The impact of the 2008 financial crisis on M&A announcement returns.

Abstract

This paper analyzes how economic turmoil and downturn, as measured by the 2008 financial crisis, has affected M&A announcement returns for US companies. Moreover, a special notion is given to the degree of corporate financial distress. The results obtained in this paper indicate that target companies benefit significantly from the 2008 crisis in terms of higher cumulative abnormal returns (CARs). These are found to increase by a staggering 20% and this increase is robust to external factors. Shareholders in acquiring companies on average suffer lower returns during the crisis. This paper also finds that severely distressed companies benefit from the 2008 financial crisis in terms of mildly higher stock returns. Lastly, the combined acquirer and target returns proved to be significantly higher during the 2008 crisis, suggestive of the higher potential of synergy gains.

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Chapter 1: Introduction

1.1 Introduction

What began in 2007 as a subprime mortgage crisis due to aggressive investing in financial derivatives, quickly evolved into the 2008 financial crisis which profoundly changed the world and economic policy (Gaughan, 2009). During this crisis, which started in the US, the entire financial system was under great risk and several major financial institutions filed for bankruptcy. Washington Mutual was the largest savings bank holding ever to fail in history and to make matters worse, the bankruptcy of Lehman Brothers further ignited the global financial crisis, leading to a severe credit crunch (Rao-Nicholson and Salaber, 2016). Due to the severe financial distress of the economic system, far reaching governmental interventions were required to prevent a further collapse. The crisis, which had originally started in the United States of America, quickly spread to the rest of the world and caused a number of unparalleled recessions, nationalizations and bank runs in the constituent nations (Degryse, Elahi, & Penas, 2010). Due to the fact how modern banking is organized, the risk and speed of financial contagion has only been increasing over recent years, posing serious financial threats to the entire global financial system. Along with many other academics, Beltratti and Paladino (2013) find that crises significantly impact M&A returns. The question which naturally arises is how the unprecedented decline in stock prices and financial instability affected M&A returns during the recent global crisis in the United States of America.

Mergers and acquisitions have long been a well-researched area in the academic world of finance. Especially during the last decades, due to both technological advancements and globalization, M&A's have been of major importance to many firms as an alternative for strategic expansion. From 1998 to 2000 alone, the total sum of transactions amounted to 4 trillion US dollars. Interestingly, this is more than the 30 preceding years combined (Shimizu et al, 2004). These activities aim at increasing shareholder value either by exploiting potential synergies leading to efficiencies from combining operations. Another motive is replacing management with a more efficient managers (Martin & Mcconnell, 1991). Much of the conducted evidence indicates that corporate takeovers manage to generate positive gains, target shareholders benefit and acquiring stockholders on average do not lose (Jensen & Ruback, 1983). While this may be the case, Nofsinger (2005) notices that due to the efficient and emotional nature of stock returns, in the aggregate, M&A returns are expected to clearly exhibit any optimistic or pessimistic investment behavior. This is because investor sentiment is incorporated in stock prices. Surprisingly, very

little research has been conducted into how recent crises influence M&A returns. For this reason, the focus of this paper is to investigate how M&A announcement returns are influenced by the recent financial crisis. In order to shed new light on how returns differed during this turbulent period with spikes in negative investor sentiment, the following research question is addressed:

"Do American target and acquirer abnormal returns react differently to M&A announcements during the recent 2008 financial crisis as compared to a control period and to what extent does corporate financial distress play a role?"

This research question is an interesting direction to pursue for several reasons. On the one hand, it can be argued that low stock prices during the 2008 crisis opened up the possibility for companies to acquire other companies at very low cost, hence provoking higher abnormal stock returns. Empirically, Mooradian and Hotchkis (1997) find that firms that merged with bankrupt firms show significant improvements in terms of performance. Moreover, this process induces abnormal positive stock returns for both bidder and target at the moment of announcement. On the other hand, increasing uncertainty during the financial crisis may lead to an opposing result. In light of the financial crisis, this claim is an interesting one to test. Especially for distressed firms, the effects of the financial crisis may be more profound. These firms, which already have a questionable future in terms of profitability and ability to pay off debts, may be more severely affected. Balcaen, Manigart, Buyze and Ooghe (2012) argue that in a perfect world, these firms should exit the financial system, in an effort to reallocate the remaining financial assets for more efficient purposes. However, due to market frictions, this does not always work in practice. In many cases these firms opt for an out-of-court solution like a merger or acquisition in an effort to keep as much value in the firm and to avoid high value destroying bankruptcy costs. Zhang (2016) finds that financially distressed firms are indeed well represented in terms of M&A activity and argues that synergies in terms of cash flow diversification are a major contributing factor. This paper will build on these findings and investigate how M&A returns vary by the degree of financial distress a firm is associated with during the financial crisis.

For the sake of the conducted research, US target and acquirer companies will be explored. An event study is performed, using data samples from both the crisis period and a control period. These returns are subsequently subject to further scrutiny and should indicate how on average the financial crisis influences the returns. The focus will primarily be on the days around the event window and the abnormal returns generated in this time frame.

As academic literature points out, there is a wide spectrum of variables that influences the returns following an M&A announcement. For instance, Kenneth, Daniele and Cesare (2012) find that the returns generated by the M&A process are strongly influenced by the similarity of the target and acquiring company. The greater the cultural distance, the less likely an acquisition is to happen and the smaller the volume and synergy gains of M&A's. A multitude of other factors like method of payment and the nature of the takeover are found to be important price determinants. In order to control for these variables, this paper will explore which variables are relevant to control for during the regression analysis.

1.2 Outline

This paper is structured as follows: the next section provides an overview of all relevant literature that has been studied. Next, the data section will elaborate upon where the data have been retrieved from and which transformations have been applied to make the data suitable for this research. Subsequently, the employed methodology will be discussed followed by the result section. The conclusion follows and will summarize the main findings of the paper. Next, limitations of this paper are discussed and suggestions for future research are proposed. Finally, some of the output generated during the research is stored in the appendix, which also happens to be the final section of this paper.

