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DISSERTATION

WEALTH CREATION OF MERGERS AND ACQUISITIONS: THE CRISIS PERIOD OF 2008-2009 AMONG U.S. FIRMS

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Wealth Creation of Mergers and Acquisitions:
the Crisis Period of 2008-2009 among U.S. firms

Glossary

AAR – Average Abnormal Returns

APT – Arbitrage Pricing Theory

AR – Abnormal Returns

CAAR – Cumulative Average Abnormal Return

CAPM – Capital Asset Pricing Model

CAR – Cumulative Abnormal Return

IMAA – Institute for Mergers, Acquisitions and Alliances

MM – Market Model

M&A – Mergers and Acquisitions

S&P 500 – Standard and Poor's 500 Index

U.S. – United States

Abstract

Mergers and acquisitions were always a popular strategy used by numerous companies for diverse reasons. They account for transactions of billions of dollars every year. Nevertheless, researchers proved that M&As often end up not creating value for its shareholders. Recently, the world faced a Global Financial Crisis that changed reality and rules for many businesses.

By using an event study, this dissertation studies and compares U.S. M&A deals from three different periods: pre-crisis, crisis, and post-crisis. CAAR values were computed for each period, and the findings state that there is value creation for the public M&A deals that took place before the crisis period. Another result claim there is a creation of wealth on the announcement day for the three periods.

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Resumo

As fusões e aquisições são estratégias populares usadas por diversas empresas com variados objectivos. Desta forma, traduzem-se, todos os anos, em transações de biliões de dollars. Ainda assim, estudos mostram que as fusões e aquisições tendem a não criar valor para os acionistas. Recentemente, o Mundo encarou uma crise financeira global que mudou a realidade e as regras em muitas empresas.

Através de um estudo de evento, a seguinte dissertação analisa e compara fusões e aquisições americanas considerando três períodos distintos: antes da crise, durante a crise e o pós-crise. Para cada período foi calculado o CAAR e os resultados mostram que há criação de valor para as fusões e aquisições públicas antes da crise. Para além disso, conclui-se que há criação de valor no dia de anúncio da transação para os 3 períodos estudados.

Classificação JEL: G01; G14; G21; G34

Palavras-chave: Fusões e aquisições; Sinergia; Retornos Anormais; Retornos Anormais Médios Cumulativos; Criação de Valor

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1. Introduction

Mergers and acquisitions are a type of strategy often adopted by companies for the most diverse purposes. They can take a long time from the announcement until closing, require many advisors, lawyers, and efforts for the due diligence process, and are often discussed in the media. Historically many large deals involving billions of dollars have occurred in the economy, but the question is if they have created value for the acquiring shareholders.

In December 2007, a great recession emerged in the U.S., which was the primary cause of the interruption of the wave of M&A that was initiated in 2000. It is interesting to understand whether the deals during and after the global financial crisis differ in its value creation from the announced deals in the pre-crisis economy.

Much empirical research is focused on value creation, but there is a lack of research in crisis and post-crisis transactions. For example, Dogan & Yildirim (2017) have studied bank mergers share price variation before and after the global financial crisis. They stated that M&As from the post-crisis period have higher value creation for all parties when compared to the pre-crisis period. Nevertheless, this research is bound to a specific sector and may not apply to other industries nor be generalized.

The literature gap about this topic gives a possibility to contribute with research on M&A's impact on shareholder's wealth during and after a severe financial crisis, as is the case of the period 2008-2009. One thousand ninety-four of completed U.S. M&A deals from diverse industries were used for the study.

Six main sections compose the dissertation. The first section dives into a literature review on several issues related to M&A value creation. Afterward, the methodology is presented and explained in detail, including all the necessary calculation steps. Section 4 presents the data sample used for the study and its descriptive statistics and is followed by discussing the results in section 5. Finally, the conclusions are in section 6.

2. Literature Review

This section includes the review of relevant literature about mergers and acquisitions in the context of value creation. It begins with the explanation of the main motives for the adoption of M&A strategy, clarification of different waves of M&A in the U.S. according to their activity, and delineation of what makes this strategy successful. Afterward, the M&A announcements, the relation of the firm's returns and size, and the short- and long-term returns are exposed. Furthermore, the present findings of the global financial crisis and M&A are stated. The section ends with the research questions subsection, where the research hypotheses are defined.

2.1. Reasons for M&A strategy

Acquiring firms decide to follow M&A strategies for different reasons. However, empirical studies face difficulties in differentiating the concrete motives because each acquisition may often have several motives at the same time in the sample (Kiymaz and Baker, 2008). Even though it is possible to sort the motives into groups such as synergy, agency, and hubris, as suggested by Berkovitch and Narayanan (1993).

Chatterjee (1986) explains the three major types of synergies that serve as a motive for M&A strategy: financial, operational, and collusive. The financial synergy is associated with a decrease in the cost of capital for the combined firm. The operational synergy has a goal to decrease the cost of production, distribution, administration, R&D, among others. The collusive synergy offers the combined firm the possibility to increase prices due to collusion between industry peers.

Morck et al. (1990) found that managerial objectives are also the reason for acquisitions. However, they say these are wrong reasons. Their study showed that bad managers are also bad acquirers, and therefore, it is an indicator of agency problems arising from the bidding firm.

When M&A takes place due to acquiring firm management's personal interest, the agency problem arises. Specialist managers tend to acquire businesses in their expertise field, which creates an even greater dependency of the merged firm on their skills.

Consequently, these actions may create agency costs, negatively impacting the firm's value and shareholders' wealth (Berkovitch and Narayanan, 1993).

According to Roll (1986), the hubris hypothesis happens when the bidding firm's management makes biased mistakes in valuing the target firm and, therefore, overpaying the acquisition. The findings also suggest that well-performing firms may tend to make poor acquisitions due to manager's hubris.

2.2. Different waves in M&A

A study developed by Mitchell and Mulherin (1996) indicates that mergers occur in waves and tend to be strongly clustered by industry within a wave. Literature suggests that waves may happen as a consequence of industry shocks. Brealey et al. (2011) also mention that, according to data about merger activity in the U.S., it is clear that mergers tend to occur in waves.

Stearns and Allan (1996) mention four mergers waves in the United States from 1895 to 1990. These waves happen due to political and economic changes that modify governmental agreements and create new opportunities. The State can adopt strategies that facilitate or difficult mergers, such as increasing or lowering their execution costs. Another driver mentioned by authors is challengers and innovations. Challengers are those who make the merger happen. They can either be individual entrepreneurs or enterprising firms willing to innovate and little to lose compared to members.

The most recent waves are mentioned by Hellier et al. (2020). Among the last ones, the authors identify a merger wave right before the global financial crisis (2001-2010) and one after the final crisis (2011-2016). Nevertheless, there are not many studies yet focusing on the impact of the financial crisis on the M&A and the shareholders' wealth creation.

