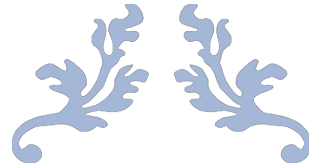


ERASMUS UNIVERSITY ROTTERDAM
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THE PROFITABILITY OF US BANKING MERGERS AND
ACQUISITIONS: ARE M&A ACTIVITIES EXPECTED TO CREATE
WEALTH FOR SHAREHOLDERS IN THE SHORT TERM

Bachelor Thesis



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Abstract

This thesis investigates whether the M&A's activities in the US banking industry create short-term abnormal returns around the announcement day of a merger or an acquisition from the years 2010 to 2019, with a sample of 216 different takeovers in total. Through the use of an event study, positive cumulative abnormal returns were found for the target firms, and negative abnormal returns were found for the acquiring companies in a three-day time period. Furthermore, these returns were affected by some deal and firm attributes including relative size, payment method and number of previous experiences of acquirers.

Keywords: Mergers and Acquisitions, Event studies, Cumulative abnormal returns, regression analysis

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1. Introduction

1.1 Preface

The impact of the business model that is introduced as part of an integrated system spanning boundaries of individual firms is profound (Christoph, Raphael and Lorenzo, 2011). Christoph and Raphael (2010) advocated that various business models allow companies to enhance their competitive advantage and create value in concert with their partners. Among these models, mergers and acquisitions (M&A's) have been an incredibly vital process in the development of enterprises for many years. Generally speaking, through M&A deals conglomerates can achieve marketing economies of scale, reduce transaction costs, and spread risks, enhancing the market performance of firms and creating a favorable condition for participating in the global competition (Brouthers, Van Hastenburg and Van Den Ven, 1998). From the perspective of economic motives, the impact of mergers on the wealth of shareholders has long been a contentious subject in the academic research and empirical investigations. Franks and Harris (1989) found that acquired-firm shareholders on average earned significantly high abnormal returns in the announcement month of around 23%, while acquiring-firm shareholders earned positive but small returns in the announcement month of about 1%. Nevertheless, some scholars held different views based on quantitative analysis. Asquith (1983) concluded that a failed merger bid implies that the bidding firm's management is usually poor, leading to that the market gathering negative information loses confidence on this merger process, and that the unsuccessful bidding firm suffers wealth losses over the period between the first announcement day and the merger outcome date.

Over the past decades, the consolidation process in the banking industry has played a considerable role worldwide (Pozzolo 2009). The data from the database Thomson One Banker show that in the last decade, completed M&A deals among banks worldwide were more than 7,200 for a value of around \$998 billion, and in 2019 the value of completed M&A deals in the banking industry was \$119.64 billion, which accounted for approximately 46.31% of the whole financial sector over the world. It indicates that most transactions take place in the commercial, energy power and materials industries, and M&A is particularly crucial in the banking industry.

In order to examine the impact of the M&A activity on stockholders in the short run, the following research question is formulated:

Can Mergers and Acquisitions (M&A's) in the United States banking industry be expected to create wealth for both target and bidder shareholders around the announcement day?

1.2 Thesis Objective

Gaughan (2010) has shown that the U.S. corporate M&A's have a history of over one hundred years, during which there were six M&As waves. As a result of a combination of regulatory, economic, and technological shocks, the wave of mergers and acquisitions has swept from the mining and manufacturing industries to the emerging industry such as financial and technology sectors. Especially, features sharply differentiated in the fourth wave from those in any other period in U.S. merger history. The aggressiveness of investment bankers in pursuing M&As was crucial to the growth this time. Hence, the six periods of high merger activity in the U.S. effectively promoted the modernization of enterprise organizational structure, saved some poorly managed companies, and greatly improved the production structure of the national economy with social resources better allocated. In U.S. M&A waves, the banking sector has experienced an unprecedented level of consolidation. Al-Sharkas, Hassan and Lawrence (2008) indicated that mergers, in general, have improved the cost and profit efficiencies of banks, as merged banks were on average more technically efficient than non-merged banks and minimized their costs of input.

While some scholars stated that the stock market response to diversifying acquisitions in the conglomerate was positive, Matsusaka (1993) found that not only did the market respond positively, but also the response was clearly negative when management was replaced as in disciplinary takeovers. Hence, M&A's are not expected always to create wealth for both target and bidder stockholders. This thesis will investigate abnormal returns around the M&A announcement date in the US banking industry. To deepen the research, we explore three independent variables, such as relative firm size, payment method and the number of previous experiences of acquirers, as well as five control variables which are commonly used as fundamental determinants of M&A. Thereby, apart from the main research question, the sub-question is formulated as following:

Which of the independent variables significantly affect the cumulative abnormal returns of both the acquirer's and the target's shareholders?

1.3 Structure

The remaining paper will be organized as follows. First, chapter 2 shows detailed literature review concerning the research questions. The hypotheses are proposed to help answer the main and sub-questions in chapter 3. Section 4 and 5 explain the sample of data and the methodology used to verify or reject the previous hypotheses. Chapter 6 will interpret the results and their significance. Finally, chapter 7 concludes the primary outcomes and discuss the potential limitations of this thesis.

2. Literature review

2.1 Basic aspects of Mergers and Acquisitions (M&A's)

Coyle (2000) defined that a merger as the combination of two separate companies of roughly equal size into a single business, and that an acquisition, in contrast, occurs when one company decide to take over control the ownership and management control of another company. An end goal of M&A's is to create synergy, or the forecasted both financial and non-financial benefits from the coming together of two companies. Devos, Kadapakkam and Krishnamurthy (2008) found evidence that mergers increase the equity market value of consolidating firms, operating synergies accounting for 8.38% of the total incremental gains. However, some people stated that the firm seeking mergers or acquisitions seldom weighed up the pros and cons of M&A's. For a few managers it is the thing they should do. Cloudt, Hagedoorn and Kranenburg(2006) pointed out that non-technological merger will have either a non-significant or a negative effect on the post-M&A's performance of bidders. Other than technological innovations, M&A's might also be motivated by other different reasons such as the aspiration to cross-border business. These M&A activities involving no or only little technical knowledge are likely to consume remarkable managerial time and energy. In addition, it is reported that there are steadily declining and negative average cumulative excess returns of both successful and unsuccessful target companies during the period before the announcement date of the merger bid.

Although certain papers consistently supported acquiring companies does not benefit from mergers, the negative effect of M&A's was not an obstacle for increasing M&A deals. Brouthers, Hastenburg and Van Den Ven (1998) divided multiple incentives that range from increasing financial value to growing managerial prestige for mergers into three parts: economic motives, personal motives, and strategic motives.

Economic motives

The economic motive is also called a synergy, which indicates that takeovers are geared to improve

the economic performance of firms. To be more specific, these financial objectives include increasing operation profits, reducing costs, spreading predicted or uncertain risks, responding to market failures or taking a defensive mechanism. Among the potential effects of M&A's, this thesis researches on economies of scale and related efficiency brought by M&A deals.

The M&A is undertaken to exploit economies of scale, and this consolidation is the result of a considered choice in the present world economy. The competition for national and global market shares arises, resulting in a substantial amalgamation of the banking industry of most developed regions such as Europe or the United States and of some developing countries. In banking, costs might be reduced or revenues may be increased by amalgamations due to information economies (Berger, Hanweck and Humphrey 1987). For instance, over past forty years there has been evidence that after M&A's a single and integrated bank develops its capabilities to process, analyze, and manage data while at the same time fixed costs or loan officer costs are spread over expanded operations, leading to that managing more data becomes less expensive. Thus, this scale efficiency results from combined banks that significantly increase the scale of activities, such as, by sharing resources and data of both previous acquired and acquiring banks.

