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The effect of M&A announcements on stock returns of acquiring firms in the US retail industry

Bachelor thesis Finance

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Date final version: 1 September 2022

ABSTRACT

This paper tries to further elaborate on the research on abnormal returns for acquiring firms around the announcement day of mergers and acquisitions in the United States retail industry. By means of an event study, the cumulative abnormal returns for three different event windows are examined for the acquiring firms. Then deal- and firm characteristics are examined for their influence on these cumulative abnormal returns. The sample included 192 retail mergers and acquisitions from the Zephyr database from 1 January 2011 to 31 December 2021. We found evidence of positive abnormal returns around the announcement day of mergers and acquisitions for acquiring firms in the US retail industry.

Keywords: Event study, Mergers and Acquisitions, Cumulative abnormal returns, Retail industry

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1 Introduction

As markets become more globalized and technological development quickens, more and more businesses are discovering that mergers and acquisitions (M&A) offer a strong growth strategy. The reasons for M&A can differ from value-maximizing strategies by pursuing synergies (Hakkinen & Hilmola, 2005) to value destruction due to the overconfidence of managers (Roll, 1986). The characteristics of these deals can hold valuable information for the stockholders who react to these announcements. More and more researchers try to understand and predict the impact of the announcement of certain M&A on the stock markets. In the presence of a reaction of the market, researchers can then search for certain deal- and firm characteristics influencing these so-called abnormal returns.

The research possibilities are enormous as the available data reaches back several decades containing information about M&A deals of different industries and countries. The Institute of Mergers, Acquisitions and Alliances (IMAA) statistics show that since the year 2000, more than 790.000 mergers and acquisitions have been announced worldwide, with a known value of almost 57 trillion USD (Imaa-Institute, 2022). The M&A market had a slight decrease due to the Covid-19 pandemic in terms of deals and value but had broken its new all-time high record in the year 2021, with the total deal values reaching an incredible 5,9 trillion USD (Bain, 2022).

The recovery of Covid-19 is also reflected in the retail industry, where M&A deal value in the global retail sector grew by 55%, from 108 billion USD in 2020 to 168 billion USD in 2021 (GlobalData, 2022). In the US alone, the retail industry counted 194 mergers and acquisitions with a total value of 33,6 billion USD and is still one of the biggest industries for M&A (White & Case LLP International Law Firm, 2022).

The retail industry is not only one of the biggest industries for M&A but is also one of the biggest providers of jobs. Due to the upcoming trend of e-commerce, there is a slight decline in the percentage of total employment. However, ultimately, the retail trade sector is expected

to make up 8.6 percent of total employment in the US in 2030, down from 9.7 percent in 2020 and 10.2 percent in 2010 (U.S. Bureau of Labor Statistics, 2022).

The existing literature indicates that when looking at the abnormal returns for both acquiring firms and target firms, corporate takeovers generate positive gains where target firm shareholders benefit and acquiring firm shareholders, in general, do not lose (Jensen & Ruback, 1983; Jarrell & Poulsen, 1989; Mackinley, 1997). Many factors could play a role if the acquiring firm earns abnormal returns. For instance, Capron and Pistre (2002) found that acquirers do not earn abnormal returns when they only receive resources from the target but can expect to earn abnormal returns when transferring their resources to the target. The positive abnormal returns for the target firms, in combination with the acquiring firms' abnormal returns close to zero, are in line with the view that a competitive market for corporate control forces the acquiring firms to pay the target firms' stockholders a fair price for the benefits they obtain from the acquisition (Travlos, 1987). So, for acquiring firms, positive abnormal returns are not that straightforward.

Additionally, when the industry's differences are not considered and the valuation results are aggregated, the study may yield insignificant findings or perhaps draw wrong conclusions. Dewenter (1995) showed in her analysis of takeover announcements by U.S. chemical and retail companies that industry (rather than time) aggregation bias might be the more likely explanation for the different results in prior research. According to other event studies, the type of industry in which a transaction occurs may directly affect stock market valuation standards (Johnson & Abbott, 1991). As a result, by taking into account, these differences between industries, Gross and Lindstädt (2005) found positive cumulative abnormal returns for bidding firms in the automotive, media, and telecom industries. In contrast, they found negative cumulative abnormal returns for acquiring firms in the financial services and pharma industries. This paper will elaborate on the analysis of abnormal returns for acquiring firms in specifically the US retail industry by answering the following main research question:

To what extent do abnormal returns for acquiring firms exist around the announcement day of mergers and acquisitions in the United States retail industry?

In this paper, we find evidence for the existence of positive abnormal returns for acquiring firms around the announcement day of M&A in the US retail industry. We find significant positive average abnormal returns of 1,9 % on the announcement day itself and 0,4 % on the fifth day before the announcement day. In addition, we find positive cumulative abnormal returns for a three-day, five-day, and eleven-day event window of 2,2 %, 2,5 %, and 3,0 %. In addition to the main research question, several hypotheses are reviewed to determine the effect of cash payments, domestic deals, and two degrees of industrial relatedness in the US retail industry on the cumulative abnormal returns. The results show no significant effects for cash deals, 2,1 percentage points higher cumulative abnormal returns for domestic deals, 5,3 percentage points lower cumulative abnormal returns for the first degree of industrial relatedness, and no significant effect for the second degree of industrial relatedness.

This thesis is structured as follows: First, the existing literature on M&A and the three hypotheses are addressed in section 2. Then the data and the methodology for this research are addressed in section 3. Hereafter, the results from this research are presented in section 4. This paper will end with the conclusion and discussion on this research and suggestions for further research in section 5.

2 Related literature

This section will discuss all the literature relevant to this research. First, the different incentives for mergers and acquisitions will be discussed. Then the relevant empirical evidence on M&A related to the retail industry will be addressed. Finally, the three supporting hypotheses for the main research question will be discussed and formulated in the last paragraphs, with the possible determinants of cumulative abnormal returns included in this research.

2.1 Incentives

There are several incentives for firms to pursue mergers and acquisitions. We make a distinction between incentives pursuing value maximization of the firm or managerial incentives which could result in value destruction.

2.1.1 Value maximizing incentives

2.1.1.1 Synergies

One of the most important incentives for M&A is synergies. We speak of the presence of synergies if the combined value of the merged firm exceeds the sum of the value of the separate firms. The increased value of the firm as a result of the synergies can come from two types of synergies. The first type of synergies is cost-reducing synergies resulting from economies of scale and scope. Economies of scope can occur as the range of products expands and decrease the unit cost to produce a product. Using the same machinery for different kinds of products can be one of the reasons for economies of scope. Economies of scale occur as the volume of the production of the goods increase and lower the costs per unit. In the case of a horizontal M&A (deals with both firms operating in the same industry) and producing the same products, economies of scale can occur if the expensive machinery can be used more efficiently by keeping a production line focused on one product only. This can result in unit cost reduction coming from less time to swap out raw materials and equipment to produce different products. Economies of scale can also occur because of a reduction in managerial costs. After the merger or acquisition, there is no need for two different CEOs present, which in its turn also lowers the

unit costs.

The second type of synergies is revenue-increasing synergies. Revenue-increasing synergies can result from the usage of each other's marketing and distribution networks or the sharing of technology from research and development. In the case of retail, retail firms can cross-sell their products to existing customer bases, increasing sales and thus increasing total revenue. Implementing an M&A strategy focusing solely on one type of synergies may contain drawbacks, but a successful M&A can result in both cost-reducing synergies and revenue-increasing synergies (Hakkinen & Hilmola, 2005).

2.1.1.2 Growth

Another incentive for firms to pursue M&A can be growth. The existing literature shows that one of the main reasons retail firms undertake M&A is to increase their assets, sales, and market presence more quickly than they could with internal growth while avoiding the risks associated with internal start-ups (Kumar, Kerin, & Pereira 1991). In terms of competition, when companies can no longer grow through organic (internal) growth to keep up with their competition, they are faced with the choice of getting behind or shifting to inorganic (external) growth through M&A.

