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*Master thesis*

# Analyzing the effect of M&A announcement on Special Purpose Acquisition Companies

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# Preface

This research has been written to fulfill the final requirements for obtaining the Master of Science (MSc) degree in Economics and Business Economics, with a specialization in Financial Economics, from the Erasmus School of Economics in Rotterdam, The Netherlands.

This means that this thesis will mark my end of my study years at the EUR. I am grateful for all the wonderful people I met that have made the past years such a success for my development both personally as professionally.

I would also like to take this opportunity to express my gratitude to my supervisor, Dr. Haikun Zhu, who, although the online setting due to the pandemic, was always available and willing to answer my questions, provide constructive feedback and valuable support during this process. This gave me the confidence to align my thesis with my personal goals and kept me motivated.

Lastly, I want to express the importance of the support of my friends and family over the years of studying and especially during the pandemic. If I ever lost eyesight of my goals, you were the ones that kept me motivated.

I hope you enjoy your reading.

Robin Maurits Ranzijn

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# Abstract

This master thesis investigates merger announcement effects of Special Purpose Acquisition Companies (hereafter: SPACs). A SPAC is a publicly listed company with a predetermined period to achieve its sole purpose of finding a private target company to merge with. SPACs have gained popularity in recent years but have been around in various forms since the 1990s, but since 2010 the structure of SPACs has been modified resulting in a new phase of SPACs. Through the analysis of an event study, it is found that there are significantly positive Cumulative Abnormal Returns (hereafter: CARs) obtained over various benchmarks and event windows. Three benchmarks are used in previous research and a fourth benchmark is set up by taking the average return of the SPACs without an identified target it is indicated that SPACs that identify a target outperform the SPACs that did not yet identify a target.

No decisive evidence is found that a higher sentiment, through having completed SPACs as a sponsor before, having a famous/well-known member in the sponsor team, receiving more media coverage, or a high value of the Index of Consumer Sentiment is resulting in a positive effect on the CARs surrounding a merger announcement of a SPAC. This implies that investors are looking more at the fundamentals per merger to evaluate the worth of the proposed merger.

The time passed relative to the predetermined period is influencing the CARs significantly in a continuous manner. The closer the SPACs are to their termination date, the lower the CARs surrounding a merger announcement, but when the SPACs extends their life above their predetermined period, the CARs are rising again suggesting that investors are more positive about the proposed merger since the sponsor does not have the incentive anymore to propose a value destructing merger. Nonetheless the ability to have a longer life than predetermined raises concerns about agency problems between the investors and the sponsor that an individual should consider before investing in a SPAC.



**Keywords:** SPAC, Event study, M&A, Reverse Merger.

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# List of abbreviations:

| | |
|---|---|
| CAR | Cumulative Abnormal Return |
| ICS | Index of Consumer Sentiment |
| IPO | Initial Public Offering |
| SPAC | Special Purpose Acquisition Company |

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# Chapter 1. Introduction

Special Purpose Acquisition Companies (hereafter: SPACs) have gained a lot of popularity recently as investment instruments. A SPAC is a publicly traded company with a predetermined period, of usually two years, that receives a blank check from investors to find and acquire a private company, the target. Management of a SPAC, called the sponsor, has the sole purpose to find this target to perform a merger with, enabling it to go public. If the sponsor fails to complete a merger within the predetermined period, the SPAC will be liquidated and the net proceeds from the Initial Public Offering (Hereafter: IPO), placed in an escrow account and invested in low-risk securities, such as government bonds, are returned to the investors. According to Bazerman and Patel (2021) in the first quarter of 2021 alone, 295 new SPACs were created, with $96 billion invested compared to 247, with $80 billion invested over the whole of 2020.

SPACs have been around in various forms since the start of the 1990s, but their structure has been modified since then. There are three distinguishable phases, whereas since 2010 the start of the last phase is identified. Most research on SPACs is based on the second phase category but not on the third phase category SPACs that gained popularity by investors recently. The data of this research ranges from 2017 till 2021.

The sponsor of a SPAC searches for a target that is private resulting in a lack of information for investors as these private companies do not have an obligation to publish their results. This makes it more difficult for investors to perform valuations, based on fundamentals, on the proposed merger, which could increase the weight of behavioral factors compared to traditional M&A.