Figure 1 discloses the number and value of M&A deal in the U.S. from January 1st, 1985 until December 31st, 2019. A merger wave pick can be observed in 2007, right

before the beginning of the crisis, and its significant decrease during the most severe 2008 and 2009.

Figure 1 - Number & Value of M&A North America.
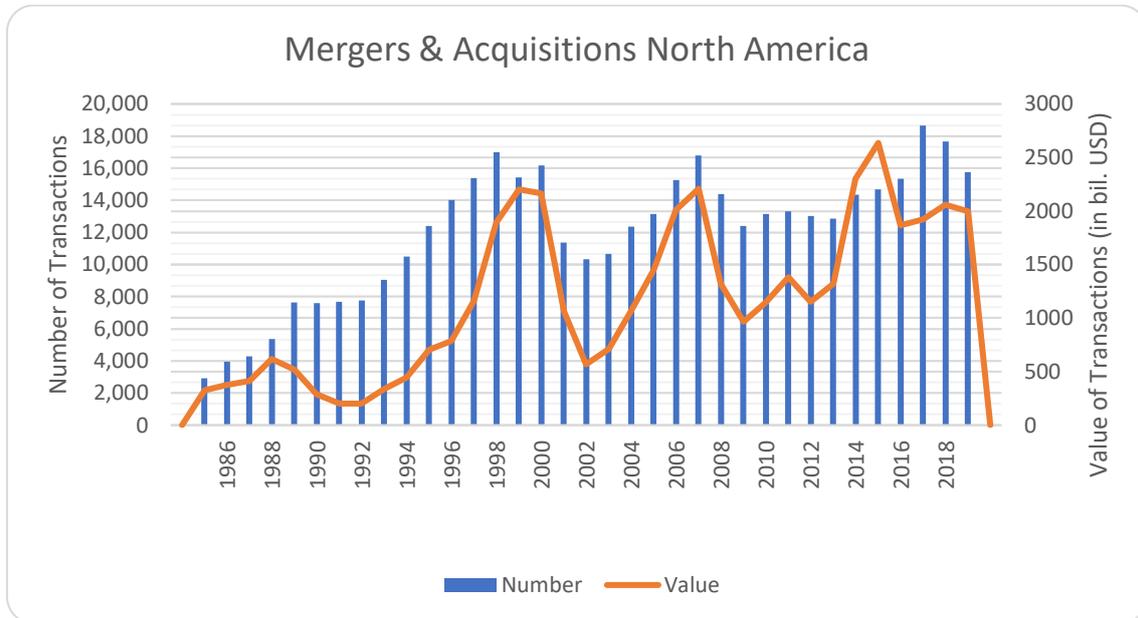
(Source: IMAA analysis; imaa-intitute.org)

2.3. What makes an M&A successful?

M&A may have a substantial impact on the wealth of both acquiring and target firms' shareholders. It may increase or decrease the value of shareholders of both firms or eventually transfer the value from one to another.

According to Andrade et al. (2001), mergers do create wealth for the combined firm shareholder. Another example was given by Devos et al. (2009), who also empirically evidenced that the combined firm makes a value creation of approximately 10%. On the other hand, Alexandridis et al. (2017) reinforce that neoclassical literature of M&A suggests more frequently the destruction of acquiring firm value than value creation.

The evidence from the financial literature is that several outcomes are possible. Consequently, it is crucial to understand what can lead to success and what can lead to failure.

Various researches are focusing on the reasons for success. For example, Hitt et al. (2009) concluded that the premium paid could not be too high, and target selection is a crucial phase of the acquisition process to avoid post-event failure. It may also happen that target firms learn from their bidding firms and create new abilities to reach a better competitive position in the market, making the M&A strategy extremely successful.

Pablo et al. (1996) underline three other factors for the successful M&A decision-making process: i) strategic and organizational fit (can boost, enlarge or explore other product markets in the company's existing strategy course); ii) past performance (may be used as predictions of future performance, it can also influence the risk component view) and; iii) resource requirements (from a managerial perspective affect candidates' selection due to future needs of financial and human resources allocations).

2.4. M&A announcements

Keown and Pinkerton (1981) provided evidence that leakage of inside information about a company's strategic move is an extensive problem and is happening up to 12 trading days before the first public announcement of the possible merger. The fact that coming merger announcements are not effectively kept secret influences the accurate wealth creation for both bidder and acquired firm's shareholders. As a consequence, this information leak can be used by speculative investors.

Jarrell and Poulsen (1989) evidenced signs of media speculations effect in the unanticipated premiums and prebid runups. Also, holding a comparatively significant portion of shares in the target firm at the time of the bid lowers unanticipated premiums. Still, it doesn't significantly impact whether the bid is friendly or hostile.

2.5. M&A returns and size of the firm

Dodd (1980) studied the daily abnormal returns to shareholders from both acquiring and target firms in concluded and withdrawn merger proposals. He found that target firms' shareholders earn high positive returns when the first public announcement of the merger is made, no matter if the merger was successfully completed or canceled. The opposite

happens to the bidder firms' shareholders. They get negative abnormal returns in both cases of completed or canceled merger events.

And what about the size of the acquiring firm? Moeller et al. (2004) showed that larger firms get lower abnormal returns in comparison to smaller firms when the acquisition announcement is made. When larger bidder companies announce the acquisition of public firms, they face wealth losses. The way of financing is irrelevant in these cases. An explanation of such results can be the amount of premium paid for the acquisition. Usually, big firms pay a higher amount in comparison to small firms, which may create negative synergies from the very beginning of M&A.

Another interesting literature outcome is presented by Fich et al. (2018). These authors found that small deals when compared to bidder size, create large-gain acquisitions.

2.6. Short- and long-term return

According to Loughran and Vijh (1997), the acquirer shareholder returns tend to be higher in cash transactions than in matching share exchange transactions. Bidding managers tend to select share exchange as a payment method when they know their shares are overvalued in the market and the cash payment method if shares are undervalued. Loughran and Vijh (1997) also show in their paper that shareholders who sell their shares after the acquisition get a wealth increase while shareholders who keep shares after the acquisition get decreased gains over time.

Loderer and Martin (1992) studies reveal that although there are some negative results in the first three years, the acquiring firm in the long term gains their required rate of return.

2.7. The Global Financial Crisis and M&A

Globalization and cross-border M&A can have a significant role in the global financial crisis resolution and economic stabilization. Grave et al. (2012) state that cross-border M&A motivates people, investors, the government to build democracy, accept the

cultural differences, and create more significant synergies to overcome the crisis through economic, political, and social coordination programs to be worldwide integrated. The authors also raise the question of whether there could be potential for global peace promotion from a long-term standpoint.

Dogan and Yildirim (2017) developed a study about bank mergers value creation before and after the global financial crisis. They found that bank mergers in the post-crisis period generate higher gains for all parties, bidders, targets, and combined firms compared to the pre-crisis period. Some of the reasons for those findings might be the new regulations adopted by the country's financial regulatory authorities, risk level reduction policies, and quality increase for target selection.