Besides, another factor, the risk is correlated with economies scale. Although more massive scale may provide banks the with stimulative to engage in more risk-taking projects, it does not mean that larger size will be certainly accompanied by the higher risk of systemic problems (Hughes, Mester and Moon, 2001). On the one hand, amalgamations are expected to branch out banks' assets classes, lowering their average costs of funds as scope rises and reducing portfolio and interest risks. On the other hand, regulators are more inclined to financially aid shareholders of large failed banks with the ability to withstand. Hence, the increased size of banks lowers the risk premium and brings value to banks. To conclude, these scale effects are likely to have a positive impact on the cost efficiency and profit efficiency of consolidating banks (Huizinga, Nelissen and Vander Vennet, 2001).

Personal motives

The M&A's might occur when shareholders and managers see a benefit from a personal perspective.

The amalgamation enhances the manager's power to control more available resources, and the growth in the firm's size and sales and is associated with increases in managers' compensation. From the view of stockholders, they focus on their wealth changes in the short term and the long term (Jensen, 1986). However, the interests and motives of shareholders and managers usually conflict because shareholders are seduced to maximize their self-interests while managers consider whether such a M&A is aimed at maximizing the company's profits. In most cases, this conflict of interests tends to undermine the company value. For example, when the enterprise generates considerable free cash flow, which is cash flow that a company can gain from its business operations, the antagonism between managers and stockholders over payout policies is likely to aggravate especially.

Strategic motives

Takeovers positively affect firms to innovate, to expand their products lines, and to improve the competitive environment and the market position (Walter and Barney, 1990). In the banking industry, M&A's can be regarded as an opportunity to develop novel financial products and delivery channels, including e-banks. This part elaborates on cross-border bank M&A's. Francis, Hasan and Sun (2008) found that the recent years saw an increasing trend toward cross-border M&A's among US financial institutions because of the development in the oversea market which has allowed firms to explore investment opportunities both at home and abroad. One of the effects of cross-border bank takeovers is that the M&A creates a diversified corporate structure that aims at product marketing. For example, business divisions, including investment banking division, asset & wealth management division and private equity division, provide with much higher access to customer resources, having a better operating performance than industry competitor in the long term.

2.2 Determinants of abnormal returns in M&As

Based on an extensive study of the existing articles, this thesis summarized that most authors classified the factors that affect the wealth creation of shareholders of both target and bidder into three types: the impact of deal characteristics, the impact of firm characteristics, and the impact of the regulatory framework. This paper will elaborate on the first two kinds of attributes.

The impact of deal characteristics

Method of payment

One deciding element in corporate mergers is the mode of payment used in a modern business context to settle the transaction. Typical payment methods by which the M&A deal value is discharged are divided into two types: one is the cash pattern; another one is the non-cash pattern, such as securities (Ray, 2010). The impact of payment method on the performance of a firm's takeover mainly results from the information asymmetry between the two parties involved in acquisitions. Companies with high information asymmetry usually intend to decrease information asymmetry by acquiring those with low asymmetry, improving internal financing resources and achieving higher market performance (Hyuk and Yang, 2006).

As for the impact of payment methods on short-term stock returns, Wansley, Lane and Yang (1987), Draper and Paudyal (1999), and Amihud, Lev and Travlos (1990), etc. all reported significantly higher short-run returns for cash-financed takeovers. Apart from this economic value, another possible reason explaining why bidding firms prefer cash might be the effect of regulatory requirements for securities (Wansley, Lane and Yang, 1983). In general, an acquiring firm that selects stocks as its payment method should have a complicated process requested by the Stock Exchange, and this approval procedure may take months compared to just several weeks by paying cash. However, Fuller et al. (2002) and Dutta et al. (2013) showed that there is no significant difference on short-term stock performance between equity and cash financed deals, and even stock used to finance a merger sometimes is more charming. It appears that stock financing conveys information that managers are given more flexibility in their current investment plans, and the market is overenthusiastic about investment opportunities of acquiring firms and overestimates synergy gains (Martin, 1996).

The selection of the exchange medium in a M&A transaction can be considered a signal of the actual value of the bidding firm (Travlos, 1987). If the acquirer has information that reflects the intrinsic value of this firm, then the manager will choose a M&A mode of payment that benefits existing shareholders. Generally speaking, the bidders of which stock prices are overvalued prefer to

stock exchange offers whereas those of which stock prices are undervalued lean towards cash. If the future price of the stock is lower than the current price, the bidding firm will select stocks as the medium of exchange; conversely, it will choose cash as its payment method. In consequence, the M&A payment method is likely to send a message that represents the future growth prospect of a bidder to the capital market.

Experience of mergers and acquisitions

The M&A's experience is a critical characteristic of deals, which affects the investment decision of an acquiring firm. There is a saying that a large part of in-depth knowledge specific to the ongoing business gained by enterprises comes from experiential learning. As for the firms with abundant experience and expertise in mergers and acquisitions, they are likely to better grasp the overall picture in takeovers. The importance of M&A experience is reflected in the following ways. One logic argument is that more experienced firms tend to develop appropriate M&A's strategies. Previous experience can promote enterprises to identify risks in the process of new M&A's activities so that the enterprise can reduce decision-making mistakes when it faces a similar situation and facilitates M&A performance. In addition, in light of the organizational learning theory that is a process of creating and transferring knowledge within an organization, experiential learning increasingly draws people's attention. Huber (1991) demonstrates that intentional learning from experience and feedback successfully increases the accuracy and effectiveness of organizational decision making through the learning curve. Hence, enterprises can obtain more directional help from experience learning, correctly summarize the experience, which is conducive for the improvement of the mechanism of a company and its multi-faceted development.

Based on the hard evidence above, it seems that the M&A experience is positively correlated with the subsequent acquisition performance. However, scholars have not reached consensus on the impact of relevant experience on merger and acquisition since the effect of organizational experience might be more complicated to forecast outside a manufacturing context. On the one hand, some scholars believed that there is a positive relationship between the prior organizational acquisition experience and efficiency. For instance, Hitt et al. (1993) found that an acquirer's prior experience leads to an effective takeover integration, achieving synergistic complementarities and

concluded that the acquirer's experience positively affects the stock returns.

On the other hand, some of them argued that M&A's experience does not always have a positive effect. Haleblian (1999) examined the M&A experience of 50 firms listed on, and his results showed an overall U-shaped relationship between organization acquisition experience and acquisition performance. Besides, previous experience may not be suitable for new situations due to the complexity of M&A transactions. A corporate blindly relying on experience might negatively affect M&A performance.

The impact of firm characteristics

Relative size of target to bidder

The relative size of the acquired banks to the acquiring banks is also a considerable component. The size effect in M&A's process is one of the important factors that enterprises have to consider and balance. The firm size might be either positively or negatively correlated with the merger premium. From the perspective of target banks, large transactions result in more substantial acquisition announcement returns for bidders. Moeller (2004) confirmed this hypothesis that the synergy returns for large acquired firms are significantly higher when they make an acquisition announcement, a positive correlation between acquirer announcement returns and the target size. However, it is convincing that as a small-scaled target firm it can benefit from the relatively low transaction cost in M&A's process. In addition to cost savings, small acquired firms are priced more competitively, especially during economic recessions, than large ones (Shawky, Kilb and Staas, 1996). The views regarding the size effect of bidding banks have also been mixed. The larger scale generally induces stronger economic strength and financing capacity, correspondingly reducing its financial burden. Meanwhile, a larger acquiring bank can keenly realize market uncertainties and quickly adjust its M&A strategies. On the contrary, large scale for the bidder is very often affiliated to managerial hubris, so managers of large bidders pay larger premiums whereas small acquirers engage in more profitable acquisitions.