Chapter 2: Literature review

2.1 M&A announcement in general

A fairly recent study conducted by Campa and Hernando (2006) analyzed a four year timespan of M&A returns before the financial crisis. Over this timeframe, the authors found positive abnormal returns for target companies. Acquiring firms on the other hand, did not gain significantly and on average had a zero percent gain. Bruner (2002) came to a nearly identical conclusion on the basis of an extensive academic research covering more than 100 scientific studies. He concludes that the acquiring management should undertake M&As with caution, regarding the wide dispersion of success for buyers. Yet, it is concluded that for targets and bidders combined, M&A does pay in terms of wealth creation. More recently, Renneboog and Goergen (2004) conducted a study on the same topic and found identical results. Their study finds an astonishing, statistically significant announcement return of 9% for target firms, compared to a slightly positive return of 0.7% for the acquiring firms.

Interestingly, it turns out that the type of takeover bid has a profound effect on the announcement returns. Hostile takeovers generally provoke a more extreme price reaction as opposed to a friendly takeover. Loughran and Vijh (1997) find the same phenomenon and link this finding to the method of payment. Ultimately, they too find that target shareholders benefit from any kind of payment. In short, most academic researchers agree that on average, target shareholders earn economically and statistically significant abnormal returns, whereas bidders do not systematically earn from any wealth creation during regular economic times.

Yet, researchers like Beitel (2001) find contradicting results. Beitel investigates whether M&A in the European banking landscape has succeeded in creating value for shareholders. He finds a shift in recent times however, towards significant value destruction.

2.2 M&A announcement during crises

Rosen (2006) investigates the overall interrelation between the broad market conditions and the stock returns of bidding firms. It appears there is a hot hand phenomenon, meaning that when the market index has been performing well and sentiment is up, M&A announcements are generally perceived more favorably by investors resulting in higher stock returns following the M&A announcement. This interesting finding reveals a gap in the existing literature, since the 2008 financial crisis is a perfect proxy to empirically test this finding.

As it turns out, plummeting stock prices manifested during economic crises, have a high impact M&A returns. Literature that analyzes M&A activity during the financial crisis finds that overall activity significantly declined during this period. Due to the fact that even for trustworthy borrowers credit was hard to come by during the US credit crunch, financing a merger or acquisition was remarkably more difficult (Gaughan, 2009). In addition, Gaughan argues that the troubling circumstances of the economic landscape and reduced profits further contributed to a reduction of the overall attractiveness of M&A.

Renneboog and Martynova (2005) succeeded in finding empirical evidence for this claim. In times of recessions, M&A activity declines, whereas the highest levels of activity are measured during periods of economic recovery. They find a direct link between M&A waves and periods of rapidly expanding credit markets and booming stock markets. Beltratti and Paladino (2013) also argue that the wealth creation process, as measured by M&A returns, is significantly influenced by financial crises. Their research indicates that acquirers do not react favorably to acquisitions during crises. Moreover, the entire financial system is negatively impacted if acquirers, looking for underpriced targets, cannot provide the best allocation of the acquired assets (Ang and Mauck, 2011). For that reason, purchasing targets at little cost as made possible by the 2008 financial crisis, may not necessarily lead to favorable abnormal returns.

On the other hand, Nofsinger (2005) points out that periods of turmoil in the stock market leads to declining stock valuations. This process in its turn will induce an increase in divergence of investors' opinions on the market and an inevitable increase in volatility. This increase which is expected in the financial crisis period insinuates that higher returns may be manifested during this period.

Unfortunately, little research is found that aims at investigating this for US companies during the 2008 crisis. In order to shed light on this relatively uncharted area, the short-term effect on cumulative abnormal returns resulting from the financial crisis will be mapped for US companies. The reason of this choice is evident given that this period was the most severe crisis since the Great Depression. During this period, investor sentiment was at an almost all-time low and 8 trillion US dollars in market wealth was lost over a one year period in the stock market (Brunnermeier, 2008). For this reason, the selected time frame is highly suitable for investigating how cumulative abnormal returns (CARs) vary during the financial crisis as compared to a control period. To facilitate answering the research question of this paper, the following two hypotheses are postulated:

H(1): The financial crisis leads to significantly higher returns for US target companies, as compared to the control period and these returns are robust.

H(2): The financial crisis leads to significantly higher returns for US acquirers, as compared to the control period and these returns are robust.

2.3 Distressed M&A announcement returns during crises

Despite the fact that many researchers have investigated M&A extensively, most of it has surpassed the effect of financial distress on the announcement returns in recent times. Nonetheless, Ang and Mauck (2011) focused specifically on whether severely financially distressed firms during economic crises would sell at deep discounts. These troubled firms might not have a choice but being forced to sell assets at major discounts. The advantage and position of negotiation of the acquirer could potentially lead to positive abnormal returns as compared to a regular economic period. Surprisingly, the authors find that financially distressed firms actually receive a premium amounting to as much as 30% as compared to a regular economic periods. Consequently, acquirers do not benefit in the short run nor in the long run. This finding may be in line with lower abnormal returns for acquirers and higher abnormal returns for targets during the 2008 crisis.

Salaber and Nicholson (2014) further argue that financially distressed companies wish to restructure and redeploy assets as soon as possible during financial crises. This may induce shorter periods of negotiation and consequently higher premiums. In the end, they find significantly higher returns during the 2008 crisis for acquiring firms. Although Mooradian and Hotchkis (1997) agree that bankruptcy of firms may generate shareholder wealth, they do find positive abnormal returns for both acquirers and targets upon an M&A announcement. Especially when firms are in related industries, higher post-merger performance is expected due to a more efficient reallocation of assets. In addition, their findings point out that mergers with healthy non-bankrupt firms do not lead to significant improvements in terms of performance. More concisely, the degree of financial distress a company copes with turns out to be of major importance to the M&A returns that can be expected.

Gaughan (2009) further theorizes that in spite of the period of turmoil, there are still companies that are performing well and which may have sufficient internal funding. These funds may on their turn be used to acquire companies at low cost at the expense of financially distressed companies which lack the required funding. Distressed companies are forced to wait for capital markets to revive. In short, this implies that despite the period of turmoil, healthy companies may have been able to achieve superior returns as compared to financially distressed companies during the 2008 financial crisis. It is interesting to investigate whether the financial crisis might have amplified this academic finding. In order to find empirical evidence in support of this claim, the following hypotheses are addressed:

H(3): During the financial crisis, US acquiring firms achieved higher abnormal returns when they were distressed as compared to healthy.

H(4): During the financial crisis, US target firms achieved higher abnormal returns when they were distressed as compared to healthy.

