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BACHELOR THESIS FINANCE

The effect of stock splits announcements during and after a financial crisis.

Name student: Boutaina el Hahaoui
Student ID number: 432337

Supervisor: Dr. R. de Bliek
Second assessor: Dr. T. Eisert

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Abstract:

There are plenty of studies that have documented positive abnormal results when stock splits are announced by companies. In addition, there are several theories that explain these results, like the signalling- and trading range hypothesis. In this thesis, I looked if there are still positive abnormal returns around stock splits during a negative time, like the financial crisis of 2008 and if we find similar results after that period. I analysed the cumulative average abnormal returns of 351 stock splits, with the market model and the market-adjusted model, for the periods 2007-2011 and 2012-2016. I found that the market reacts negatively to stock split announcement after the financial crisis period, but reacts positive during the financial crisis depending on the model being used.

Table of contents

Introduction

A stock split is when a company decides to adjust the stock price in such way that the before and after market capitalization of a company remains the same. Companies usually issue stock splits when their stock price has been increasing to levels that are either way higher than the price levels of similar companies or are too high and will probably continue to rise. There are different kinds of stock splits, whereas 2-for-1, 3-for-1 and 3-for-2 splits are the most common. These ratios are called split factors, for example, the split factor for a 2-for-1 split is 2. Although a stock split does not have a direct effect on the cash flow of a firm, the market usually reacts positively to an announcement of a stock split. Most studies found significant positive abnormal returns on and around the announcement date, with a split factor greater than 1.25 (Van der Sar, 2015). Grinblatt, Masulis, and Titman (1984), for example, found a significant positive announcement effect of 3.4% over a few days for stock splits in the U.S. from 1967 to 1976. A study that was conducted by Ikenberry, Rankine and Stice (1996) found a similar result for 2-for-1 splits from 1975 to 1990. When looking at the Amsterdam Stock Exchange, De Waard (1999) looked at data from 1985 to 1996 and also found a significant positive average cumulative abnormal return of 3.7%.

When looking at more of these studies, however, almost all were conducted before the economic crisis of 2008. Stock splits were really popular back in de days, with its peak in 1982, where 23% of firms in the US undertook a stock split. Over the next 30 years the proportion of U.S. companies announcing stock splits went down sharply to lower than 1% of firms in 2009. This drop occurs during the economic crisis (Minnick & Raman, 2014). Since then, the amount of studies about abnormal returns from stock splits have also declined. One of those few studies were conducted by Jain & Robbani (2014). They found a positive reaction of the market to a stock split announcement even while being in a financial crisis, but these abnormal returns decrease within a smaller event window (3 to 5 days) when they are compared to the pre-crisis period.

There are several negative consequences of stock splits that are documented in empirical researches, such as increased transaction costs, increased volatility and larger spreads. Since a stock split is just a superficial change, the answer to why there are abnormal returns is still a puzzle. There are three main hypotheses that can give support as to why we observe positive abnormal returns with stock splits; the signalling hypothesis, the attention hypothesis and the trading range hypothesis. The overall view is that, to a certain degree, psychological reasons are the main reasons instead of economic ones.

By writing this thesis I will look if there are also positive abnormal returns soon after a depressing time period like the financial crisis of 2008. This leads to my main research question:

'Do abnormal returns of stock splits differ during the financial crisis when compared to post financial crisis?'

The reason for taking those two periods is because of the decline in stock splits and the change in human behaviour during depressing times. Since the reasoning as to why there are positive abnormal returns are based on psychological reasons, I think that the abnormal returns after the financial crisis will be positive, but very small. This is because people are most likely risk averse in real life and they tend to weigh negative outcomes more than positive ones. After a depressing time like the financial crisis, people will tend to be even more careful and since a stock split does not really have a direct effect on the company's cash flow, more risk averse investors will less likely invest in the company.

