



The effects of mergers and acquisitions on stock prices:  
Evidence from international transactions from 2001-2016

MASTER THESIS

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## **Abstract**

This thesis evaluates the effects of mergers and acquisitions (M&As) in an international comparison. The data sample consists of 3,094 completed transactions around the world. The results show evidence, that the announcement date of M&As do have a positive effect on stock prices of both acquirer and target company. However, the effect is much more beneficial for target companies. Target companies experience an average abnormal return of 19.32% within a three-day event window around the announcement date. The magnitude for acquirers only equals 0.57% on average. This thesis also illustrates, that there are different variables that influence these abnormal returns in both ways. Furthermore, this study incorporates a separation into different country groups to point out international differences. In addition, the data set is clustered into four different time periods to see the development of abnormal returns due to M&A transactions over time.

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## 1. Introduction

Investments across all asset classes often offer high opportunities, but also involve several risks. However, the biggest investment decisions for companies are most likely M&As. Companies, who decide to merge face many risks but also may have great opportunities. Firms may generate synergies by increasing market share, cutting costs, expanding geographically to name a few reasons, which is why M&As are often a valuable tool to grow externally. But the outcome of such transactions is ambiguous. Managers never know if these transactions create value in the short- and/or long-term.

This study evaluates the effects of the announcement of M&A transactions on stock prices of both acquirer and target company. Therefore, an event study is used in order to calculate abnormal returns within a specified time window of three days. This methodology is widely used within the literature among M&A related topics. However, the literature on M&A is either not recent enough or is focusing on one specific geographic region. This thesis examines 3,094 completed M&A transactions from 2001 to 2016 all around the world. That is one reason why this thesis is able to offer new evidence on the performance of international transactions.

Furthermore, this thesis uses two different sets of variables combined with several regression models in order to see, what factors might influence the magnitude of abnormal returns of M&A transactions for both acquiring and target companies. This thesis includes deal characteristics on the one hand and firm characteristics on the other hand.

These two approaches are able to answer the main research question, that is associated with the following hypothesizes:

*Does the announcement of M&As have a significant influence on stock prices of firms involved in the transaction?*

H0: M&A announcements have no significant influence on stock prices of firms involved in the transaction (CAAR<sup>1</sup> = 0 and t values do not exceed critical values)

H1: M&A announcements do have a significant influence on stock prices of firms involved in the transaction (CAAR<sup>1</sup> ≠ 0 and t values exceed critical values)

The sub-research questions try to explain the results of this main research questions. Therefore, this thesis uses several regressions in order to answer the following sub-research questions:

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<sup>1</sup> CAAR = Cumulative average abnormal return. See detailed explanation and calculation in chapter 3.2.1.

*Do deal characteristics of M&As have a significant influence on the magnitude of acquirer's and target's CARs<sup>2</sup>?*

*Do firm financials of target and acquirer of M&A transactions have a significant influence on the magnitude of acquirer's and target's CARs?*

This thesis is structured around six different chapters, starting with a detailed overview of the current literature on M&A related topics. This section starts by giving a first understanding of the M&A context in general. Then, this chapter explains the results of other research on comparable research methodologies as used within this thesis. Chapter three illustrates the conception of the data as well as the methodology of each research approach. The next chapter shows and interprets the results from all research approaches. The last two chapters point out the conclusions and limitations of this thesis associated with implications for further research.

## **2. Literature Review**

Existing literature contains a lot of research on M&A transactions due to its relevance in the context of corporate financing. However, in order to understand the context of this thesis, the reader should have basic knowledge about M&As. First, there are different types of corporate transactions, which are explained within the first subchapter. Moreover, it is important to emphasize the various reasons companies have to acquire or merge with other firms. This is summarized within the second subchapter. In addition, M&As have become so popular that researchers categorized several time periods of high M&A activity as merger waves. After explaining all this theoretical knowledge, the current literature on abnormal returns is illustrated within the last two subchapters. This gives a brief overview of the results that are already set out in the research topic of this thesis.

### **2.1 Types of M&As**

In order to investigate the effect of M&As on firm performance, you should start with defining what M&As are. In this subchapter, you receive a brief overview of both a definition of the terms M&As as well as the different types of corporate consolidations. The main literature is based on Depamphilis D. from 2009 and from Bower J. L. from 2001.

Several definitions of a M&As exist. On the one hand, an acquisition or a merger can be explained as the combination of two companies, in which the acquirer in most cases pays a

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<sup>2</sup> CAR = Cumulative abnormal return. See detailed explanation and calculation in chapter 3.2.1.

premium in order to create synergies (Gersdorff and Bacon 2009). On the other hand, “*mergers can be described from a legal perspective and an economic perspective*” (Depamphilis 2009, p. 23). From the legal perspective, a merger is defined by the combination of two or more companies into one consolidated legal entity. In many cases, their economic sizes are comparable. Within a direct or statutory merger, the acquirer incorporates all assets and liabilities automatically. In comparison to that, the result of subsidiary mergers is two legal entities only with a change in control. The acquiring company then becomes the parent company to the target. There is also the possibility of a statutory merger with two or more firms merging to a new company. However, this is technically not considered as a merger (Depamphilis 2009).

From an economic point of view, the differences within M&As occur due to whether both businesses are operating in the same industry or not. Mergers of companies in the same industry are considered as horizontal and as conglomerate if they are not. Transactions between companies on the same value chain but at a different stage of the process are called vertical. However, vertical mergers are classified whether as backward integrate or as forward integrate depending on the position of the target on the value chain of the acquirer (Depamphilis 2009). Furthermore, there is a differentiation between acquisitions, divestures, spin-offs, split-offs, carve-outs and buyouts. An acquisition on the one hand is defined by a company taking over controlling interest in another legal entity or its assets. This may also be the case in that the acquired company continues to exist as a subsidiary to the parent company. On the other hand, a divesture is the disposition of a substantial part or of all parts of a company to another firm. These transactions can be paid with both cash or securities, or a mixture of the two. In contrast, a spin-off is a change in the structure of legal entities. This enables a company to create a new subsidiary and to issue shares to its existing shareholders as a dividend. A split-off is comparable to a spin-off with the difference that a split-off also includes a stock exchange offer from the parent stock against the subsidiary of the parent firm. Another approach is an equity carve-out. In these kind of transactions companies are issuing a part of the parent company to the public and make it to a subsidiary. This also involves corporate restructuring (Depamphilis 2009).

## **2.2 Reasons of M&A transactions**

In the most cases, target companies show significant positive short-term returns around the announcement date of M&As, which is not surprising due to the premiums that are usually incorporated in a transaction. On the other hand, bidding companies show significant negative

or slight positive returns in the short run (Agrawal and Jaffe 2000). So why are M&A transactions still such a popular tool for corporate financing?

In accordance with Trautwein 1990, the motives for mergers can be divided into seven strategic different groups. In this thesis, the first four groups will be discussed in detail. The first group is defined by the *Efficiency theory*. This strategy aims accurately to receive synergies. There are three different types of synergies, that this strategy tries to generate. First, financial synergies are aimed at reducing the overall costs of the new merged company. Second, operational synergies which are for example new products and services that can be offered as a result of the merger. And third, managerial synergies equipped with better monitoring abilities. The second group of M&A strategies is the *Monopoly theory*. This motive is straight forward to the idea of increasing the market power by acquiring a competitor. That is also why this motive mostly occurs in horizontal mergers, i.e. in M&A transactions where one company within the same industry acquires another. However, this can also happen in conglomerate acquisitions. The third group of M&A motives is classified in the *Valuation theory*. It states that a transaction can be done due to a potential information advantage of the bidding company's manager regarding the target. Furthermore, the fourth group explains the *Empire-building theory* of acquiring company's managers (Trautwein 1990). The idea is that managers tend to "maximize their own utility instead of their shareholders' value" (Trautwein 1990, p. 284).

Another approach in order to illustrate M&A strategies has been summarized by J.L. Bower in 2001. Within this article there are five different reasons for acquisitions. First, it is beneficial for companies with substantial overcapacity to acquire other companies. These transactions often occur in matured and capital-intensive sectors, such as automotive and steel. The acquiring companies within this scenario basically receive more market share by buying less competitive companies. This reason accounts for 37% of all transactions in the sample. The second M&A strategy is the "*Geographic Roll-up M&A*" (Bower 2001, p. 98). The reasons for this strategy are relatively comparable with the overcapacity scenario. However, roll-ups are executed to benefit from economies of scope and scale, rather than to reduce overcapacities. In most cases, geographic roll-ups are win-win situations. That is also why they are easier to carry out. Third, companies use M&A transactions as a strategy to extend their product or market portfolio. Instead of developing their own new products, some firms acquire companies to have new technologies and/or products. The fourth strategy is "*M&A as R&D*" (Bower 2001, p. 99). Industries, such as biotech and high-tech are acquiring other firms in order to keep their research and development pipeline filled and stable. This is a comparable approach to the third M&A

strategy. The important difference between the two is the age and risk profile of the target companies. Target companies of the biotech and high-tech industry are considered to be relatively risky but have more potential. The last approach is a complete different approach in comparison to the first four M&A strategies. Few large companies are betting on new emerging industries to establish an early and strong position in this area (Bower 2001).

Another interesting research about the motives of M&As has been undertaken by Ngyen, Yung and Sun in 2012. They found that 73% of their sample transactions are related to market timing advantages. The second largest result is related to agency motives and/or hubris theories. In addition, about 80% of these transactions have combined motives. Due to this fact, value-increasing as well as value-destroying motives can be involved in a single merger (Nguyen, Yung and Sun 2012).

### **2.3 Merger waves**

In the context of M&A activity, past experiences have shown that there were periods with extreme peaks, considering the number of M&A transactions. Several researchers have investigated the reasons for these time periods and called them “Merger waves”. In over 100 years of transaction history, six periods emerged. They are characterized by a high level of M&A activity. For this subchapter I am primarily focusing on the literature of Depamphilis D. from 2009 and of Jarrad Harford from 2005.