Multivariate and univariate regressions on the CARs will be run for the control sample and the crisis sample. A dummy for the crisis sample will indicate the economical and statistical significance of the crisis' effect. The purpose of the multivariate regression is to ensure robustness of the crisis' effect whilst controlling for multiple factors.

2.4 CAR return determinants

As previous literature claims, cumulative abnormal returns vary substantially for both target and acquirer and the investigated time frame. In the cross-section, a lot of variables are found to explain a great deal in the variance of CAR. Rau and Vermaelen (1998) focus on the long run post-acquisition performance and find that on average, acquiring firms in mergers suffer poor returns which are primarily caused by the low book-to-market acquirers, better known as glamour stocks. They attribute this finding to market participants who incorrectly extrapolate the bidding glamour firms' past performance. Value companies on the contrary, which are characterized by a high book-to-market ratios, do a better job which insinuates that value bidders make better M&A decisions. Interestingly, investor sentiment, characterized by the pessimistic view of market participants with respect to the managerial capacities of value firms, are a key factor in the long run superior long term returns of value bidders in M&A returns. Moreover, whether an M&A is executed abroad turns out to significantly impact returns (Campa & Hernando, 2006). In their conducted research, cross-border M&As were found to come along with higher abnormal returns. In short, many variables appear to influence generated returns. This paper will control for the most prominent ones, in an attempt to clearly separate these effects from the net effects of the financial crisis. Investigating these control variables in depth, however, is beyond the scope of this paper.

As Shimizu et al (2004) notice, research into M&A has not kept in pace, leaving gaps. This paper aims to complement the existing body of research on how CARs were affected by the 2008 financial crisis and the degree of financial distress.

Chapter 3: Data

3.1 Data collection method

In light of the conducted research, data will be retrieved from various sources. To start with, first a list of companies that matches a specific set of criteria must be retrieved from the ThomsonOne database. These US companies either announced an M&A or received the offer. Subsequently, the resulting list of companies including the unique identifier and the date of M&A announcement will be downloaded. Based the unique identifier, the variables of interest will then be downloaded from Compustat in order to run cross-sectional regressions. The stock prices corresponding to the relevant event window of the announcement dates are downloaded from CRSP.

For the sake of this research, the 2008 financial crisis data sample and a control period are required. In this paper, data is retrieved for the years ranging from 2003 up to and including 2015. The year 2002 is excluded due to the fact that the dotcom bubble manifested itself during these years. This paper follows a widely used proxy for the beginning of the crisis, being August 2007. The end date of the crisis will be June 2009. This date has been chosen given the fact that on this date, the financial recession officially ended in the United States of America according to the US National Bureau of Economic Research. The period January 2003 until August 2007 and January 2012 until January 2016 will act as control periods. The post-crisis period only commences a few years after the crisis, in an attempt to filter the aftermath effects of the recession from the analysis. This is done intentionally, given the fact that the financial crisis that started in 2007 still affected the economy years later, in the form of increased unemployment and decreased output in terms of GDP (Tridico, 2012). Moreover, the pre-crisis and post-crisis control periods are combined into a single entity and act as a single control sample. The benefit of using a pre-crisis and post-crisis control period is twofold. First, the amount of observations increases, hereby increasing statistical power of the analysis. Secondly, the paper will add additional value to existing academic literature since the most recent available data are included in this paper. Table 1 shows the exact dates that are adopted by this paper.

Start date	End date	Description
01/01/2003	31/07/2007	pre-crisis
01/08/2007	30/06/2009	2008 global financial crisis
01/01/2012	31/12/2015	post-crisis

Table 1. The table above shows the dates which are used to proxy the financial crisis.

3.2 Firm criteria

Apart from the fact that United States targets and acquirers are analyzed, several other restrictions are imposed on the data. For the sake of this research, it is necessary that in each case, the US firm is listed on a stock exchange. This criterion is essential given the fact that the conducted research both analyses target as well as acquiring firms' abnormal returns, for which a listing is required. On top of this, the ThomsonOne output will be further downsized due to the fact that deals with a value below 10 million US dollars are excluded. Additionally, in order to be classified a valid acquisition, it is required that a majority stake is obtained by the acquirer. In other words, all deals where less than 50% was ultimately acquired are deleted from the sample. Lastly, cross-border deals are not examined in this paper, meaning that only M&As in the United States itself are analyzed. No further restrictions are imposed on the data.

3.3 Variables of interest

On top of the announcement dates, several additional variables will be retrieved that are of great interest to the research. During the cross-sectional regression analyses, variables that have proven to influence CARs are controlled for. Except for the Altman Z-score, all of the displayed variables will be included as control variables. Table 2 provides an overview of the included variables which have received broad coverage in academic research.

Variable	Abbreviated variable	Description	Specification
Deal value	LN(DV)	Natural logarithm of total monetary amount of transaction.	Deal specific
Relative size	RelSize	Size of acquirer in terms of deal value. Equals quotient of acquirer's market capitalization and deal value.	Deal specific
Return on Equity	ROE	Net income per single monetary unit of equity.	Firm specific
Cash dummy	Cash	Equals 1 if the deal is fully financed in cash. If else, it equals 0.	Deal specific

Crisis dummy	Crisis	This dummy takes the value 1 during crisis, else 0.	Deal specific
Market capitalization	MktCap	Acquirer's market capitalization.	Firm specific
Altman's Z-score	Distressed	Equals 1 when a firm is classified as distressed.	Firm specific

Table 2. The above table shows the variables which are utilized in the cross-sectional regression analyses.

Deal value & relative size: A recent study by Travlos, Alexandridis, Fuller and Terhaar (2013) studies how offer premiums and overpayment are related. In their study, they find that the larger the deal value, the smaller the offered premium. Surprisingly still, the acquisition of larger targets leads to a greater value destruction for acquiring shareholders. Moreover, it indicates that the lower the relative size is, the increasingly difficult it becomes to successfully merge.

Return on Equity: Beltratti and Paladino (2013) find that the acquirer's profitability impacts CARs to a great extent. A company with a higher the Return on Equity (ROE) or a greater efficiency is found to have higher CARs. This finding is consistent with investors trusting managerial capacities, hence a higher abnormal return is manifested upon an M&A announcement.