The data for this thesis are obtained from the database CRSP (The Centre for Research in Security Prices) which contains American stock prices from 1925 onwards. The final obtained data consists of 351 observations, where 204 stock splits were issued between 2007 and 2011, and another 147 from 2012 to 2016. To obtain the answer for the main research question, an event study will be carried out by using Eventus. Both periods will be taking separately for computing cumulated abnormal returns (also known as CARs). The results will then be compared to one another to see the differences between both periods.

The thesis has the following structure. Section 2 will show the relevant literature and the theoretical background. In section 3 the data will be discussed in detail. Section 4 presents the used methodology. Section 5 will present and discuss the obtained results. Finally, section 6 provides the conclusion of the study.

Theoretical background

Stock splits can give us an indicative of a company's performance in the future in a traditional view of corporate finance. As said before, although a stock split does not have a direct effect on the cash flows of a firms, the market usually reacts positively to an announcement of a stock split. Many studies observed abnormal returns around the time a company announces a stock split. Most studies found a significant positive announcement effect with a split factor greater than 1.25 (Van der Sar, 2015). Van der Sar (2015) describes a split factor as the quotient of the nominal value of the old and the new stock, and so it indicates the exchange ratio. When the value of the split factor is smaller than 2, but bigger than 1.25, it is called a small split. Otherwise, a split factor lager than 2 is considered a large split. The category in between 1 and 1.25 refers to stock dividend, for which the implementation rules and also the consequences are different from those of stock splits. Finally, a stock split smaller than 1, so called reverse split, may be considered the reverse of stock splits (also known as forward splits) (Dykstra, 1976).

Grinblatt, Masulis, and Titman (1984) looked at the valuation effects of stock splits and stock dividends. Their evidence showed a positive correlation of stock prices with stock dividend and stock splits announcements that were not influenced by other firm-specific announcements. The authors found a significant positive announcement effect of 3.4% over a few days for stock splits in the U.S. from 1967 to 1976. The paper shows positive significant excess returns around and on the ex-dates of splits and stock dividends.

Ikenberry, Rankine and Stice (1996) found a similar result for data from 1975 to 1990. They looked at a data of 1,275 2-for-1 stock splits and observed significant post-split excess returns 7.93% in the initial year , and in the first three years other excess returns of 12.15%. An announcement return of 3.38% followed these returns afterwards, suggesting that the market underreacts to announcements about splits. Their results suggests that stock splits rearrange stock prices to a lower trading range.

One of the first studies that looked at stock splits during a financial crisis was conducted by Jain & Robbani (2014), the authors analysed the cumulative average abnormal returns (CAAR) and the market adjusted CAAR during and before the financial crisis of 2008. They did so by taking a pre-financial crisis period from 2004 to 2007 and a financial crisis period from 2008 to 2011. Jain & Robbani found that the market shows a positive reaction to a split announcement even whilst it being a financial crisis time, but these abnormal returns do decrease in a smaller event window (3 to 5 days) when comparing it to the pre-crisis period. During the latter time, they observed abnormal returns on a bigger event window.

There has been plenty of research trying to explain the reasoning behind the observed positive abnormal returns around stock splits. The results are that the reasoning is mostly based on psychological reasons. Amongst all the theories there are two main hypotheses that can give support as to why we observe abnormal returns with stock splits; the signalling hypothesis and the trading range hypothesis. The attention hypothesis gives us another insight why we observe higher abnormal returns at smaller firms than bigger firms.

The periods that are used in this thesis are the financial crisis period and the 5 years after that (post-financial period). As said before, the reason behind taking those two periods is because of the decline in stock splits and the change in human behaviour during and after depressing times. After the great depression of the 1930s, the financial crisis of 2007 is considered to be the worst crisis until now, it is also known as the global financial crisis (Eigner & Umlauft, 2015). As said before, during the financial crisis the amount of stock splits declined tremendously with an all-time low in 2009 (Minnick & Raman, 2014). This is easily explained, because companies tend to only put out stock splits when their future looks positive and this was not the case with the majority of companies during the financial crisis. After the financial crisis however, we still saw a decline in stock splits, with only a small increase in 2013 (see graph 1 in the appendix).