Most of the empirical evidence reports that a large firm with high goodwill was acquired by an unknown small company. Asquith, Bruner and Mullins (1983) presented results of relative values: If

the acquiring firm is affected by a takeover, the cumulative excess return should be higher when the size of the target is larger relative to the bidding firm. A possible explanation could be that in the banking industry, the relatively larger the size of a bank is, the more potent its economic strength is and the stronger its lending and financing capacity is, correspondingly reducing its fiscal burden. Meanwhile, a large scale represents that the ability to prevent and respond to future risks of a bank is stronger.

Overall, it is worth to conclude that the majority of previous literature supported that the wealth created for shareholders is positively related with the size of the target bank.

2.3 Empirical Findings

A lot of studies have been done regarding to value creation around the announcement of M&A's for both the bidder and the target. There are mainly two types of wealth effects of takeovers to time-related dimensions: the short-term impact that covers a couple of days around the M&A's announcement date and the long-term implication that appears after the completion of M&A's in the long run, typically three to five years. Because of the interest of this thesis in investigating the former, we will present a series of research focusing on the short-term performance of M&A's announcement.

The majority of the studies investigating the abnormal returns of either bidders or targets have usually applied the standard event study method to investigate the shareholder wealth effects of mergers and acquisitions over a short period of time. With respect to methods based on the analysis of financial data, the event study uses the market data better explaining the actual economic effects on the announcement day of the M&A activity.

The opinions on the wealth creation for shareholders of acquired companies are very united. Consensus has been reached that the target firm has received significant premiums and increased value for its shareholders. In contrary, the findings of studies coming to abnormal returns of acquiring firms are more diversify and contradictory. Houston and Ryngaert (1994) examined 153 consolidation operations taking place between 1985 and 1991. They found that the acquiring banks

have recorded a loss of value and the target' shareholders gain significant abnormal returns. when notifying a takeover bid, and also explained a phenomenon that the wealth created is more abundant when the degree of relatedness of the companies involved in the takeover is very high. Other studies also presented similar results. Madura and Wiant (1994) analyzed a sample of 152 M&A's activities between US banks from 1983 to 1987. They came to the same conclusion that the shareholders of acquired banks gained great value. However, there are mixed findings when it comes to the abnormal returns of bidders. Becher (2000) shown that there a significant increase in stock price of both firms, with the majority of returns obtained by the shareholders of the target firm. The data was obtained with enhanced significance compared with that over the 1980's. Additionally, and the author concluded that the abnormal returns of bidders are significantly affected by the length of event windows.

3.Theoretical Framework

This chapter will put forward hypotheses regarding the above findings and supports by reviewing the existing literature. These studies and empirical evidence enable this thesis to develop the theories as far as concerns the short-term effect on wealth for both target and acquiring firms and the relevant attributes. The following research question will be investigated:

H1: Can Mergers and Acquisitions (M&A's) in the United States banking industry be expected to create short-term wealth for both target and bidder shareholders around the announcement day?

Furthermore, in order to elaborate on the determines that explain the abnormal returns, this report will verify the following hypotheses from two perspectives.

Method of Payment

Becher (2000) studied on the relationship between diversified methods of payment and value creation on stockholders, and it is stated that cash payments trigger significantly higher abnormal returns than equity payments for both the bidder and the target. The main advantage of cash payment mode is that the shareholders' ownership and earnings per share are not diluted in the company, with the regarding to the study of Sherman (2011). Thus, the second hypothesis states:

H2: Cash as a method of payment has a positive effect on wealth for shareholders of both the bidder and the target.

Size effect

Many of M&A's literature indicates the importance of the relative size effect of the acquired firm to the bidder. Asquith et al. (1983) in their study have confirmed that the relative size has a strong impact on abnormal gains. The larger relative size of the target to the bidder seems to induce the substantially greater cumulative excess returns. This research expects this finding to also be applicable in the US banking industry. Thereby, the hypothesis is formulated as:

H3: Relative size of the acquired firm has a positive effect on the abnormal returns for both the acquiring and the acquired company.

Experience in mergers and acquisitions

According to organizational learning and cognitive systems theory, the corporate generally learns from its prior M&A events that have been undertaken. Under the condition that previous mergers knowledge can provide directional assistance to the next deal, the number of former mergers and acquisitions of the acquiring firm has a positive correlation with the performance on stock returns in the next M&A activity. Therefore, the last hypothesis is proposed as follows:

H4: The prior experience of the bidding company results in higher abnormal returns for both the acquiring firm and the acquired firm.

4.Data selection and validity analysis

This chapter will focus on the information regarding the data and methods used to test the main research question and to verify or reject the hypothesis in the previous section. To be more specific, the research criteria to be fulfilled will be discussed to create the initial data sample, an event study will be explained, and regression analysis will be applied to process the data.

The dataset for both the acquiring and acquired firm is obtained from the database Thomson One Banker, Bloomberg and Datastream. A sample of 216 different announcement dates of the takeover was collected during a period from 2010 to 2019. This is a period over which the economic running circumstance in the USA is relatively stable, providing a growing external environment for the development of M&A. It is also necessary to examine a period of normal market condition, the impact of mergers accurately assessed on stock prices without interference factors from the extreme macroeconomy. In order to avoid that abnormal samples are likely to affect the objectivity and accuracy of empirical results, all merger activities have to fulfil a set of criteria as presented below.

Table 1: Research criteria satisfied by M&A deals

Deal Criteria	
1.	The acquirers and targets are public companies traded on the US stock market and are located in the United States of America.
2.	The dates announced for all M&A's events are between 2010 and 2019.
3.	All transaction values are higher than 1 million.
4.	The acquirer owns equal to, or larger than 50% of the target company's stock.
5.	M&A deals are completed.
6.	The acquiring and acquired firm's stock price returns are available.
7.	The acquiring and acquired firm's accounting data is available.
8.	The financial condition of all firms is sound, and the announced acquisition is not a result of the ultimate aim of assisting financially troubled firms.
9.	Any firm is not involved in other takeovers during the six months prior to the

acquisition announcement date of interest and during the month after the announcement.

As for the first criterion, the U.S. stock market includes the New York Stock Exchange, the American Stock Exchange, and the over-the-counter market, and this thesis only selects domestic M&A activities. Besides, it is critical to note that the acquirer status is public as all information about financials is publicly accessible. The third criterion requires that the percentage of shares owned after transaction should fall in between 50% and 100%, because these shareholdings are perceived to dictate “control” within a firm, with influential votes right. Also, the eighth standard is used to avoid distressed and illiquid stocks with unrepresentative financial data, interfering with the final results. Last but not least, we leave out the data for the acquiring firms that participate in frequent M&A’s activities over a short period of time. The reason behind this is to avoid the potential cross impact caused by two close takeover deals on stock returns. Lastly, table 2 gives the descriptive statistics for both the independent variables and the control variables. Table 3 displays the distribution of the dummies.