Cash dummy: Loughran and Vijh (1997) find that the method of payment is an important factor in their investigation to post-acquisition stock returns. This is explained by the fact that firms are generally more likely to pay in stock whenever their stock is overvalued. Moreover, tender offers are generally hostile in nature and investors perceive this as favorable news since synergy gains might arise. For this reason, a dummy will be included that equals 1 whenever the payment occurs in cash.

Market capitalization: Rau and Vermaelen (1998) empirically show that market capitalization significantly influences CARS. They find that firms with a high market capitalization, which are classified glamour stocks, generally have lower abnormal returns as compared to growth stocks, stocks with a lower market capitalization.

Altman's Z-score: In order to be able to discriminate well performing companies from financially distressed companies, the Altman's Z-score is utilized. The Z-score uses quantifiable data from publicly traded companies' annual statements in order to predict the chance that a firm files for bankruptcy in two

years. In order to do so Altman (2000) optimized a formula which incorporates working capital, total assets, retained earnings, total assets, EBIT, market value of equity, liabilities, sales and total assets. Over time, this Z-score has gained importance due to its great accuracy. A Z-score below 1.81 indicates that a company is financially distressed, whereas a Z-score in excess of 3 indicates a company is performing well and has very little chance of bankruptcy. As a matter of fact, this measure is an extremely broad and reliable indicator, which correctly predicted bankruptcy filings in 94% of the cases over a two year investigation horizon (Hayes, Kay, & Larry, 2010). In addition, their research proved that in 90% of the cases financial distress was correctly predicted by the Z-score.

3.3 Descriptive Statistics

The list of companies that fulfill all required conditions amounts to 1722 companies over the relevant timeframe. Of these, 242 belong to the crisis sample, and the remaining 1480 companies belong to the control sample. Unfortunately, there are missing values for certain control variables. The descriptive statistics in table 3 show that 14% of the M&A activity of interest is during the 2008 crisis, as shown by the mean value of the crisis dummy. Moreover, the ROE already provides an interesting insight when comparing the crisis and control sample. In line with expectations, the ROE decreases during the crisis, and actually becomes negative, hereby showing the financial distress companies cope with. Moreover, these thoughts are substantiated by the Altman Z-score that declines during the crisis.

	Control sample			Crisis sample			Total sample		
Variable	Obs	Mean	Std.dev	Obs	Mean	Std.dev	Obs	Mean	Std.dev
Ln(DV)	1480	5.64	1.93	242	5.32	2.05	1722	5.6	1.95
RelSize	1439	40.58	256.18	232	67.05	277.57	1671	44.26	259.33
ROE	1400	0.07	0.36	224	-0.12	6.68	1624	0.05	2.5
Cash	1021	72.23	32.84	147	74.80	31.51	1168	72.59	32.68
CashDummy	1021	0.51	0.5	147	0.55	0.5	1168	0.52	0.5
Mkt Cap	1439	198841	6966139	232	15136	34952	1671	173336	646504
Crisis	1480	0	0	242	1	0	1722	0.14	0.35
Altman Z-score	1039	4.59	6.73	199	2.80	4.77	1238	4.30	6.49

Table 3. The above table shows the descriptive statistics of the control variables that have been used in this paper. The statistics are separated by the time in which they occurred.

Another interesting observation is the strong increase in relative size during the crisis, whilst the standard deviation of this variable remains more or less the same. Further analysis will provide empirical proof of the economical and statistical significance.

Chapter 4: Methodology

4.1 Event study

An event study is performed in order to map and quantify how stock prices react to M&A announcements. Brown and Warner (1980) described a standard procedure for conducting an event study, which is replicated in this paper. Firstly, the relevant timeframe over which abnormal returns should be measured will be established. In order to do this, this paper will calculate the abnormal returns (ar_t) from 10 days before the announcement (t_{-10}) until 10 days after the announcement date (t_{+10}) for every single company in the dataset. Subsequently, based on the significance of the average abnormal return, the relevant time window will be established over which the CAR_j is calculated. This approach makes sure that only days are included for which sufficient statistical evidence is found that indeed abnormal returns are present. The resulting CAR value indicates for every single company the returns generated during the established timeframe which are in excess of expected returns. This means that the CAR value will show the net effect of the M&A announcement. Lastly, the cumulative average abnormal returns (CAAR) will be calculated by taking the mean of all CAR values. This value indicates the average abnormal return for the entire cross-section of companies in the relevant timeframe. This process will be performed for both the target sample as well as the acquiring sample.

The process of calculating normal returns crucially depends on the concept of efficient market hypothesis. According to this theory, stock prices should fully and efficiently reflect all available information (Fama, 1970). Normal returns are the expected returns based on a broad market index, for which the S&P500 is used in this paper. The estimation period over which a stock's alpha and beta (CAPM) value will be calculated runs from [T_{-170} , T_{-70}]. The resulting 60 day ''gap'' is intentionally included in order to prevent possible leaked information to bias the estimation parameters. The alpha value equals a stock's intercept in the CAPM model, whereas the beta measures its direct exposure to the overall direction of the market index. The formula is as follows:

$$ar_{jt} = R_{jt} - (\alpha_j + \beta_j * R_{mt})$$

In this equation, ar_{jt} represent the abnormal return and, as mentioned, R_{mt} is calculated by using the broad S&P500 index as a benchmark. As a second step, the mean value of the abnormal returns is calculated for all companies and for all the 21 included days. This yields the average abnormal return and is done using the following formula:

$$AR_t = \frac{1}{j}\sum_{j=1}^{j} ar_{jt}$$

Once these values have been obtained, the significance of the AR_t can be established and the relevant time frame is chosen. A short time frame reduces the possibility that other events influence the CAR. On the other hand, a longer time frame may account for information leakage before T_0 and delayed stock price reaction to the event. The cumulative abnormal returns, and ultimately the cumulative average abnormal returns (CAAR) are calculated using:

$$CAR_i = \sum_{t=T_1}^{T_2} AR_t$$

$$CAAR_i = \frac{1}{N}\sum_{i=1}^{N} CAR_i$$

Once the timeframe(s) have been established, the CAAR values can be analyzed over these different time spans.