Alexandridis et al. (2017) refer to a more efficient resource distribution strategy and significant corporate governance environment improvement post-2009. They study a sample of U.S. deals announced between 1990 and 2015 and find positive improvements in the value creation for acquiring shareholders. They also conclude that shockwaves from a global scale financial crisis can force improvements in corporate investment decisions.

2.8. Research questions

M&A literature is based on many studies that were performed by many experienced researchers. The takeaways from the literature review suggest that when M&A is correctly set, it can create synergies, unlock growth and expansion, increase supply chain pricing power, and even eliminate competition. Consequently, wealth creation was always a concern for both bidding and target firms' shareholders but not obvious or easy to achieve.

Findings from the literature review state that premium paid should not be excessive, and target firms must be carefully selected. Illegal but sometimes unavoidable information leakage can create abnormal gains to some and losses to others. Positive average abnormal returns are expected for target firms' shareholders around the first public announcement of merger proposals, but negative average abnormal returns for bidder firms' shareholders. Larger firms get lower abnormal returns in comparison to

smaller firms when the acquisition announcement is made. Shareholders who sell their shares after the first announcement of acquisition get a wealth increase, but those who keep shares after the acquisition may get decreased gains overtime when the M&A is not successful.

The scientific literature evidence that M&A is a broad research subject. However, there is a gap in the literature on their effect on wealth creation and share prices because of the global financial crisis. For this reason, our Master Thesis explores the analysis of Wealth Creation after a Merger and Acquisition before, during, and after the most severe Crisis Period of 2008-2009 to find the differences in wealth creation for the shareholders during those periods.

Therefore, the hypotheses to be tested are:

H1: The announcement of M&A has a positive impact on acquiring firms shareholder's value; therefore, there is value creation.

H2: The announcement of M&A has a positive impact on acquiring firms' shareholder's value before the global financial crisis.

H2: The announcement of M&A has a positive impact on acquiring firms' shareholder's value during the global financial crisis in 2008-2009.

H3: The announcement of M&A has a positive impact on acquiring firms' shareholder's value after the global financial crisis.

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3. Methodology

This empirical study on M&A performance is based on an event study to find if M&A creates value for the firm's shareholders before, during, and after the crisis period. This section explains the methodology used, followed by several subsections that justify the steps taken by presenting methodology assumptions and the performed computations.

3.1. Event Study

Event Study, as it is used these days, was firstly introduced by Ball and Brown (1968) and Fama et al. (1969). It is a statistical method used in finance to study how a particular event impacts the firm's value by examining its share price before, during, and after the event. (MacKinlay, 1997). The results are used to create estimations of an upcoming economic performance of the firm. (Bromiley et al., 1988).

3.1.1. Event Study assumptions

The event study methodology is grounded in three main assumptions: a) the market is efficient; b) the event is unexpected; c) no other events arose during the event window. (Brown and Warner, 1980).

Capital market efficiency is a critical condition to perform an event study. Market efficiency happens when the prices fully reflect the available information in the market. (Fama, 1970). When this condition happens, no securities are undervalued or overvalued because market prices already reflect all the information. Therefore, we can make a clear distinction between pre-event returns (expected returns) and post-event returns (abnormal returns). (Fama, 1970).

The second condition is the unexpectedness of the event, which means that the share price has not yet incorporated the event's effect. Given that M&A is a business strategy planned by the firm and can be predicted before the announcement date, this condition is not always met. The leakage of information can also destroy this assumption. (Lubatkin and Shrieves, 1986; Wang and Moini, 2012).

The third assumption is that there were no other interfering events during the same event window, which could provoke share price changes. (Wang and Moini, 2012). The authors state that this assumption strongly depends on the length of the event window.

3.1.2. Models for Event Study

To perform an event study, researchers use either a statistical or economic model. The most well-known statistical models are the Market Model and the Constant Mean Return Model. On the other hand, the most common economic models are the Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT). (Campbell et al., 1997; MacKinlay, 1997). Literature states that CAPM was common during the 1970s however, its limitations threaten the validity of those findings. Furthermore, Brown and Weinstein (1985) state that APT negatively impacts event study methodology implementation and is less practical than the Market Model. Due to these arguments, this dissertation is based on the Market Model.

3.1.3. Estimation period and event window

We must choose the event window and estimation period to study the effects of a particular event on the firm's share price.

The estimation period is used to compute expected returns, which are the returns during the time period where no events occur. On the other hand, to compute abnormal returns, the event window is selected. This window includes pre-event days, the event day, and post-event days. The researchers determined the length of these time parameters, but there isn't any substantial period defined. Nevertheless, it is essential to avoid making it too short or too long to avoid excluding the event's effect in the share price or including the effects of other events irrelevant to the study, respectively. (Peterson, 1989).

The main event window of 31 days was chosen [-15; 15] to perform the study. The event window includes fifteen days before the event, the event day itself, and fifteen days after the event. In this study, the announcement day of M&A is considered to be the event day. In case the event happens on a non-trading day, the next trading day after the event is taken into consideration.

The estimation period length applied is of 150 days, which are counted backward from day -16. Therefore the estimation period is [-165; -16].

3.1.4. Abnormal returns computation

The abnormal returns (AR) are computed to understand if there was value creation or value destruction after the effective date of the M&A. It is said that there will be value creation when abnormal returns are positive; this means the shareholders receive a higher amount of earnings than it was expected, assuming a certain amount of risk in normal market conditions. When the opposite happens, it is said that value destruction occurred. According to MacKinlay (1997), the abnormal returns are computed according to the following equation:

$$(1) \qquad AR_{i,t} = R_{i,t} - E(R_{i,t})$$

Where,

$AR_{i,t}$ – is the abnormal return of combined firm i on day t,

$R_{i,t}$ – is the actual return of the share of the combined firm i on day t,

$E(R_{i,t})$ – is the expected return of the share of combined firm i on day t.

Since it was defined that the estimation of expected returns will be done using the market model, the OLS regression estimation is defined as (MacKinlay, 1997):

$$(2) \qquad E(R_{i,t}) = \alpha_i + \beta_i R_{m,t} + \epsilon_{i,t}$$

Where,

$E(R_{i,t})$ – is the expected return of the share of the firm i on day t,

α_i – is the intercept,

β_i – is the sensitivity of the share of the firm i to the market's return,

$R_{m,t}$ – is the return on the market index on day t,

$\epsilon_{i,t}$ – is the random error term.

The OLS regression parameters' computations, abnormal returns, and respective tests were done using Excel and its Analysis Tool Pack. The share market index considered for the study is S&P 500 because only U.S. M&As compose the sample.

The average abnormal return (AAR) is computed using the equation:

$$(3) \qquad AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{i,t}$$

Where,

AAR_t – is the average abnormal return in period t,

N – is the number of combined firms,

$AR_{i,t}$ – is the abnormal return of combined firm i on day t.

3.1.5. Cumulative average abnormal returns computation

The cumulative abnormal return (CAAR) will be an indicator of any value creation for the shareholders. Several intermediary calculations should be taken. When CAAR is positive, then the event created value in the period of analysis; if CAAR is negative, the event destroyed value. (Kirchhoff and Schiereck, 2011).