Table 2: Descriptive Statistics

	Targets			
Independent Variables	Mean	Std. Dev.	Min	Max
Relative Size	1.10249	11.64003	0.00306	171.2887
The number of prior M&A deals	2.56019	2.33200	0	13
Control Variable				
Tobin’s Q	1.02166	0.05449	0.8033	1.3479
ROA	0.78679	0.77841	-6.5375	3.9085
TAGR	0.73442	0.18174	-0.23008	1.06121
Operating Expenses	17.30871	1.25245	14.5061	22.45898
Cash Flows	105.9951	910.9965	-27.254	13198

Acquirers

Independent Variables	Mean	Std. Dev.	Min	Max
Relative Size	1.10249	11.64003	0.00306	171.2887
The number of prior M&A deals	2.56019	2.33200	0	13
Control Variable				
Tobin's Q	1.039859	.0541878	.9416	1.3303
ROA	0.62026	3.60509	-51.2721	2.1898
TAGR	0.23207	0.25504	-0.09262	1.14125
Operating Expenses	18.77506	1.22061	15.50616	22.79442
Cash Flows	165.5187	470.7938	-1244.774	3210

Table 3: Dummy Variable Distribution

Consideration	Freq.	Percent
Cash	8	3.70%
Stock	102	47.22%
Mixed	61	28.24%
Unknown	45	20.82%

5. Methodology

To answer the main research question, this study mainly investigates the short-term wealth performance of shareholders from the micro perspective of the M&A's returns effect. It elaborates on an event study by estimating the Normal Returns (R), and thus separately determines the Abnormal Returns (AR) and the Cumulative Abnormal Returns (CAR) to evaluate changes of short-term stock prices. Particularly, the use of CAR as a dependent variable to verify the hypothesis and the market model used in the paper of MacKinlay (1997) are explained below.

5.1 Event study

Fama, Fisher, Jensen and Roll (1969) introduced the event study methodology that is essentially the same as that in use today. The event study method is one of the most common methodologies to research the impact of M&A's or other influential events on the corporate value. Under the assumption of the Efficient Market Hypothesis, which means that the market's judgments concerning the information effect of any event are completely reflected by the stock prices, this method is suitable for examining whether these events will immediately result in differential stock returns over a short horizon before and after an announcement date and thus determining the effect on the shareholder wealth and corporate value. These specific events can be diverse, including stock splits, earnings announcements, issues of new debt and equity or, as in this case, the announcement of a merger.

Commonly an event study can be divided into seven steps:

Step 1: Define the event.

Step 2: Determine event window.

Step 3: Determine estimation window.

Step 4: Calculate normal returns (R).

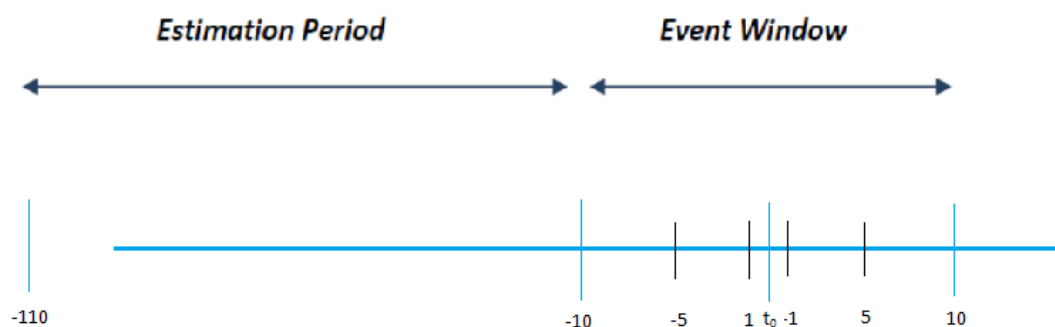
Step 5: Calculate abnormal returns (AR).

Step 6: Calculate cumulative abnormal returns (CAR).

Step 7: Evaluate the statistical significance of the AR and the CAR.

According to MacKinlay (1997), the initial step is to define the event of interest and the event date in which the research is interested. Obviously, this thesis investigates the impact of a merger on shareholder wealth of both acquiring and acquired firms in the United States banking industry from 2009 to 2019. In our case the event date in this essay is defined as the date of the M&A announcement day, represented by $t = 0$. Subsequently, it is identified the period over which the stock prices of the firms involved in the event are detected. To fully reflect the market caused by, for example, the possibility of early leakage of the M&A information and analyse whether it is efficient to incorporate the M&A news, it is advisable to determine the event window to be long enough to capture the whole event. Hence, multiple event windows are examined as follow: a twenty-one-day event window defined as $[-10, 10]$ is employed, comprised of an eleven-day period $[-5, 5]$ and a three-day period $[-1, 1]$ intervals around the acquisition announcement. Also, figure 1 illustrates the timeline that is shown in event time below.

Figure 1: Event study timeline



Normal Returns (R)

Before calculating abnormal returns, it is essential to select a regular performance model for measuring normal returns. The normal return is the expected return on the stock without assuming the presence of the event. Commonly there are four usual approaches—the constant mean return model, the market model, the proxy/control portfolio return model, and the risk-adjusted return model. This report will use the second alternative as the estimators of the market model is relatively stable in the short term and thus accurately define normal returns, leading to improving the ability to test the event effect. Moreover, as the listing of all firms is in the United States, this report specifies the Standard and Poor's 500 Index as the based stock index. For any security i the market

model is formulated below:

$$R_{it} = \alpha_i + \beta_i * R_{mt} + \varepsilon_{it}$$

Where:

R_{it} : return on security i at day t .

R_{mt} : return on the market index S&P 500 at day t .

α_i : constant term.

β_i : measures the stock i 's sensitivity to the market portfolio.

ε_{it} : the statistical error term with $E(\varepsilon_{it}) = 0$ and $var(\varepsilon_{it}) = \sigma_{\varepsilon_i}^2$.

To estimate the market model parameters α_i and β_i , ordinary least squares (OLS) under general assumptions is used. Note that the normal return model provides parameter estimates that are not affected by the event while the abnormal return captures the event impact, thus the estimation period should not overlap with days of the event window. To weaken the interference of heteroscedasticity, both returns on individual security and returns on the market index are converted into gains that are expressed as the natural logarithm of the closing price over the opening price.

$$R_{it} = \ln P_{it} - \ln P_{i(t-1)}$$

$$R_{mt} = \ln P_{mt} - \ln P_{m(t-1)}$$

With the known estimators for parameters, then expected return can be calculated for any given security i .

$$\widehat{R}_{it} = \widehat{\alpha}_i + \widehat{\beta}_i R_{mt}$$

Abnormal Returns (AR)

The next step is to define abnormal returns. The abnormal return is literally the difference between the realized return of stock i over the period of the event window and the normal return over the period of the event window. Given the parameter estimates of the market model, the

abnormal returns can be calculated as follows:

$$AR_{it} = R_{it} - \widehat{R}_{it} = R_{it} - \widehat{\alpha}_i - \widehat{\beta}_i R_{mt}$$

Cumulative Abnormal Returns (CAR)

Based on the results of the abnormal returns, the cumulative abnormal returns (CAR) can be estimated for days in the event window.

$$CAR_{(t1,t2)} = AR_{it1} + \dots + AR_{it2}$$

To obtain the average cumulative abnormal return and draw the overall inference for the effect of M&A, the abnormal return samples should be aggregated and averaged. The average abnormal return (AAR) across all securities for each event period is calculated as follows:

$$\overline{AR}_t = \frac{1}{n} \sum_{i=1}^n AR_{it}$$

Where:

N : the number of observations

T : the event window from the day $t1$ to the day $t2$.

After having established the average abnormal returns, the cumulative abnormal return (CAAR) for an individual stock for any interval $[t1, t2]$ in the event window can be estimated:

$$CAAR_{(t1,t2)} = \sum_{t=t1}^{t2} \overline{AR}_t$$

Statistical Significance

Finally, the last step is to verify the validity of the value of CAR by measuring the statistical significance. A t-test is employed here to test the null hypothesis that whether the cumulative abnormal return is equal to zero in the event window $[t1, t2]$. If t-statistics computed for the CARs to bidders and targets are significantly different from zero, it means that the market price variations of stocks are caused by the announcement of M&A, rather than random factors. In this research, the t-value can be compared with the critical value (-)1.960, which is at a confidence level of 95%.

$$t(\overline{CAR}) = \frac{\overline{CAR}(t1, t2)}{S(\overline{CAR}) / \sqrt{n}}$$

Where:

$S(\overline{CAR})$: the sample standard deviation of the cumulative abnormal return.