The first wave starting in 1897 is defined by the tremendous amount of horizontal consolidations. During this period, M&A transactions were supported by “*lax enforcement of the Sherman Anti-Trust Act*” (Depamphilis 2009, p. 18) and by a change in technology. This act was initiated in the US by John Sherman in order to reduce the power of cartels and monopolies in the national economy (Letwin 1981). However, due to low enforcement there was more motivation for companies to merge. As a result of this period, there was an increasing number of consolidations in the industry for metals, transportation and in the mining business. Due to fraud in financing the transactions and a stock market crash in 1904 the M&A activity decreased and the first merger wave ended (Depamphilis 2009).

The second wave began in 1916 and was enhanced by the entry of the United States into World War I. Due to the economic boom after the war, companies merged a lot which increased the concentration across all industries. The transactions were primarily horizontal. This wave ended with the stock market crash in 1929 (Depamphilis 2009).

In the third wave or the “*Conglomerate Era*” (Depamphilis 2009, p. 19) firms with high price earnings ratios (P/E) understood, that they could increase their earnings per share ratio (EPS)



by buying other firms with lower P/E and higher EPS ratios. This increases the overall EPS ratio of the combined corporation. As a result of these transactions, the stock price of the new combined companies within this period skyrocketed as long as the P/E ratio of the new company did not decrease and went lower than the P/E ratio of the target company. This led to a pyramiding effect which increased the P/E multiples that investors were ready to pay. This merger wave collapsed in 1969 with the increased leverage of the resulted conglomerates (Depamphilis 2009).

The next wave, the fourth one, started in 1981 and was defined by the fall of many large conglomerates. This was undertaken by “*corporate raiders*” (Depamphilis 2009, p. 19) via hostile takeover and leveraged buyouts. Conglomerates started to sell subsidiaries bought within the third merger wave. This was also the first time in history, where US companies were primarily bought by foreign investors, considering both number of transactions and deal volume. It was like a run on US companies, enhanced by the sophisticated technology in the US, but also due to the weak dollar in comparison to foreign currencies. The fourth merger wave ended in 1989 because of a weaker economy in the US as well as a lot of LBO bankruptcies (Depamphilis 2009).

Three years after the end of the fourth merger wave, the fifth wave started in 1992 and is described as “*The Age of the Strategic Megamerger*” (Depamphilis 2009, p. 19). The economic power was accelerated by the changes in information technology and continued deregulation as well as increasing globalization (Depamphilis 2009). The deal volume as well as the number of transactions continuously increased until the so-called “*Dot-com Bubble*” (Ljungqvist and Wilhelm 2003, p. 723) burst in 1999 which also ended the fifth merger wave (Depamphilis 2009).

The sixth and last investigated merger wave had its start in 2003. This economic period was characterized by a highly levered and collateralized real estate market (Depamphilis 2009). During this time, financial products such as mortgage-backed securities (MBS) and collateralized debt obligations (CDOs) became more and more famous. In addition, the number of LBOs also increased again so that the market was highly levered. The monthly volume of leveraged loans increased from almost \$20 billion in January 2007 to almost \$60 billion in March 2007 (Acharya et al. 2009). This highly liquid market led acquiring companies to overpay significantly for their target firms. However, increasing interest rates resulting in a lot of defaults in mortgage loans caused one of the biggest financial collapses in history. This also ended the sixth merger wave (Depamphilis 2009).

To sum up all these results, merger waves often occur due to shocks or to market timing components (Harford 2005). At first, the market environment has to be characterized as highly liquid, which means it is relatively easy to organize a lot of money in order to finance a transaction. This can be managed by an environment of low interest rates. This higher capital liquidity also lowers the cost for the transactions (Depamphilis 2009). However, shocks, no matter if economic, regulatory or if they are of technological nature, are the most important initiators of merger waves. Both effects, macro-level liquidity and industry shocks are not necessarily correlated, and therefore can both increase M&A activity (Harford 2005).

#### **2.4 Abnormal returns from M&A announcements**

There is a lot of research done on the effects of M&As on firm performance. The two most common methods of measuring these effects are investigating changes in post-merger profitability on the one hand and by calculating cumulative abnormal returns around the announcement date on the other hand. The research of this thesis focused on the second approach. The most interesting results on abnormal returns were found by Mulherin and Boone in 2000, Andrade, Mitchell and Stafford in 2001, Houston et al. in 2001 and by a more recent paper from Shah and Arora in 2014. The results are explained in more detail below.

The sample of Mulherin and Boone from 2000 consisted of 1,305 companies within a variety of 59 different industries from 1990-1999. They distinguished both acquisitions and divestures as well as the size of the transactions. They used an event window of  $[-1,+1]$  in order to calculate abnormal returns. Their results show a significant value creation for both events with significant abnormal returns of 20.2% for target companies. Due to their results, acquirers are put at a disadvantage with abnormal returns of -0.37% but without statistical significance. However, combined returns yield 3.56% on average within the  $[-1,+1]$  event window. This return is in line with the synergy theory, which predicts that larger transactions are positively related with the effects on shareholder wealth. Their results are also showing positive returns when splitting the sample into the different types of transactions. Spinoffs are creating 4.51%, equity carve-outs 2.27% and 2.60% are achieved by asset sales (Mulherin and Boone 2000).

Another research has been undertaken by Andrade, Mitchell and Stafford in 2001. Their sample contains 4,256 total observations with a full data base of 3,688 completed M&A deals from 1973-1998. They investigated the effects of the payment method, the deal attitude and the financials of the involved companies on the resulted abnormal returns. In addition, they tested the average abnormal operating performance by calculating the difference between the operating margin of the combined firms with an industry median operating margin. They

divided the sample in several decades and also used the event window of  $[-1,+1]$  around the announcement date of the corresponding transactions. In order to control for long-term effects, they also compared this event window with another time frame reaching from 20 days prior to the announcement to the official closing date of the mergers. The long-term event window scales to a mean of 142 days in total length in comparison to the three-day short-term window. Their results also show significant positive returns for target companies with a magnitude of 16.0% in the short event window and even higher returns of 23.8% in the long run (Andrade, Mitchell and Stafford in 2001). This illustrates an average abnormal return of \$37 million for target companies in the three-day window with a median equity value of target firms of \$230 million. The returns of acquiring firms show negative returns in both time frames with -0.7% and -3.8% respectively in the period of 1973-1998. However, the abnormal returns for acquirers are not statistically significant. More interesting are the returns for the combined companies with a magnitude of 1.8% in the three-day window around the announcement date, which are also significant. The results for the long-term window are interestingly close to this return with 1.9%. However, this result is not statistically significant. Another striking outcome of their research is that the way of financing a deal has a strong impact on the returns. Target shareholders have significant higher returns in the case of no equity, i.e. stock-financed mergers. Equity financed deals still show positive returns of 13.0% for target firms, but in the comparison with merger when no equity financing is involved, the returns yield up to 20.1%. This huge difference still remains even when controlling for the deal size (Andrade, Mitchell and Stafford 2001).

Further research on the value creation hypotheses of mergers is done by Houston et al. in 2001. Similar to the already mentioned papers above, this paper uses the event study method in order to find abnormal returns. However, their sample only consists of bank mergers with a deal value over \$400 million in the time period from 1985-1996. Only transactions in which the ratio between target's assets to acquirer's assets exceed 10% are included. This leads to a sample size of 64 mergers. In other words, they primarily focus on the largest bank mergers within a time frame of 12 years. Their event window of interest ranges from four days prior to one day following the announcement date. The outcome of their research shows significant abnormal returns for the combined firms and target with a magnitude of 3.11% and even 24.60% respectively. However, this only applies to the second time frame reaching from 1991 to 1996. Bidder abnormal returns are on average consistently negative, but without statistical significance. The change in value creation due to mergers yield \$285.31 million for the combined companies on average (Houston et al. 2001).

Furthermore, Shah and Arora in 2014 investigated more recently on this topic. Their sample includes M&A transactions in the Asia-Pacific area within a relatively short time frame. In fact, they use a six months' period of mergers and sum up to 37 observations. In comparison to the other highlighted research papers, they use four different event windows for their event study in order to analyze abnormal returns on stock prices generated by M&A announcements. Their event windows are  $[-2,+2]$ ,  $[-5,+5]$ ,  $[-7,+7]$  and  $[-10,+10]$  and result in target average abnormal returns of 9.5% at a significance level of 5% and 10%. The outcome for the 5-, 7- and 10-day event windows are 10.0%, 16.1% and 14.6% respectively, with even higher level of statistical significance. The cumulative average abnormal returns for bidding firms range from 1.2% to 2.5% around the four event windows and therefore only demonstrate positive results. However, these returns are statistically insignificant and therefore could have occurred due to other effects (Shah and Arora 2014).

To sum it up, most research papers found out that M&A transactions are creating value. However, on average this is only the case for target firms and the combination of target and acquirer. In fact, some authors suggest that bidder returns are positive and some argue that they are negative as these abnormal returns are mostly statistically insignificant.

## **2.5 Abnormal returns from M&A announcements by firm and deal characteristics**

There are several research papers that investigate the effects of different characteristics of targets or acquirer on the performance of M&A deals. One of the most significant factors, that might affect the magnitude of M&A announcement returns is the firm size effect. Several papers have carried out research on that particular factor. However, other firm characteristics might also affect the performance of M&A deals, such as profitability of acquirer and target before the transaction. Within this subchapter recent literature will be evaluated on the effects on abnormal returns from M&A transaction announcements by firm and deal characteristics.