The cumulative abnormal return (CAR) for the is computed using the equation:

$$(4) \qquad CAR_i = \sum_{t=k}^{l} AR_{i,t}$$

Where,

CAR_i – is the cumulative abnormal return of the combined firm i,

$AR_{i,t}$ – is the abnormal return of combined firm i on day t,

k – is the first day of the event window,

l – is the last day of the event window.

Afterward, the cumulative average abnormal returns (CAAR) can be computed to evaluate the impact of M&A on the value creation of the combined firms belonging to the sample:

$$(5) \qquad CAAR = \frac{\sum_{i=1}^{N} CAR_i}{N}$$

Where,

$CAAR$ – is the cumulative average abnormal return,

CAR_i – is the cumulative abnormal return of the combined firm i,

N – is the number of combined firms.

According to Henderson (1990), the estimates result from the estimation period and to approximate returns to the normality assumption of the regression model, the logarithm is used:

$$(6) \qquad \hat{R}_{i,t} = \ln\left(\frac{P_t}{P_{t-1}}\right)$$

Where,

$\hat{R}_{i,t}$ – is the estimate of the return of the share of the firm i on day t,

P_t – is the market share price of firm i on day t,

P_{t-1} – is the market share price of the firm i on the day previous to the day t.

$$(7) \qquad \hat{R}_{m,t} = \ln\left(\frac{I_t}{I_{t-1}}\right)$$

Where,

$\hat{R}_{m,t}$ – is the estimate of the return on the market index on day t,

I_t – is the S&P 500 index share price on day t,

I_{t-1} – is the S&P 500 index share price on the day previous to the day t.

Subsequently, to drive relevant conclusions about the outcomes of the study, significance testing is necessary. This testing permits the evaluation of forecasting errors (Peterson, 1989). As reinforced by Brown and Warner (1985), the parametric standardized t-test assumes that the abnormal returns are independent and cross-sectionally distributed. Therefore, the t-test of the cumulative average abnormal returns (CAAR) is performed. Other parametric tests used in this dissertation are the Pattel test and Standardized Cross-Sectional test, which are not influenced by how ARs are distributed. To ensure that the results are not due to outliers, a non-parametric Corrado Rank is also performed. (Pattel, 1976; Boehmer et al., 1991; Corrado and Zivney, 1992).

4. Data

This section explains the data sample used for the event study. It is divided into two subsections clearing up the data selection process and the data description. Some of the additional graphs and tables are attached to appendices.

4.1. Data selection

To perform the study, it was necessary to collect data on M&A deals before, during, and after the Global Financial Crisis. For this purpose, the Thomson Reuters Datastream database terminal was used, and data about 1094 M&A deals was collected.

It was defined to use a 14 years period and deals announced by American companies to acquire or merge with another American company. Therefore the currency associated is the American dollar.

During the first access, the list of the deals whose announcement date was from January 1st, 2001 until December 31st, 2015, and their RIC codes were extracted. All of the deals followed the following criteria: i) deal status is completed; ii) target nation and acquirer nation are the U.S.; iii) form of the transaction is a merger or/and acquisition; iv) target and acquirer public status is public; v) deal attitude is friendly; vi) percentage acquired is higher or equal to 50%.

On the second access to the Thomson Reuters database, it was necessary to collect the share prices from January 1st, 2000 until December, 31st 2020 of the previously extracted deals and S&P 500 to proceed with the calculations necessary for the study, defined in the methodology section.

S&P 500 index was used for the market return since it is a common benchmark for the U.S. economy, used by investors. Its possible implications for the results will be discussed in the next section.

4.2. Data description

The sample was split into three subsamples: 2001-2007 deals (defined as a pre-crisis period), 2008-2009 deals (crisis period), 2010-2015 deals (post-crisis period).

To start with the contextualization, figures 2 and 3 give an overview of the full sample.

Figure 2 – Number of M&A deals per year in the sample.

(Source: Author's figure)

Figure 3 – Cummulative number and percentage of M&A deals in the sample.
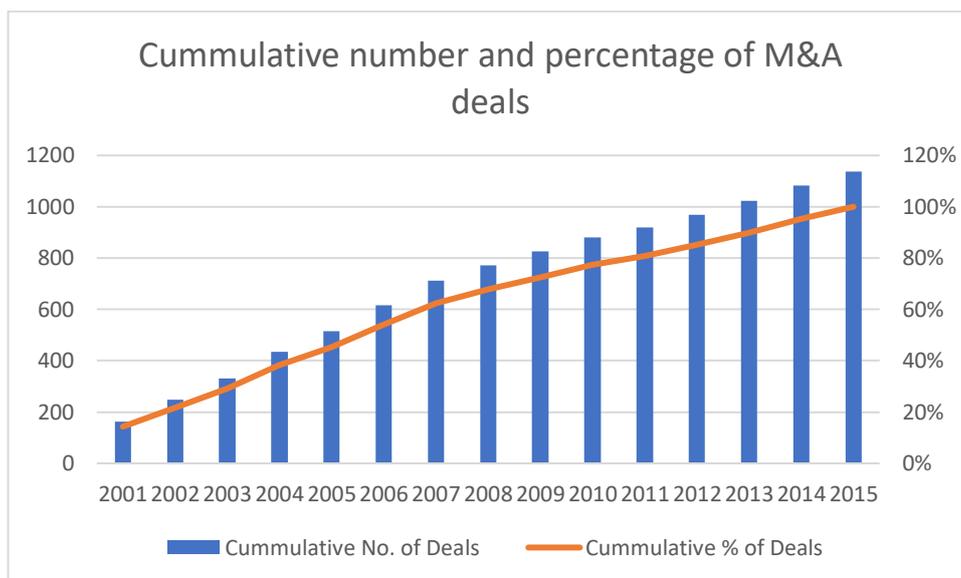
(Source: Author's figure)

According to the sample, the highest number of M&A announcements occurred before the global financial crisis in the years 2001, 2004, and 2006 with 163, 104, and 101 deals announced (representing almost 33% of the sample).

On the other hand, the sample includes M&A transactions from 75 different acquirers industries with the highest number of deals in the Bank sector, representing 22,67% of the sample, followed by Oil and Gas (62 deals, 5.45% of the sample). The table with the number of deals per industry can be found in Annex 1.

It is essential to state that the M&A deals list collected from Thomson Reuters Datastream included companies that announced numerous deals from 2001 to 2015. For this study, only the first deal announced was considered. As per Pilloff and Santomero (1998), this leads to selection bias since some important deals may be neglected. For example, companies known as active acquirers have a good reputation regarding the efficiency in the post-merger integration process, can be excluded from the sample. In this research, this exclusion step was necessary due to software inability to differentiate between different M&A deals for the same company RIC code.