Signalling hypothesis

According to the signalling hypothesis managers use stock splits to release favourable (private) information when thinking about the market value of the firm. McNichols and Dravid (1990) explained the positive reaction to stock split announcements as a sign of the firm's management having positive private information. Stock splits mainly occur after years of stock price increase and substantial earnings growth, and signals their permanent nature, instead of being only incidental or temporary. It is also used to diminish uncertainty when looking at the earnings prospects (Fama, Fisher, Jensen, & Roll, 1969). According to Heinkel (1984) if false signalling will result in (indirect) costs, like a loss in reputation, only then a signal can be credible. He also mentioned that there needs to be an increase in attention paid by analysts to the firm concerned, because this would be a disadvantage if the firm would be overvalued according to Grinblatt, Masualis and Titsman (1984).

Trading range hypothesis

The second theory is the trading range hypothesis. It gives us another reason, instead of only to release information, as to why there are abnormal returns during a stock split. It is intended to bring the market price to a level within an optimal or desired trading range (Lakonishok & Lev, 1987). As said before, the announcement of a split can be seen as an indicator of the permanent nature of a firm's earning growth prospective instead of being it only temporary or incidental. The trading range hypothesis has a stronger relationship with the past, whereas the signalling hypothesis does so with the future, but they do not exclude each other.

There are some positive sides of having a stock price in between a particular range, but Grinblatt, Masulis and Titman (1984) conjecture that managers with unfavourable (private) information will not carry out a stock split. Some of these advantages are that stocks that are traded in a range usually have smaller brokerage fees and show to be more liquid. Stocks that are traded in a range, often a range of $30 to $60, tend to be chosen by investors, either consciously or subconsciously. A firm can decide to announce a split when the stock price surpasses the upper limit of this range, so they can bring the share price down to the optimal range. This can falsely be seen as a diversification, because investors that have a smaller budget to invest would want to get a bigger amount of shares even though the total amount that they have invested would be the identical, so this optimal trading range is largely psychological (Huang et al., 2014).

The attention hypothesis

The attention hypothesis is complementary to the signalling hypothesis, which states that a signal can only be credibly it false signalling leads to costs, such as a loss in reputation, and an increase in the attention paid by analysts to the firm concerned. Brennan and Hughes (1991) showed that firms get more attention by analysts after a stock split. Smaller firms generally receive less attention from analysts than bigger firms, because of that a consequence of the attention hypothesis is that the announcement of a stock split produces a relatively lager market price increase for smaller firms (Van der Sar, 2015). Brennan and Copeland (1988) stated that it is less likely that for smaller firms the stock split related information is already taken into the price.

Risk aversion

In the introduction I commented that I think the abnormal returns would be positive, but small after the financial crisis. The reasoning behind is, is that people tend to be risk averse in general and since abnormal returns are created by people, it could be one of the reasons that we might obtain small positive abnormal returns after the financial crisis period.

Risk aversion is the actions of humans (mostly investors and consumers) that attempt to lower the uncertainty when they are exposed to it. An investor that is risk averse would like lower returns with known risks instead of higher returns with unknown risk. This investor tends to avoid risk and would rather invest in, for example, government bonds, savings accounts and index funds than into a stock (Kimball, 1993).

Malmendier and Nagel (2011) investigated if someone that experienced macroeconomic shocks, as for example the Great Depression, would be affected by it when undertaking financial (risk) activities. The authors found that someone would indeed have a smaller probability of taking financial risk when they have experienced low returns during their lives. The changes of them participating in the stock market is also slim and if they do so, they would invest a smaller portion of their liquid assets in stocks. Finally, the individuals are also more pessimistic about stock returns of the future.

Data

The results of this thesis, to if there are indeed abnormal returns during the announcement of a stock split, will be obtained through an event study. For this, data is needed prior to the event (known as the control period), around the event (event period) and on the announcement day for firms that issued a stock split, from 2007 to 2011 and from 2012 to 2016. These data are obtained from the database CRSP (The Centre for Research in Security Prices) which contains American stock prices from 1925 onwards. CRSP is offered through the interface of WRDS (Wharton Research Data Services).