4.2 Cross-sectional

Once the CAR values have been obtained, the cross-sectional analysis will be executed. This process aims at explaining which factors affect CARs. In order to test the first two hypothesis, the acquirer and target sample will be investigated separately. First, the total sample including both the control period and crisis period are grouped, but are differentiated by the use of the crisis dummy. This dummy will equal 0 in the control period, and will equal 1 if the M&A took place during the financial crisis. Subsequently, running a regression in the following form for both acquirers and targets will serve as a starting point for preliminary analysis:

$$CAR_i = \beta_0 + \beta_1 Crisis + \epsilon_i$$

The estimated parameters β_0 and β_1 will be of significant importance. The former will represent the average cumulative abnormal return experienced by companies in the control period sample. The size and significance of β_1 will be even more informative since this will indicate how on average, the crisis affected the CARs. In fact, the parameter estimate is similar to running a two sample independent t-test between both means. Subsequently, additional regressions which include the control variables will be run in order to test the robustness of β_1, and hence the robustness of the crisis' effect on the wealth creating

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process of M&As. This means various regressions will be run, where the following is the most comprehensive:

$$CAR_i = \beta_0 + \beta_1 Crisis + \beta_2 LN(DV) + \beta_3 RelSize + \beta_4 ROE + \beta_5 Cash + \beta_6 MktCap + \in_i$$

A possible significant crisis parameter in the first regression, might be the effect of a lurking variable. Running several regressions with a multitude of control variables mitigates this complication. In effect, various variables which have empirically proven to be of major impact, are controlled for. Eventually, evaluating the robustness and economic and statistical significance of the crisis parameter will be at the foundation for the possible rejection of hypotheses 1 and 2.

As explained, this paper will also specifically address the issue of how the degree of financial distress affects M&A returns during the crisis. Unfortunately, the required Z-score is not directly available, and for that reason various computations are performed in order to derive the variable of interest. In order to quantify the degree of financial distress, the Altman's Z-score in this paper is calculated as follows (Altman, 1968):

$$Z\ score = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 1.0X5$$

- X1 = working capital/total assets
- X2 = retained earnings/total assets
- X3 = earnings before interest and taxes (EBIT)/total assets
- X4 = market value of equity/book value of total debt
- X5 = sales/total assets

After evaluating the formula, the Z-scores are matched to the corresponding companies. Unfortunately, a large amount of companies had to be deleted from the data sample due to the fact that Compustat could not provide all requested data for every company in the dataset. The remaining sample is subsequently divided into two group by using the Distressed dummy. Companies with a Z-score below 1.81 are classified as distressed, whereas companies with a Z-score higher than or equal to 3.0 are classified as healthy (Altman, 1968). All companies with 1.82 ≤ Z-score ≤ 2.99 are excluded from the subsequent analysis.

H0(3): During the financial crisis, US acquiring firms achieved higher abnormal returns when they were distressed as compared to healthy.

H0(4): During the financial crisis, US target firms achieved higher abnormal returns when they were distressed as compared to healthy.

$$CAR_i = \beta_0 + \beta_1 Crisis + \beta_2 Distressed + \beta_3 Crisis * Distressed + \in_i$$

For hypotheses 3 and 4, the above regression will be run. Here, the Distressed dummy refers to the acquiring firm in hypothesis 3 and the target company in hypothesis 4. By using two dummy variables, the regression allows to differentiate the effects caused by crisis from the effects of the degree of financial distress. This paper partly follows Zhang's (2016) methodology by including an interaction effect between the period of interest and the distressed dummy. The sign and size of the β_3 parameter estimate will be of major importance in evaluating the hypotheses, since it may provide a direct answer towards these hypotheses. Moreover, the robustness of the parameters of interest will be extensively tested. For this purpose, the control variables which have previously been introduced, will be added to the regressions as well. The regression that will be run in its most extensive form, will be as follows:

$$CAR_i = \beta_0 + \beta_1 Crisis + \beta_2 Distressed + \beta_3 Crisis * Distressed + \beta_4 LN(DV) + \beta_5 RelSize + \beta_6 ROE + \beta_7 Cash + \beta_8 MktCap + \in_i$$

Lastly, in order to improve statistical inference, White standard errors are employed when conducting the cross-sectional analysis. These robust standard errors take into account that heteroscedasticity of the standard errors may be at play. By using these standard errors, the severity of heteroscedasticity on statistical inference is mitigated.

Chapter 5: Results

5.1 Event study

Figure 1 (appendix) shows for both targets and acquirers the abnormal returns over the combined crisis and control period, relative to the announcement date of the M&A. In line with much academic research, the figure shows significant positive wealth creation for target shareholders, whereas acquirers experience slightly negative returns upon the announcement. Moreover, there is strong statistical evidence in favor of leaked information, due to the fact that targets experience positive returns several days prior to the announcement. This effect might be attributable to speculation. Table 4 shows the cumulative average abnormal returns based on the statistical significance over various time paths as can be inferred from figure 1. The corresponding p-values are in-between parentheses.

	CAAR total		CAAR control		CAAR crisis	
Time frame	**Targets**	**Acquirers**	**Targets**	**Acquirers**	**Targets**	**Acquirers**
[-10,10]	25.80%	-0.73%	23.90%	-0.67%	38.19%	-1.80%
	(0.00)	**(0.01)**	**(0.00)**	**(0.05)**	**(0.00)**	**(0.08)**
[-5,5]	25.12%	-0.64%	23.22%	0.39%	37.73%	-1.34%
	(0.00)	**(0.02)**	**(0.00)**	**(0.05)**	**(0.00)**	**(0.09)**
[-6,1]	25.11%	-0.47%	23.35%	-0.51%	36.56%	-1.50%
	(0.00)	**(0.00)**	**(0.00)**	**(0.03)**	**(0.00)**	**(0.03)**

Table 4. The table above shows the cumulative average abnormal return (CAAR) over various time frames relative to the announcement date of the M&A. The p-values are in bold between parentheses beneath the mean values. In the conducted t-test, a two sided test was used.