However, the authors also define another type of bias that happens if the researcher selects only the largest deals occurring during the study period (Pilloff and Santomero, 1998). Nevertheless, this bias does not apply to this study since the deal size was not considered for the sample selection.

Another critical issue related to the data is the availability of the share prices for CAR's computations. 44 M&A deals had to be removed from the sample since their share price was not available for the defined event window and estimation period in the Datastream. There might be several reasons for such, for example, cases when companies are public on the announcement date but go delisted a few months after, which precludes its AR calculation, etc. Therefore, the total final sample includes 1094 M&A deals.

According to Table I, the crisis period is defined by a negative average of CAR for the event window [-15;15], which means that the shareholders of acquiring firms had,

on average, value destruction for M&A deals that happened in 2008 and 2009 during that event window. The contrary happens for average CAR in the pre-crisis and post-crisis period, which are positive and indicate a wealth creation on the deals. Another conclusion is that the standard deviation's risk decreased in the post-crisis period compared to the pre-crisis and crisis periods. Nevertheless, only the pre-crisis period value is statistically different from zero.

For all periods, the CAR distribution is far from symmetrical, a typical characteristic of market returns, which means that there are larger values from the left or right side than in the middle due to different levels of risks. Nevertheless, the pre-crisis period and post-crisis period CARs are positively skewed (median is lower than the mean). However, during the crisis period, the CARs are negatively skewed (median is higher than the mean). According to kurtosis, the CARs are leptokurtic (positive kurtosis), meaning that more values are close to the mean.

Table I – Descriptive statistics of CAR for the event window [-15;15], for pre-crisis, crisis, and after the crisis period.

2001-2007		*2008-2009*		*2010-2015*	
Mean	0.0273	Mean	-0.0142	Mean	0.0018
Standard Error	0.0196	Standard Error	0.0273	Standard Error	0.0103
Median	-0.0153	Median	-0.0042	Median	-0.0066
Mode	-0.0623	Mode	0.0449	Mode	0.0476
Standard Deviation	0.5087	Standard Deviation	0.2838	Standard Deviation	0.1822
Sample Variance	0.2587	Sample Variance	0.0806	Sample Variance	0.0332
Kurtosis	311.202	Kurtosis	6.6340	Kurtosis	17.9702
Skewness	15.0949	Skewness	-1.3387	Skewness	1.4569
Range	12.4874	Range	2.1053	Range	2.2819
Minimum	-1.6062	Minimum	-1.2892	Minimum	-0.7778
Maximum	10.8812	Maximum	0.8161	Maximum	1.5041
Sum	18.3682	Sum	-1.5314	Sum	0.5492
Count	674	Count	108	Count	310

(Source: Author's figure)

5. Results

This section presents the event study results for a total sample of 1094 companies with the advanced event study calculator provided by EventStudyTools.com. The complete results are displayed in the annexes.

5.1. Abnormal Returns

The main sample was divided into subsamples according to pre-crisis, crisis and post crisis periods form 2001-2007, 2008-2009, 2010-2015. Therefore, the three main event studies were performed. They have the same estimation period of 150 days [-166; -16] and the same event window. 674 M&A announcements compose the pre-crisis period sample, 114 deals comprise the crisis period, and 312 deals are included in the post-crisis period.

Table II shows the AAR generated during the 31 day event period for the M&A deals announcements of the pre-crisis period of 2001-2007. The AAR is positive from the 4th day before the announcement until the 2nd day after the event itself. On the day of M&A announcement (day 0), the AAR is 0.59%, and this result is significant at a 1% significance level according to the Patell test and at a 5% significance level according to both the Standardized Cross-Sectional test and Corrado Rank test. On the event day, 290 companies from the sample created positive AARs while the other 384 got negative results.

The results from day one and day two, with a positive value of AAR after the event day (0.94% and 0.43%, respectively,) are also significant at a 1% significance level for Patell test and at a 5% for the Standardized Cross-Sectional test. AAR is also positive and statistically significant (at 10% level) on day 14 after the event day representing a value creation of 0.12% for the investors.

Table II – Average abnormal return (AAR) during the event window [-15;15] for M&A deals announcements before the crisis period (2001-2007).

Day	AAR	Pos:Neg	Patell Z (Parametric Test)	StdCSect Z (Parametric Test)	Rank Z (Non-parametric Test)
-15	-0.0002	341:333	0.2696	0.2751	-0.2927
-14	0.0011	345:329	1.0589	1.044	-0.3462
-13	-0.0029	330:344	-1.0292	-0.9816	-0.9183
-12	0.0001	315:359	-0.6165	-0.6605	-0.9084
-11	-0.0049	320:354	-1.0783	-1.135	-0.9084
-10	-0.0002	318:356	-1.6427	-1.6001	-1.385
-9	-0.0017	298:376	-2.2374**	-2.2126**	-1.7593*
-8	0.0047	354:320	1.4829	1.5922	-0.0009
-7	-0.0025	304:370	-3.125***	-2.9422***	-1.656*
-6	0.0028	335:339	0.2732	0.2681	-0.5986
-5	-0.0005	315:359	-0.4136	-0.3705	-1.0717
-4	0.0041	346:328	1.3598	1.2731	-0.1754
-3	0.005	341:333	0.8283	0.7981	-0.2787
-2	0.0027	334:340	-0.2433	-0.2456	-0.5575
-1	0.0045	326:348	1.3015	0.6465	-0.5758
0	**0.0059**	**290:384**	**-5.5083***	**-2.2614**	**-2.0583**
1	0.0094	312:362	-3.661***	-1.9743**	-1.6149
2	0.0043	364:310	2.7538***	2.1612**	0.1372
3	-0.0023	320:354	-1.4268	-1.3716	-0.8446
4	0.0027	332:342	0.3309	0.3411	-0.3801
5	-0.001	312:362	-1.2932	-1.2721	-1.2701
6	0.0003	320:354	-0.8758	-0.9042	-0.9839
7	-0.0011	320:354	-2.2311**	-2.2749**	-1.4805
8	-0.0027	312:362	-0.8017	-0.5837	-0.694
9	0.0007	311:363	-0.2681	-0.2693	-0.9955
10	-0.003	322:352	-1.2445	-1.0801	-0.8736
11	0.001	337:337	0.5123	0.5467	-0.3886
12	-0.0001	329:345	-0.1721	-0.1545	-0.874
13	0.002	330:344	0.1603	0.153	-0.5191
14	0.0012	350:324	1.7276*	1.4131	-0.0356
15	-0.0022	300:374	-1.2635	-1.3606	-1.1096

*** 1% significance level, ** 5% significance level, * 10% significance level

(Source: Author's figure)

Table III presents the AAR generated during the 31-day event window for the M&A deals announcements of the crisis period of 2008-2009. On the day of the M&A announcement, the market reacts negatively. As a result, the sample firms get a negative AAR of (-0.86%.), which is 5% statistically significant (according to Pattel test). AARs from day 4, 6 and 7 are also statistically significant AARs but still negative: -1.03%, -1.13%, and -0.54%, respectively.