2.1.1.3 Diversification

The last value-increasing incentive is diversification through M&A. We can divide diversification into two sorts of diversification, namely geographical and industrial diversification. Geographical diversification refers to diversification based on obtaining a firm in a different market, and industrial diversification refers to obtaining a firm in a different industry. In the case of retailers, we can also speak of format diversification, which refers to expanding the range of formats that retailers use to sell their target audience products or services. Launching a new format enables retailers to target different consumer segments (Gonzalez-Benito, Munoz-Gallego & Kopalle, 2005; Gielens & Dekimpe, 2007; Gauri, Trivedi & Grewal, 2008). Diversification can reduce the risk of cash-flow volatility, which in turn

reduces the cost of capital, increasing the firm's value. However, if managers undertake diversifying acquisitions to reduce their personal risk (Amihud & Lev, 1981), it may lead to value-destroying M&A.

2.1.2 Managerial incentives

Managers can go into non-value increasing M&A because of several possible reasons.

2.1.2.1 Agency problems

With managers operating as agents and shareholders as their principals, a conflict of interest could lead to non-value increasing decisions. We address two forms of agency problems. The first one is Jensen's free cash flow problem (1986). Managers may engage in non-value increasing M&A when firms have excess free cash flow. They are more likely to engage in M&A with a low net present value or even a negative net present value rather than to payout dividends to shareholders, as their compensation is based on the company's growth. The way managers are compensated brings us to the second agency problem, the 'empire-building' problem. Managers tend to grow the company beyond its optimal size. The reason is that general management compensation increases, and the manager's discretion and power increase after M&A deals (Grinstein & Hribar, 2004; Harford & Li, 2007).

2.1.2.2 Managerial hubris

The second reason for managers to engage in non-value increasing M&A can come from the so-called managerial hubris, stating that managers tend to be overconfident regarding their own firm (Roll, 1986). Managers then overestimate their ability to improve a target firm. As a result, they overpay target companies and undertake value-destroying mergers (Malmendier & Tate, 2008).

2.2 Empirical evidence for M&A in the retail industry

As mentioned before, the existing literature shows that in general M&A has positive abnormal returns for both acquiring as target firms but that the abnormal returns of acquiring firms are close to zero (Jensen & Ruback, 1983, Jarrell & Poulsen, 1989, Mackinley, 1997). For acquiring

firms to experience positive abnormal returns is not so straightforward as industrial differences also influence the abnormal returns and can result in both negative and positive results (Gross & Lindstädt, 2005). Dragun and Howard (2003) showed that by investigating M&A from 1997 to 2001 on corporate consolidation in European retailing, that consolidation had not delivered shareholder value in the short term. Namely, for the retail industry in Europe, target shareholders' stock price gains, suggesting the presence of value creation, are primarily offset by the loss of market value for the shareholders of acquiring firms. The retail industry in the United States shows different results. A recent study showed that the stock market reacted positively to acquiring firms' M&A announcements in the US retail industry, meaning that M&A deals increased the value of acquiring firms (Zhu & Hilsenrath, 2015). This study only investigated the abnormal returns for M&A in the US retail pharmacy from 1981 to 2009. Looking at the Retail industry in total, the paper of Hogan, Olson, & Capella (2015) tried to identify trends in M&A activity for retail trade sectors from 1980 to 2009 and tried to see what type of returns the acquirer and the target shareholders have earned. This paper showed significant positive returns for both acquiring as well as target firms for almost all sectors and decades included in the research. These positive returns could imply that the US retail industry does have positive abnormal returns for acquiring firms as opposed to other markets and industries. By looking at M&A of the last decade, we try to further investigate the possible positive abnormal returns for acquiring firms in the United States retail industry. Moreover, in doing so, this study will complement the literature trying to explain what factors influence these possible abnormal returns.

2.2.1 Deal method of payment

How the merger or acquisition is financed is vital to investigate in this research. How M&A is financed could be used to indicate the acquiring firms' expectations about the merger or acquisition. If the merger or acquisition is financed with an all-cash payment, the acquirer carries the risk of failing synergies. If (partially) paid in stock, the acquiring firm shares the

losses of possible failure of merging. Nevertheless, on the other hand, it does not lose any ownership of its firm. The existing literature shows a lot of evidence for the negative effect of payments entirely in stocks but does not have a clear conclusion for payments fully in cash. For instance, Travlos (1987) and Chang (1998) show that M&A fully paid in shares give negative abnormal returns, and when the M&A is entirely paid in cash, they experience normal rates of return. On the contrary, Alexandridis, Petmezas, & Travlos (2010) show that acquiring firms in the US even have positive abnormal returns when M&A is financed fully in cash. To further investigate the effect of M&A fully paid in cash, specifically in the retail industry in the US, the first hypothesis that will be tested:

H1: Mergers and acquisitions fully paid in cash have a positive effect on the abnormal returns of the acquirer.

2.2.2 Same Country

The following characteristic that is investigated of the M&A deals is whether domestic deals (deals between two firms both operating in the US) experience higher abnormal returns than cross-border deals (deals between two firms where only the acquiring firm operates in the US). There could be obstacles like cultural fit or legal and transaction barriers that decrease the value-creation for M&A. The existing literature has mixed results regarding the effect of domestic and cross-border deals on the abnormal returns of the acquiring firms. Some studies show value-increasing results for the acquiring firms when a cross-border M&A is executed (Doukas & Travlos, 1988; Doukas, 1995). This could imply that the inverse is expected for domestic deals as there would be no barriers. These results are in line with Lang et al. (1991), who show that domestic acquisitions decrease acquiring stockholders' wealth. Some studies show the opposite effect. For instance, Datta and Puia (1995) show that cross-border acquisitions, on average, do not create value for acquiring firm shareholders and that cultural fit does play an important role. Further research found evidence for US firms who acquire domestic targets to have significantly

higher abnormal returns of approximately 1% relative to those who acquire cross-border targets (Moeller & Schlingemann, 2005). Denis et al. even found evidence that cross-border acquisitions decrease the value of acquiring firms. Therefore, to see if domestic deals have higher abnormal returns than cross-border deals, the second hypothesis will be tested:

H2: Mergers and acquisitions with both the acquirer and the target located in the US experience higher abnormal returns than mergers and acquisitions with only the acquirer located in the US.

2.2.3 Industrial relatedness

The third and last deal characteristic being investigated in this research is whether the acquiring firm and the target firm have any industrial relatedness. Industrial relatedness states that both firms are operating in the same industry. When both companies are operating in the same industry, synergies can occur through economies of scale and scope, which can increase the total value of the merged firm. Some studies suggest a positive relationship between industrial relatedness and stockholder returns (Walker, 2000) and that industrial-related M&A outperforms unrelated M&A (Anand & Sigh, 1997). On the other hand, unrelated acquisitions, where such efficiencies are not expected to be present, experience value creation nevertheless (Seth, 1990) and do not get outperformed by horizontal M&A (Matsusaka, 1993). One possible reason for this is the benefits of diversification stated earlier. This could imply that the benefits of industrial relatedness are not necessarily more prominent than in the case of no industrial relatedness. To see whether industrial relatedness in the US retail industry has a positive influence on the abnormal returns, the last hypothesis in this paper will be formulated as follows:

H3: Mergers and acquisitions between firms with industrial relatedness outperform mergers and acquisitions between companies with no industrial relatedness in the US retail industry.

3 Data and methodology

3.1 Data

This section covers the data selection process for all the information regarding the M&A deals covering this study. First, we will discuss how all the data was collected for the deals and the financial data for the acquiring firms. Then, we will discuss how the variables included in this research are created. Then the statistics of all the data will be addressed. Ending with the correlation between all the variables.

3.1.1 Data collection

The data of the M&A deals were collected from the Zephyr database. Zephyr also contained all the financial data for the acquiring firms. To be included in the sample, mergers and acquisitions must meet several criteria.

- The acquiring firm is operational in division G (Retail industry) of the Standard Industrial Code (SIC)[1].
- The acquirer must be a public company so the stock prices can be investigated.
- Only mergers and acquisitions are covered.
- The deal status must be fully completed or assumed to be fully completed.
- The announcement dates of all the M&A activities must be between 01/01/2011 and 31/01/2021.
- The acquirer's primary address must be in the United States.
- Only mergers and acquisitions with a deal value greater than US$ 1 million are considered.
- Only mergers and acquisitions with a final stake of 100% are considered.

With these criteria, an initial sample of 261 acquisitions was formed. Next, based on the following criteria, more events were filtered out of the sample:

[1] SIC codes describe the primary business activity of a company. It is divided into different divisions, with each containing several 4-digit codes. For this study, the SIC codes for division G are used, ranging from 5200 to 5999 shown in table G of the appendix.