To get the data needed, I firstly chose out all the variables I need and then restricted the values. To obtain stock splits during the chosen time period, the variable 'distribution code' needs to be selected, which has to be equal to 5523 (the code for stock splits). To get stock splits of NYSE-listed stocks, the variable 'exchange code header' needs to be equal to 1. Finally, since according to Desai and Jain (1997) stock splits that have a split ratio smaller than 1.25 are considered to be very small, I only chose stock splits with a split factor greater than or equal to 1.25. For that the 'factor to adjust price' needs to be greater than or equal to 0.25 (Data description guide – CSRP).

The final total number of observations are 351 stock splits, where 204 stock splits were issued between 2007 and 2011, and another 147 from 2012 to 2016. Throughout the whole data, the top three preferred splits are a 2-for-1 stock split with a total of 217 observations, a 3-for-2 with 49 observations and a 3-for-1 split with a total of 26 observations. These splits take up to 83.2% of the whole dataset, this can be seen in table 1.

Table 1: Distribution of stock split factors during 2007-2011 and 2012-2016.
An overview of the distribution of stock splits per split factor, where the number of stocks show the absolute number per split factor and the percentage shows the proportional weight per split factor.

	2007-2011		2012-2016	
Split factor	**Number of splits**	**Percentage**	**Number of splits**	**Percentage**
5 for 4	11	5,4%	8	5,4%
13 for 10	0	0,0%	1	0,7%
4 for 3	1	0,5%	0	0,0%
3 for 2	32	15,7%	17	11,6%
5 for 3	1	0,5%	0	0,0%
2 for 1	126	61,8%	91	61,9%
5 for 2	1	0,5%	2	1,4%
3 for 1	17	8,3%	9	6,1%
769 for 250	0	0,0%	1	0,7%
10 for 3	1	0,5%	0	0,0%
4 for 1	6	2,9%	7	4,8%
5 for 1	6	2,9%	9	6,1%
10 for 1	1	0,5%	2	1,4%
50 for 1	1	0,5%	0	0,0%
total	**204**	**100,0%**	**147**	**100,0%**

The amount of yearly splits differs significantly from a high 89 in 2007 to a low 6 just two years later, in 2009. There were a total of 204 stock splits announced during the financial crisis period (2007-2011), which is 58.1% of the total observations. During the post-financial crisis period (2012-2016) a total of 147 stock splits were announced, what relatively takes up 41.9% of the total dataset. This overview can be found in table 2 and for a more in-dept overview see table 3 in the appendix.

Table 2: Distribution of stock splits per year.
An overview of the distribution of stock splits per year, where the number of stocks splits show the absolute number per year and the percentage shows the proportional weight per stock split.

	Year	**Number of stock splits**	**Percentage**
Financial crisis period	2007	89	25,4%
	2008	30	8,5%
	2009	6	1,7%
	2010	32	9,1%
	2011	47	13,4%
	Total	**204**	**58,1%**
Post-financial crisis period	2012	34	9,7%
	2013	39	11,1%
	2014	37	10,5%
	2015	28	8,0%
	2016	9	2,6%
	Total	**147**	**41,9%**

Since there are two independent normally distributed groups I need to see if the t-test can be used. The t-test is recommended when the variances are equal (Moser & Stevens, 1992). To test this I put the data into STATA and computed a two-sample variance comparison test and used the logarithm of the split factor. The null hypothesis is that the variances of both groups are equal and will be rejected when the probability is smaller than the significant level of 0.05. When it is bigger however, it means that there is not enough evidence to reject this statement or prove it wrong, so we must accept the null hypothesis. The results show that we cannot reject the null hypothesis and that we can use a t-test, since the probability of 0.7076 is bigger than the significant level of 0.05 (see table 4 in the appendix).