For this subsample, statistically significant positive AARs were only detected on days 8 and 14 after the M&A announcement with 0.05% and 1.13%, respectively. Even with positive and significant at 10% level results on day 8, their outcome is quite trivial.

On day -1 and -2, the AAR values are positive. Nevertheless, they are not significant, so we can not conclude the leakage of information before the crisis period's announcement date.

Table III – Average abnormal return (AAR) during the event window [-15;15] for M&A deals announcements during the crisis period (2008-2009).

Day	AAR	Pos:Neg	Patell Z (Parametric Test)	StdCSect Z (Parametric Test)	Rank Z (Non-parametric Test)
-15	0.0062	56:52	0.5371	0.5214	0.0825
-14	0.0037	62:46	0.035	0.0402	1.1939
-13	-0.0014	53:55	-0.4462	-0.522	-0.3271
-12	-0.0131	48:60	-1.5908	-1.0869	-1.3341
-11	0.0097	61:47	1.4701	0.7757	1.2599
-10	0.0044	59:49	0.1061	0.1296	0.3903
-9	-0.0127	60:48	-1.9764**	-0.8789	-0.0458
-8	0.0082	52:56	0.1652	0.0838	-1.3543
-7	-0.0065	50:58	-0.9454	-1.0003	-0.5809
-6	0.0092	64:44	1.6482*	1.6077	2.0681**
-5	-0.0006	60:48	-0.0129	-0.0115	0.6441
-4	0.0094	60:48	2.7641***	2.2518**	1.7684*
-3	-0.0069	48:60	-0.8718	-0.8953	-1.1884
-2	0.0035	54:54	-0.1973	-0.2129	0.5049
-1	0.0058	55:53	-0.5629	-0.5493	-0.0541
0	**-0.0086**	**54:54**	**-2.1392****	**-1.0888**	**-0.8641**
1	0.0013	53:55	-0.3202	-0.1352	-0.7394
2	-0.004	52:56	-1.0708	-0.9895	-0.6671

3	-0.0078	52:56	-0.6246	-0.4954	-0.1814
4	-0.0103	42:66	-2.1722**	-2.2382**	-2.3402**
5	-0.0036	59:49	-0.8464	-0.6982	0.2566
6	-0.0113	50:58	-1.7442*	-1.5572	-1.565
7	-0.0054	50:58	-2.4014**	-2.2913**	-1.8894*
8	0.0005	55:53	1.8719*	1.5825	0.0605
9	0.0061	57:51	0.2776	0.3083	0.5195
10	0.0035	59:49	1.1653	1.462	1.2251
11	-0.0013	50:58	-0.3263	-0.3008	-0.9401
12	0.0041	59:49	0.796	0.8892	0.7917
13	-0.0069	55:53	-0.1108	-0.1273	-0.5021
14	0.0113	61:47	4.1395***	2.3251**	2.1524**
15	-0.0007	54:54	0.2537	0.2107	0.2071

*** 1% significance level, ** 5% significance level, * 10% significance level

(Source: Author's figure)

Table IV shows the AAR generated during the 31-day event window for the M&A deals announcements of the post-crisis period of 2010-2015. According to the day of the M&A announcement, the AAR is positive (0.97%) and statistically significant on the parametric Pattel test. It should be noticed that there are no other significant positive AAR's for this period.

Nevertheless, this subsample observed statistically significant negative values on days -3, 4, and 10 with -0.2%, -0.09%, and -0.38%, respectively. For the 4th day after the deal announcement, the AAR is only statistically significant according to the non-parametric test, while the 10th day is significant only according to parametric tests.

Table IV– Average abnormal return (AAR) during the event window [-15;15] for M&A deals announcements after the crisis period (2010-2015).

Day	Addition	Pos:Neg	Patell Z (Parametric Test)	StdCSect Z (Parametric Test)	Rank Z (Non-parametric Test)
-15	0.0028	150:161	1.1874	1.0896	0.7993
-14	-0.0003	153:158	0.4576	0.4886	-0.1407
-13	-0.0002	143:168	-0.0188	-0.0202	-0.501
-12	0.0009	142:169	-0.8458	-0.9125	-1.1351

-11	0.0017	150:161	0.2081	0.2169	-0.1763
-10	0.0002	150:161	0.5619	0.578	0.5482
-9	0.0011	163:148	1.3729	1.3958	1.6102
-8	0.0002	149:162	-0.4027	-0.3826	-0.6097
-7	0.0024	153:158	1.4382	1.2833	0.1514
-6	-0.0008	142:169	-0.2622	-0.2605	-0.5777
-5	0.0003	153:158	0.7937	0.7557	0.2078
-4	-0.002	140:171	-1.3665	-1.3451	-1.4293
-3	-0.002	129:182	-2.783***	-2.6444***	-2.7397***
-2	-0.0009	160:151	-0.1395	-0.1439	-0.0183
-1	-0.0004	154:157	0.2971	0.2488	-0.1286
0	**0.0097**	**156:155**	**3.4635***	**0.999**	**0.1865**
1	-0.0004	159:151	1.5485	0.5224	1.5299
2	-0.0001	153:157	1.3471	0.9183	0.5437
3	-0.0018	155:155	0.533	0.4684	0.0782
4	-0.0009	134:176	-0.9742	-0.9458	-1.8023*
5	0.0047	146:164	0.7223	0.6045	0.0107
6	-0.0042	153:157	-1.5397	-1.5079	-0.2342
7	0.0000	140:170	-1.0849	-0.9098	-0.9314
8	0.0026	162:148	0.9078	0.9296	0.5762
9	-0.0004	157:153	-0.6654	-0.6313	-0.3724
10	-0.0038	138:172	-2.3436**	-2.3195**	-1.6336
11	-0.0005	151:159	-0.6603	-0.7411	-0.6184
12	-0.0008	155:155	0.4023	0.3931	0.2835
13	-0.0006	151:159	-0.8869	-0.9345	-0.7678
14	-0.0024	154:156	-0.195	-0.2035	0.0188
15	-0.0023	157:153	-0.7414	-0.683	-0.7561

*** 1% significance level, ** 5% significance level, * 10% significance level

(Source: Author's figure)

It is possible to visualize the AAR movements in figure 5. The AAR increases near the announcement date for the pre-crisis and post-crisis M&A deals, however after day 2, the abnormal returns tend to decrease. Yet, this observation does not apply for the crisis period deals.