- when an acquisition has multiple acquiring companies for one deal
- when an acquisition has an unknown remaining stake
- when an acquisition has an initial stake of 100% and increases its stake to 100%.
- when the acquiring firm has any missing financial data.

This resulted in a sample of 210 events with the complete financial data of the acquiring firms Next, the stock prices for the acquiring firms were collected from the DataStream database. Some of the stock prices could not be retrieved from the database. One of the possible reasons could be that the firm has gone bankrupt and is not available anymore in the database. As a result, another 18 events are left out of the sample, leaving a final sample of 192 M&A deals. Lastly, the Event Study Tool, provided by the Erasmus Data Service Centre, was used to retrieve the abnormal returns for the given sample and will be discussed further in section 3.2. All the gathered data was then combined into one dataset and imported to the program Stata to form an ordered dataset.

3.1.2 Variable creation

Before the data can be used, some adjustments have been made. This is done so that the information can be interpreted correctly. First the creation of the independent variables will be addressed, then the creation of the control variables and the reasons why they are included in the regression will be addressed.

3.1.2.1 independent variables

Several dummy variables were created for the variables used to answer the hypotheses stated in the previous section. To examine the effect of the different methods of payment on the abnormal returns, the control variable for the payment method is divided into two different dummies. The Cash dummy with value 1 if a merger or acquisition was entirely paid in cash; the shares dummy with value 1 if it was entirely paid with shares; and different payment types are taken as the constant. Due to the lack on data of M&A entirely paid in shares, as shown in table A in the appendix, the dummy for shares was left out of the research. Then the dummy

was created for the deals with both the acquirer as target operating in the US with value 1 for the domestic deals and cross-border deals as the constant. The last independent variable is divided into three categories to see if industrial-relatedness influences the abnormal returns. The first dummy is the retail dummy with a value of 1 if both the acquirer and the target company are active in the retail industry based on the first two digits of the 4-digit sic code (52-59). The second dummy mid_industry takes value 1 if both the acquirer and the target are both operating in the same industry based on all the 4 digits of the 4-digit sic codes, e.g., 5912 = 5912. This implies a higher degree of industrial relatedness. The third category is for the M&A with no industrial relatedness left as the constant.

3.1.2.2 Control variables

This section addresses the control variables which are added to the regression. First, the firm-specific control variables are addressed then the deal-specific control variables are addressed.

3.1.2.2.1 Market capitalization

The first firm characteristic that will be controlled for is market capitalization. It is a measure used to evaluate the stock market's perception of the total worth of a company. Since it is directly connected to the stock price, it could be an essential factor in determining the cumulative abnormal returns around the announcement of M&A. The market cap is formed as the total shares outstanding times the share price established by the stock market. The distribution of the data for the market capitalization is right skewed and therefore transformed into a logarithmic variable.

3.1.2.2.2 *Tobin's Q*

Tobin's Q is used to estimate a company's market value of assets relative to the replacement value of assets, in other words, the market to book ratio. Its measure may contain valuable information about the company's stock, e.g., whether stock prices are over- or undervalued. Previous literature shows that acquirers with a high Tobin's Q experience higher returns when pursuing M&A than acquirers with a lower Tobin's Q (Servaus, 1991, Lang et al., 1989). For

that reason, the influence of Tobin's Q on the abnormal returns should be controlled for. There are different formulas to determine Tobin's Q. In this paper, a company's total market capitalization is divided by its total assets. Just like the distribution for the market capitalization data, the distribution of the data of Tobin's Q is also right skewed and therefore transformed into a logarithmic variable.

3.1.2.2.3 *Debt-to-equity ratio*

The debt-to-equity ratio is one of the most commonly used leverage ratios to show a company's capital structure and solvency. A high leverage ratio implies that a company uses a lot of debt relative to equity to finance its investments. Research on the effect of leverage on stock returns showed that leverage is a firm characteristic that loads on a risk factor, which results in a decrease in stock returns (Adami, Gough, Muradoglu & Sivaprasad, 2010). The effect of the debt-to-equity ratio will therefore be controlled for is calculated by dividing the company's total debt by the book value of equity.

3.1.2.2.4 *Relative deal size*

The relative deal size can play an essential role in explaining the abnormal returns in M&A. By comparing the deal value relative to the company's market value of equity, the relative deal size can show the potential risk of failing M&A. Relatively large M&A deals could be hard to execute for example due to potential integration complexity and therefore create less value than relatively small deals (Alexandridis, Fuller, Terhaar & Travlos, 2013). Its influence will therefore be controlled for and it is calculated by dividing the deal value by the total market capitalization.

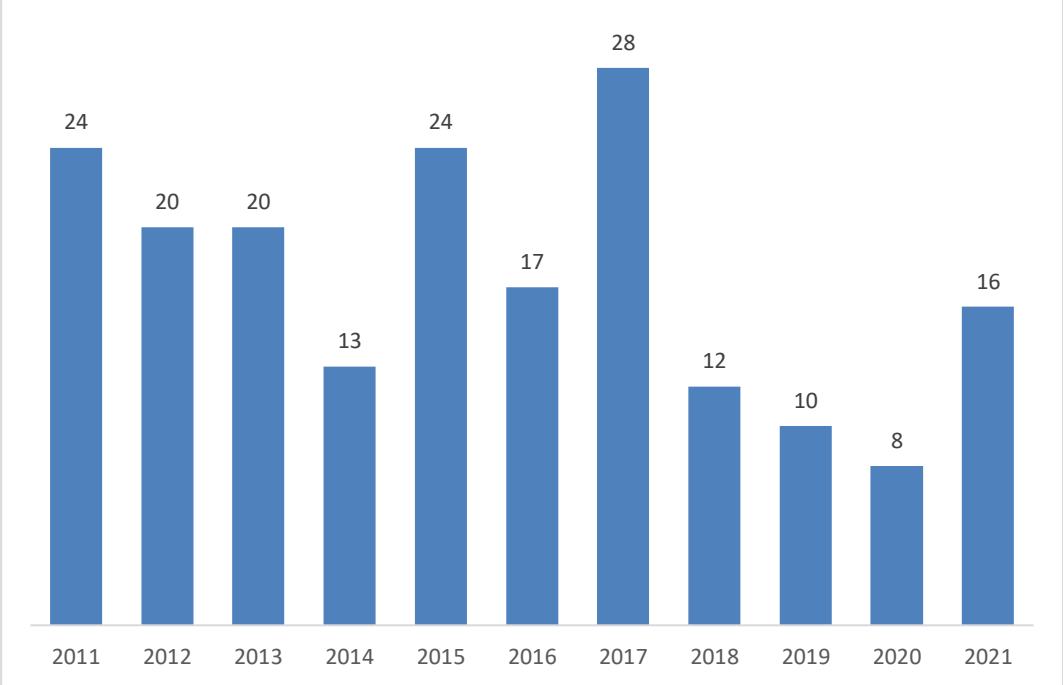
3.1.2.2.5 *Year fixed effects*

Lastly, factors could change over the years regarding all M&A deals. For instance, changing regulations or merger waves in different years could influence the results of abnormal returns. By controlling for these effects, the yearly effects are taken care of.

3.1.3 Summary statistics

As mentioned in the introduction, the amount of M&A experienced a decrease in number with the Covid-19 pandemic as one of the possible reasons. The figure below illustrates the number of M&A deals announced per year where the recent decrease can be seen. The increase in M&A in the last year can also be seen in the increasing number of M&A in 2021.

Figure 1: Number of mergers and acquisitions per year by acquiring firms in the United States retail industry.



Next, the descriptive statistics are shown in table 1 below. Looking at the different CARs, we find results for the retail industry comparable to those for acquiring firms in the automotive and media industry in the research of Gross and Lindstädt (2005). The only notable thing is the extremely negative and extremely positive values for the debt-to-equity ratio. E.g., the maximum value of 152,84 states that one of the companies from the dataset has 152,84 times more debt than equity. Looking at the mean and median, as both have a value of around 1,5, we can conclude that these minimum and maximum values are extreme cases. In the next section we adjust for these outliers by winsorizing the debt-to-equity ratio to see if these outliers negatively influence our results.

Table 1: Descriptive statistics of the acquiring firms.