5.2 Regression Design

In order to verify sub-hypotheses of this thesis, a regression analysis method is employed to study the impact on cumulative abnormal returns when any one of the explanatory variables' changes, holding other independent variables fixed. According to the hypotheses discussed earlier, CAR is modelled as a function of the three determinants, including method of payment, relative firm size, and the number of former mergers and acquisitions deals.

The cumulative abnormal returns are regressed on a set of independent variables without control variables. Thereby, the following multivariate regression model is formulated:

$$CAR_i = \alpha + Dummy_1(Cash) + Dummy_2(Stock) + Dummy_3(Combination) + \beta_4(The\ number\ of\ prior\ M\&A's) + \beta_5(Firm\ size) + \varepsilon$$

Where:

α : constant term

β_i : correlated coefficient of the independent variable

ε : error term

Next, all control variables will be put in the above regression. This step is to make sure that the results are not due to a spurious correlation between the cumulative abnormal returns and the characteristics of firms. Because we only design one independent variable related to firms' characteristics, there might be other missing variables that make the coefficient insignificant. In fact, the inclusion of control variables in the regression enhances the result of the estimated correlated coefficient. The following multivariate regression model with control variables is composed:

$$\begin{aligned}
CAR_i = & \alpha + Dummy_1(Cash) + Dummy_2(Stock) + Dummy_3(Combination) \\
& + \beta_4(TheNumberofPriorM\&A's) + \beta_5(FirmSize) + \beta_6(ROE) + \beta_7(CashFlow) \\
& + \beta_8(Tobin'sQ) + \beta_9(OperatingExpenses) + \beta_{10}(TAGR) + \varepsilon
\end{aligned}$$

Where:

α : constant term

β_i : correlated coefficient of the independent variable

ε : error term

5.3 Determinants

To test the hypotheses above, this thesis will discuss the determinants resulting in bank acquisition premiums or losses. The CAR is defined as the dependent variable, and three independent variables are shown in the following paragraph.

Method of Payment

The payment method in a M&A activity mainly includes three types: cash, stock and combination of cash and stock. In the regression models, we set three dummy variables for these three payment types separately. If a M&A deal is financed with cash, the value of the dummy variable will take the value of 1.

Relative Size

In order to test the impact of the relative size of the target company to the acquiring company, we define a size ratio and the total asset is a great indicator. Thereby, the rate is equal to target total assets divided by acquirer total assets in the fiscal year preceding the deal.

Experience of mergers and acquisitions

In general, the previous experience and knowledge are difficult to be quantified. This study uses the number of M&A's completed deals for an acquiring firm over the recent years before the announcement day.

Moreover, since there are fewer variables related to firm-specific characteristics, this thesis imports several control variables that measure a firm's profitability, solvency, and future development capacity. These determinants include return on assets (ROA), Price/Earnings ratio, cash flow, leverage, Tobin's Q ratio, and total assets growth rate (TAGR). Although these control variables are not main determinants that this report hypothesizes, it is important to assess their impacts on stock prices of both acquirers and targets in the short term, and importing control variables aims to exclude alternative explanations while testing the hypotheses with explanatory variables.

Return on Assets

The return on assets ratio known as ROA, which defined as net income produced by total assets, is a commonly used benchmark for profitability as it measures the extent to which a firm efficiently generates profits by exploiting its total assets. Return on Assets is commonly used as a tool to measure the rate of return on assets (Heikal, Khaddafi, and Ummah, 2014). A high ROA indicates that the company has great performance as far as operation and profit growth.

Cash flow

Cash flow defined as liquid assets is the net amount of cash and cash-equivalents being received or given out of a business. This factor is in correlation with the efficiency and operating income that both represent how well a firm enables to manage its resources. However, there is an excess free cash flow problem for the governing party when it takes over a company and thus generates substantial free cash flow. Poor cash management can intensify agency problems and give the managers the opportunity to make inferior decisions primarily borne by shareholders. Another lousy practice in valuing M&A's is that acquiring firms might overpay to targets if there are large merger cash flows of the target firm. Hence, this attribute implies that managers of bidding companies with high cash flows are likely to undertake value-destroying acquisitions. In contrast,

the impact on M&A's announcement returns for shareholders of the target company is mixed (Jensen, 1986). This control variable is found from the most recent fiscal cash-flow statement of the firm.

Tobin's Q ratio

The Tobin's Q ratio is defined as the ratio of the market value of a firm to its assets' replacement cost. In general, the Q ratio describes the relationship between market valuation and intrinsic value, a means of the valuation misperception of a company. If the Q ratio is high (greater than one), then a company's stock is more valued than the replacement cost of its assets, implying that the company is overvalued. Conversely, a ratio lower than one means the company is undervalued. The Q is an important indication that explains the future growth of earnings related to those predicted by the book value. Servaes (1991) analyzed the relation between M&A's gains and the Q ratios of targets and bidders and found that more value can be created by taking over a poorly managed firm if q is expressed as a measure of managerial performance. It is defined that Tobin's Q ratio is equal to the total market value of the firm divided by the total asset value of the firm.

Operating expenses

The operating expense refers to a cost that a business incurs through its running of business operations, and it pertains to a firm's ability to compete. Examples include rent, inventory costs, equipment, marketing, etc. Operating expenses are necessary but at the same time unavoidable for most firms. This control variable represents the total operating expenses of the most recent fiscal period for the company. In order to normalize the variable in the linear regression analysis, it is defined as $\text{operating expenses} = \ln(1 + \text{operating expenses})$.

Total assets growth rate (TAGR):

The total assets growth rate is a novel indicator that researchers on M&A's performance seldom use. Only through continuous growth and expansion can a business have the opportunity to obtain greater profits. When enterprises are full of confidence in their future development, they are more inclined to rapidly achieve scale growth and operation expansion through mergers and acquisitions.

Enterprises with strong growing capacity tend to have relatively rapid asset expansion. So, the growth rate of total assets is an excellent indicator to measure the development of enterprises, and it is of great significance to the long-term growth of corporates in the future. Total assets growth rate is defined as $TAGR = ((\text{Total Assets}) / (\text{Total Assets of the last year}) - 1) * 100\%$.

6.Results

In this section, the results from both the event study and the regression analysis are presented and explained. Firstly, to answer the research question we have calculated the Abnormal Returns (AR) and the Cumulative Abnormal Returns (CAR). Based on the numbers and sign of correlated coefficients from the results of regression analysis, we will verify or reject all the previous hypotheses. Both event study analysis and regression analysis are done with STATA.

6.1 Event Study Results

After calculating the Abnormal Returns (AR) for all firms per day, we report the outcomes of the Average Abnormal Returns (AAR) for both the acquirer and the target in the table 4 below, the significant value highlighted with three different significance levels: 10%, 5% or 1%.

Table 4: Average Abnormal Returns (AAR) for acquiring and acquired firms

Test Day	Target	Acquirer
t=-10	0.00117	-0.00080
t=-9	0.00131	0.00109
t=-8	0.00014	-0.00196**
t=-7	0.00134	-0.00137
t=-6	-0.00040	-0.00073
t=-5	0.00091	0.00050
t=-4	0.00207	-0.00099
t=-3	0.00035	-0.00246***
t=-2	0.00114	0.00032
t=-1	-0.00104	0.00082
t=0	0.10035***	-0.00846***
t=1	0.09691***	-0.00378***
t=2	0.00268	0.00276***
t=3	0.00128	-0.00055

t=4	0.00038	0.00017
t=5	-0.00215	0.00023
t=6	0.00052	-0.00126
t=7	-0.00010	-0.00130
t=8	-0.00086	0.00047
t=9	-0.00014	0.00110
t=10	0.00063	-0.00025

*** represents statistical significance at the 1% level

** represents statistical significance at the 5% level

* represents statistical significance at the 10% level

As for the bidders, they obtain a negative abnormal return on average, which is approximately -0.85%, on the announcement day, and the results of the eighth day and third day before the announcement and of the first and second day after the announcement are negative with significance. For the targets, a positive return is acquired from the day of the announcement and the first day after the announcement, with statistically significant value of 10.04% and 9.69% respectively. Nevertheless, the significance of the outcomes above is incidental. To determine the time interval of CAR used in the regression model, we also examine the significance of the Cumulative Average Abnormal Returns (CAAR) for the three different event windows in table 5 and table 6.