*Figure 4 - Average abnormal return around announcement date for pre-crisis, crisis,
and post-crisis periods per day in the event window.*
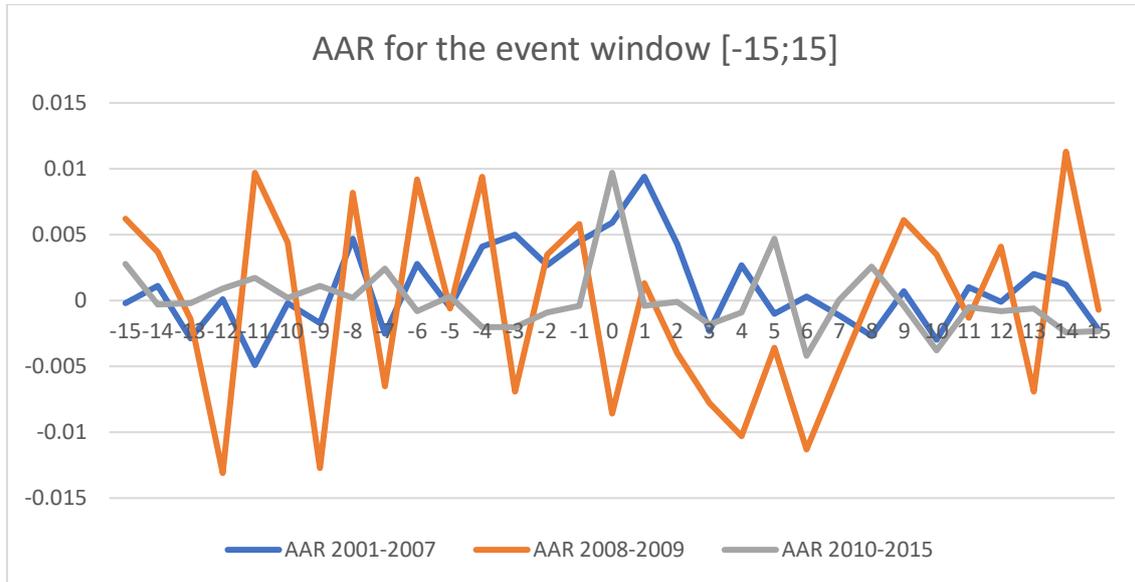
(Source: Author's figure)

Table V presents the cumulative average abnormal return (CAAR) for the event window [15;15] for M&A deals announcements before, during, and after the crisis period. As expected, the CAAR value is positive for the pre-crisis and post-crisis periods and negative for the crisis period corresponding to 2.73%, -1.42%, and 0.18%, respectively. However, the results are only significant for the M&A deals announced before the crisis period, which means that investors' shares were positively impacted by earning a positive abnormal return of 2.73% from 2001-2007.

*Table V – Cumulative average abnormal return (CAAR) during the event window
[15;15] for M&A deals announcements before, during, and after the crisis period.*

Period	Event Window	CAAR Value	pos:neg	Patell Z (Parametric Test)	StdCSect Z (Parametric Test)	Rank Z (Non-parametric Test)
Pre-crisis 2001-2007	[-15;15]	0.0273	293:381	-3.0702***	-2.8212***	-4.5652***
Crisis 2008-2009	[-15;15]	-0.0142	52:56	-0.5618	-0.5646	-0.2602
Post-crisis 2010-2015	[-15;15]	0.0018	149:161	0.0698	0.0446	-1.4419

*** 1% significance level, ** 5% significance level, * 10% significance level

(Source: Author's figure)

The industry with the biggest representation in the total sample is the Banks (22.67%). Its CAAR values for different periods are exhibited in the table below. The results obtained are consistent with the study of Dogan and Yildirim (2017), who state that post-crisis M&A deals yield higher gains than pre-crisis deals. However, our results are only statistically significant for the pre-crisis and crisis periods. This distinction might have happened due to different period delimitation and different sample selection between our studies. Dogan and Yildirim (2017) defined the pre-crisis period from 2000 until 2007 and the post-crisis period from 2010 until 2014. Their sample only included commercial banks and bank holding companies.

Table VI - CAAR for Bank Industry during the event window [15;15] for M&A deals announcements before, during, and after the crisis period.

Period	CAAR Value	Patell Z (Parametric Test)	StdCSect Z (Parametric Test)	Rank Z (Non-parametric Test)
Pre-crisis 2001-2007	-0.0294	-4.0023***	-4.3583***	-4.2884***
Crisis 2008-2009	-0.0632	-1.6272	-1.8375*	-0.9088
Post-crisis 2010-2015	0.0018	-0.1883	-0.1865	-0.6214

*** 1% significance level, ** 5% significance level, * 10% significance level

(Source: Author's figure)

6. Conclusions

This Master Thesis's main goal was to do an empirical study on shareholders' value creation for M&A deals before, during, and after the Global Finacial Crisis in the U.S.. For that purpose, a total sample of 1094 M&A deals between 2001 and 2015 among public U.S. companies was collected from Thomson Reuters Datastream and divided into subsamples according to the economic cycle. The number of deals per subsample is distributed as follows: 674 deals for the pre-crisis period, 108 deals for the crisis period, and 312 deals for the post-crisis period. As banks represented 23% of the sample deals, we also analyze this subsample to see if any difference could exist, considering they were heavily affected during the crisis.

The research was conducted by using an event study to estimate CAAR values around the M&A announcement date for the three periods defined above. Results from the pre-crisis period state that the abnormal returns arising from the M&A first announcement are positive and statistically different from zero. Therefore there is a value creation of 2.73% for the 31-day event window. This conclusion is not reached for the two other periods because even with negative CAAR for the crisis period and positive CAAR for the post-crisis period, the results are not significant.

Findings also indicate a positive market reaction on the announcement day for the pre and post-crisis periods. Contrarily, during the crisis period, the AAR value is negative and has a negative impact on shareholders' gains. Contrarily to Keown and Pinkerton's (1981) conclusions, there is no statistically significant evidence of information leakage about the M&A deals for our subsamples.

The banking sector was one of the largest industries in our total sample. The results obtained from its analysis show significant value destruction in the pre-crisis period (CAAR of -2.94%). This finding differs from the full sample, which created value in this period). During the crisis period, Bank M&A had a negative CAAR (-6.32%). Yet, much higher than the total sample. Throughout the post-crisis period, Bank M&A created, on average, the same value as the rest of the industries (0.18% CAAR). These findings are consistent with Dogan and Yildirim (2017).

When analyzing the study, several limitations should be taken into consideration. Firstly, only the first deal announced was considered for the study due to data structure complexity. According to Pilloff and Santomero (1998), this leads to selection bias because important deals from multiple bidders might be omitted. Multiple bidders tend to be more efficient than less experienced bidders and, therefore, create more value. Secondly, this study uses the only U.S. publicly traded companies as bidders and targets. Consequently, the outcome may not fully represent all three economic cycle periods presented in this dissertation. Thirdly, the abnormal returns were estimated with the commonly used market model, but it also has some criticisms.

As a recommendation for future research, it would be very interesting to compare perform a long-term study about M&A value implication for the shareholders before, during, and after the Global Financial Crisis. A similar study using different short term event windows would also significantly complement this research.

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Appendices

Appendix 1 – Number of deals per industry.