Variable	Mean	Std. Dev.	Median	Min	Max
CAR3	0,022	0,10	0,008	-0,29	0,92
CAR5	0,025	0,14	0,008	-0,24	1,38
CAR11	0,030	0,11	0,015	-0,23	0,87
Market capitalization (ln)	15,33	2,65	15,11	4,66	21,25
Tobin's Q (ln)	0,29	0,96	0,23	-2,54	3,81
Debt to equity ratio	1,71	13,15	1,57	-73,80	152,84
Relative deal size	0,16	0,39	0,03	0,00	3,88
Dummy Cash	0,28	0,28	0	0	1
Dummy Domestic	0,80	0,80	1	0	1
Dummy Retail	0,44	0,44	0	0	1
Dummy Mid_Industry	0,36	0,36	0	0	1
Number of observations	192	192	192	192	192

3.1.4 Correlation matrices

In this paper, all the variables are analyzed for their linear correlation with each other by creating a Pearson correlation matrix. Tables 2, 3, and 4 represent the Pearson correlation matrices for the independent variables and the CARs for different event windows. Tables 5, 6, and 7 represent the Pearson correlation matrices for the control variables and the CARs for different event windows. The coefficients created show the relationship's strength between two variables and whether the variables are negatively or positively related to each other. First, the correlation between the different CARs and the independent variables will be discussed, and then the correlation with the control variables. Then a quick check for multicollinearity by means of the Variance Inflation Factor (VIF) is conducted. If the VIF value exceeds the value of 10, we can speak of multicollinearity in the data, but lower is preferable as the value of 10 is

a rule of thumb and should be used with caution (O'brien, 2007). The multicollinearity among independent variables will otherwise result in less reliable statistical inferences. Interesting to see is that the relationship changes for some variables when the event window length changes.

3.1.4.1 Correlation for Independent variables

The variable 'Cash' has a negative relationship with all three CARs, and the strongest relationship is seen with CAR3. The negative correlation is not in line with the expectation stated in the first hypothesis that deals fully paid in cash positively influence the abnormal returns. The variable 'Domestic' is positively correlated with all the CARs, and its correlation gets stronger with the length of the event window. This is in line with the expectation stated in the second hypothesis that domestic deals experience higher abnormal returns than cross-border deals, as the correlation should be positive. Also interesting to see is that the correlation gets stronger with the length of the event window, which means that the variable 'Domestic' is stronger related to bigger event windows having a positive influence. The next variables are 'Retail' and 'Mid_Industry', which strongly correlate. This is not shocking as Mid_Industry can only get value 1 if 'Retail' also has value 1. A check for multicollinearity by means of the Variance Inflation Factor (VIF) also shows a relatively high factor for both variables shown in table B in the appendix. However, it is still far below the value of 10, so we will keep both variables. In addition, we see that the sign of the correlation between the CARs and the variables 'Retail' and 'Mid_Industry' changes over the length of the event window. The hypothesis stating that M&A between firms with industrial relatedness in the US retail industry outperforms M&A between firms without industrial relatedness can have different outcomes for different event windows.

Table 2. Pearson correlation matrix between the cumulative abnormal returns for the three-day event window and the independent variables.

	CAR3	Cash	Domestic	Retail	Mid_Industry
CAR3	1,000				
Cash	-0,094	1,000			
Domestic	0,076	-0,007	1,000		
Retail	-0,014	-0,004	0,158	1,000	
Mid_Industry	0,046	-0,008	0,114	0,859	1,000

Note. The coefficients represent the linear correlation between two different sets of data.

Table 3. Pearson correlation matrix between the cumulative abnormal returns for the five-day event window and the independent variables.

	CAR5	Cash	Domestic	Retail	Mid_Industry
CAR5	1,000				
Cash	-0,030	1,000			
Domestic	0,080	-0,007	1,000		
Retail	0,032	-0,004	0,158	1,000	
Mid_Industry	0,051	-0,008	0,114	0,859	1,000

Note. The coefficients represent the linear correlation between two different sets of data.

Table 4. Pearson correlation matrix between the cumulative abnormal returns for the eleven-day event window and the independent variables.

	CAR11	Cash	Domestic	Retail	Mid_Industry
CAR11	1,000				
Cash	-0,050	1,000			
Domestic	0,108	-0,007	1,000		
Retail	-0,017	-0,004	0,158	1,000	
Mid_Industry	-0,003	-0,008	0,114	0,859	1,000

Note. The coefficients represent the linear correlation between two different sets of data.

3.1.4.2 Correlation for control variables

The first control variable is the logarithmic variable for the market capitalization 'ln_Mcap'. This variable has the highest correlation with CAR3 and CAR5 and one of the highest for CAR11. It is negatively correlated with all the CARs, implying that a high market valuation of an acquiring firm would negatively influence the firm's abnormal returns. The same can be said for the other logarithmic control variable 'ln_TobinsQ', where all the correlation coefficients with the different CARs show relatively high negative correlation but now get more negative with the length of the event window. Something interesting to notice is the relatively high correlation between both logarithmic variables. This can be explained by the fact that the market capitalization is part of the calculation for Tobin's Q. There is no reason to believe that there is multicollinearity present, as Table B in the appendix shows a normal VIF value. The last two variables, 'DE_Ratio' and 'Dealsize', show a relatively low positive correlation with the CARs.

Table 5. Pearson correlation matrix between the cumulative abnormal returns for the three-day event window and the control variables.

	CAR3	ln_Mcap	ln_TobinsQ	DE_Ratio	Dealsize
CAR3	1,000				
ln_Mcap	-0,159	1,000			
ln_TobinsQ	-0,069	0,425	1,000		
DE_Ratio	0,016	0,128	0,012	1,000	
Dealsize	0,011	-0,299	-0,190	-0,008	1,000

Note. The coefficients represent the linear correlation between two different sets of data.

Table 6. Pearson correlation matrix between the cumulative abnormal returns for the five-day event window and the control variables.

	CAR5	ln_Mcap	ln_TobinsQ	DE_Ratio	Dealsize
CAR5	1,000				
ln_Mcap	-0,118	1,000			
ln_TobinsQ	-0,092	0,425	1,000		
DE_Ratio	0,061	0,128	0,012	1,000	

Dealsize	0,023	-0,299	-0,190	-0,008	1,000

Note. The coefficients represent the linear correlation between two different sets of data.

Table 7. Pearson correlation matrix between the cumulative abnormal returns for the eleven-day event window and the control variables.

	CAR11	ln_Mcap	ln_TobinsQ	DE_Ratio	Dealsize
CAR11	1,000				
ln_Mcap	-0,108	1,000			
ln_TobinsQ	-0,117	0,425	1,000		
DE_Ratio	0,052	0,128	0,012	1,000	
Dealsize	0,025	-0,299	-0,190	-0,008	1,000

Note. The coefficients represent the linear correlation between two different sets of data.

3.2 Methodology

In this section, the way how this research is conducted will be addressed. First, the methodology for event studies is addressed, which is used to determine the cumulative abnormal return (CAR) for the days around the M&A announcements to answer the research question. By assuming that the efficient-market hypothesis holds that all available information is incorporated in the price of stocks, we can evaluate the price changes directly resulting from the announcement of mergers and acquisitions. After calculating the CARs, the regression analyses are conducted to answer hypotheses 1-3.

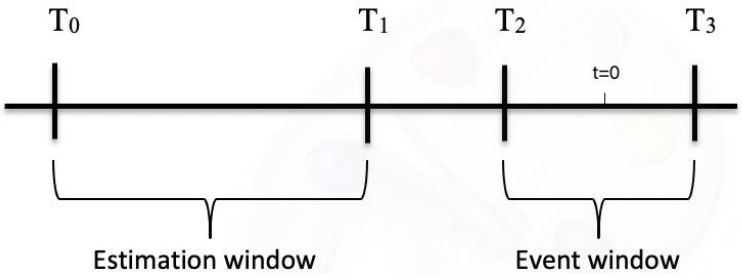
3.2.1 Event study

The study of Fama, Fischer, Jensen, and Roll (1969) about the adjustments of prices to new information is one of the pioneering research types showing that stock prices indeed react to the publicly available information. They introduced the event study tool methodology, one of the most used methodologies for research about how stock prices react to a specific type of information. The same method will be used in this research. The following paragraphs will further explain how the event study methodology was used.

3.2.1.1 Estimation window

First, the estimation window illustrated in figure 2 as [T0, T1] is determined. The estimation window will provide the information to specify the normal return. Studies investigating the sensitivity of results for different lengths of estimation windows (the predicted return on the event date) suggest that results are not sensitive to varying estimation window lengths as long as the window lengths exceed 100 days (Armitage, 1995; Park, 2004). Therefore, this paper will use an estimation window of 100 days [-150, -50].