The above figure allows for some preliminary analysis of how the 2008 financial crisis has affected shareholder wealth creation, and the division of synergy gains in the form of the stock returns. In order to increase the robustness, the cumulative average abnormal returns are calculated over various timeframes. The asymmetry in returns to targets and acquiring companies over the entire sample is overwhelming since targets earn, on average, approximately 26% more than acquiring companies. The average abnormal returns to targets as pointed out by table 4 are more sizable than in most other academic works. This holds over all timeframes. In addition, this already astounding result is only amplified by the 2008 financial crisis. When turning to the crisis sample, on average, targets achieve a return that outperforms the acquirers' return by almost 40%. Not only do targets perform better, but acquirers also perform worse during the crisis. Moreover, the superior stock returns experienced by

targets are significant at any conventional significance level. Another interesting observation from table 4 is that the combined returns of the two involved parties in an M&A announcement is strongly positive, indicating the existence of synergy gains.

It is of great importance to quantify the statistical significance of variables which might affect the CAR values. For this purpose, cross-sectional regression analysis will be performed in the following chapters. For subsequent analysis, the timeframe [-5,5] is chosen for mapping the global financial crisis' effects on announcement returns.

5.2 Cross-sectional – financial crisis

Running the regressions as specified in the methodology section confirms earlier findings of the presence of economically significant and positive returns to targets upon the announcement. As noted earlier, shareholders of target companies benefit by an increase of 25.1% over the course of 11 days around the announcement of the M&A. Although many other researchers have found sizable wealth creation effects for target companies as well, table 5 confirms that the effect is still present in more recent data. More interestingly, when the effect of the 2008 financial crisis is brought into the model as per regression 1, the effect is only amplified by a net effect of 14%, indicating that in line with previous research, the financial crisis induces even more sizable abnormal returns for target companies. Moreover, both independent variables remain extremely significant at any conventional significance level. In order to test the robustness of aforementioned effects, regression 2-6 introduce control variables. A striking observation is that on average, the crisis parameter estimate remains not only significant, but even increases when including more variables. Along the lines of previous research, deals financed 100% in cash appear to have significantly positive contributions towards the achieved CARs. In all models, the effect of fully cash financed M&As averages approximately 6%. The natural logarithm of the deal value associated with a deal, on the other hand, induces an opposite reaction on the stock price of the target company. On average, a 1 percent increase in the price paid for the target company induces a reduction in acquired gains of approximately 0.025%. As for ROE and relative size, their effects are insignificant at the conventional 5% level.

When analyzing the return announcements of the acquirers on the other hand, a whole different picture arises. The size and significance of the constant of regression 1 in table 6 is as expected by the preliminary analysis. Regardless of whether the returns are measured over a crisis period or not, the average CAR is small and not significantly different from 0 at a 5% level on average. As a matter of fact, the effect of the crisis, as well as the constant in regression 1 appear not to be robust when introducing the control variables. The overall significance of the crisis' parameter estimate and the constant's estimate disappear altogether. However, as for the target companies, the natural logarithm of deal value appears to be of significance in the analyzed models. Once again, the model indicates that the bigger the deal size associated with the M&A, the larger the drop in CARs. On average, a decrease amounting to 0.03% is expected when the deal value increases by 1%. Also, the cash dummy is extremely significant throughout all regressions run and has a mildly positive contribution to the generated CARs for the acquirers. Lastly, the return on equity of the acquiring company appears to be of economic and statistical significance. As

suggested in previous literature, an acquisition or merger of a successful acquirer, as measured by its ROE, is positively received on the stock market.

Table 5 – Cross-sectional regression results

The table underneath reports the regression results that have been obtained on the cumulative abnormal returns (CAR) for target companies. The employed robust standard errors are between the parentheses. The regressions have been run on the [-5,5] time frame relative to the announcement date of the M&A. The crisis dummy equals 1 from 01/08/2007-30/06/2009.

VARIABLES	(1) CAR	(2) CAR	(3) CAR	(4) CAR	(5) CAR	(6) CAR
Crisis	0.16***	0.15***	0.19***	0.20***	0.19***	0.20***
	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)
Ln(DV)		-0.02***	-0.02***	-0.03***	-0.02***	-0.02***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
CashDummy			0.06***	0.06***	0.05**	0.05**
			(0.02)	(0.02)	(0.02)	(0.02)
RelSize				7.07e-05	0.00*	0.00*
				(5.86e-05)	(0.00)	(0.00)
MarketValue					-7.30e-09*	-7.09e-09*
					(3.85e-09)	(3.87e-09)
ROE						0.15
						(0.21)
Constant	0.23***	0.36***	0.38***	0.38***	0.35***	0.35***
	(0.01)	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)
Observations	1,086	1,086	763	743	743	730
R-squared	0.04	0.05	0.09	0.10	0.12	0.13

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 6 – Cross-sectional regression results
The table underneath reports the regression results that have been obtained on the cumulative abnormal returns (CAR) for acquiring companies. The employed robust standard errors are between the parentheses. The regressions have been run on the [-5,5] time frame relative to the announcement date of the M&A. The crisis dummy equals 1 from 01/08/2007-30/06/2009.

VARIABLES	(1) CAR	(2) CAR	(3) CAR	(4) CAR	(5) CAR	(6) CAR
Crisis	-0.01	-0.01	-0.01	-0.02	-0.01	-0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Ln(DV)		-0.002	-0.003*	-0.003*	-0.003**	-0.003**
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CashDummy			0.02***	0.02***	0.02***	0.02***
			(0.01)	(0.01)	(0.01)	(0.01)
RelSize				-7.32e-06	-2.63e-05	-2.28e-05
				(7.81e-06)	(1.76e-05)	(1.62e-05)
MarketValue					8.74e-10	8.02e-10
					(5.52e-10)	(5.12e-10)
ROE						0.10**
						(0.05)
Constant	0.00*	0.01	0.00	0.00	0.01	-5.88e-05
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	1,383	1,383	962	946	946	931
R-squared	0.001	0.004	0.019	0.020	0.023	0.037

*** p<0.01, ** p<0.05, * p<0.1

5.3 Cross-sectional – distressed firms

In order to give a special notion to the degree of financial distress in M&A returns during the 2008 financial crisis, the regression models in table 7 were run. Looking at the first model in isolation suggests that distressed target companies, which have a Z-score below 1.81, on average earn an 8% premium as compared to target companies which are financially healthy. Moreover, these returns are significant at the 5% significance level. Introducing the crisis variable appears to increase the combined announcement returns. However, including the interaction term between crisis and distressed causes the former variables to lose statistical and economic significance. The interaction term itself however, happens to be mildly significant at the 10% level and conveys the expected sign. In addition, the interaction effect leads to a sizable contribution in excess of 20% on the generated CARs. This means that when the crisis and financial distress of a target company coincide, a sizable positive effect on target CARs can be expected on average. Once again, the natural logarithm of the deal value appears to be highly significant across all models and has a negative effect on the dependent variable. Although the cash dummy has the expected sign and economic significance, the variable does not appear to be of significant influence on CARs, hereby contrasting findings in section 5.2 of this paper.