Acquirer industry	No. of deals	Percentage
Banks	258	22.67%
Oil & Gas	62	5.45%
Software	54	4.75%
Healthcare Equipment	45	3.95%
Other Financials	44	3.87%
Pharmaceuticals	42	3.69%
Semiconductors	39	3.43%
IT Consulting & Services	33	2.90%
Professional Services	33	2.90%
REITs	32	2.81%
Computers & Peripherals	30	2.64%
Internet Software	29	2.55%
Machinery	23	2.02%
Metals & Mining	21	1.85%
Food and Beverage	20	1.76%
Healthcare Providers	17	1.49%
Brokerage	16	1.41%
Biotechnology	15	1.32%
Electronics	15	1.32%
Other Consumer Products	15	1.32%
Insurance	14	1.23%
Other Industrials	14	1.23%
Telecommunications Equipment	13	1.14%
Power	13	1.14%
Aerospace & Defense	12	1.05%
Chemicals	12	1.05%
Building/Construction	12	1.05%
Food & Beverage Retailing	11	0.97%
Telecommunications Services	11	0.97%
Transportation & Infrastructure	11	0.97%
Textiles & Apparel	9	0.79%
Alternative Financial Investments	9	0.79%
Publishing	9	0.79%
Other Retailing	9	0.79%
Asset Management	8	0.70%
Petrochemicals	8	0.70%
Paper & Forest Products	7	0.62%

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Advertising & Marketing	6	0.53%
Automobiles & Components	5	0.44%
Other Energy & Power	5	0.44%
Wireless	5	0.44%
E-commerce / B2B	5	0.44%
Hospitals	5	0.44%
Motion Pictures / Audio Visual	5	0.44%
Casinos & Gaming	5	0.44%
Cable	5	0.44%
Internet and Catalog Retailing	5	0.44%
Home Furnishings	4	0.35%
Pipelines	4	0.35%
Broadcasting	4	0.35%
Educational Services	3	0.26%
Containers & Packaging	3	0.26%
Apparel Retailing	3	0.26%
Other Real Estate	3	0.26%
Hotels and Lodging	3	0.26%
Household & Personal Products	3	0.26%
Real Estate Management	3	0.26%
Travel Services	2	0.18%
Tobacco	2	0.18%
Industrial Conglomerates	2	0.18%
Credit Institutions	2	0.18%
Agriculture & Liveshare	2	0.18%
Discount and Department Store Retailing	2	0.18%
Water and Waste Management	2	0.18%
Automotive Retailing	2	0.18%
Home Improvement Retailing	2	0.18%
Employment Services	2	0.18%
Other Materials	1	0.09%
Other Telecom	1	0.09%
Space and Satellites	1	0.09%
Alternative Energy Sources	1	0.09%
Residential	1	0.09%
Other High Technology	1	0.09%
Other Healthcare	1	0.09%
Computers & Electronics Retailing	1	0.09%
Recreation & Leisure	1	0.09%
Total	1138	100.00%

(Source: Author's figure)

Appendix 2 – Banks' CAAR during the event window [15;15] for M&A deals
announcements before, during, and after the crisis period.
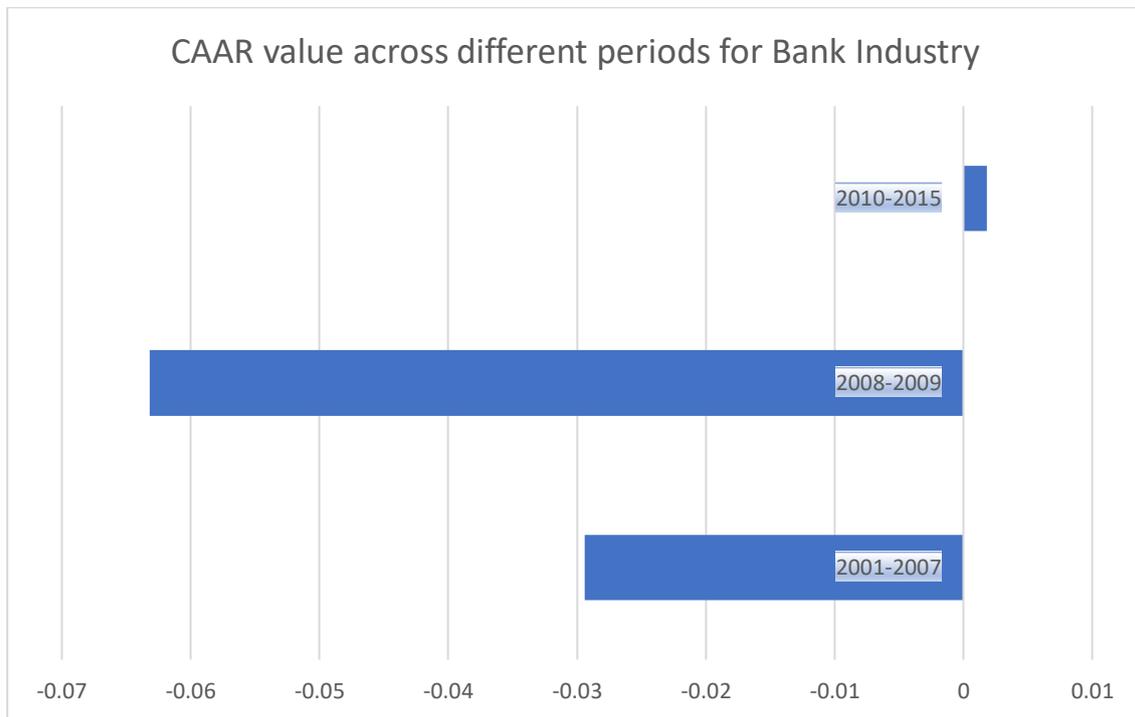
(Source: Author's figure)

Appendix 3 – Breusch-Pagan test for Heteroskedasticity for the pre-crisis period of
2001-2007.

ANOVA

	df	SS	MS	F	Significa nce F	LM.	signif LM.
Regressi on	1	0.000147 27	0.000147 27	0.277313 23	0.598641 42	0.278023 84	**0.5979994**
Residual	672	0.356866 04	0.000531 05				**p value 0.598 is > alpha level 0.05**
Total	673	0.357013 31					**No heteroskedasti city**

(Source: Author's figure)

Appendix 4 – Breusch-Pagan test for Heteroskedasticity for the crisis period of 2008-2009.

ANOVA

	df	SS	MS	F	Significance F	LM.	signif LM.
Regression	1	0.00194995	0.00194995	2.30058378	0.13230207	2.29419861	**0.12985822**
Residual	106	0.08984445	0.00084759				**p value 0.13 is > alpha level 0.05**
Total	107	0.0917944					**No heteroskedasticity**

(Source: Author's figure)

Appendix 5 – Breusch-Pagan test for Heteroskedasticity for the post-crisis period of 2010-2015.

ANOVA

	df	SS	MS	F	Significance F	LM.	signif LM.
Regression	1	2.1869E-06	2.1869E-06	0.14129063	0.70725924	0.14214014	**0.706162628**
Residual	309	0.00478264	1.5478E-05				**p value 0.707 is > alpha level 0.05**
Total	310	0.00478482					**No heteroskedasticity**

(Source: Author's figure)