Methodology

An event study is a method to analyse the effect of announcements or events on stock prices or value of a firm. The data for the abnormal returns will be retrieved from Eventus, which is also provided by WRDS. Eventus is an econometric program that is mostly used to look at the effect of stock split announcements on abnormal returns (Jain & Robbani, 2014). An event study will be computed through Eventus with the stock split data, retrieved from CRSP, to compute the cumulative abnormal returns (CARs) with daily stock prices. The abnormal returns will be computed by using the market model:

$$R_{it} = a_i + b_i R_{MIt} + u_{it} \qquad (1).$$

Where R_{it} denotes the rate of return of security i on time t, a_i is the asset's return that is not correlated to the return of the market, R_{MIt} is the return of the market portfolio and the degree of the stocks' responsiveness that is measured by beta (b_i) and u_{it} is an error term for past returns that is not explained by the regression. To compute the abnormal returns, I will need a control period which is used as an estimation window for normal returns and must be unrelated to the event. Normal returns are essentially the expected or predicted returns unconditional on the event taking place, but conditional on other information in normal circumstances. The estimation window will be 250 days and will end 50 days before the event date. The formula for the normal returns is:

$$R^{*}_{io} = \hat{a}_i + \hat{b}_i R_{MIo} \qquad (2).$$

Where R^{*}_{io} is the normal return (also known as the expected return) of a security on day 0, $\hat{a}_i$ is the expected asset's return that is not correlated to the return of the market, R_{MIO} is the expected corresponding return of the market portfolio and the degree of the stocks' responsiveness that is measured by beta. Day 0 (t = 0) will be the event date, when the stock splits are announced by the companies. This approach assumes that the information was first known to the market on the event date itself. The event window is chosen around the event date (t = 0), but in such a way so that both periods will not overlap. Lev (1989) did a study about the

length of the event windows that were used in a data of 19 cross-sectional returns/earnings studies that were published in three major accounting journals from 1980 to 1988. Except for one, all studies he surveyed used fixed-length windows that range from one to two years. Even the one study that did not use a fixed event window length in his sample, did not so by conducting a statistical test. According to Krivin, Patton, Rose and Tabak (2003) the previous method is mainly used in studies where it can be not so practical to choose a length of the window for every observation in the data, because the data is simply too big to do so. Moreover, they say, when a ton of company's reaction to an event is being averaged, the chances are big that initial misinterpretations by the market will cancel each other out. Since I have a large sample and will look at averaged results, I will use predetermined fixed-length event windows. I will use multiple event windows to compare the results when computed during different moments of time and different time length. The chosen event windows will be relatively close to the event day, as well as relatively far from the event days. The event windows will be ; [-30, -2], [-30, +30], [-10, +20], [-10, +10], [-5, +5], [-1, +1] and [0, +30].

The abnormal returns will be computed with the market model and the market adjusted model so I can compare the results. Even though the market model is the model that is used by default, it still faces some criticism. On of the criticism is that the model assumes that the risk-free interest rate that is incorporated in the a_i is constant, that is contrary to the presumption that returns on the market change over time. The market adjusted model uses the real market return and it is the easiest way to monitor the event's possible effects on the market, however it does not change for essential CAPM risk and in this way abstracts from the company's distinct systematic risk profile (Eventstudytools, 2019). The realized returns are identified by R_{io}, so that we can compute the abnormal returns (ar_{io}) on the market model (3) and on the market adjusted model (4):

$$ar_{io} = R_{io} - R^{*}_{io} \qquad (3)$$

$$ar_{io} = R_{io} - R_{Mt} \qquad (4).$$

In this thesis I will use the Average Abnormal Returns (AARs), which are computed by averaging the abnormal returns of the companies for each day of the event period. After that

the Cumulative Average Abnormal Returns (CAARs) will be computed by summing up the AARs during the event window. The reason for assessing the average and then combing the result is because it has a benefit when performing an event study on a large sample of firms. This is that the length of the event window can be standardized across observations, since the impact of the errors should be small on average according to the Law of Large Numbers from having a too short or too long window length. (Krivin et al., 2003). Then test statistics need to be applied to see specifically if the abnormal returns differ from zero with some statistical validity or not. The Null H_0: $CAAR_i = 0$ is defined as:

$$t_{CAAR} = \frac{CAAR_i}{S_{CAAR}} \tag{5}$$

where S_{CAAR} is the standard deviation of the cumulative abnormal returns in the estimation window. When the probability is smaller than the significant level we can reject the null hypothesis and state that there are cumulative abnormal returns and that they significantly differ from zero.