In 2002, Fuller et al. investigated the sizing effect of companies with multiple M&A transaction in a short time window. Their data sample is clustered into four panels depending on the firm's ownership structure: panel A included all firms, panel B public companies, panel C private companies and panel D included subsidiaries. In order to first receive abnormal returns, they used a five-day event window  $[-2,+2]$  to calculate CAR within their event study. Their whole sample includes 539 unique acquirers with 3,135 takeover bids. The results suggest that the abnormal returns from private targets outperform those from public targets with a difference of approximately 2% (Fuller et al. 2002).

In the research paper of Moeller et al. in 2004, 12,023 acquisitions from 1980-2001 have been investigated in order to find a relationship between the firm size and the gains from acquisitions. At first, they used an event study with a three-day event window (CAR [-1,+1]) to measure abnormal acquisition returns. After receiving these results, a cross-sectional regression was used to figure out what influences the magnitude of these CARs the most. They categorized the acquirer size into two groups: large acquirers are companies with a market capitalization greater than the 25<sup>th</sup> percentile of the sample and all other companies were considered to be small acquirers. Their results suggest that small acquirers roughly have 2% higher returns on average (Moeller et al. 2004).

Another research done by Capron and Shen in 2005 investigates the effects of pre-acquisition profitability on M&A abnormal returns of both acquirer and target company. Therefore, their sample included 101 deals covering 52 public targets and 40 private targets excluding 9 targets due to government ownership. They used qualitative survey answers combined with data from SDC. Their results suggest a positive relationship between the profitability of targets prior to the acquisition with acquisition returns. They also found out, that private companies are yielding higher abnormal returns due to acquisitions than public companies. The relative median of transaction values for private companies equals \$158 million in comparison to public targets which yield \$826 million in their sample (Capron and Shen 2005).

A more recent research has been done by Li et al. in 2016. Their research sample includes 10,384 transactions of UK public acquirers from 1989-2014. The sample is clustered in a subsample of 3,489 non-serial acquisitions and 6,895 serial acquisitions. Companies who had more than one deal within three years are considered to be serial acquirers and non-serial, if there was only one deal within three years. The research results suggest, that abnormal returns of serial acquisitions are much lower than these of non-serial acquisitions (Li et al. 2016). Furthermore, *“the shareholder wealth effects are significantly and negatively associated with firm size, and this association is applicable for both non-serial and serial groups”* (Li et al. 2016, p. 3).

### **3. Research methodology and data resources**

This section illustrates the research methods as well as the data bases used for collecting the necessary data. In the first place, the composition of the data sample is explained. Then there will be a detailed methodology plan that is used in order to test the first hypothesis. In addition, summary statistics give a brief overview of the data set.

### **3.1 Data collection**

In order to collect data for investigating the effects of M&As on firm performance, three data bases are used. Deal characteristics are available on Securities Data Company Platinum (SDC) from Thomson Reuters, which covers worldwide M&A deals. The second data base is Compustat from Wharton Research Data Services (WRDS). This source provides stock returns for market indices. The third data resource used is DataStream also from Thomson Reuters, which serves as the main resource for this thesis.

The sample ranges from 2001 to 2016 in order to have a relative large number of observations and has to meet the following requirements: International deals with a transaction value of at least \$1 million are included in accordance with Gugler et al. (2002). In addition, both acquiring and target company have to be listed. Only acquiring firms which controlled less than 50% of the target's shares prior to the announcement date and control 100% after the deal are considered. In order to reduce biases, the data set excludes acquirers and targets with multiple transaction within the time period. All observations with missing data on one of the researched variables are excluded as well.

Moreover, the sample is divided into six different country groups also following the approach of Gugler et al. (2002). The country groups are 1. United States of America, 2. Australia, New Zealand and Canada, 3. Japan, 4. United Kingdom, 5. Continental Europe and 6. Rest of the world. Continental Europe covers transactions from Austria, Belgium, Denmark, France, Finland, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Spain, Sweden and Switzerland. The last group includes transactions from 38 different countries worldwide. The three countries of group six with the most completed mergers are South Korea, India and South Africa with 50, 43 and 39 deals respectively. However, the two largest transactions within this group took place in Hong Kong with a combined transaction value of almost \$50 billion.

The sample requirements shrink the full SDC data set from 16,188 completed transactions from 2001-2016 to 3,094 evaluable observations. With 1,371 M&As, the largest group are the United States of America. 239 merger took place in the United Kingdom, 308 in Continental Europe, 304 in Japan, 502 in Australia, New Zealand and Canada and 370 transactions took place in the Rest of the world. Only 17 transactions are considered to be hostile takeovers, i.e. when acquirers address their takeover bid directly to the shareholders in order to avoid a management decision (Shivdasani 1993). The average deal value of all M&As equals \$1,413 million. This sample is used for the event study in the first research approach. As a result of adding other variables, such as firm financials in order to evaluate the second research approach, the sample

shrinks again from 3,084 to 2,347 completed mergers. However, this only affects the tables with an involvement of firm financials and does not affect the number of observations of the event study.

### **3.2 Research Methodologies**

There are several possible methods in order to measure the effects of M&A transactions on stock prices of both, acquirer's and target's company. The first method this study uses is an event study to look for abnormal stock returns resulting from M&A announcement dates. This research methodology will be explained within the next subchapter. Furthermore, this thesis uses two different cross-sectional regressions to explain the results of the event study.

#### **3.2.1 Event study: Effects of M&A announcement dates on stock prices**

Event studies enable researchers to study the effect of special events on certain variables (Brown and Warner 1980). In this thesis, the effects of the announcement date of M&A transactions on stock prices of acquirers and targets will be examined. The variables of interest in this case are cumulative average abnormal returns (CAARs), which will be calculated in order to test the hypothesis  $H_0$ . This variable basically explains the excess returns generated by the M&A transactions. Hence, positive values of CAAR suggest a positive effect of mergers on stock prices and therefore a positive effect on firm's performance. Vice versa negative CAARs would imply negative effects of M&As on firm performance.

The methodology of an event study requires three important steps. First, an event date has to be set to know around what date the research is placed. In the field of M&As this will clearly be the announcement date of such transactions. Event dates after the announcement date may cause biases due to other events, which influence the stock price as well. The announcement dates of the data sample for this thesis have been retrieved from the SDC database. For the second step of the event study, a benchmark for expected returns has to be selected. In order to do so, in accordance with Brown and Warner (1980) there are different approaches of choosing a suitable benchmark. On the one hand, there is the mean adjusted model where benchmarks are considered to be the average return over a certain period of time. On the other hand, the market adjusted returns model also incorporates single stock price movements. Within this model the expected or normal returns are equal to the returns of a market index (Brown and Warner 1980). The final step of the event study methodology is the calculation and analysis of the variable of interest – the abnormal returns.

This thesis uses the event study methodology in accordance with Brown and Warner (1980). At first, the announcement date of each observations serves as the event date, as mentioned

above. Therefore, an event window of three days  $[-1,+1]$  around the event date (in accordance with Moeller et al. 2005) is chosen. This event window was also used in Mulherin and Boone from 2000 as well as in Andrade, Mitchell and Stafford (2001). In order to get the most reliable results, this short event window is picked to minimize biases coming from other events (Andrade et al. 2001). For the second step, selecting a benchmark for the expected returns variable, this thesis uses the value-weighted index daily returns provided by CRSP database from WRDS. To reduce further biases, these daily index returns exclude dividends. The third step of the event study methodology is to calculate the abnormal returns. For this approach the following formula is used (Goeij and Jong 2001):

$$AR_{it} = R_{it} - NR_{it}$$

The variable  $R_{it}$  represents the daily stock returns of company  $i$  at time  $t$  within the three-day event window. The daily returns of the benchmark are denoted as  $NR_{it}$ , or as the normal return. This thesis uses the market adjusted model in order to estimate the normal returns (Brown and Warner 1980):

$$NR_{it} = R_{mt}$$

Where  $R_{mt}$  presents the value-weighted index daily returns. An estimation window with the time frame of  $[-205,-6]$  is used to measure the average index returns as the normal return  $NR_{it}$  (following Moeller et al. 2005). With these two sets of variables, stock returns of acquirers and targets and the estimated normal return of the benchmark index, the calculation of the cumulative abnormal returns (CARs) and its average CAAR is possible with the following formulas (Goeij and Jong 2011):

$$CAR_i = \sum_{t=t_1}^{t_2} AR_{it}$$

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

In order to show the international differences, CAARs are determined for each of the six country sets separately within the period from 2001 to 2016. These abnormal returns are combined with a t-test to figure out whether the results illustrate statistical significance. The t-values are calculated as follows (Goeij and Jong 2011):



$$TS_2 = \sqrt{N} \frac{CAAR}{s} \approx N(0,1)$$

Where  $N$  denotes the number of observations in the data sample and  $s$  represents the standard deviation with:

$$s = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (CAR_i - CAAR)^2}$$

The t-test implies statistical significance in all cases, where the t-values are greater than the following critical values (following Shah and Arora 2014):

Level of Significance	Critical Values
10%	$\pm 1.688$
5%	$\pm 2.028$
1%	$\pm 2.719$

With all these values, this study can finally test the main hypothesis of this thesis (in accordance with Brown and Warner 1984):

H0: M&A announcements have no significant influence on stock prices of firms involved in the transaction ( $CAAR = 0$  and t values do not exceed critical values)

H1: M&A announcements do have a significant influence on stock prices of firms involved in the transaction ( $CAAR \neq 0$  and t values exceed critical values)

### 3.2.2 Cross-sectional regression: Effects of deal characteristics on CAR

After receiving abnormal returns, this study investigates possible factors, that might influence the magnitude of these returns. Cross-sectional analyses are often able to explain these factors. In this thesis, two approaches are used: the deal characteristics on the one hand and the firm financials on the other. This methodology is a common-used analysis in order to explain event study results. Papers such as Braggion, Dwarkasing and Moore (2012) used the same research method. The first cross-sectional approach is used to look at whether the characteristics of each deal have an effect on the magnitude of the CARs. The data set for this regression takes 2,347 transactions into account. For this approach, this thesis evaluated the following regression model:

$$CAR_{it} = \beta_0 + \beta_1 DEAL\ SIZE_{it} + \beta_2 INT_{it} + \beta_3 HOR_{it} + Year\ Effects_i + Industry\ Effects_i + Country\ Effects_i + \varepsilon_{it}$$