Figure 2: Timeline of the Event study



3.2.1.1 Event window

Then the event window is determined, illustrated in figure 2 as [T2, T3]. These are the days around the event. Within the event window, scholars investigating M&A transactions found the information content of the first official announcement to be highest, therefore representing the correct event date in the context of M&A studies (Dodd, 1980). The Event windows typically range in length between 1 and 11 days and center symmetrically around the event day (Holler, 2014). The most common choice of event window length in a recent paper by Oler, Harrison, and Allen (2007) is smaller or equal to five days. You could argue that a shorter event window only holds the relevant information for the announcement and therefore is more correct as irrelevant abnormal returns are less likely to influence it. For this reason, a three-day [-1, 1], a five-day [-2, 2], and an eleven-day [-5, 5] event window will be used for this research. Schwert (1996) showed the possible presence of a price runup due to insider trading beginning 42 days

before the event. This paper will use a 50-day gap between the estimation window and the event date to ensure price runups do not affect the research.

3.2.1.2 Market model and abnormal returns

To determine the abnormal returns, several models can be used. This paper uses the market model as by removing the portion of the return that is related to variation in the market's return, the variance of the abnormal return is reduced, which can lead to better detection of the actual effects (Mackinlay, 1997). First, the expected returns are predicted with a regression analysis that regresses market returns over the previously described estimation window. The market model is given with the following formula:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

Where: $E(R_{it})$ = the expected return of stock i on time t

α_i = the risk adjusted return for stock i

β_i = the slope for stock i

R_{mt} = the return on the index on time t

ε_{it} = the zero mean disturbance term

Since the acquiring firms are all in the US, the Standard & Poor 500 (S&P500) is used as the market index in this event study. With the predicted return on the stock i on a specific time t, we calculate the abnormal returns using the following formula:

$$AR_{it} = R_{it} - \hat{\alpha}_i - \beta_i R_{mt}$$

Where: AR_{it} = the abnormal return for stock i on time t

R_{it} = the return of stock i on time t

$\hat{\alpha}_i$ = the estimated slope for stock i

β_i = the estimated beta coefficient for stock i

R_{mt} = the return on the index on time t

Next, the abnormal returns are then aggregated to the three different lengths of event windows. The different CARs then show the total effect estimated for the different event windows on a company's performance. If the CAR is positive, it indicates that the shareholders gained wealth as a result of the announcement. If negative, then the announcement decreased the wealth of the shareholders. The CAR is calculated using the following formula:

$$CAR_{i(T_2T_3)} = \sum_{t=T_2}^{T_3} \widehat{AR}_{it}$$

Where: $CAR_i(T_2T_3)$ = the sample cumulative abnormal return from T_2 to T_3

To determine the cumulative average abnormal return (CAAR) of a certain stock for a certain window, simply the CAR is divided by the length of the event window formulated as follows:

$$CAAR_{(T_2T_3)} = \frac{1}{N} \sum_{t=T_2}^{T_3} \widehat{CAR}_{i(T_2T_3)}$$

Where: $CAAR_{(T_2T_3)}$ = the sample cumulative average abnormal return from T_1 to T_2

In addition, the average abnormal returns (AAR) are calculated for the different event window days to show a more specific overview of the abnormal returns for a certain day around the announcement day.

$$AAR_t = \frac{1}{N} \sum_{i=1}^{N} \widehat{AR}_{it}$$

Where: AAR_t = average abnormal returns for event window day t

3.2.3 regression analyses

After testing for the CARs, if they differ significantly from zero, the three hypotheses stated in the previous chapter will be tested. Four main multivariate regressions will be performed in this paper, with the cumulative abnormal returns for the three-day event window as the dependent variable. In addition, two regressions are added to test the robustness of the results. The first three regressions are conducted to determine the effect of the three different independent variables on the cumulative abnormal returns, namely 'Cash', 'US', and the industrial relatedness divided into 'Retail' and 'Mid_Industry'. Then the fourth regression is formed by including all the independent variables.

The first individual effect that is determined is the effect of the deals fully paid in cash on the CARs. We include the control variables 'Market capitalization', 'Tobin's Q', Debt-to-equity ratio', 'Dealsize', and 'Year' as the year fixed effects to form the first regression:

$$(1)\ CAR_i = \alpha + \beta_1 Cash_i + \beta_2 \ln\_\text{Mcap}_i + \beta_3 \ln\_TobinsQ_i + \beta_4 DE\_Ratio_i + \beta_5 Dealsize_i + i.Year + \varepsilon_i$$

The second regression is to determine the effect of the independent variable ‘US’ on the CARs. We also include the control variables 'Market capitalization', 'Tobin's Q', Debt-to-equity ratio', 'Dealsize' and 'Year' as the year fixed effects, but we now leave out ‘Cash’ to the regression and form the next regression:

$$(2)\ CAR_i = \alpha + \beta_1 Domestic_i + \beta_2 \ln\_\text{Mcap}_i + \beta_3 \ln\_TobinsQ_i + \beta_4 DE\_Ratio_i + \beta_5 Dealsize_i + i.Year + \varepsilon_i$$

The third regression is to determine the effect of the industrial relatedness on the CARs divided into two degrees of relatedness, namely 'Retail' and 'Mid_Industry'. Again, adding the control

variables 'Market capitalization', 'Tobin's Q', Debt-to-equity ratio', 'Dealsize' and 'Year' as the year fixed effects leaves us with the third regression.

$$(3)\ CAR_i = \alpha + \beta_1 Retail_i + \beta_2 Mid\_Industry_i + \beta_3 \ln\_Mcap_i + \beta_4 \ln\_TobinsQ_i + \beta_5 DE\_Ratio_i + \beta_6 Dealsize_i + i.Year + \varepsilon_i$$

We will then determine the effect of the three different independent variables on the CARs, by conducting the regression analysis, including all the independent variables. Adding the control variables 'Market capitalization', 'Tobin's Q', Debt-to-equity ratio', 'Dealsize' and 'Year' as the year fixed effects leaves us with the last main regression:

$$(4)\ CAR_i = \alpha + \beta_1 Cash_i + \beta_2 Domestic_i + \beta_3 Retail_i + \beta_4 Mid\_Industry_i + \beta_5 \ln\_Mcap_i + \beta_6 \ln\_TobinsQ_i + \beta_7 DE\_Ratio_i + \beta_8 Dealsize_i + i.Year + \varepsilon_i$$

Then the regression that is performed in this research is for the robustness check of the variable Tobin's Q. As explained in section 3.1.2.2.2, this paper prefers one calculation for Tobin's Q over the others. There are different formulas to determine Tobin's Q. A second variable for Tobin's Q is created to check whether the results are robust to the different formulas of Tobin's Q. The second variable is created by adding the total assets to the difference between the market- and the book value of equity and then dividing it by its total assets. Leaving the rest of the variables the same, the following regression is formed:

$$(5)\ CAR_i = \alpha + \beta_1 Cash_i + \beta_2 Domestic_i + \beta_3 Retail_i + \beta_4 Mid\_Industry_i + \beta_5 \ln\_Mcap_i + \beta_6 \ln\_TobinsQ2_i + \beta_7 DE\_Ratio_i + \beta_8 Dealsize_i + i.Year + \varepsilon_i$$

The last regression is to check whether the outliers for the debt-to-equity ratio shown in table 1 influence our regression results. By winsorizing the data of the debt-to-equity ratio on the 1, 5, and 10 percent levels, the 5 % winsorization level gave the best results for taking care of the outliers without adjusting the data too much. Leaving all the other variables the same gives the last regression:

$$(6)\ CAR_i = \alpha + \beta_1 Cash_i + \beta_2 Domestic_i + \beta_3 Retail_i + \beta_4 Mid\_Industry_i + \beta_5 \ln\_\mathrm{Mcap}_i + \beta_6 \ln\_TobinsQ2_i + \beta_7 winsor\_DE\_Ratio\_5_i + \beta_8 Dealsize_i + i.Year + \varepsilon_i$$

To check for the presence of heteroskedasticity, we conduct a white test for heteroskedasticity. If present, the heteroskedasticity will be dealt with by clustering the data in an appropriate way. There is no need to check for autocorrelation as the data is not time-series.