Table 5: Descriptive statistics for the acquired firms

Event Windows	CAAR	t-value	p-value	Number of Observations	CAR>0	CAR<0
[-10,10]	0.20558***	12.81775	0.00000	216	191	25
[-5,5]	0.20287***	13.25056	0.00000	216	194	22
[-1,1]	0.19622***	13.86452	0.00000	216	196	20

Table 5: Descriptive statistics for the acquiring firms

Event Windows	CAAR	t-value	p-value	Number of Observations	of CAR>0	CAR<0
[-10,10]	-0.01641***	-3.52269	0.00051	216	80	136
[-5,5]	-0.01143***	-3.30116	0.00111	216	92	124
[-1,1]	-0.01141***	-4.36640	0.00000	216	77	139

As can be seen from the t values, the average CAR for all event widows significantly differs from zero for both the acquiring and acquired firms. Also, these values are strongly significant at the 1% level, and it is evident that the statistical significance of the event widow [-1, 1] is highest. Hence, we only use the empirical outcomes of CAR [-1, 1] below. In light of the data above, the main research question, saying that to what extent wealth value for stockholders at times of M&A's are created in the US banking industry can be verified. The cumulative average abnormal returns for targets are 19.62%, whereas those for bidders are roughly -1.14%. This thesis thus finds considerably positive abnormal returns for targets and slight loss of wealth for bidding firms, and this conclusion is well in line with many earlier empirical studies.

6.2 Correlation Matrices and White Test

Prior to the regression analysis, it is informative to evaluate the linear correlation between all the dependent and independent variables. This thesis uses the Pearson correlation coefficient to test the overall fit of our model. Correlations greater than 0.8 imply that there is a strong linear correlation between the variables. If two independent variables are highly correlated, the issue of multicollinearity will occur, violating the assumption of linear regression. In general, correlated independent variables can affect the effectiveness and quality of results. The table A and table B (appendix) display that all the coefficients are less than 0.5, and all the variables are weakly correlated. Overall, the outcomes of the correlation matrices test allow to isolate the relationship between the dependent variable and each independent variable, improving the reality of conclusions.

Another key to control for the major econometrical problems is to examine whether the variance of the errors in a regression model is constant. Homoskedasticity refers to that the variability of a variable is strictly equal for all stocks. To interpret the coefficient of the variables one of the assumptions requires homoscedasticity. If it is not the case, heteroscedasticity occurs. A widely used test for heteroskedasticity is the White test that allows the independent variable to have nonlinear error variances. Table C to tale F (appendix) presents that the White test statistic is statistically significant for the regression model for the target with control variables. Thereby, the following regression analysis will use default standard errors for the regression model without the control variables, and robust standard errors for that with the control variables is needed to correct the problem of errors that are not independent and identically distributed.

6.3 Regression Analysis Results

Subsequently, the regression analysis is carried out. The cumulative abnormal returns as the dependent variable are related to attributes that have already been elaborated. Although all t values of CAR have high statistical significance, it is noted that mergers in the event window [-1,1] generate the most significant CAAR for both the bidding and target companies, with highest absolute t values. Hence, we select this time interval to perform the regression analysis and to see the different impacts brought by the various attributes. Table 7 and table 8 show the results, including coefficients and the adjusted R-square, of the regression analysis for the event window [-1,1]. Having seen all the regression models for both acquiring and acquired companies, then we will summarize each one to answer other hypotheses.

Table 7: Results for the OLS regression with the acquired firms' cumulative abnormal returns as the dependent variable for the event window [-1, 1]. In parentheses, the t-statistics calculated by STATA model is displayed, and *, ** and *** represent the statistical significance at the 10%, 5% and 1% level respectively.

	Without control variables	With control variables
	CAR [-1, 1]	CAR [-1, 1]

Size	-0.00115	0.00111
	(-0.94)	(0.28)
Number	-0.00267	0.0599*
	(-0.04)	(1.65)
Cash	0.16211**	0.13878*
	(2.03)	(1.83)
stock	-0.01324	0.00692
	(-0.36)	(0.2)
Mixed	0.00621	0.00984
	(0.15)	(0.32)
Tobin's Q		-0.65633**
		(-2.13)
ROA		0.07017**
		(2.23)
TAGR		-0.10613*
		(-1.65)
Operating Expenses		-0.03149*
		(-1.75)
Cash Flow		-0.000
		(-0.07)
_cons	0.19667***	1.33707***
	(5.75)	(3.764)
N	216	216
Adj R-squared	0.03	0.17

Table 8: Results for the OLS regression with the acquiring firms' cumulative abnormal returns as the dependent variable for the event window [-1, 1]. In parentheses, the t-statistics calculated by STATA model is displayed, and *, ** and *** represent the statistical significance at the 10%, 5% and 1% level respectively.

	Without control variables	With control variables
	CAR [-1, 1]	CAR [-1, 1]
Size	-0.00015	0.00011*
	(0.67)	(1.88)
Number	-0.00125	-0.00039
	(-1.00)	(-0.33)
Cash	-0.12520	-0.12543
	(-0.77)	(-0.57)
Stock	-0.00767	-0.00720
	(-1.02)	(-0.85)
Mixed	-0.01538	-0.01418
	(-1.85)	(-1.48)
Tobin's Q		0.04873
		(1.35)
ROA		0.00070
		(1.32)
TAGR		0.00191
		(0.17)
Operating Expenses		-0.00796
		(-1.40)
Cash Flow		-0.0008*
		(1.74)
_cons	0.197***	1.337***
	(5.704)	(4.184)
N	215	215
R-squared	0.03	0.06

We firstly discuss the wealth effect on the target firms. Starting with the second hypothesis, the

dummy variable for cash is strongly significant at a 5% level for debating whether the cash payment method creates more abnormal returns for shareholders. It means that an all-cash bid has a positive impact on stock prices around the announcement day of M&A's, and it can result in an estimated increase of the cumulative abnormal returns by 0.162 units. After adding the five financial control variables related to firms' characteristics, the significance level of the coefficient drops to 10% and the value decreases to 0.139.

The values of the stock and mixed payment mode display a similar behavior with the previous hypothesis. Stock as a payment method generates a decline by 0.013 units, and the mixed mode produces an increase by 0.006 units. It reveals that stock as a method of payment is negatively related with benefits of the targets and that the mixed mode has a little influence. Still, the dummies for stock and mixed payment mode do not yield any significance for both parties. This conclusion cannot be drawn to confirm whether these two methods affect the stock prices in our thesis.

When looking at the third hypothesis, if the relative size goes up by 1 unit the CAR decreases by 0.001 units, keeping everything else unchanged. In the regression with the five control variables, the CAR increases by 0.002 units when the relative size increases by 1 unit. The result of the latter regression model is in line with our hypothesis and a lot of previous literature. However, both data from the two different regression models is not significantly from zero. It is obvious that this thesis cannot confirm that the relative size of the target to the bidder has a slight positive effect, which can almost be ignored.