Where  $CAR_{it}$  is again the dependent variable and is determined by the abnormal returns retrieved from the event study earlier. In this regression, there are four additional independent variables of interest that might affect the performance of M&A transactions. The first new variable is  $DEAL SIZE_{it}$ , which is a dummy variable that can only take the values 1 or 0. It takes the value of 1 if the deal volume exceeded the average of the sample, which amounts to an average of \$1,363,31 million. All observations with a deal value below that average take the value of 0 for this variable. The independent variable  $INT_{it}$  illustrates whether the deal was internationally or domestically. Cross-border, or international, deals take the value of 1. That is when the nation of the acquirer firm and the nation of the target firm are not the same (Gugler et al. 2002). Hence, domestic deals are denoted with a value of 0. Next, the independent variable  $HOR_{it}$  explains whether the merger was horizontal, that is when both involved parties are operating within the same primary 4-digit SIC industry at the announcement date (Gugler et al. 2002). This is also a dummy variable, where 1 stands for horizontal mergers and 0 if the transaction is not classified as horizontal. This regression also controls for year, industry and country fixed effects and is clustered into the six described country groups, which are again 1. United States, 2. United Kingdom, 3. Continental Europe, 4. Japan, 5. Australia / New Zealand / Canada and 6. Rest of the World. The error term  $\varepsilon_{it}$  illustrates the residual factors that influence the dependent variable. In order to test for heteroscedasticity, the regressions included robust standard errors.

### 3.2.3 Cross-sectional regression: Effects of firm financials on CAR

In order to investigate the effect of firm financials on the abnormal returns due to M&A transactions, this study uses an additional regression model. The second cross-sectional regression for this section is as follows:

$$CAR_{it} = \beta_0 + \beta_1 ALAR_{it} + \beta_2 TLAR_{it} + \beta_3 AROE_{it-1} + \beta_4 TROE_{it-1} + \beta_5 ALEV_{it-1} + \beta_6 TLEV_{it-1} + Year\ Effects_t + Industry\ Effects_i + Country\ Effects_i + \varepsilon_{it}$$

The dependent variable  $CAR_{it}$  presents the cumulative abnormal return of acquirer or target company  $i$  within the time window from 2001-2016. The independent variables used in this regression are the following:  $ALAR_{it}$  and  $TLAR_{it}$ , that are dummy variables for the size measurement of acquiring firms and target firms respectively. The variables take the value of 1 if the sales of company  $i$  one year prior to the announcement is larger than \$500 million at the announcement date and 0 if their sales volume is below. This threshold is chosen in accordance

with the KfW bank research paper for mid cap companies in Germany (2017). Even if the currency between this data set (\$) and the reference (KfW with €) is different, this is a common benchmark within the M&A market in Europe and the USA.  $AROE_{it-1}$  and  $TROE_{it-1}$  are determined by the return on equity (ROE) of the acquirer and target firm one year before the announcement of the merger. The ROE is calculated by the net income of company  $i$  divided by the company's shareholder equity. In this case, the market value of equity is used, which is calculated by multiplying the number of outstanding shares with the current stock price. The variables  $ALEV_{it-1}$  and  $TLEV_{it-1}$  are illustrating the financial leverage of company  $i$  one year prior to the announcement date of each of both involved parties. It is the ratio of the book value of total debt to the market value of shareholder's equity. In this regression also year fixed effects as well as industry fixed effects are included across all regressions. Industry fixed effects are added by grouping all companies into three different industry groups according to the first two digits of their 4-digit SIC codes. The first industry group is scaling from SIC codes 01-49 and therefore clustering the industries agriculture / forestry / fishing, mining, construction, manufacturing and transportation / communications / electric / gas / sanitary services. This accounts for 1,261 and hence more than half of the full data sample. The second industry group scales from SIC codes starting with 50-59 and includes wholesale and retail trade businesses. This industry group roughly reflects 6% of all observations. The third group contains companies with the two-digit SIC codes from 60 and above. These include the following industries: finance / insurance / real estate, services and public administration. 945 observations count towards the third industry group. Country fixed effects are added only for the full data set and not for each country group separately. The error term  $\varepsilon_{it}$  also illustrates the residual factors that influence the dependent variable in these regressions. Heteroscedasticity is also tested in this regressions by using robust standard errors.

### 3.3 Summary statistics

#### 3.3.1 Summary statistic: Deal characteristics

The first summary statistic of this thesis represents a data collection from Securities Data Company Platinum (SDC) and DataStream both from Thomson Reuters. 3,094 completed deals are included by defining several research criteria requirements as described in the data section of this thesis. The most M&A deals were undertaken within the last time frame of table 1 (826 from 2013 to 2016). However, there are big differences between the different country groups.

Table 1. Summary statistics on the deal characteristics from 2001-2016

	2001-2004	2005-2008	2009-2012	2013-2016	Whole period
<u>United States of America</u>					
Number of transactions	379	328	260	404	1,371
Deal Size	0.12	0.20	0.23	0.37	0.23
Cross-border	0.09	0.09	0.17	0.10	0.12
Horizontal	0.42	0.43	0.42	0.43	0.45
<u>United Kingdom</u>					
Number of transactions	77	69	55	38	239
Deal Size	0.04	0.19	0.15	0.32	0.14
Cross-border	0.26	0.25	0.42	0.37	0.33
Horizontal	0.32	0.38	0.33	0.45	0.39
<u>Continental Europe</u>					
Number of transactions	75	92	62	79	308
Deal Size	0.20	0.29	0.11	0.44	0.28
Cross-border	0.45	0.65	0.50	0.71	0.71
Horizontal	0.35	0.26	0.34	0.38	0.37
<u>Japan</u>					
Number of transactions	69	84	82	69	304
Deal Size	0.01	0.12	0.07	0.19	0.11
Cross-border	0.01	0.13	0.13	0.25	0.13
Horizontal	0.39	0.29	0.38	0.42	0.40
<u>Australia / New Zealand / Canada</u>					
Number of transactions	92	149	133	128	502
Deal Size	0.05	0.13	0.08	0.13	0.10
Cross-border	0.22	0.17	0.14	0.23	0.20
Horizontal	0.54	0.56	0.53	0.49	0.54
<u>Rest of the World</u>					
Number of transactions	59	95	108	108	370
Deal Size	0.12	0.17	0.19	0.26	0.19
Cross-border	0.32	0.25	0.24	0.39	0.31
Horizontal	0.22	0.38	0.46	0.33	0.38
<u>Total Sample</u>					
Number of transactions	751	817	700	826	3,094
Deal Size	0.10	0.19	0.16	0.31	0.19
Cross-border	0.17	0.20	0.22	0.24	0.23
Horizontal	0.40	0.41	0.43	0.42	0.44

The databases for these statistics are Thomson Reuters DataStream and SDC. This summary statistic covers the whole data sample with 3,094 international transactions with a deal value of at least \$1 million. In addition, only transactions where the acquirer held less than 50% prior to the announcement and holding 100% of the target after the transaction are considered. The sample is clustered into four different four-year time periods with an additional whole period summation ranging from 2001-2016. The data set is also grouped into six country groups explained as follows: 1. *United States of America*, 2. *United Kingdom*, 3. *Continental Europe* (covering transactions from countries such as Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Spain, Sweden and Switzerland), 4. *Japan, Australia / New Zealand / Canada* and 6. *Rest of the World* which covers 38 different countries. The first variable is *Deal Size* which is a dummy variable for the size of each transaction. It takes the value of 1 if the deal value is greater than the average transaction volume of \$1,363,31 million. The second variable *Cross-border* is also a dummy variable taking the value 1 for each observation, where the nation of both target and acquirer are not the same. The third variable in this statistic is *Horizontal*. It is also a dummy variable taking the value of 1 for each deal, where the four-digit SIC code is the same for acquirer and target. It takes the value of 0 if they differ. In this case it could be either a vertical or a conglomerate merger. Due to missing relevance within this research, only this differentiation is used.

For example, United Kingdom illustrates the opposite by having 77 deals from 2001 to 2004 compared to only 38 deals from 2013 to 2016. The table shows that the half of the sampled deals have taken place in the USA. The deal size variable shows the highest magnitude over the whole period and sample within Continental Europe with 28% of large deals. Continental Europe also shows the highest amount of cross-border deals with 71% of the whole data set. In other words, 71% of all deals from the country group Continental Europe were deals, where a European company acquired a company from another nation. Horizontal deals, i.e. deals within the same industry, are mostly done in Australia / New Zealand / Canada over the whole period. 54% of all deals from there are classified as horizontal mergers. The amount of deals changed from every of the four time windows again. From 2001-2004, there were 751 deals, from 2005-2008 there were 817 deals, from 2009-2012 there were 700 and from 2013-2016 there were 826 deals. This behavior of M&A activity might be explained by the two financial crises in 2001 and 2007 and could also support a new merger wave as described in the second chapter.

### **3.3.2 Summary statistic: Firm financials**

Table 2 illustrates the characteristics of both acquirer and target as well as the deal value of each transaction. The number of observations decreased from 3,094 to 2,347 completed M&A deals due to missing data of some variables of the firm financials. The average deal value of across all country groups equals \$1,412.79 million. The largest deal happened in Continental Europe and has a transaction volume of \$69,445 million. However, most deals were, shown in table 1, undertaken in the USA with 1,048 completed transactions from 2001 to 2016. The least amount of deals come from the United Kingdom. On average, the largest deals were executed in Continental Europe with an average deal value of \$2,576 million per transaction. The second and the third variable are dummy variables measuring the size of both acquirer and target, taking the value 1 for companies with annual sales higher than \$500 million one year prior to the announcement date of the transaction. The highest amount of large acquirers is coming from Continental Europe with 70% of large acquirers. However, Japan also have a high amount of large acquirers within the data set with 69% of all acquiring companies. The lowest amount of large acquirer but also of large targets are coming from Australia / New Zealand / Canada with only 37% of large acquirers and 17% of large targets. The profitability is measured by the ROE of both involved parties. There are significant international differences within this category as well. The most profitable acquiring firms are coming from the United Kingdom with an average of 13% ROE one year prior to the M&A deal.