4 Results

In this section, the results of this paper are presented. First, the results of the event study will be evaluated. Then the regression results will be presented for the main regression. Lastly, the results of the robustness checks will be presented.

4.1 Results from the event study

To answer the main research question, we first look at the cumulative abnormal returns for the three different event windows in table 8 below. The mean CAR of 0,022 for the smallest event window means that acquiring firms experience 2,2% abnormal returns on average. For the five-day event window, this is 2,5%, and for the eleven-day event window, this is 3,0%. A t-test has been performed for the different CARs to see whether they significantly differ from zero. All the coefficients are highly significant as the lowest p-value is for the five-day event window, which is almost at the 1% significance level. So, looking at the main research question with the results of the CARs we can state that there are positive abnormal returns for the acquiring firms around the announcement day of M&A in the US retail industry, but they are close to zero.

Table 8: Cumulative abnormal returns of the acquiring firms

Event window	Mean CAR	Mean CAAR	Std. dev.	t-value	p-value	significance
[-1, 1]	0,022	0,007	0,101	2,981	0,003	***
[-2, 2]	0,025	0,005	0,136	2,522	0.013	**
[-5, 5]	0,030	0,003	0,112	3,661	0,000	***

*Note. Significance is indicated with * p < 0.1, ** p <0.05, *** p < 0.01*

To further look at the abnormal returns per day in the event windows, table 9 shows the average abnormal returns (AAR) for every event window day. A t-test has been performed for the different AARs to see whether they significantly differ from zero. Only the fifth day before the

announcement day and the day of the announcement itself show significant results. Therefore, we cannot say much about the presence of the average abnormal returns for all the other days as we cannot reject the null hypotheses that they do not significantly differ from zero. We do have evidence that the abnormal returns are the highest on average on the day of the announcement (1,9 %) within the reach of this research. This complements the research of Hogan, Olson, and Capella (2015), who also found positive abnormal returns for the acquiring firms on the announcement day of M&A. The fact that t-5 shows positive abnormal returns of 0,4% could indicate the presence of insider trading mentioned before.

Table 9: The average abnormal returns for all the event window days

Event window day	AAR	Std. dev.	t-value	p-value	significance
t = -5	0,004	0,023	2,105	0,018	**
t = -4	0,000	0,021	-0,230	0,409	
t = -3	0,000	0,018	-0,165	0,434	
t = -2	0,000	0,042	0,124	0,451	
t = -1	0,002	0,025	1,245	0,107	
t = 0	0,019	0,102	2,640	0,005	***
t = 1	0,000	0,033	0,094	0,463	
t = 2	0,003	0,058	0,622	0,268	
t = 3	-0,001	0,040	-0,263	0,397	
t = 4	0,001	0,026	0,277	0,391	
t = 5	0,002	0,025	1,240	0,108	

*Note. Significance is indicated with * p < 0.1, ** p <0.05, *** p < 0.01*

So, looking at the main research question with the results of the CARs, we can state that there are positive abnormal returns for the acquiring firms around the announcement day of M&A in the US retail industry, but they are close to zero. When looking at the average abnormal returns per event window day, we cannot conclude much, only that on average, there are positive abnormal returns present on five days before the announcement day and on the announcement day itself.

4.2 Regression results

With the knowledge that the acquiring firms experience positive abnormal returns, we can now look for the possible factors that explain these abnormal returns by conducting several multivariate ordinary least squares (OLS) regressions using the statistical software Stata. Regressions allow us to discover distinct correlations between variables and provide insight into how these affect one another by examining what causes the variation in observations. After conducting the white test, we found evidence for heteroskedasticity and clustered the standard errors by year to correct for this. As a result, all variables are regressed with fixed year effects.

To correctly interpret the results of the regression, we first conducted an F-test for joint significance. The P-value determined by the F-statistic shows us the significance level to reject the null hypothesis that all the included variables do not significantly differ from zero. This means they do not have any predictive power, and the added coefficients do not improve our model.

Table 10 shows us the results of the four main regression analyses with the CARs of the three-day event window as the dependent variable. Looking at the P-value of the F-statistic of all four regressions, we see that only the third regression with the variables for industrial relatedness is significant at the 10 % level but not at the 5 % level. This model is the only weak significant model, whereas there is not enough evidence for the other models that the independent variables have a statistically significant effect on the CARs.

Then looking at the third regression with the two variables for retail, we only find significant results at the 5 % level for the market capitalization. The negative coefficient implies that a higher market capitalization of the acquiring firm results in lower cumulative abnormal returns for the acquiring firms. As for the independent variables, which look at the influence of the industrial relatedness, and for the other three control variables, we cannot say much. No other coefficient in this model is significant, stating that we cannot reject the null hypotheses that they significantly differ from zero.

Also, looking at the adjusted R-squared for the four different regressions, we see that the third regression has the most explanatory power adjusted for the number of included independent variables.

Table 10: Main OLS regression results for the relationship between the deal/firm characteristics and CARs for the three-day event window

	Independent variable included			
Variable	**Cash**	**Domestic**	**Industry**	**All**
Cash	-0,014			-0,015
	(0,010)			(0,010)
Domestic		0,017		0,021*
		(0,010)		(0,010)
Retail			-0,049	-0,053*
			(0,028)	(0,028)
Mid_Industry			0,045	0,048*
			(0,025)	(0,025)
Market capitalization (ln)	-0,005**	-0,006*	-0,005**	-0,005*
	(0,002)	(0,002)	(0,002)	(0,002)
Tobin's Q (ln)	0,000	-0,002	0,000	0,002
	(0,006)	(0,006)	(0,005)	(0,006)

Debt-to-equity ratio	0,000	0,000	0,000	0,000
	(0,000)	(0,000)	(0,000)	(0,000)
Relative deal size	-0,008	-0,008	-0,008	-0,013
	(0,009)	(0,008)	(0,008)	(0,009)
_cons	0,118***	0,108***	0,068**	0,106***
Year fixed effects	Yes	Yes	Yes	Yes
Observations	192	192	192	192
R-squared	0,057	0,057	0,068	0,078
Adj_R-squared	0,032	0,032	0,038	0,037
Prob > F	0,141	0,149	0,078	0,113

*Note: Clustered standard errors are in parentheses; * p < 0.1, ** p <0.05, *** p < 0.01;*

4.3 Robustness checks

For the completeness of this research, we will conduct several robustness checks. First, we try to see if the results are robust to the different lengths of the event window. Then we try to see if the results are robust to the use of different formulas of Tobin's Q. Lastly, we check if the results are robust to the presence of outliers in the data by winsorizing the data of the debt-to-equity ratio.

4.3.1 Different event windows

4.3.2.1 Five-day event windows

The first robustness check is to see if the results are robust to the use of the five-day event window CARs as the dependent variable, shown in table C of the appendix, instead of the three-day event window CARs. By first looking at the P-value determined by the F-statistic of all four regressions, we can reject the null hypothesis that all the included variables do not significantly differ from zero at the 1 % significance level. Unfortunately, not one of the independent variables in one of the four regressions is significant to draw any conclusions for

the three hypotheses stated in section 2.2. The first big difference we can see is the positive effect of the debt-to-equity ratio at the 5 % significance level for all four models. This implies that a higher debt to equity ratio results in higher cumulative abnormal returns for the acquiring firms. However, only uncommon scenarios of extremely high or extremely low debt-to-equity ratios would affect the CARs. The second big difference is the loss in significance for the influence of the market cap, although the coefficient keeps almost identical results. As a result, we can state that the results of the market cap are not robust to using a different event window for the CARs as the dependent variable. Because of no other significant coefficients and the extremely low explanatory power of the models because of the low adjusted R-squared, no further conclusions can be drawn.

4.3.2.2 Eleven-day event windows

The next Robustness check is to see whether the results are robust to using the eleven-day event window CARs as the dependent variable, shown in table D of the appendix. Again, looking at the P-value determined by the F-statistic of all four regressions, we can reject the null hypothesis that all the included variables do not significantly differ from zero at the 5 % significance level. We can see that the significance of the results of the market cap is again not robust to the use of the different lengths of the event window of the CARs. The only notable result is that the results of the third regression show a negative coefficient of Tobin's Q at the 10 % level. This implies that a higher Tobin's Q of the acquiring firm has a negative effect on the CARs. These results show the opposite effect of the results in the existing literature, which shows a positive effect of Tobin's Q on the CARs (Servaus, 1991, Lang et al., 1989).