In the regression without the control variables, the coefficient between the independent variable the previous experience of the acquiring firm and the CAR implies a negative relation. When the bidders have one more former experience, the cumulative abnormal returns decrease by 0.0003 units. The negative sign does not indicate that the prior M&A's knowledge, in fact, brings negative the abnormal returns, with the t value of -0.04. However, this attribute has a positive effect of 0.06 units on the abnormal returns in the regression with the control variables at a 10% significance level. So, we can partially accept the hypothesis when taking consideration of the targets' financial situation. Besides, the control variables also have a certain impact on the short-term market returns

of the targets as their estimated coefficient are all significant apart from cash flow.

Next, this thesis briefly explains the results from the perspective of the acquirers. In the regression without the control variables, the majority of coefficients are positive and not significant except the variable relative size. It can be observed that the dummy variable for mixed payment mode is significant at a 10% level, and the value of the related coefficient is -0.015. Its negative sign gives an explanation that the mixed mode has a negative influence on the stock prices to some extent. After adding the five financial control variables, it is surprising that the coefficient of the variable relative size reveals significance at a 10% level, and there is no significance for the variable mixed mode. Also, we find that the significance of all control variables disappears apart from that of the variable cash flow, even if the influence is extremely small. This finding is contrary to that for the target firms' analysis.

To conclude, we can accept the hypothesis that cash as a payment method, as well as the previous knowledge of M&A's from the acquirers, do creates wealth for the shareholders of targets, and the relative size and the mixed payment method can be partially accepted that they slightly affect the wealth of acquirers' stockholders.

7. Conclusions and Discussions

In this research, the main objective was to investigate whether the M&A's activities in the US banking industry create short-term abnormal returns from the years 2010 to 2019, with a sample of 216 different takeovers in total. Furthermore, this thesis aims to examine which deal and firm attributes influence or not. To answer the research question and test the remaining hypotheses, an event study and the regression analysis are used. The cumulative abnormal returns (CAR) for the day before, while and after the announcement are for the acquiring and acquired companies of -1.14% and 19.62% respectively. Thereby, the M&A announcements generate significant positive returns for the target firm and its shareholders, while it has a slightly negative effect on the stock prices of the bidding company.

Concerning the variables of wealth creation, the variable cash and the acquirers' previous experiment of takeovers are found a relationship with the CAR, and the relative size in the regression model with default standard errors and the mixed payment method in the regression model with robust standard errors can be partially accepted that they slightly affect the wealth of acquirers' stockholders. Unfortunately, the other variables used in this research have no significant effect on the value creation of M&A's in the US banking industry, and as a result the hypotheses should be rejected.

This thesis also consists of some limitations. First, the data sample might be not big enough to draw reliable conclusions. A big size of a data set will bring higher expected prevalence. Besides, the sample maybe have omitted variable bias, because perhaps other relevant variables are not included in the regression models. This would help us better explain the abnormal returns. Furthermore, there is little research on the risk control for the mergers and acquisitions.

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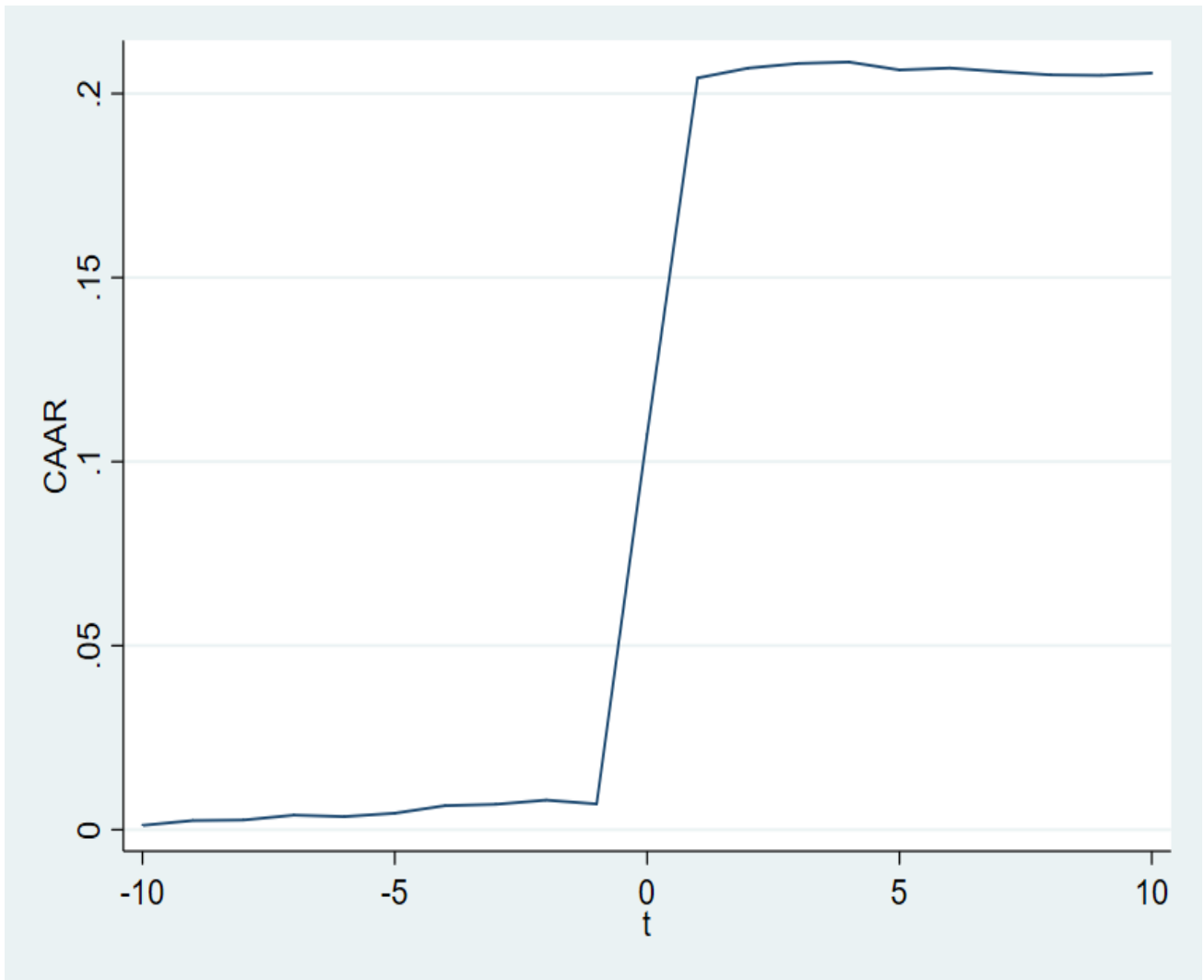
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Appendix

Graph A: The cumulative abnormal returns for the targets around the announcement day from $t=-10$ to $t=10$



Graph B: The cumulative abnormal returns for the bidders around the announcement day from t=-10 to t=10