Table 2. Summary statistics of firm's financials from all sample deals from 2001-2016

	Obs.	Mean	Std. dev.	Min.	Max.
<u>United States of America</u>					
Deal value (Mn \$)	1,048	1,617.11	4,010.82	1.83	62,141.06
Large acquirer	1,048	0.57	0.49	0.00	1.00
Large target	1,048	0.27	0.44	0.00	1.00
ROE, acquirer	1,048	0.10	0.35	-4.35	3.20
ROE, target	1,048	0.06	0.42	-2.80	3.58
Debt-to-Equity, acquirer	1,048	0.35	0.25	0.00	0.97
Debt-to-Equity, target	1,048	0.32	0.27	0.00	0.97
<u>United Kingdom</u>					
Deal value (Mn \$)	181	1,161.88	4,332.96	1.50	49,053.66
Large acquirer	181	0.49	0.50	0.00	1.00
Large target	181	0.21	0.41	0.00	1.00
ROE, acquirer	181	0.13	0.33	-1.96	1.63
ROE, target	181	0.05	0.42	-3.25	0.78
Debt-to-Equity, acquirer	181	0.25	0.23	0.00	0.93
Debt-to-Equity, target	181	0.26	0.24	0.00	0.92
<u>Continental Europe</u>					
Deal value (Mn \$)	237	2,576.91	6,871.27	4.65	69,445.02
Large acquirer	237	0.70	0.46	0.00	1.00
Large target	237	0.38	0.49	0.00	1.00
ROE, acquirer	237	0.12	0.29	-2.76	0.88
ROE, target	237	0.06	0.52	-2.76	4.57
Debt-to-Equity, acquirer	237	0.38	0.25	0.00	0.98
Debt-to-Equity, target	237	0.32	0.28	0.00	0.98
<u>Japan</u>					
Deal value (Mn \$)	241	725.02	3,483.42	1.68	41,431.03
Large acquirer	241	0.69	0.46	0.00	1.00
Large target	241	0.30	0.46	0.00	1.00
ROE, acquirer	241	0.06	0.35	-2.21	4.25
ROE, target	241	0.03	0.25	-1.55	0.56
Debt-to-Equity, acquirer	241	0.34	0.26	0.00	0.98
Debt-to-Equity, target	241	0.35	0.28	0.00	0.96
<u>Australia / New Zealand / Canada</u>					
Deal value (Mn \$)	363	853.61	2,453.71	1.20	28,286.52
Large acquirer	363	0.37	0.48	0.00	1.00
Large target	363	0.17	0.37	0.00	1.00
ROE, acquirer	363	0.09	0.37	-3.72	1.33
ROE, target	363	0.04	0.49	-3.55	1.05
Debt-to-Equity, acquirer	363	0.26	0.22	0.00	0.92
Debt-to-Equity, target	363	0.23	0.24	0.00	0.94
<u>Rest of the World</u>					
Deal value (Mn \$)	277	1,138.91	2,583.66	1.90	25,416.14
Large acquirer	277	0.57	0.49	0.00	1.00
Large target	277	0.35	0.48	0.00	1.00
ROE, acquirer	277	0.12	0.30	-0.49	4.11
ROE, target	277	0.08	0.27	-1.50	1.17
Debt-to-Equity, acquirer	277	0.31	0.24	0.00	1.00
Debt-to-Equity, target	277	0.33	0.25	0.00	0.95
<u>Total Sample</u>					
Deal value (Mn \$)	2,347	1,412.79	4,077.98	1.20	69,445.02
Large acquirer	2,347	0.56	0.50	0.00	1.00
Large target	2,347	0.27	0.45	0.00	1.00
ROE, acquirer	2,347	0.10	0.34	-4.35	4.25
ROE, target	2,347	0.05	0.42	-3.55	4.57
Debt-to-Equity, acquirer	2,347	0.32	0.25	0.00	1.00
Debt-to-Equity, target	2,347	0.31	0.26	0.00	0.98

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The databases for these statistics are Thomson Reuters DataStream and SDC. This summary statistic covers the whole data sample with 2,347 international transactions with a deal value of at least \$1 million. In addition, only transactions where the acquirer held less than 50% prior to the announcement and holding 100% of the target after the transaction are considered. This statistic uses a time window ranging from 2001-2016. The *Deal Value* shows the volume of each deal in millions of USD. The variables *Large acquirer* and *Large target* are representing companies, which annual sales volume exceed the threshold of \$500 million one year prior to the announcement date, in accordance with the KfW criteria considered to be a large cap company (KfW 2017). These observations take a value of 1 and 0 if their annual sales volume is below \$500 million. *ROE, acquirer* and *ROE, target* are representing the return on equity of both involved parties one year prior to the announcement. The ROE is calculated by dividing the net income by the shareholder's equity. The last two variables are *Debt-to-Equity, acquirer* and *Debt-to-Equity, target*. Both explain the leverage ratio of both companies one year prior to the announcement. This ratio is calculated by the division of market debt by shareholder's equity.

In comparison to that, acquirers from Japan only yield an average of 6% ROE one year prior to the announcement date. This also accounts for the ROE of target companies. Japan's target companies only yield returns of 3% on average one year prior to the announcement. Also interesting, the spread between average ROE of acquirer to ROE of targets is 5%. In other words, acquiring companies within the data sample yielded 5% higher ROE than target companies on average. The last two variables are measuring the financial leverage of the firms by dividing the book value of debt by the market value of shareholder's equity of both acquirer and target. On average, all companies have debt-to-equity ratios of 31-32%. Country groups United Kingdom and Australia / New Zealand / Canada have significantly lower leverage ratios with roughly 10% lower values.

## **4. Results**

### **4.1 Results: Event study**

For the first research method an event study is used in order to test hypothesis H1 and to answer the main questions of this thesis:

*Do M&A announcements have a significant influence on stock prices of firms involved in the transaction?*

To answer this question, this thesis uses an event window of three days [-1,+1] to figure out if the stock price movements are significant around the announcement date. Table 3 illustrates CAAR [-1,+1], which explains the average of all calculated CARs. Almost all CAARs in this table show the highest statistical significance at the 1% level. The average abnormal return for target companies is 19.32% and 0.57% for acquirers. In other words, target companies are benefiting much more from M&A deals than acquirers do. These results are close to the results of Mulherin and Boone in 2000. However, there are also huge differences between the country groups. The highest CAAR results for targets are yielded in M&A deals from the USA. Target

companies in the USA are generating 24.73% abnormal returns on average within the three-day event window. Targets in Japan and Rest of the World are only creating 8.51% and 9.54% respectively in comparison. Also interesting, acquiring companies from Continental Europe and Rest of the World are yielding the highest CAARs among their peer with 1.62% and 2.64% respectively. These results are also supported by looking at the percentage of positive CARs. The portion of positive CARs for targets in Japan only equal 62.83%. But the positive CARs in the Rest of the World also only amount to 68.11% of all CARs in comparison to the average of the whole sample with 75.95%. However, the percentage of positive CARs among acquirers for the Rest of the World is 60.27%. To sum up the main results of this table, M&A transactions lead to positive abnormal returns for both target and acquiring company with significant higher results for targets associated with international differences.

Table 3. Event study results: CAARs for target and acquirers from 2001-2016

	Total Sample	(1)	(2)	(3)	(4)	(5)	(6)
<u>Target</u>							
Number of observations	3,094	1,371	239	308	304	502	370
CAAR [-1,+1]	0.1932	0.2473	0.1888	0.1981	0.0851	0.1823	0.0954
% positive CARs	75.95%	80.09%	74.48%	79.22%	62.83%	77.09%	68.11%
T-value	79.37***	44.25***	15.25***	57.31***	35.25***	46.86***	45.95***
<u>Acquirer</u>							
Number of observations	3,094	1,371	239	308	304	502	370
CAAR [-1,+1]	0.0057	-0.0009	0.0027	0.0162	0.0077	0.0023	0.0264
% positive CARs	48.97%	44.93%	49.79%	54.55%	52.30%	45.82%	60.27%
T-value	29.58***	-2.07**	9.13***	36.41***	32.73***	6.85***	54.26***

The numbers (1) to (6) represent the country groups as explained in table 1. The time frame of this table ranges from 2001-2016. CAAR [-1,+1] is the average of all cumulative abnormal returns (CAR) within a three-day event window. The T-value shows the relevance of the results by explaining the statistical significance level. \* is statistical significance at the 10% level, \*\* at the 5% level and \*\*\* at the 1% level. This is the probability that CAAR differs from 0.

In order to also see differences among different time periods, table 4 illustrates the results of table 3 clustered for target's CAARs into four time periods as described in table 1. The development of target's CAAR over time for the USA shows a significant increase over the first three time frames from 19.99% to 31.93% average abnormal returns. However, the effect decreased to an average of 26.12% from 2013 to 2016. The results for the United Kingdom show a decrease from 14.55% to 12.33% from the first to the second time window and increases significantly to 28.66% in the time period from 2009 to 2012. From 2013 to 2016, these effects slightly dropped to an average abnormal return for targets of 25.42%. Transactions in Continental Europe increased continuously with a CAAR of 16.22% from 2001-2004 to



22.89% in the last four-year time window. The strongest country discrepancies are illustrated in the case of Japan. Targets only generated a CAAR of 3.70% from 2001 to 2004. However, in Japan there is also a significant increase in CAAR over the four time windows to a target's CAAR of 11.70% in the time period from 2013 to 2016. Target companies in Australia / New Zealand / Canada also experienced a continuous increase in CAAR over time from 14.84% to 24.71%.