In this master thesis, I will thus take a closer look at merger announcement effects of this third phase category SPACs with data ranging from 2017 till 2021. With the above in mind, the research question of this thesis is as follows:

*How do takeover announcements impact the short-term stock performance of Special Purpose Acquisition Companies and how do sentiment and time influence this?*

To test the above research question three different hypotheses are formulated, with several sub hypotheses. The first hypothesis addresses the merger announcement effects. It is expected that, although there is a new phase of SPACs, announcing a merger still increases the value of

a SPAC, outperforming the SPACs that did not announce a merger. This is derived from the fact that investing in a SPAC provides investors with very low-risk options in future acquisitions (Jenkinson & Sousa, 2011). A SPAC is only worth the funds of the escrow account plus the option value of an unknown acquisition, until the point where there is a merger announcement which is assumed to be a surprise event. The sole purpose of the SPAC, merging with a private company, is a step closer, the option becomes more valuable as there is more certainty the SPAC will achieve a merger, outperforming the SPACs that did not achieve this step yet. This results in the first hypothesis:

*Hypothesis 1: SPACs announcing a merger have positive abnormal returns, outperforming those SPACs that did not identify a target.*

Over various benchmarks and event windows, it is found that there are significantly positive abnormal returns obtained for a SPAC when announcing a merger, thus accepting the first hypothesis. When comparing these CARs to CARs of second phase SPACs, using the same benchmark and event window of Lewellen (2009) it is established that the identified CARs are larger in magnitude.

Secondly, there is a difference in the velocity of obtaining the CARs. Lewellen (2009) finds that not all the CARs are obtained instantly at the announcement date, while this event study shows that the CARs are almost instantly obtained at the announcement date. This could be explained by the improved ways of investing and the information society that reaches more investors at earlier convenience.

SPACs are shell companies without history or operating assets making their abnormal returns based on different aspects compared to operating companies. For this second hypothesis, a closer look at the influence of sentimental factors on the found CARs is taken. It is expected that since there are no revenues or financial reports linked to the performance, that SPACs with higher sentiment receive higher CARs surrounding a merger announcement. To test this, multiple variables that are labelled as an estimator of sentiment, will be regressed against the obtained CARs.

The first and second variable is the experience of a sponsor in previous SPAC mergers. Sponsors rely already mainly on their reputation to raise capital (Lewellen, 2009). Since a

SPAC merger is a very specific merger, which is just a minor stake of the total M&A market, having completed a SPAC merger before announcing a merger should be a good indicator of a sponsor their sentiment. Both a dummy on the completed SPACs as the total number of completed SPACs will be used.

The third variable is whether the sponsor has a famous or well-known individual listed as a member. This could increase the attention focused on the SPAC, and thus increase the sentiment of the SPAC.

The fourth variable is the media coverage by the platform of Factiva. With the increasing number of SPACs, investors could be more vulnerable to the attention effect. There are a few attention-drawing events like extreme past performance, news announcements, and media coverage. Engelberg and Parsons (2011) find that media effects improve the buy and sell-side, but significantly influence the buy-side more.

The fifth and final variable for sentiment is the Index of Consumer Sentiment as Charoenrook (2005) finds that changes in consumer sentiment reliably predict excess stock market returns.

*Hypothesis 2: Investors are especially willing to pay for SPACs that identified a target that has high sentiment.*

No decisive evidence was found for the second hypothesis. High sentiment from either the sponsor, the media coverage, or the Index of Consumer Sentiment does not influence the CARs significantly.

Lastly, the payment structure for the work the sponsor performs in finding a target, creates the incentive to close a deal at any cost, leading to many value-destroying mergers (Jenkinson & Sousa, 2011). The passed time relative to the predetermined period of a SPAC could be reflecting the sponsor norms and values towards investors, resulting in the third hypothesis:

*Hypothesis 3: The out or underperformance of a takeover announcement depends on the time relative to the termination of the SPAC.*

Expected is that this incentive to close a deal at any cost, not caring about the possible value destroyed during the merger, will be higher towards the termination date or the end of the

predetermined period. The sponsor has done work for a substantial amount of time to find a suitable target for the investors and will be more prone to the sunk cost fallacy, leading to the sub hypothesis below:

*Hypothesis 3a: SPACs that are close to their termination date while identifying their target underperform.*

The incentive to close a deal at any cost also leads to the next hypothesis. After the IPO the sponsor can start searching for a target, which will also be assumed in this thesis. If the sponsor announces a merger relatively close after their IPO, it could mean that the sponsor did not look further for better targets and wants to close the deal early, receiving compensation sooner and making it possible to focus on a next deal, resulting in the following hypothesis:

*Hypothesis 3b: SPACs that are close to their starting date while identifying their target underperform.*

There is a continuous high significant relation between the ratio, defined as the months passed relative to the predetermined period, and the CARs surrounding the merger announcement. Hypothesis 3a is accepted as the closer the ratio is to the value of 1, meaning closer to their termination date, the lower the obtained CAR. Hypothesis 3b is rejected however since the SPACs that are closer to the ratio value of 0, meaning closer to the starting date, obtain higher CARs.