Results

In this thesis, I looked at the abnormal returns after the announcement of stock splits by companies. The following seven time intervals were for both time periods, 2007-2011 and 2012-2016: (1) [-30, -2], (2) [-30, +30], (3) [-10, +20], (4) [-10, +10], (5) [-5, +5], (6) [-1, +1] and (7) [0, +30]. The cumulative average abnormal returns and their respective significance levels were retrieved for the whole data set of 351 observations. In the financial crisis period (2007-2011) there were 204 stock splits and in the post-financial crisis period (2012-2016) there were only 147 stock splits. Both the market model and the adjusted market model were used for the total sample of firms that had stock splits during 2007-2016.

Table 5 shows the cumulative average abnormal returns for the whole dataset while using the market model and table 6 shows the previous returns while using the market-adjusted model. Majority of the market reaction to stock splits were negative for the time period 2012-2016, with only having one non-significant positive abnormal return for the -30 to -2 days interval with the market-adjusted model. The time period of 2007-2011 does show more positive abnormal returns, but still majority of the returns with the market model are negative. The extent and significance of the abnormal returns do vary for the two periods.

When looking at the cumulative average abnormal returns with the market model, as seen in table 5, almost all the returns are negative. Only in the period 2007-2011 a positive abnormal return is seen with the time interval of -30 to -2 days, this return however is non-significant so we cannot say that there are abnormal returns and that they significantly differ from zero. Furthermore, there are only two significant abnormal returns for the financial crisis period for the intervals [-10, +20] and [0, +30], with the latter being at a 0.1% level. For those periods we can state that there are indeed significant negative abnormal returns. Contrary to 2007-2011, the period 2012-2016 only shows significant results, with the majority being significant at the 0.1% level. Concluding, we can state that there are significant negative abnormal returns during the post-financial crisis period of 2012-2016. Additionally, the market reaction to splits is bigger in the period of 2012-2016 instead of 2007-2011 as showed by the size and significant level for the results of the market model.

Table 5: Cumulative Average Abnormal Returns with market model.
*This table shows the cumulative average abnormal returns on a market model following split announcements for period 2007-2011 (financial crisis period) and 2012-2016 (post-financial crisis period). The symbols *, ** and *** denote the statistical significance at the 5%, 1% and 0.1% levels, respectively.*

	2007-2011		2012-2016	
Days relative to announcement date	**N**	**Cumulative Average Abnormal Return**	**N**	**Cumulative Average Abnormal Return**
[-30, -2]	204	1.08%	147	-2.33%**
[-30, +30]	204	-1.65%	147	-5.75%***
[-10, +20]	204	-2.84%**	147	-4.27%***
[-10, +10]	204	-1.39%	147	-3.34%***
[-5, +5]	204	-0.32%	147	-1.86%***
[-1, +1]	204	-0.24%	147	-0.60%**
[0, +30]	204	-3.11%***	147	-3.47%***

Table 6 shows the cumulative average abnormal returns with the market-adjusted model, with only 50% of the results being significant. In contrast to 2007-2011, the period 2012-2016 has mostly negative returns with the time interval [-30, -2] being the only one with a positive abnormal return, which is not significant. There are only positive abnormal returns during the financial crisis when using the market-adjusted model. The time intervals [-30, -2] and [-30, +30] show the biggest and most significant positive abnormal returns for 2007-2011, where the intervals [-10, +20] and [-10, +10] are also positive and significant, but at a lower level of 5%. Moreover, a notable remark is that, excluding [-1, +1], time intervals that are not significant at the market model are significant at the market-adjusted model and vice versa. The market-adjusted model also gives a majority of negative abnormal returns in the post-financial crisis period, similar to the market model, but only three of the intervals are significant. Finally, there are significant positive abnormal returns during the financial crisis period and significant negative abnormal returns during the post-financial period, when looking at the market-adjusted model.