Table 4. Target's CAARs measured in four different time periods

Year of announcement	2001-2004	2005-2008	2009-2012	2013-2016
<u>United States</u>				
Number of observations	379	328	260	404
CAAR [-1,+1]	0.1999	0.2278	0.3193	0.2612
% positive CARs	73.09%	78.66%	83.46%	85.64%
T-value	24.84***	14.57***	26.19***	26.20***
<u>United Kingdom</u>				
Number of observations	77	69	55	38
CAAR [-1,+1]	0.1455	0.1233	0.2866	0.2542
% positive CARs	75.32%	69.57%	81.82%	71.05%
T-value	25.74***	23.17***	5.97***	2.96***
<u>Continental Europe</u>				
Number of observations	75	92	62	79
CAAR [-1,+1]	0.1622	0.1961	0.2052	0.2289
% positive CARs	70.67%	83.70%	72.58%	87.34%
T-value	18.97***	34.37***	22.37***	42.23***
<u>Japan</u>				
Number of observations	69	84	82	69
CAAR [-1,+1]	0.0370	0.0825	0.1014	0.1170
% positive CARs	53.62%	65.48%	59.76%	72.46%
T-value	8.07***	17.59***	21.77***	20.79***
<u>Australia/New Zealand/Canada</u>				
Number of observations	92	149	133	128
CAAR [-1,+1]	0.1484	0.1486	0.1812	0.2471
% positive CARs	78.26%	76.51%	74.44%	79.69%
T-value	25.23***	27.72***	29.14***	18.31***
<u>Rest of the World</u>				
Number of observations	59	95	108	108
CAAR [-1,+1]	0.1151	0.0937	0.0692	0.1122
% positive CARs	69.49%	69.47%	66.67%	67.59%
T-value	20.55***	25.34***	23.37***	22.46***
<u>Total sample</u>				
Number of observations	751	817	700	826
CAAR [-1,+1]	0.1626	0.1705	0.2163	0.2241
% positive CARs	71.64%	75.64%	75.29%	80.75%
T-value	42.48***	33.91***	44.09***	40.19***

The sample is clustered into four different four-year time periods with an additional whole period summation ranging from 2001-2016. The detailed explanation to the different country groups is explained in table 1. CAAR [-1,+1] is the average of all cumulative abnormal returns (CAR) of target companies within a three-day event window. The *T-value* shows the relevance of the results by explaining the statistical significance level. \* is statistical significance at the 10% level, \*\* at the 5% level and \*\*\* at the 1% level. This is the probability that CAAR differs from 0.

The results for acquirer's CAAR over time is illustrated in table 5 with the same time cluster as in table 4 and table 1. However, the acquirer's CAARs are not as satisfying as target's CAARs. Acquirers in the USA destroyed value by undertaking acquisitions in the first two time frames 2001 to 2004 and 2005 to 2008 with magnitudes of negative 1.78% and negative 0.41% respectively.

Table 5. Acquirer's CAARs measured in four different time periods

Year of announcement	2001-2004	2005-2008	2009-2012	2013-2016
<u>United States</u>				
Number of observations	379	328	260	404
CAAR [-1,+1]	-0.0178	-0.0041	0.0199	0.0043
% positive CARs	41.69%	41.46%	49.62%	47.77%
T-value	-34.10***	-11.89***	6.39***	14.85***
<u>United Kingdom</u>				
Number of observations	77	69	55	38
CAAR [-1,+1]	-0.0086	0.0086	0.0077	0.0078
% positive CARs	49.35%	47.83%	49.09%	55.26%
T-value	-11.11***	19.20***	14.54***	17.00***
<u>Continental Europe</u>				
Number of observations	75	92	62	79
CAAR [-1,+1]	0.0097	0.0089	0.0347	0.0164
% positive CARs	56.00%	51.09%	53.23%	58.23%
T-value	23.15***	27.74***	13.57***	18.30***
<u>Japan</u>				
Number of observations	69	84	82	69
CAAR [-1,+1]	0.0101	0.0044	0.0057	0.0117
% positive CARs	57.97%	54.76%	48.78%	47.83%
T-value	24.19***	10.87***	12.36***	18.26***
<u>Australia/New Zealand/Canada</u>				
Number of observations	92	149	133	128
CAAR [-1,+1]	0.0025	0.0030	-0.0053	0.0093
% positive CARs	50.00%	46.31%	43.61%	44.53%
T-value	4.29***	5.36***	-5.80***	14.70***
<u>Rest of the World</u>				
Number of observations	59	95	108	108
CAAR [-1,+1]	0.0075	0.0166	0.0305	0.0412
% positive CARs	52.54%	55.79%	64.81%	63.89%
T-value	10.57***	25.84***	55.03***	23.74***
<u>Total sample</u>				
Number of observations	751	817	700	826
CAAR [-1,+1]	-0.0071	0.0030	0.0154	0.0118
% positive CARs	47.27%	47.00%	51.00%	50.73%
T-value	-25.53***	15.48***	17.00***	44.69***

The sample is clustered into four different four-year time periods with an additional whole period summation ranging from 2001-2016. The detailed explanation to the different country groups is explained in table 1. CAAR [-1,+1] is the average of all cumulative abnormal returns (CAR) of acquirer companies within a three-day event window. The *T-value* shows the relevance of the results by explaining the statistical significance level. \* is statistical significance at the 10% level, \*\* at the 5% level and \*\*\* at the 1% level. This is the probability that CAAR differs from 0.

These magnitudes increased to slightly positive values of acquirer's CAARs of 1.99% and 0.43% within the last two time windows. The results for acquirer's CAARs in the United

Kingdom is also starting with a negative CAAR in 2001 to 2004 and increasing to relatively low positive CAARs in the other three periods with values of 0.86%, 0.77% and 0.78%. Acquirers from Continental Europe are performing better with having only positive acquirer's CAARs across all four periods. The values for acquirer's CAARs in Continental Europe are ranging from 0.89% to 3.47%. The results for acquiring firms from Japan are similar with magnitudes from 0.44% to 1.17%. The performance of acquirers from Australia / New Zealand / Canada is relatively low and is not moving as much as its peers. Acquirer's CAARs scale from negative 0.53% to positive 0.93%. The highest acquirer's CAAR comes from the country group Rest of the World with a magnitude of 4.12% in the last period. However, it started from 0.75% in acquirer's CAAR in 2001 to 2004. By looking at the total sample, the acquirer's CAAR is moving from negative 0.71% in the first time window to positive 1.18% in 2013 to 2016. However, the highest values of acquirer's CAARs are yielded in the time from 2009 to 2012 with an average over the total sample of 1.54%. The poor performance of the first two time windows might be explained with the financial crises in 2001 and in 2007. All values of acquirer's CAARs in table 5 show the highest level of statistical significance at the 1% level.

## **4.2 Results: Cross-sectional regression**

Within the next subchapters the effects of deal and firm characteristics of CAR will be evaluated. Therefore, this thesis uses two regression approaches separated for each of the six country groups including a model for the total sample. The international differences and differences due to various independent variables will be examined.

### **4.2.1 Results: Effects of deal characteristics on CAR**

Table 6 represents seven different regression models depending on the geographic categorization with a total sample regression. The country groups are explained in table 1. The dependent variables of interest are the target's CARs resulting from M&A transactions and calculated within the three-day event window from the event study method from the previous chapter. The first independent variable is *Deal Size*, that is a proxy for the volume of each transaction, is showing a negative and statistical significance across all regression models, except for the Rest of the World. In other words, larger deals reduce the magnitude of target's abnormal returns resulting from M&A transactions.

Table 6. Cross-sectional regression on target's CAR by deal characteristics

Country group	Total sample	(1)	(2)	(3)	(4)	(5)	(6)
Deal Size	-0.067*** (0.015)	-0.079*** (0.022)	-0.178* (0.097)	-0.068* (0.038)	-0.091** (0.039)	-0.083* (0.044)	0.006 (0.025)
Cross-border	0.117*** (0.016)	0.031 (0.031)	0.182** (0.080)	0.160*** (0.038)	0.299*** (0.034)	0.090** (0.039)	0.153*** (0.022)
Horizontal	-0.006 (0.012)	0.004 (0.019)	0.004 (0.068)	-0.039 (0.036)	0.003 (0.023)	-0.006 (0.030)	-0.030 (0.021)
Constant	0.257*** (0.047)	0.264*** (0.052)	0.142 (0.133)	0.254** (0.100)	0.023 (0.056)	0.092 (0.102)	-0.104 (-0.104)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	No	No	No	No	No	No
R <sup>2</sup>	0.202	0.111	0.250	0.289	0.422	0.193	0.318
Observations	2,347	1,048	181	237	241	363	277

The databases for these statistics are Thomson Reuters DataStream and SDC. The data sample includes 2,347 international transactions with a deal value of at least \$1 million. In addition, only transactions where the acquirer held less than 50% prior to the announcement and holding 100% of the target after the transaction are considered. This statistic uses a time window ranging from 2001-2016. The numbers (1) to (6) are representing the country groups as explained in table 1. The dependent variable of interest within this regression is the CAR of each target company. The first independent variable is *Deal Size* which is a dummy variable for the size of each transaction. It takes the value of 1 if the deal value is greater than the average transaction volume of \$1,363,31 million. The second independent variable *Cross-border* is also a dummy variable taking the value 1 for each observation, where the nation of both target and acquirer are not the same. The third independent variable in this statistic is *Horizontal*. It is also a dummy variable taking the value of 1 for each deal, where the four-digit SIC code is the same for acquirer and target. It takes the value of 0 if they differ. In this case it could be either a vertical or a conglomerate merger. Due to missing relevance within this research, only this differentiation is used. The regression is also controlling for year, industry and country fixed effects.