4.3.2 Different Tobin's Q

We then try to see if the results are robust to using the different formulas for Tobin's Q. Table E in the appendix shows the regression results with the different Tobin's Q variables conducted in this research. Looking at the results, we first look at the P-value of the F-statistic and see that only the first three regressions are significant at the 10 % level. In comparison to the main

regressions, we do see changes in the P-value of the F-statistics, whereas the coefficients of the first two regressions are now both jointly significant. There are no other notable differences in the results; even the adjusted R-squared is similar to the main regressions for all the regressions. Therefore, we can conclude that our results are robust to using a different formula of Tobin's Q.

4.3.3 Winsorized debt-to-equity ratio

To see whether the results are robust to the presence of outliers in the data, we added another robustness check by winsorizing the data of the debt-to-equity ratio at the 5 % level. By doing so, we adjusted the data for the disruptive outliers that could influence the regressed coefficients. Looking at the results in table F in the appendix, we see that the third and fourth regression can now reject the null hypothesis that all the included variables do not significantly differ from zero at the 1 % significance level. The coefficients show some interesting results.

Looking at the regression with all the independent variables included, we can now see that whether the deal is domestic is now significant at the 10% level, showing higher cumulative abnormal returns of 2,1 percentage points. This is in line with Moeller and Schlingemann (2005), who found that firms who acquire domestic targets experience significantly higher abnormal returns of approximately 1% relative to those who acquire cross-border targets. Our fourth main regression showed the same results, but we could not conclude anything due to the lack of significance.

Looking at the two variables for retail, we only find significant results at the 10% level for the first degree in industrial relatedness. We find that acquiring firms experience 5,3 percentage points lower cumulative abnormal returns if the deal happens between two firms operating in the retail industry based on the first two digits of the 4-digit sic code. A possible explanation for this could be, for instance, that Gasoline Service Stations (SIC 5541) and boat dealers (SIC 5551) do not necessarily occur many synergies through M&A even though they both operate in the Automotive Dealers and Gasoline Service Stations sector (55). The

production processes might differ too much, which makes it hard to achieve economies of scale. This could lead to a negative reaction on the stock market, explaining the negative effect on the CARs. Interesting to see is that if we look at the results of all the regressions for the influence of the second degree of relatedness if the last 2 digits of the 4-digit sic code also match, they show positive effects. This could imply that these economies of scale do exist with greater certainty when the degree of industrial relatedness is higher. These negative effects are then largely offset by positive effects. However, because of the lack of significance, we cannot conclude anything about the higher degree of industrial relatedness.

The other variables are not significant, and as a result, we cannot draw any conclusions. We can therefore conclude that the results are not robust to the disruptive outliers in the data of the debt-to-equity ratio, and winsorizing the data results in a model that fits our data better.

5 Conclusion and discussion

5.1 Conclusion

This paper examined a total of 192 deals from 2011 to 2021 to find evidence for the existence of abnormal returns for acquiring firms around the announcement of mergers and acquisitions for acquiring firms in the United States retail industry. By means of an event study, the cumulative abnormal returns were determined around the event data for three different event window lengths. Furthermore, deal- and firm characteristics were then tested for their influence in explaining these possible abnormal returns by means of several multivariate regressions.

The results of the event study showed significant positive cumulative abnormal returns on average for the three-day, five-day, and eleven-day event window of 2,2%, 2,5%, and 3,0%, respectively. In addition, the average abnormal returns were determined for the days ranging from five days before the announcement to five days after the announcement day. Looking at the average abnormal returns per event window day, only the fifth day before the announcement day and the announcement day itself showed significant positive average abnormal returns of 0,4% and 1,9%, respectively.

The existing literature showed indications of possible positive abnormal returns for acquiring firms in the United States retail industry (Zhu & Hilsenrath, 2015; Hogan, Olson, & Capella, 2015). Our results confirm this finding for acquiring firms in the United States retail industry. We can answer the main research question, stating: *To what extent do abnormal returns for acquiring firms exist around the announcement day of mergers and acquisitions in the United States retail industry*, that there are indeed positive abnormal returns for the acquiring firms around the announcement day of M&A in the United States retail industry.

This paper then looked at three different deal characteristics for their influence on the cumulative abnormal returns for three different event windows. The first hypothesis is about the influence of a deal fully paid in cash. Only we could not find sufficient evidence for the positive effect of cash on the different CARs and reject the first hypothesis. The fact that the

sign of the coefficient even changes between the different models makes us unable to indicate a possible positive or negative influence.

The second hypothesis is formulated to examine the effects of domestic and cross-border deals. Because of the lack of significance for our main regressions, we could not make any conclusion. The results of the model with the winsorized data of the debt-to-equity ratio showed that deals earn 2,1% higher than cross-border deals at the 10% significance level for the three-day event window. This is in line with Moeller and Schlingemann (2005), who found that firms who acquire domestic targets experience significantly higher abnormal returns of approximately 1% relative to those who acquire cross-border targets. Therefore, we found evidence to support the claim that domestic deals experience higher abnormal returns than cross-border deals in the US retail industry. However, the results are not robust to outliers in the data of the debt-to-equity ratio and to changes in the event window. As a result, we can partly accept the hypothesis but have to note the dependence on the winsorized data and event window used.

For the third hypothesis, this paper researched the effect of two degrees of industrial relatedness in the US Retail industry on the abnormal returns of acquiring firms. Again, because of the lack of significance for our main regressions, we initially could not make any conclusion. When looking at the results of the models with the winsorized data of the debt-to-equity ratio, we find significant results at the 10% level. The first degree of industrial relatedness showed 5,3% lower CARs, but due to the lack of significance no conclusion could be drawn about the higher degree of industrial relatedness. Because of the negative effect of the first degree of industrial relatedness, we will reject the hypothesis that M&A between firms with industrial relatedness in the US retail industry outperforms M&A between firms with no industrial relatedness in the US retail industry.

5.2 Discussion and further research

This paper did encounter some shortcomings. Initially, this paper would extend its research to the CARs of target firms and the acquiring firms. As most of the target firms were non-listed companies, the stock prices of the target firms could not be used for research on abnormal returns. In addition, this paper does not consider the difference between mergers and acquisitions. One of the reasons for this was that almost all the deals in this research were acquisitions, and there was not enough data for mergers to separate the data into two equal sets of data. This was also the case for the dummy variable Shares, as there were only five deals fully paid in shares in the data set. So, for further research, a more comprehensive dataset could be assembled to look at the effect of other deal- and firm characteristics on cumulative abnormal returns. In addition, we saw that the results of the main regression were not robust to the use of different lengths of the event windows and only found evidence for abnormal returns on t=0 and t=-5. As this research looked at the cumulative abnormal returns around the announcement date of M&A in the United States retail industry, further research could just look at the abnormal returns of only the announcement day of M&A or extend its research to a before or after announcement day event window.

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7 Appendix

Table A. Dummy variable distribution

Variable	**N=**	**Percentage**
Cash	53	27,6 %
Shares	5	2,6 %
Mixed	134	69,8 %
Domestic	153	79,69 %
Cross-border	39	20,31 %
Retail	84	43,75 %
Mid_Industry	70	36,46 %
No industrial relatedness	108	56,25 %
Total	**192**	**100 %**

Table B. Variance Inflation Factor test for all variables

Variable	VIF	1/VIF
Year		
2012	**1.72**	**0.581455**
2013	**1.86**	**0.537275**
2014	**1.47**	**0.680262**
2015	**1.89**	**0.528970**
2016	**1.65**	**0.607405**
2017	**2.10**	**0.476898**
2018	**1.53**	**0.654548**
2019	**1.39**	**0.719029**
2020	**1.33**	**0.754185**
2021	**1.59**	**0.629487**
Cash	**1.12**	**0.890301**
Domestic	**1.19**	**0.841099**
Retail	**4.14**	**0.241808**
Mid_Industry	**4.10**	**0.243663**
ln_Mcap	**1.61**	**0.621466**
ln_TobinsQ	**1.51**	**0.662643**
DE_Ratio	**1.08**	**0.926095**
Dealsize	**1.19**	**0.842576**
Mean VIF	**1.80**	

Note. Value between 1-2 means no multicollinearity with certainty.