Table 6: Cumulative Average Abnormal Returns with market-adjusted model.
*This table shows the cumulative average abnormal returns on a market adjusted model following split announcements for period 2007-2011 (financial crisis period) and 2012-2016 (post-financial crisis period). The symbols *, ** and *** denote the statistical significance at the 5%, 1% and 0.1% levels, respectively.*

	2007-2011		2012-2016	
Days relative to announcement date	**N**	**Cumulative Average Abnormal Return**	**N**	**Cumulative Average Abnormal Return**
[-30, -2]	204	4.27%***	147	0.07%
[-30, +30]	204	5.44%***	147	-0.90%
[-10, +20]	204	1.27%	147	-1.71%*
[-10, +10]	204	1.41%*	147	-1.63%*
[-5, +5]	204	1.06%*	147	-1.00%*
[-1, +1]	204	0.16%	147	-0.33%
[0, +30]	204	1.01%	147	-0.86%

These results are not expected, since previous studies showed that there are positive abnormal returns around stock split announcements. The average results of stock split announcements are positive abnormal returns around 3.5%, just like the results of Grinblatt, Masulis and Titman (1984) were they found a positive 3.4% abnormal return. The results of the financial crisis period with the market-adjusted model, however, are less surprising. They are comparable with those of Jain & Robbani (2014), since they also found positive abnormal returns during 2008-2011 with the market-adjusted model. Furthermore, only the results of 2007-2011 with the market-adjusted model supports the signalling hypothesis, since we do find significant positive abnormal returns after a stock split announcement.

Conclusion and discussion

In this thesis, I analysed the effect of stock splits on abnormal returns during the financial crisis period (2007-2011) and the post-financial crisis period (2011-2016). The aim of this thesis is to see how the market reacts on stock split announcements during a negative time period and how it reacts afterwards. The total data used were 351 stock splits, with 204 in 2007-2011 and 147 in 2012-2016. As expected, the total amount of stock splits did drop during the finance crisis. From 2009 onwards it rose again, but it never got at the same level as it was before and finally continued to drop from 2011 onwards.

The research question of this thesis was: do abnormal returns of stock splits differ during the financial crisis when compared to post financial crisis? Contrary to previous literature, the results show significant negative abnormal results during the post-financial crisis period, with even a high significant -5.75% abnormal result for [-30, +30] at a 0.01% level, when using the market model. When looking at the financial crisis period however, there were some positive significant abnormal results as expected, but only when using the market-adjusted model. Subsequently to the results of the post-financial crisis period, the market model only showed significant negative abnormal results for the financial crisis period. In conclusion, the results show that the abnormal returns do differ between the financial crisis period and the post-financial crisis period. There are only negative abnormal returns during 2012-2016 and both positive and negative abnormal returns during 2007-2011, depending on the model used.

The results are not expected and one can look further into this subject in future research to see why there were negative abnormal returns observed. Especially when looking at the market-adjusted model, we find significant positive results for 2007-2011 and significant negative results for 2012-2016, one can look into why we observe such contrary results. A suggestion is to look if there are some theories linked to the results, for example risk aversion. Moreover, the data used are general and do not differentiate between the companies. An improvement can be to distinguish the data between risky and less risky or big and small firms companies, with the latter we can also see if the attention hypothesis holds.

In addition, an alternative explanation could be that, since we observe greater negative results over larger windows, perhaps they may be assigned to the bigger spreads that are charged by brokers accompanied by higher scales of volatility and higher transaction costs after a stock split. Along with that, this could indicate that there is indeed no value created by the stock split and this causes there to be negative effects.

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Appendix

Graph 1: stock splits (2007-2016).

This graph shows the total amount of times a stock split announcement was carried out during the financial crisis (2007-2011) and the period afterward (2012-2016) with the data of this thesis. Since 2007, the amount of stock splits have declined rapidly, with only a small increase between 2009 and 2011, but went down again to almost the same level as 2009.