The highest magnitude for this behavior is observed within the country group Continental Europe (-0.178). The next deal characteristic, that is investigated is *Cross-border*. This independent variable illustrates the international orientation of each M&A transaction. The variable takes the value of 1 for deals, where the nation of acquirer and target differ (in accordance with Gugler et al. 2002). The results show a strong positive relation between the magnitude of target's CARs and the fact, that a deal was international. This effect is statistically significant across all country groups except for the USA. The highest coefficient is found for cross-border deals from Japan (0.299) at a level of 1% of statistical significance. The variable *Horizontal* explain the industry orientation of each deal, taking the value 1 if the acquisition was undertaken within the same four-digit SIC coded industry and 0 if not. However, since none of the coefficients are statistical significant, they have no relevance for this research. By looking at the values for R<sup>2</sup> (scaling from a level of explanation of the variation to the total

variation of 11.1% to 42.2%), one can conclude that these variables are of high relevance in order to explain the magnitudes of target's CARs within the three-day event window.

Table 7 uses the same set up from table 6, but it uses acquirer's CARs as the dependent variable of interest. The coefficients of *Deal Size* are positive for United Kingdom and the Rest of the World and negative for the other country groups. However, none of these show statistical significance, which is why they have no relevance for this thesis.

Table 7. Cross-sectional regression on acquirer's CAR by deal characteristics

Country group	Total sample	(1)	(2)	(3)	(4)	(5)	(6)
Deal Size	-0.008 (0.006)	-0.011 (0.010)	0.012 (0.016)	-0.016 (0.011)	-0.005 (0.017)	-0.012 (0.013)	0.004 (0.012)
Cross-border	-0.004 (0.006)	-0.006 (0.013)	0.016 (0.013)	0.010 (0.011)	0.000 (0.014)	-0.001 (0.012)	-0.025** (0.011)
Horizontal	-0.001 (0.005)	-0.004 (0.008)	-0.015 (0.011)	0.005 (0.010)	0.021** (0.010)	-0.002 (0.009)	-0.003 (0.010)
Constant	0.004 (0.018)	0.006 (0.022)	-0.007 (0.022)	0.015 (0.028)	-0.030 (0.024)	0.007 (0.031)	-0.061 (0.043)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	No	No	No	No	No	No
R <sup>2</sup>	0.106	0.059	0.242	0.173	0.193	0.218	0.199
Observations	2,347	1,048	181	237	241	363	277

The databases for these statistics are Thomson Reuters DataStream and SDC. The data sample includes 2,347 international transactions with a deal value of at least \$1 million. In addition, only transactions where the acquirer held less than 50% prior to the announcement and holding 100% of the target after the transaction are considered. This statistic uses a time window ranging from 2001-2016. The numbers (1) to (6) represent the country groups as explained in table 1. The dependent variable of interest within this regression is the CAR of each target company. The first independent variable is *Deal Size* which is a dummy variable for the size of each transaction. It takes the value of 1 if the deal value is greater than the average transaction volume of \$1,363,31 million. The second independent variable *Cross-border* is also a dummy variable taking the value 1 for each observation, where the nation of both target and acquirer differ. The third independent variable in this statistic is *Horizontal*. It is also a dummy variable taking the value of 1 for each deal, where the four-digit SIC code is the same for acquirer and target. It takes the value of 0 if they differ. In this case it could be either a vertical or a conglomerate merger. Due to missing relevance within this research, only this differentiation is used. The regression also controls for year, industry and country fixed effects.

It is interesting to see the different effects of deal characteristics on acquirer's and target's CARs by looking at the negative coefficient for cross-border deals done in the Rest of the World (-0.025). In other words, cross-border deals from countries from the Rest of the World are not beneficial for acquirer's abnormal returns on average. That is the only coefficient with a statistical significance among this regression model at a 5% level. This result goes in line with

the research of Amihud et al. in 2002. They find out, that the abnormal returns for acquirers in cross-border bank mergers are negative and statistically significant (Amihud et al. 2002). The next variable, *Horizontal*, only shows negative magnitudes across all regressions, except for Continental Europe and Japan, meaning deals within the same industry reduces acquirer's CARs. Since these coefficients are not statistically significant, they do have no relevance. However, the coefficient for Japan (0.021) shows statistical significance at a 5% level and therefore is interesting to look at. The interpretation of this is that horizontal mergers, i.e. mergers within the same four-digit SIC code, increase the acquirer's CARs on average. The values of  $R^2$  from all regressions of table 7 are ranging from 5.9% to 24.2%.

#### **4.2.2 Results: Effects of firm characteristics on CAR**

In order to explain the results of table 3 to 5, this study uses two regression models with different sets of independent variables. The first regression investigates the effect of firm characteristics on the performance of M&A deals measured by CAR. Table 8 illustrates the results for target's CARs. The results for *Large acquirer* suggest that the abnormal returns for targets of M&A transactions is positively related to the size of acquiring companies. This is not in line with the results of literature such as Fuller et al. (2002) and Moeller et al. (2004) who suggest that smaller acquirer's make better deals on average. But, they use a different approach in order to measure the size for both acquirers and targets. The effects of table 8 are not statistically significant for the country groups USA and Australia / New Zealand / Canada. The strongest impact with a coefficient of 0.209 is in Continental Europe. In other words, the size of acquirers of M&A deals in Continental Europe is significantly positive relating to the magnitude of abnormal returns for targets. In comparison to that, the size of target companies is inversely related to the magnitude of target's CARs in M&A deals across all country groups except Rest of the world. This means that the larger the target, the lower the abnormal return for this target will be on average. These results are statistically significant except for the country groups Japan and the Rest of the World. This underperformance of large target companies can be explained by less intense competition due to a lower amount of potential buyers for large targets (Gorton, et. al 2009), which may lead to lower acquisition premiums (Alexandridis et al. 2010). Another reason for this negative relation between target CARs and targets size may be that the ownership is less concentrated within large firms (Demsetz and Lehn 1985). This in turn may lead to an acceptance of lower transaction premiums and hence less value creation for shareholders (Bauguess et al. 2009). Furthermore, the probability of small firms to be acquired is higher than

it is for large targets (Palepu 1986), which may lead managers to accept lower premiums (Alexandridis et al. 2013). The next independent variable *ROE, acquirer* also illustrates interesting results and suggests, that more profitable acquirers, measured by their ROE, are also generating higher abnormal returns for target companies on average. However, the statistical significance is only given for the total sample, USA and Continental Europe. This effect has the strongest impact on abnormal returns for targets that are acquired by firms from Continental Europe with a coefficient of 0.175 and a statistical significance at the 1% level.

Table 8. Cross-sectional regression on target's CAR by firm characteristics

Country group	Total sample	(1)	(2)	(3)	(4)	(5)	(6)
Large acquirer	0.047*** (0.014)	0.001 (0.022)	0.209** (0.086)	0.112** (0.045)	0.070** (0.030)	0.063 (0.038)	0.047* (0.026)
Large target	-0.063*** (0.016)	-0.067** (0.025)	-0.209** (0.102)	-0.068* (0.040)	-0.031 (0.029)	-0.111** (0.050)	0.011 (0.026)
ROE, acquirer	0.059*** (0.018)	0.073** (0.028)	0.029 (0.116)	0.175*** (0.060)	0.052 (0.034)	0.002 (0.041)	0.041 (0.038)
ROE, target	-0.033** (0.015)	-0.025 (0.023)	-0.068 (0.080)	-0.086** (0.034)	-0.007 (0.050)	-0.011 (0.031)	-0.068 (0.041)
Debt-to-Equity, acquirer	-0.041 (0.028)	-0.032 (0.043)	0.005 (0.160)	-0.075 (0.085)	-0.087* (0.051)	-0.018 (0.074)	-0.074 (0.052)
Debt-to-Equity, target	-0.081*** (0.026)	-0.098** (0.039)	0.057 (0.152)	-0.065 (0.073)	-0.130** (0.050)	-0.023 (0.071)	-0.093* (0.048)
Constant	0.259*** (0.048)	0.287*** (0.054)	0.060 (0.145)	0.369*** (0.104)	0.063 (0.070)	0.116 (0.103)	-0.016 (0.097)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	No	No	No	No	No	No
R <sup>2</sup>	0.199	0.125	0.257	0.308	0.282	0.188	0.212
Observations	2,347	1,048	181	237	241	363	277

The databases for these statistics are Thomson Reuters DataStream and SDC. The data sample includes 2,347 international transactions with a deal value of at least \$1 million. In addition, only transactions where the acquirer held less than 50% prior to the announcement and holding 100% of the target after the transaction are considered. This statistic uses a time window ranging from 2001-2016. The numbers (1) to (6) represent the country groups as explained in table 1. The dependent variable of interest within this regression is the CAR of each target company. The independent variables *Large acquirer* and *Large target* represent companies, whose annual sales volume exceed the threshold of \$500 million one year prior to the announcement date, in accordance with the KfW criteria considered to be a large cap company (KfW 2017). These observations take a value of 1 and 0 if their annual sales volume is below \$500 million. *ROE, acquirer* and *ROE, target* represent the return on equity of both involved parties one year prior to the announcement. The ROE is calculated by dividing the net income by the shareholder's equity. The last two independent variables are *Debt-to-Equity, acquirer* and *Debt-to-Equity, target*. Both are explaining the leverage ratio of both companies one year prior to the announcement. This ratio is calculated by the division of market debt by shareholder's equity. The regression also controls for year, industry and country fixed effects.