The thesis is set up as follows. In the second chapter, the background is presented followed by the third chapter discussing the literature of SPACs. In the fourth chapter, the data and the data transformations will be discussed. In the fifth chapter, the methodology used to answer the research question and hypotheses is reflected. The sixth chapter will present the results of this research. The seventh chapter provides the final answer to the research question and hypotheses, a discussion of the findings, and suggestions for further research.

# Chapter 2. Background

In this chapter, the background information on SPACs will be discussed through current academic literature.

## Chapter 2.1 What is a SPAC

A SPAC, written out Special Purpose Acquisition Company, is a publicly traded shell company set up with the sole purpose of finding a suitable private target company to merge with (Jenkinson & Sousa, 2011) (Cumming, Haß & Schweizer, 2014). The merger performed is called a reverse merger, where the publicly traded SPAC merges with a private company.

The management of the SPAC has a certain deadline after a predetermined period, which is usually 18 months, called the termination date. Within this predetermined period the sponsor needs to find an appropriate target since the SPAC is meant to merge with a target. If the deadline is not met the SPAC will be liquidated on the termination date.

The IPO of a SPAC is typically a sale of units consisting of common stock, rights, and in-the-money-warrants that only can be exercised after a completed merger. After completion of the IPO the units are decoupled and traded separately (Dimitrova, 2017).

The SPAC is a blank check company since the investors write a blank check to the management (Jog & Sun, 2007). The company does not have any operating assets and the net proceeds from the IPO are moved to an escrow or trust account, where the proceeds are invested in low-risk securities until a completed business combination or liquidation of the SPAC (Riemer, 2007).

In the following sub-chapters, some additional information regarding the characteristics and process of a SPAC will be explained.

### Chapter 2.1.1 Stakeholders of a SPAC

#### Chapter 2.1.1.1 The sponsor

The sponsor is a term used to describe the small group of typically experienced managers that establish the SPAC. They rely mainly on their reputation to raise capital via an IPO for the SPAC (Lewellen, 2009). Their reputation can be affected by having a famous or well-known team member, drawing public attention to the SPAC, or from the amount of completed SPAC deals, showcasing their experience in SPACs.

This team is responsible for finding a good target company for the investors within the predefined period of the SPAC. The sponsors usually seek a suitable target within an industry they are veterans of. The entrepreneurs who decide to go public via a SPAC merger mention this as a huge benefit since they are able to evaluate merging companies more efficiently and reach agreements faster, referring to the sponsors as business partners (Gahng, Rhitter & Zhang, 2021).

The sponsor is not granted a salary or other cash compensation. They commonly receive a 20% interest in the SPAC, which is purchased by a small private placement executed prior to the IPO. They may also purchase heavily discounted warrants through a private placement around the time of the IPO. If a deal is made, the 20% share of the founders becomes very valuable. If the SPAC liquidates because no acquisition was completed, the shares, and warrants owned by the sponsors end up worthless. Sponsors do not receive any of the liquidation proceeds if a deal is not made. This situation, in effect, creates an extremely strong economic incentive for the founders of the SPAC to complete an acquisition before the SPAC's expiration date (Dimitrova, 2017).

This compensation structure for sponsors creates the incentive to close a deal, before liquidation, at any cost that will likely lead to many value-destroying acquisitions for SPAC shareholders (Jenkinson & Sousa, 2009). This could also be a problem for SPACs finding a target in the early stage of the predefined period of a SPAC. By closing a deal relatively early, the sponsor receives compensation earlier, making them able to take on the next SPAC or project, making a sponsor potentially rushing to closing a deal instead of looking further for a better target. Expected is that there is a concave parabolic relation, between the time passed and the CARs, as the incentives explained above automatically imply, that if the time passed is neither at the start nor the end, the SPACs that are identifying a target during that time will outperform the others.

