announcement period returns of 77 transactions between Japanese public companies completed between 2000 and 2005. In his sample, he found that both acquiring

and target shareholders earn positive abnormal returns at the time of the announcement and that the total wealth effects of the announcement are positive and significant.

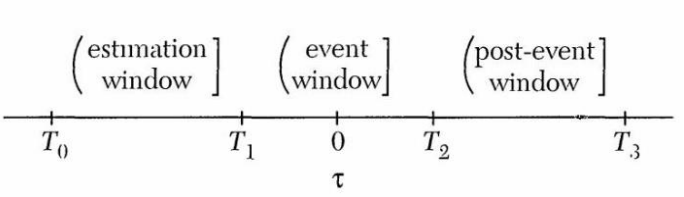
This report investigates whether announcements of mergers and acquisitions (M&A) have an impact on the performance of US companies. The study focuses on the announcement period returns of 50 transactions involving US public companies completed between 2022 and 2023. The objective is to determine whether the disclosure of accounting information imparts valuable insights to the market. If this is the case, there should be a correlation between the actual change in the company's market value and the information disclosed.

In the context of mergers and acquisitions, does the event study reveal unusually large abnormal returns on the event date or during the event window, indicating a significant impact of the event?

DATA & METHODOLOGY

In this phase of the research, we will discuss the data and methodology employed to analyze the impact of mergers and acquisitions (M&A) on stock prices. Specifically, we will focus on the number of events, the event window chosen for analysis, the stock price data obtained, and the selection of the MSCI US Return Index as a benchmark.

For this study, a total of 50 companies that have undergone mergers and acquisitions will be analyzed. These companies have been selected based on their significance, diversity of industries, and availability of relevant data. The stock prices of the 50 companies have been collected over a period of time spanning 252 trading days before the announcement date and 10 days following it. The event window covers a period of 10 days before and 10 days after the announcement date.



To ensure the reliability and accuracy of the stock price data, a reputable financial data provider such as *Refinitiv* has been chosen. For this study, the Total RI of the MSCI US Return Index will be utilized as a benchmark.

Based on the provided data, the following calculations have been conducted using the specified formulas.

RETURN = (Adj. Closing Price on Day X – Adj. Closing Price on Day X-1) / Adj. Closing Price on Day X-1

Alpha = INTERCEPT

Beta = SLOPE

R2 = Rsq

Standard dev = STEYX

These formulas played a crucial role in financial analysis and regression modeling for evaluating abnormal returns.

$$AR_{i\tau} = R_{i\tau} - E(R_{i\tau}|X_{\tau})$$

The modified market model was used to estimate abnormal stock returns for acquirers and targets. The abnormal return is the actual *ex post* return of the security over the event win-dow minus the normal return of the firm over the event window.

$$CAR_i(\tau_1,\tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau}.$$

The CAR is the cumulative sum of ARs over the event window. It provides an overall measure of the cumulative impact of the event on the company's stock.

$$AAR = (\Sigma AR) / n$$

AAR (Average Abnormal Return) represents the average of the Abnormal Returns (ARs) observed during the event window, considering all the companies involved.

$$CAAR(t) = \Sigma AAR(i) \qquad for\ i = 1\ to\ t$$

CAAR (Cumulative Average Abnormal Return) is the cumulative sum of AARs over the event window.

Following the appropriate calculations using the explained formulas, multiple statistical analyses have been carried out. Statistical tests, such as t-tests, have been employed to determine the statistical significance and to assess the relationship between the M&A event variables and the stock price movements.

In order to address the research question, a formal hypothesis test is conducted, with the null hypothesis stating that the expected value of a certain random variable is zero. If the null hypothesis is rejected, it leads to the conclusion that the event had a significant “impact.” The random variable is the average abnormal return on the respective event day (AAR) or the average cumulative abnormal return during the respective event window, which can alternatively be expressed as the cumulative average abnormal return (CAAR). It is a standard practice in the literature to employ two-sided tests, wherein the alternative hypothesis considers the expected value to be different from zero, as opposed to being solely larger or smaller than zero. We adhere to this convention in our study.