The opposite effect is shown for the profitability of target companies. With the independent variable *ROE, target* is negatively associated with the magnitude of abnormal returns for targets

across all countries. However, statistical significance is only present in the total sample and in Continental Europe. In other words, the more profitable targets of M&A transactions are, the lower their abnormal return within the three-day event window on average will be. The last two independent variables *Debt-to-Equity, acquirer* and *Debt-to-Equity, target* explain the leverage ratios for both companies. The effect of the leverage of acquirers on target's CARs is negative across all country groups except for United Kingdom. However, only in Japan is this effect associated with a statistical significance at the 10% level. This means that the higher the debt-to-equity ratio of acquirers in Japan, the lower the target's CARs on average will be. The effect is illustrated for target's debt-to-equity ratios. The higher the amount of debt is in relation to equity a target has one year prior to the announcement, the lower will the target's abnormal returns within the three-day event window be. This effect does not account for targets in the United Kingdom. Statistical significance is present for the total sample, USA, Japan and the Rest of the World. Due to relatively high values for  $R^2$  (ranging from 12.5% to 30.7%), the results of table 8 explain a reasonably portion of the total variation.

Table 9 explains the effects of firm characteristics on acquirer's CARs resulting from M&A transactions. By the first look, one can see that the amount of statistical significant coefficients is much lower when looking at the effects on acquirer's CARs. The first independent variable *Large acquirer* only show negative magnitudes or magnitudes of zero for Continental Europe. In other words, the size of acquirers has a negative effect on the abnormal return CAR for acquiring companies. However, the effect is only statistically significant for the Rest of the World at the 5% level of significance. This is the opposite effect in comparison to the results from table 8, which explains the effects of target's CARs. This negative relation between the acquirer's size and acquirer's CARs is also supported by the papers of Fuller et al. (2002) and Moeller et al. (2004). Again, it is important to mention that their papers use different approaches in order to measure the size. The next independent variable *Large target* also only shows a statistical significance for the Rest of the World with a positive coefficient of 0.024. This means, that targets with sales over \$500 million tend to generate higher acquirer's CARs. The results for acquirer's profitability, measured by *ROE, acquirer*, are statistically significant and positive for the regression model for Continental Europe. The interpretation of this significance is that the higher the ROE of acquirers from Continental Europe is, the higher their abnormal returns will be due to M&A transactions. The same effect is present for the profitability of targets within Continental Europe. The higher the profitability measure ROE of targets in Continental Europe is, the higher the acquirer's CARs from acquisitions will be. The coefficients for the other country groups are primarily negative, but do not show any statistical significance.



Table 9. Cross-sectional regression on acquirer's CAR by firm characteristics

Country group	Total sample	(1)	(2)	(3)	(4)	(5)	(6)
Large acquirer	-0.005 (0.005)	-0.001 (0.010)	0.000 (0.015)	-0.007 (0.013)	-0.007 (0.012)	-0.006 (0.011)	-0.030** (0.011)
Large target	0.003 (0.006)	0.001 (0.011)	0.020 (0.017)	-0.006 (-0.006)	0.005 (0.011)	-0.003 (0.015)	0.024** (0.012)
ROE, acquirer	0.009 (0.007)	0.006 (0.012)	0.000 (0.020)	0.044** (0.017)	0.009 (0.013)	0.018 (0.012)	-0.027 (0.017)
ROE, target	-0.003 (0.006)	-0.014 (0.010)	-0.003 (0.013)	0.017* (0.009)	-0.005 (0.019)	0.008 (0.009)	-0.013 (0.018)
Debt-to-Equity, acquirer	0.002 (0.010)	0.002 (0.019)	-0.011 (0.027)	0.034 (0.024)	-0.021 (0.020)	-0.011 (0.022)	0.049** (0.023)
Debt-to-Equity, target	-0.008 (0.010)	-0.015 (0.017)	0.022 (0.026)	-0.033 (0.020)	0.009 (0.019)	0.015 (0.021)	-0.022 (0.021)
Constant	0.004 (0.018)	0.004 (0.023)	-0.007 (0.025)	0.048 (0.029)	-0.012 (0.027)	0.007 (0.031)	-0.055 (0.043)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	No	No	No	No	No	No
R <sup>2</sup>	0.106	0.060	0.241	0.225	0.182	0.224	0.225
Observations	2,347	1,048	181	237	241	363	277

The databases for these statistics are Thomson Reuters DataStream and SDC. The data sample includes 2,347 international transactions with a deal value of at least \$1 million. In addition, only transactions where the acquirer held less than 50% prior to the announcement and holding 100% of the target after the transaction are considered. This statistic uses a time window ranging from 2001-2016. The numbers (1) to (6) represent the country groups as explained in table 1. The dependent variable of interest within this regression is the CAR of each target company. The independent variables *Large acquirer* and *Large target* represent companies, whose annual sales volume exceed the threshold of \$500 million one year prior to the announcement date, in accordance with the KfW criteria considered to be a large cap company (KfW 2017). These observations take a value of 1 and 0 if their annual sales volume is below \$500 million. *ROE, acquirer* and *ROE, target* represent the return on equity of both involved parties one year prior to the announcement. The ROE is calculated by dividing the net income by the shareholder's equity. The last two independent variables are *Debt-to-Equity, acquirer* and *Debt-to-Equity, target*. Both explain the leverage ratio of both companies one year prior to the announcement. This ratio is calculated by the division of market debt by shareholder's equity. The regression also controls for year, industry and country fixed effects.

The next independent variable, *Debt-to-Equity, acquirer*, representing the leverage ratio of acquiring firms shows statistical significance for the Rest of the World (0.049) at a 5% level. In other words, the higher acquirer's debt-to-equity ratio is, the higher their resulting abnormal returns of M&A transactions on average will be. The effects of *Debt-to-Equity, target* are not statistical significant and therefore not relevant. The values of R<sup>2</sup> of the regression models in table 9 also show lower magnitudes than these from table 8, ranging from 6.0% to 24.1% of explaining the variation of each model.

## 5. Conclusion

The results of this thesis show that on average M&A transactions result in a positive abnormal return. This in turn leads to a rejection of hypothesis H0 and accept hypothesis H1. However, there are several factors that should be considered in order to maximize these returns. This study uses an event study at first to evaluate whether M&A transactions in general are beneficial for target and acquiring companies in the short-term measured by the stock price movements in different periods of time. Second, different regression models suggest that there are huge international differences and various factors that influence the magnitude of the abnormal returns calculated in the first approach.

The first approach, the event study methodology, illustrates that M&A transactions are positive for both target and acquirer. However, the effect is significantly better for target companies with an average abnormal return of roughly 19%. In contrast, the average abnormal returns for acquirers are hence positive, but slightly above 0%. In order to show differences within different time periods, this study demonstrates that the abnormal returns for both acquirer and target continuously increased over time, except for the small decrease of acquirer's CAARs from 2009 to 2012 in comparison to the time period of 2013 to 2016.

The second approach points out, that several factor clearly improve the performance of M&A deals, in the means of CAR. For the deal characteristics for instance, the deal size has a positive effect on the performance of both acquirer's and target's CARs. By looking at the effect of cross-border deals on the performance of M&A transactions it is not as clear as mentioned before. Target's CARs show a significant positive relation to cross-border deals, but this effect does not count towards acquirer's CARs. However, this only accounts for one of the seven regression models and therefore the positive impact on target's CARs is stronger. The industry orientation of M&A deals does not seem to have a strong impact on the magnitude of target's and acquirer's CARs.

For the firm characteristics, this study suggests that large acquirers, measured by the sales volume, increase the target's CARs significantly within M&A transactions. However, there is a slightly negative effect on acquirers CARs of large acquirers. In contrast to the relative strong impact of large acquirers, the opposite is the case for large targets. Large targets illustrate a strong and significant negative impact on target's CARs. Again, there is a little trade-off due to the slightly positive effect of large targets on acquirer's CARs in contrast. These results are still in favor of increases in abnormal returns, because their magnitudes are much stronger across all regressions. The profitability variable of acquirers does not lead to a trade-off. It rather

suggests that more profitable acquirers result in larger target's and acquirer's CARs in total. However, this effect does not account for the profitability of target companies. In other words, the higher the ROE of target companies is, the lower the abnormal returns due to M&A transactions for targets will be. The effect of leverage is clearly negatively associated with abnormal returns, concluding higher debt-to-equity ratios lead to worse acquisitions.

Furthermore, there are huge country differences, especially within the magnitude of target's CAAR in comparison. The abnormal returns for targets in the USA is much higher than in Japan and the Rest of the World. This observation shows the opposite result by looking at acquirer's CAAR. Country groups Continental Europe and Rest of the World are yielding higher acquirer's CAARs than all other peers.

It is also important to mention that there are clear differences within the different periods of time. This study investigates M&A transactions from 2001 to 2016. By clustering the sample into four different time period with four years each, there is already a clear increase over time, which may be explained by several external factors, such as financial crises. However, these topics are elaborated more in detail within the next chapter.

## **6. Limitations and further research**

This study examined the effects of M&A transactions with different approaches. However, some aspects that could also have been important to the research were not included. For example, the differences between the Dotcom bubble in 2001 and the financial crisis in 2007 were not precisely incorporated. Furthermore, the event study methodology within a three-day window only illustrate the short-term effects of M&A on stock prices. In order to evaluate the performance of M&A transactions, long-term investigations are also important. This effect could have been included by using multiple event window with expanded time frames.

The industry orientation of each M&A transaction did not lead to interesting results within this thesis. However, this variable might be an important influence factor within the research of M&A transaction and its performance and should therefore also be more researched on. The usage of sales instead of market capitalization to categorize company's size is not used in most literature, but shows different results and future research should elaborate more on this.

In the context of explaining the abnormal returns of M&A transactions, the regressions could also include more variables in order to increase  $R^2$  and to deliver more results. Interesting variables might be the payment structure of the deal as researched by Heron and Lie in 2002,

distinguishing between cash and equity financed deals. Also interesting is whether the presence of financial distress has an impact on the performance of M&A deals. The differentiation between friendly and hostile deals did not create any relevance due to the low amount of only 4% of hostile takeovers. Managerial objectives should also be included into further research such as elaborated in Morck et al. in 1990.

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