#### Chapter 2.1.1.2 Target company

The SPAC sponsor is looking for a suitable target company and often already knows in which industry they will search for this operating company as stated in their IPO filings.

The target is a private company that wants an attractive way to obtain access to additional public capital without having to do their IPO, since doing an IPO is very costly, difficult and a lengthy process (Dimitrova, 2017). The fees for the underwriters are also considered as high

costs during an IPO (Loughran & Ritter, 2002) whereby with a reverse merger with a SPAC are no IPO costs for the target company. During a traditional IPO, the private company is required to supply detailed financial statements and other disclosures (Sjostrom, 2007) but also do a roadshow to gain interest in the IPO from investors (Cumming, Haß & Schweizer, 2014).

One of the other reasons why a private company would like a reverse merger with a SPAC is the exit opportunity according to Dimitrova (2017). The owners of the private company would like to cash out because as a public traded company liquidity is gained and one can sell their shares.

Lastly, the target company can value the expertise from the SPACs sponsor that usually is an industry expert and could help the development of the company (Dimitrova, 2017).

#### Chapter 2.1.1.3 Investors

The third stakeholder is a huge influence on the outcome of the SPAC. Next to being the supplier of capital for the SPAC, the IPO investors have an economic role.

SPACs have three possible outcomes: good mergers, bad mergers, and liquidation if no merger is proposed or accepted before the deadline. As stated in chapter 2.1.1.1 the sponsor does not get compensation until a merger is completed. Thus, a sponsor that is unable to come up with a good merger has an incentive to propose a bad merger once the deadline approaches.

This is where the investor obtains the economic role since, they have a redemption option. The redemption option gives the investor the option to get their part of the proceeds out of the escrow account back. If enough shareholders make use of this option the merger will fail because the SPAC does not have enough cash to fulfill the merger agreement requirements unless the sponsor invests its own money or takes a haircut to induce other parties to provide cash (Gahng, Ritter & Zhang, 2021).

### Chapter 2.1.2 Process of a SPAC

In Figure 1 the SPACs process is visually explained and below is the step-by-step explanation.

1. Private placement sponsor

The SPAC starts with the sponsor setting up the SPAC and placing a private placement for a nominal fee of USD 25,000 (Lakicevic, Shachmurove & Vulanovic, 2014). The reason for this private placement is to strengthen the sponsor their incentives to look for promising targets

(Kolb & Tykvova, 2016) because if no merger is completed within the predefined period, and the SPAC is liquidated, the sponsor loses their invested funds (Jog & Sun, 2007)

2. SPAC IPO

After the private placement, the IPO of the SPAC takes place. The majority of the funds necessary for future acquisition are obtained during this phase by selling units that commonly consist of common shares with voting rights and warrants. The net proceeds of the IPO are placed in a trust account, invested in risk-free securities such as government bonds (Kolb & Tykvova, 2016).

3. No Target phase

During this third phase, the sponsor start looking for a suitable target. Usually, the sponsor states in their S-1 prospectus at IPO what characteristics they are looking for in a target in a certain specified industry.

4. Potential target identified (merger announcement date)

Once the sponsor identifies a target, the shareholders get a notification. The date when this happens is the merger announcement date. This is the first time the outside world should be able to access the information on the proposed merger. The requirement to go to the next step is that the proposed target must be at least 80% of the SPACs net asset value. When this requirement is met, a special meeting will be held to vote in favor of the acquisition or against it (Cumming, Haß, & Schweizer, 2014).