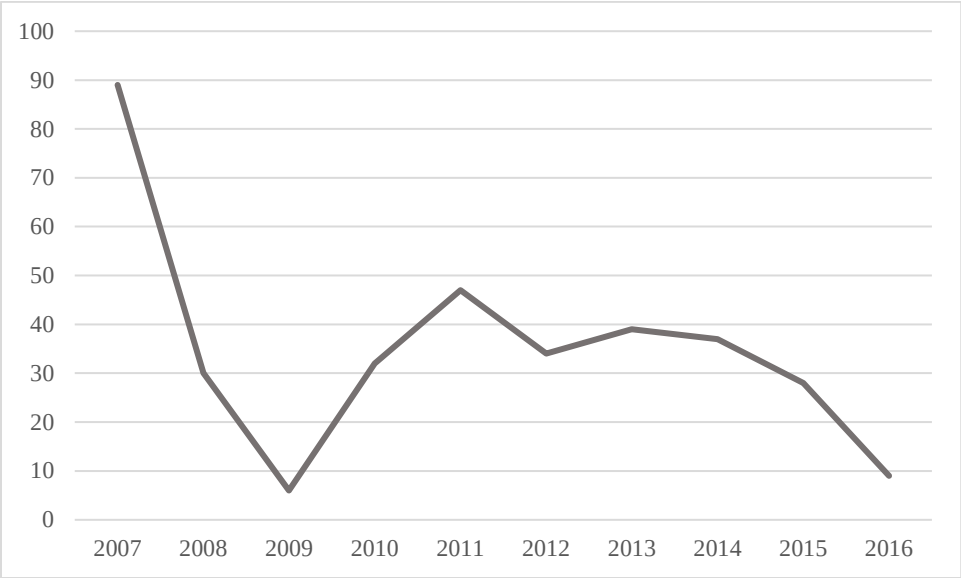

Table 3: detailed stock split data overview (2007-2016).

This table shows a more in-dept overview of the stock splits that were used in this thesis. The stock splits are shown per stock split factor and the amount of times they occurred per year during 2007-2016.

	Financial crisis period					Post-financial crisis period					
Split	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
5 for 4	2	3	1	2	3	3	4	0	1	0	**19**
13 for 10	0	0	0	0	0	0	1	0	0	0	**1**
4 for 3	1	0	0	0	0	0	0	0	0	0	**1**
3 for 2	15	3	0	9	5	5	5	4	2	1	**49**
5 for 3	0	0	0	1	0	0	0	0	0	0	**1**
2 for 1	62	17	4	12	31	23	21	24	16	7	**217**
5 for 2	0	0	0	1	0	1	0	1	0	0	**3**
3 for 1	6	4	0	3	4	1	4	2	2	0	**26**
769 for 250	0	0	0	0	0	0	0	0	1	0	**1**
10 for 3	0	0	0	0	1	0	0	0	0	0	**1**
4 for 1	0	1	1	2	2	0	2	1	4	0	**13**
5 for 1	3	1	0	1	1	1	2	3	2	1	**15**
10 for 1	0	1	0	0	0	0	0	2	0	0	**3**
50 for 1	0	0	0	1	0	0	0	0	0	0	**1**
Total	**89**	**30**	**6**	**32**	**47**	**34**	**39**	**37**	**28**	**9**	**351**

Table 4: two-sample variance comparison test output for stock splits (2007-2016).
This table shows the results of a two-sample variance comparison test on the data of this thesis. The results show that we can accept the null-hypothesis, since the probability (0.7076) is bigger than the 5% level (0.7076 > 0.05).

Group	Observations	Mean	Std. Error	Std. Deviation
2007-2011	204	-0.0240161	0.0454553	0.6492314
2012-2016	147	0.0562126	0.0562126	0.6678232
Combined	351	0.009584	0.009584	0.6573299
H0: sd (A)/sd (B) = 1 | Ha: ratio ≠ 1 | f = 0.9451 | DF = 203, 146 | Prob. = 0.7076				