Table 8 shows the regression models that were run on the CARs for acquiring companies. As expected from earlier findings, variables in the regression models are statistically and economically less significant as compared to target companies. Unfortunately, the distress, crisis and interaction term are insignificant at any conventional significance level. The only factors which remain statistically significant throughout all models are again the method of payment variable and the ROE of the acquiring company. As before, it appears that also for distressed acquirers, a cash payment results in significantly higher announcement returns. Additionally, the higher the acquirers ROE, the higher the eventual shareholder wealth created.

Table 7 – Cross-sectional regression results

The table underneath reports the regression results that have been obtained on the cumulative abnormal returns (CAR) for target companies. The employed robust standard errors are between the parentheses. The regressions have been run on the [-5,5] time frame relative to the announcement date of the M&A. The crisis dummy equals 1 from 01/08/2007-30/06/2009.

VARIABLES	(1) CAR	(2) CAR	(3) CAR	(4) CAR	(5) CAR	(6) CAR	(7) CAR	(8) CAR
Distressed	0.08**	0.06	0.02	-0.01	0.03	0.03	0.02	0.03
	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.05)
Crisis		0.17***	0.07	0.07	0.08	0.08	0.08	0.08
		(0.06)	(0.06)	(0.05)	(0.07)	(0.07)	(0.07)	(0.06)
Distressed*Crisis			0.21*	0.20	0.22	0.26*	0.23	0.27*
			(0.13)	(0.12)	(0.15)	(0.15)	(0.14)	(0.14)
Ln(DV)				-0.03***	-0.03**	-0.03**	-0.02*	-0.03*
				(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
CashDummy					0.05	0.05	0.04	0.04
					(0.04)	(0.04)	(0.04)	(0.04)
RelSize						6.30e-05	0.00**	0.00**
						(5.88e-05)	(0.00)	(0.00)
MarketValue							-1.12e-08**	-1.03e-08**
							(4.95e-09)	(4.94e-09)
ROE								0.27
								(0.28)
Constant	0.27***	0.25***	0.26***	0.44***	0.46***	0.46***	0.40***	0.40***
	(0.01)	(0.01)	(0.01)	(0.07)	(0.11)	(0.11)	(0.11)	(0.11)
Observations	543	543	543	543	422	413	413	404
R-squared	0.01	0.04	0.06	0.08	0.12	0.14	0.17	0.18

*** p<0.01, ** p<0.05, * p<0.1

Table 8 – Cross-sectional regression results

The table underneath reports the regression results that have been obtained on the cumulative abnormal returns (CAR) for acquiring companies. The employed robust standard errors are between the parentheses. The regressions have been run on the [-5,5] time frame relative to the announcement date of the M&A. The crisis dummy equals 1 from 01/08/2007-30/06/2009.

VARIABLES	(1) CAR	(2) CAR	(3) CAR	(4) CAR	(5) CAR	(6) CAR	(7) CAR	(8) CAR
Distressed	0.00	0.00	-0.00	-0.00	-0.01	-0.00	-0.00	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Crisis		0.01	0.01	0.01	-0.01	-0.01	-0.01	-0.01
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Distressed*Crisis			0.01	0.01	0.01	0.01	0.01	-0.00
			(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Ln(DV)				-0.00	-0.00	-0.00	-0.00	-0.01**
				(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CashDummy					0.04***	0.04***	0.04***	0.03***
					(0.01)	(0.01)	(0.01)	(0.01)
RelSize						-1.37e-05	-5.95e-06	-1.98e-05
							(1.07e- 05)	
						(1.03e-05)		(1.22e-05)
MarketValue							-6.89e-08	3.13e-09
							(6.08e- 08)	
								(5.92e-08)
ROE								0.38***
								(0.11)
Constant	-0.01*	-0.01**	-0.01*	0.00	-0.02	-0.01	-0.02	-0.00
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
Observations	456	456	456	456	354	348	348	344
R-squared	0.00	0.00	0.00	0.00	0.05	0.06	0.06	0.13

*** p<0.01, ** p<0.05, * p<0.

Chapter 6: Conclusion and implications

6.1 Conclusion and implications

This paper was written in an effort to map how the 2008 financial crisis has affected the wealth creation of shareholders in both the involved acquirer and the target company. To this end, the short term announcement returns were measured around the days that the M&A announcement was published. Although M&A returns have received broad academic coverage, the extent to which these returns are affected by the 2008 financial crisis has not yet been accurately mapped. In some respects, this paper builds on the findings by Beltratti & Paladino (2013) who investigate how M&A completion and announcement returns vary during the 2008 financial crisis. This paper however, does not focus solely on banks but investigates how all US listed target and acquiring companies were impacted by the turbulent economic period experienced during the 2008 crisis. For this reason, cross-border M&As are beyond the scope of this research.

In line with academic research (Campa & Hernando, 2006; Goergen, 2004; Loughran & Vijh, 1997), this paper finds that on average, target companies experience highly significant economic and statistical returns upon the M&A announcement, whereas the success for buyers is widely dispersed. This paper investigates these mean returns over several time frames relative to the announcement date [-5,5], [-10,10] and [-6,1] and the findings are robust regardless of the chosen time frame. In fact, targets experience on average a +25% return over all analyzed data. When the control sample and crisis sample are compared explicitly, the CAAR value increases by 14% when the 2008 financial crisis hit the financial markets as compared to the control period. For acquirers however, the opposite scenario shows from the result section. On average, acquirers experience returns which are approximately 1% lower during the crisis as compared to a control period. In order to test whether these results hold when control variables are included, table 5 and 6 show the multivariate regressions that were run.