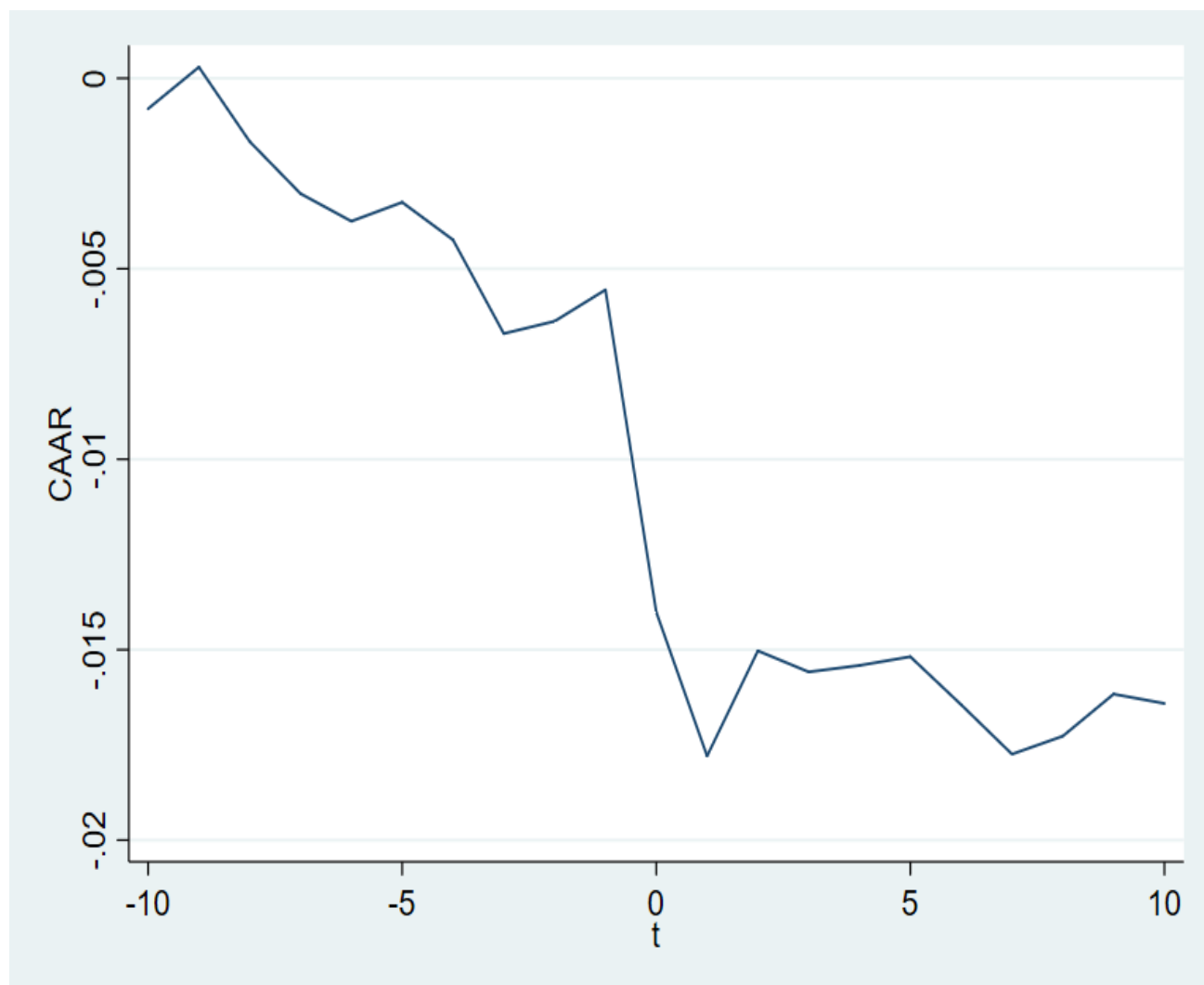


Table A: Correlation between the dependent and the independent variables concerning the targets

Variables	Car1	Car5	Car10	Size	Number	Cash	Stock	Mixed	Tobin's Q	ROA	TAGR	Expenses	Cash flow
CAR[-1,1]	1.0000												
CAR[-5,5]	0.9727	1.0000											
CAR[-10,10]	0.9495	0.9693	1.0000										
Size	-0.0693	-0.0713	-0.0672	1.0000									
Number	-0.0121	-0.0176	-0.0041	-0.0818	1.0000								
Cash	0.1531	0.1516	0.1315	-0.0148	-0.1210	1.0000							
Stock	-0.0719	-0.0824	-0.0777	0.0752	-0.0484	-0.1855	1.0000						

Mixed	0.0167	0.0208	0.0241	-0.0445	0.1451	-0.1230	-0.5934	1.0000					
Tobin	-0.2182	-0.2170	-0.2100	0.4089	0.1151	-0.1134	0.0996	-0.0202	1.0000				
ROA	0.2114	0.2282	0.1941	0.0370	-0.0155	-0.0527	-0.0209	0.0473	0.1182	1.0000			
TAGR	-0.1444	-0.1410	-0.1327	-0.0484	0.0256	-0.0652	0.1098	-0.0302	0.1580	0.1037	1.0000		
Expenses	-0.2513	-0.2356	-0.2161	0.2804	0.1865	-0.1560	0.1048	0.0291	0.4029	0.0840	0.2321	1.0000	
Cash flow	-0.0832	-0.0879	-0.0801	0.9824	-0.0298	-0.0174	0.0800	-0.0362	0.4073	0.0372	-0.0434	0.3640	1.0000

Table B: Correlation between the dependent and the independent variables concerning the targets

Variables	Car10	Car5	Car1	Number	Cash	Stock	Mixed	Size	Tobin	ROA	TAGR	Expenses	Cash flow
CAR[-10,10]	1.0000												
CAR[-5,5]	0.8362	1.0000											
CAR[-1,1]	0.5267	0.6204	1.0000										
Number	-0.1019	-0.0999	-0.0860	1.0000									
Cash	0.0223	0.0380	-0.0114	-0.1210	1.0000								
Stock	-0.0653	0.0270	0.0239	-0.0484	-0.1855	1.0000							
Mixed	0.0829	0.0008	-0.1160	0.1451	-0.1230	-0.5934	1.0000						
Size	0.0894	0.0381	0.0527	-0.0818	0.0148	0.0752	-0.0445	1.0000					
Tobin	0.0288	0.0673	0.0331	0.0264	0.0584	0.0739	-0.0534	-0.0165	1.0000				
ROA	-0.0067	-0.0460	0.0112	0.1085	-0.3530	0.0644	0.0466	-0.0009	-0.3099	1.0000			
TAGR	-0.0947	-0.0371	0.0158	0.0154	0.0227	0.1241	-0.0735	0.2271	0.1479	-0.2505	1.0000		
Expenses	-0.1195	-0.1376	-0.1498	0.4624	-0.1449	0.0049	0.1389	-0.0999	0.0260	0.1675	-0.0689	1.0000	
Cash flow	0.0393	0.0210	0.0022	0.2973	-0.0494	-0.0202	0.1017	-0.0263	-0.0261	0.0449	-0.0719	0.6048	1.0000

chi2(59) = 105.94

Prob > chi2 = 0.0002

Source	chi2	df	p
Heteroskedasticity	105.94	59	0.0002
Skewness	15.02	10	0.1315
Kurtosis	1.20	1	0.2736
Total	122.15	70	0.0001

Table C: White Test of the regression model without the control variables concerning the targets

chi2(14) = 11.81

Prob > chi2 = 0.6212

Source	chi2	df	p
Heteroskedasticity	11.81	14	0.6212
Skewness	5.35	5	0.3742
Kurtosis	1.13	1	0.2868
Total	18.30	20	0.5674

Table D: White Test of the regression model with the control variables concerning the targets

chi2(14) = 10.90

Prob > chi2 = 0.6938

Source	chi2	df	p
Heteroskedasticity	10.90	14	0.6938
Skewness	2.56	5	0.7681
Kurtosis	3.41	1	0.0648
Total	16.87	20	0.6617

Table E: White Test of the regression model without the control variables concerning the acquirers

chi2(59) = 130.28

Prob > chi2 = 0.0000

Source	chi2	df	p
Heteroskedasticity	130.28	59	0.0000
Skewness	23.47	10	0.0091
Kurtosis	4.23	1	0.0397
Total	157.98	70	0.0000

Table F: White Test of the regression model with the control variables concerning the acquirers