Table C: OLS regression results for the relationship between the deal/firm characteristics and CARs for the five-day event window

	Independent variable included			
Variable	**Cash**	**Domestic**	**Industry**	**All**
Cash	0,001			0,001
	(0,013)			(0,014)
Domestic		0,017		0,019
		(0,016)		(0,016)
Retail			-0,020	-0,023
			(0,025)	(0,025)
Mid_Industry			0,020	0,022
			(0,030)	(0,030)
Market capitalization (ln)	-0,005	-0,005	-0,004	-0,005*
	(0,003)	(0,003)	(0,003)	(0,003)
Tobin's Q (ln)	-0,005	-0,003	-0,006	-0,003
	(0,007)	(0,008)	(0,006)	(0,008)
Debt-to-equity ratio	0,001**	0,001**	0,001**	0,001**
	(0,000)	(0,000)	(0,000)	(0,000)
Relative deal size	0,000	-0,002	-0,001	-0,003
	(0,010)	(0,009)	(0,009)	(0,009)
_cons	0,101**	0,091*	0,100***	0,090**
Year fixed effects	Yes	Yes	Yes	Yes
Observations	192	192	192	192
R-squared	0,044	0,046	0,045	0,048
Adj_R-squared	0,018	0,020	0,014	0,006
Prob > F	0,006	0,000	0,004	0,001

*Note: Clustered standard errors are in parentheses; * p < 0.1, ** p <0.05, *** p < 0.01;*

Table D: OLS regression results for the relationship between the deal/firm characteristics and CARs for the eleven-day event window

	Independent variable included			
Variable	**Cash**	**Domestic**	**Industry**	**All**
Cash	-0,005			-0,006
	(0,013)			(0,014)
Domestic		0,019		0,022
		(0,016)		(0,016)
Retail			-0,023	-0,027
			(0,027)	(0,027)
Mid_Industry			0,009	0,012
			(0,031)	(0,030)
Market capitalization (ln)	-0,001	-0,002	-0,001	-0,002
	(0,003)	(0,002)	(0,001)	(0,002)
Tobin's Q (ln)	-0,011	-0,009	-0,012*	-0,010
	(0,007)	(0,006)	(0,007)	(0,0063)
Debt-to-equity ratio	0,000**	0,000**	0,000*	0,000
	(0,000)	(0,000)	(0,000)	(0,000)
Relative deal size	0,002	0,001	0,001	-0,003
	(0,010)	(0,010)	(0,010)	(0,011)
_cons	0,071**	0,060*	0,080***	0,068**
Year fixed effects	Yes	Yes	Yes	Yes
Observations	192	192	192	192
R-squared	0,061	0,064	0,065	0,070
Adj_R-squared	0,035	0,039	0,034	0,030
Prob > F	0,050	0,027	0,036	0,018

*Note: Clustered standard errors are in parentheses; * p < 0.1, ** p <0.05, *** p < 0.01;*

Table E: OLS regression with the different Tobin's Q formula

	Independent variable included			
Variable	**Cash**	**Domestic**	**Industry**	**All**
Cash	-0,014			-0,015
	(0,010)			(0,011)
Domestic		0,015		0,020**
		(0,009)		(0,009)
Retail			-0,049	-0,053*
			(0,029)	(0,028)
Mid_Industry			0,045	0,047*
			(0,025)	(0,025)
Market capitalization (ln)	-0,005**	-0,005**	-0,004**	-0,004**
	(0,002)	(0,002)	(0,002)	(0,002)
Tobin's Q (ln)	-0,003	0,000	-0,003	-0,000
	(0,006)	(0,006)	(0,006)	(0,006)
Debt-to-equity ratio	0,000	0,000	0,000	0,000
	(0,000)	(0,000)	(0,000)	(0,000)
Relative deal size	-0,009	-0,008	-0,008	-0,013
	(0,009)	(0,008)	(0,009)	(0,001)
_cons	0,117***	0,104***	0,118***	0,103***
Year fixed effects	Yes	Yes	Yes	Yes
Observations	192	192	192	192
R-squared	0,057	0,057	0,068	0,077
Adj_R-squared	0,032	0,032	0,038	0,037
Prob > F	0,088	0,086	0,061	0,128

*Note: Clustered standard errors are in parentheses; * p < 0.1, ** p <0.05, *** p < 0.01;*

Table F: OLS regression with winsorized debt-to-equity ratio

	Independent variable included			
Variable	**Cash**	**Domestic**	**Industry**	**All**
Cash	-0,014			-0,015
	(0,010)			(0,011)
Domestic		0,017		0,021*
		(0,010)		(0,010)
Retail			-0,049	-0,053*
			(0,028)	(0,028)
Mid_Industry			0,044	0,047
			(0,026)	(0,026)
Market capitalization (ln)	-0,005**	-0,006**	-0,005**	-0,005**
	(0,002)	(0,003)	(0,002)	(0,002)
Tobin's Q (ln)	0,001	0,003	0,001	0,003
	(0,006)	(0,007)	(0,006)	(0,006)
Debt-to-equity ratio	0,002	0,002	0,002	0,002
	(0,004)	(0,004)	(0,004)	(0,004)
Relative deal size	-0,007	-0,007	-0,007	-0,012
	(0,009)	(0,008)	(0,008)	(0,009)
_cons	0,119***	0,110***	0,120***	0,107***
Year fixed effects	Yes	Yes	Yes	Yes
Observations	192	192	192	192
R-squared	0,057	0,057	0,068	0,077
Adj_R-squared	0,031	0,032	0,037	0,037
Prob > F	0,115	0,164	0,003	0,001

*Note: Clustered standard errors are in parentheses; * p < 0.1, ** p <0.05, *** p < 0.01;*

Table G. All Standard Industrial Codes included in this research

SIC	Industry Title
52	Building Materials, Hrdwr, Garden Supply & Mobile Home Dealers
5211	Lumber and Other Building Materials
5231	Paint, Glass, and Wallpaper Stores
5251	Hardware Stores
5261	Retail Nurseries and Garden Stores
5271	Mobile Home Dealers
53	General Merchandise Stores
5311	Department Stores
5331	Variety Stores
5399	Miscellaneous General Merchandise
54	Food Stores
5411	Grocery Stores
5421	Meat and Fish Markets
5431	Fruit and Vegetable Markets
5441	Candy, Nut, and Confectionery Stores
5451	Dairy Products Stores
5461	Retail Bakeries
5499	Miscellaneous Food Stores
55	Automotive Dealers and Gasoline Service Stations
5511	New and Used Car Dealers
5521	Used Car Dealers
5531	Auto and Home Supply Stores
5541	Gasoline Service Stations
5551	Boat Dealers
5561	Recreational Vehicle Dealers
5571	Motorcycle Dealers
5599	Automotive Dealers, Nec
56	Apparel and Accessory Stores
5611	Men's and Boys' Clothing Stores
5621	Women's Clothing Stores
5632	Women's Accessory and Specialty Stores
5641	Children's and Infants' Wear Stores
5651	Family Clothing Stores
5661	Shoe Stores
5699	Miscellaneous Apparel and Accessories
57	Home Furniture, Furnishings and Equipment Stores
5712	Furniture Stores
5713	Floor Covering Stores
5714	Drapery and Upholstery Stores
5719	Miscellaneous Homefurnishings
5722	Household Appliance Stores

5731	Radio, Television, and Electronic Stores
5734	Computer and Software Stores
5735	Record and Prerecorded Tape Stores
5736	Musical Instrument Stores
58	Eating and Drinking Places
5812	Eating Places
5813	Drinking Places
59	Miscellaneous Retail
5912	Drug Stores and Proprietary Stores
5921	Liquor Stores
5932	Used Merchandise Stores
5941	Sporting Goods Stores and Bicycle Shops
5942	Book Stores
5943	Stationery Stores
5944	Jewelry Stores
5945	Hobby, Toy, and Game Shops
5946	Camera and Photographic Supply Stores
5947	Gift, Novelty, and Souvenir Shops
5948	Luggage and Leather Goods Stores
5949	Sewing, Needlework, and Piece Goods Stores
5961	Catalog and Mail-Order Houses
5962	Automatic Merchandising Machine Operators
5963	Direct Selling Establishments
5983	Fuel Oil Dealers
5984	Liquefied Petroleum Gas (Bottled Gas) Dealers
5989	Fuel Dealers, Not Elsewhere Classified
5992	Florists
5993	Tobacco Stores and Stands
5994	News Dealers and Newsstands
5995	Optical Goods Stores
5999	Miscellaneous Retail Stores, Not Elsewhere Classified