The multivariate regressions show that target company returns remain highly significant regardless of the amount of control variables that are included. The crisis dummy further indicates that target companies experience a staggering additional return of approximately 20%, which is robust to the control variables. Additionally, the cash dummy is highly significant, indicating that deals fully financed in cash are positively received by target shareholders. When turning to acquirers in table 6, the crisis dummy does not appear to be significant at the 5% level, indicating that the 2008 financial crisis does not significantly impact the returns experienced by acquirers. However, once again, the cash dummy is of

importance and causes acquirers' returns to increase by approximately 2%. Moreover, the ROE contributes positively to the CAAR by 1%. This is in line with Beltratti and Paladino (2013) who also find that a higher ROE implicates that the acquiring management is skilled, and hence will be able to transfer this to the acquired target. When aggregated, the 2008 crisis interestingly amplifies the combined announcement returns experienced by the involved parties, hinting at higher synergy gains.

In conclusion, this paper finds strong evidence that the 2008 financial crisis positively impacts target company returns. Moreover, these returns are robust to external factors. Acquiring companies on average do display negative returns during the crisis, but these returns are not robust to the included control variables and in fact are more tied to the method of payment and ROE. For this reason, hypothesis 2 is rejected and hypothesis 1 is not.

Lastly, this paper investigated how the degree of corporate financial distress affected the experienced M&A returns during the 2008 financial crisis. The interaction term between target corporate distress and the crisis dummy is mildly significant across the regressions that were run, indicating that the effect of the 2008 financial crisis and distress in conjunction lead to a sizable positive effect on stock returns. On average, this leads to a sizable contribution in excess of 20% on the obtained CARs. Acquirers' CARs on the other hand, were not affected by the interaction of corporate distress and the 2008 financial crisis. For this reason, hypothesis 3 and 4 are rejected.

Chapter 7: Limitations and recommendations for future research

7.1 Limitations

In some respects, the results obtained in this paper might not always paint the full picture of what they aim to explain. For instance, this paper matches a list of M&A announcement dates with a time frame over which the acquirer or target abnormal returns are calculated. Hypothetically speaking, a firm could announce two or more mergers or acquisitions on the same day, which means that the announcement returns could be biased since they contain the info of both events. This confounding factor might bias the results. The same holds for target companies, which may receive two or more bids on a single day. This paper however, did not differentiate for this and took all available cases into consideration.

Another point of improvement is the quantity of data which is analyzed in this paper. Especially when running cross-sectional multivariate regressions, the amount of observations occasionally drops sharply due to a limited availability of the variables in question. If however, the number of missing variables is correlated with company size due to an availability of the information, the regressions might be biased towards large companies who are broadly covered in databases. For this reason, combining several databases in order to counteract this complication deserves preference. Another benefit of opting for this procedure is the resulting increase in statistical power.

7.2 Future research

There are several interesting directions that can be pursued in order to complement the results obtained in this paper. First of all, the above mentioned limitations can be improved upon in future research conducted by practitioners. Moreover, this paper uses solely the Z-score introduced by Altman as a measure of financial distress a company copes with. There are, however, multiple measures available that have the power to quantify the degree of financial distress. Using multiple of these measures as part of a robustness analysis will yield valuable contributions to existing literature.

Also, employing more statistical methods on the data like non-parametric tests may be an interesting direction to pursue, since these test generally make less assumptions on the underlying data, hereby providing yet another robustness test. Moreover, along the lines of increasing the data sample size, future researchers may benefit from adjusting the crisis period. In this paper, 01/08/2007 until 30/06/2009 is used as a proxy for the 2008 financial crisis, whereas adjusting the duration of the crisis period has several benefits. Firstly, an increase of the period under investigation will yield more observations. Secondly, it is of great interest to see whether adjusting the time frame will yield similar

results as obtained in this paper in light of the robustness.

This paper finds that especially target companies benefit from M&A announcement in the short run during the 2008 financial crisis. It may also be of interest to explore whether these results also hold over a longer time frame, or whether the results may in fact reverse over the long term.

Finally, for the 3rd and 4th hypothesis, the degree of financial distress played a key role. This paper specifically addressed how either the target or acquirer's Z-score influenced M&A returns in conjunction with the 2008 financial crisis. However, several other aspects beyond the focus of this research can be analyzed further anlogously. For instance, an interaction term between the acquirer's and target's Z-score can be included in the multivariate regressions part. Including these variables in the same regression allows the researcher to investigate how these variables interact. In this research however, this has not been analyzed due to a lack of sufficient observations.

Chapter 8: References

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Chapter 9: Appendix

Figure 1 – significance of abnormal returns

The figure underneath shows for both acquirers and targets, the abnormal returns relative to the M&A announcement date. P-values below or equal to 0.05 have been bolded. On these days, the absolute return deviated so much from the expected return (CAPM), that it only occurs in 5% or less by chance.

Day	Targets			Acquirers		
	Abnormal return	**t-statistic**	**p-value**	**Abnormal return**	**t-statistic**	**p-value**
-10	0.16%	2.00	**0.05**	-0.04%	-0.81	0.42
-9	-0.03%	-0.38	0.704	-0.02%	-0.26	0.78
-8	0.13%	1.52	0.129	0.01%	0.16	0.87
-7	0.13%	1.11	0.267	-0.06%	-1.02	0.31
-6	0.26%	2.72	**0.01**	-0.02%	-0.38	0.70
-5	0.21%	2.17	**0.03**	0.03%	0.58	0.56
-4	0.22%	1.99	**0.05**	0.08%	1.46	0.14
-3	0.45%	3.05	**0.00**	-0.10%	-1.87	0.06
-2	0.25%	2.43	**0.02**	0.05%	0.84	0.40
-1	0.65%	3.84	**0.00**	0.01%	0.12	0.90
0	16.27%	22.63	**0.00**	-0.45%	-3.32	**0.00**
1	6.79%	13.20	**0.00**	-0.24%	-2.28	**0.02**
2	0.07%	1.03	0.30	0.07%	1.13	0.26
3	0.01%	0.19	0.85	-0.10%	-1.85	0.06
4	0.10%	1.09	0.28	0.03%	0.61	0.54
5	0.13%	1.85	0.06	0.11%	1.81	0.07
6	-0.08%	-1.31	0.19	-0.17%	-3.22	**0.00**
7	-0.03%	-0.40	0.69	-0.06%	-0.77	0.44
8	0.02%	0.29	0.77	0.10%	2.01	**0.04**
9	0.10%	2.02	**0.04**	0.03%	0.58	0.56
10	-0.02%	-0.29	0.77	-0.08%	-1.56	0.12