RESULTS

The results indicate that acquirers, on average, earn statistically significant and positive abnormal returns during the announcement period as shown in Table 1 and in Figure 1. Based on the results presented, it can be concluded that the Average Abnormal Return (AAR) experiences a negative trend starting from 10 days before the event date until 3 days before it. However, there is a significant positive shift observed from 3 days leading up to the event date until the event date itself. After the event date, the AAR returns to a negative trend again. These findings suggest that there might be a pattern of negative market sentiment in the pre-event period, followed by a positive reaction to the event, and subsequently returning to a negative sentiment in the post-event period.

The evolution of CAAR during the 21-day window for acquirers indicates that there was an increase at the time of the announcement. From day -3 to day 4, the CAAR turns positive, implying a positive cumulative effect, which means the stock performs better than expected during this period. After day 4, the CAAR gradually turns negative again, suggesting a downward trend in stock performance.

Table 1. Average abnormal return and Cumulative average abnormal return

	AAR	CAAR
-10	-0,008	-0,008
-9	-0,001	-0,010
-8	-0,005	-0,015
-7	-0,003	-0,018
-6	-0,005	-0,022
-5	-0,001	-0,023
-4	0,003	-0,021
-3	-0,002	-0,023
-2	0,002	-0,021
-1	0,003	-0,018
0	0,016	-0,002
1	-0,001	-0,003
2	-0,005	-0,008
3	-0,005	-0,013
4	0,005	-0,009
5	-0,001	-0,009
6	-0,009	-0,018
7	-0,009	-0,027
8	-0,005	-0,033
9	-0,005	-0,037
10	0,004	-0,034

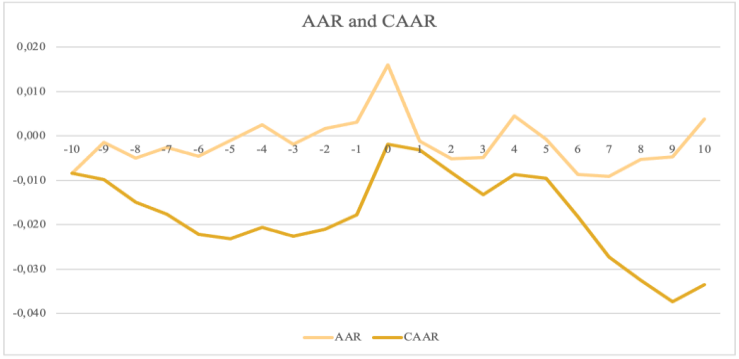


Figure 1. Graphic of AAR and CAAR

A parametric test was utilized to assess the representativeness of the sample. The t-test analysis was conducted to determine the significance of the study within the chosen 21-day window. The results revealed that the study was significant in all the selected windows except for the intervals (-3,3) and (-5,5). Significance levels of 1% and 5% were used for the analysis, and these findings are summarized in Table 2.

Table 2. T- test analysis across different time windows with significance levels of 1% and 5% respectively

Item	Result	Comment
AAR (0)	0,01597	
standard deviation	0,00062	
variance	0,00000	
t-Test	25,66783	significant

Item	Result	Comment
CAAR (-1,1)	0,01785	
standard deviation	0,00187	
variance	0,00000	
t-Test	9,56003	significant

Item	Result	Comment
CAAR (-3,3)	0,00743	
standard deviation	0,00347	
variance	0,00001	
t-Test	2,13875	not significant

Item	Result	Comment
CAAR (-5,5)	0,01263	
standard deviation	0,00546	
variance	0,00003	
t-Test	2,31511	not significant

Item	Result	Comment
CAAR (-10,10)	-0,03354	
standard deviation	0,01042	
variance	0,00011	
t-Test	-3,21937	significant

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variance	0,00011	
t-Test	-3,21937	significant

In this study, the returns of recent acquisition announcements among public US companies were analyzed. The findings indicate that shareholders of acquiring companies earned positive abnormal returns upon the announcement. Additionally, the overall wealth effects of these announcements were observed to be positive and statistically significant.

The study's results were consistent with previous research, reporting statistically significant and positive abnormal returns for acquiring companies upon M&A announcements. Overall, the findings of this paper revealed that M&A announcements had a positive impact on the performance of acquiring US companies. Shareholders of these companies earned positive abnormal returns, and the cumulative wealth effects were statistically significant.

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