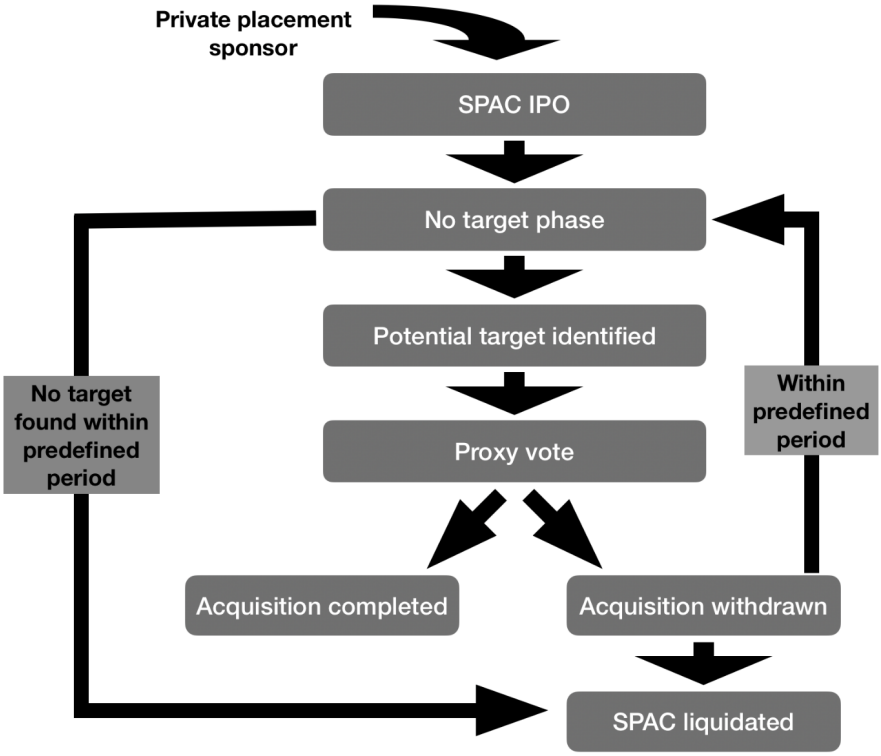
5. Proxy vote

The next step in the process is the proxy vote where shareholders vote whether to approve the acquisition (Kolb & Tykvova, 2016). In order to obtain a successful acquisition, two requirements must be met. The majority of shareholders must vote in favor of it and the percentage of shareholders that redeem can not exceed a certain maximum, historically between 20% and 40% (Cumming, Haß, & Schweizer, 2014).

If these requirements are met the SPAC finalizes the reverse merger with the target and will become an operating company. The sponsor will finally be compensated for their time and effort by obtaining shares and warrants that usually are locked up to avoid opportunistic behavior (Cumming, Haß, & Schweizer, 2014).

If these requirements are not met the SPAC either has to return to their search for a target or to liquidation.

*Figure 1: Visual presentation of the process of a SPAC*




## Chapter 2.2 History of SPACs

SPACs have been around for a very long time, but since regulation and demand are changing as well, the SPAC can be divided into three distinctive phases.

1. Phase 1: 1993 - 1996

During this first phase, fourteen SPAC did their IPO. The SPAC was a relatively new kind of risky investment since normally these blank check companies were penny stocks but due increased regulation in penny stocks, it was more sought-after to have larger blank check companies (Murray, 2014).

2. Phase 2: 2003 - financial crisis 2008

During the second phase, the SPAC market grew quickly with 161 IPOs completed in the United States between August 2003 and September 2008. During this phase, the SPAC market also gained greater acceptance with their introduction to the national exchanges, initially AMEX in 2005 followed by the NYSE and NASDAQ in 2008. The SPAC IPO volume fell dramatically during the financial crisis (Murray, 2014).

3. Phase 3: late 2009 onwards

During this last phase that builds up to the current hype in SPACs, the structure of SPACs was modified which would make SPAC acquisitions take less time to execute than IPO (Kolb & Tykvova, 2016).

Around 2010, the structure of SPAC IPOs was modified in two different ways.

Firstly the voting and redemption rights of public common shareholders became separate decisions, meaning that since 2010 shareholders can vote in favor of a merger but still redeem their shares. This creates the incentive to approve bad mergers and redeem their shares, so their warrants are still worth something. If they disapprove of the bad merger and the SPAC gets liquidated the investors are still able to redeem their shares but the warrants will be worthless (Gahng, Ritter & Zhang, 2021).

Secondly, sponsors started to "top up" the initial trust value per share by buying more private placement warrants at the IPO and putting the money into the trust, increasing the incentive of the sponsor to propose a good merger (Gahng, Ritter & Zhang, 2021) and signals the sponsors quality (Blomkvist & Vulanovic, 2020). If the merger gets disapproved, they both have no compensation for the work done for the SPAC and lose more money than they invested into the SPAC.

## Chapter 2.3 Going public as a private firm

When a private firm wants to go public there are multiple possibilities to do so:

- Traditional IPO
- Direct listing
- Merging with a SPAC

For all the above possibilities a lot of costs are involved but according to Gahng, Ritter & Zhang (2021) merging with a SPAC is the most expensive of them all.

Jenkinson & Sousa (2011) state that SPACs are still attractive to raise external equity and go public because there is less uncertainty about valuation. Also merging with a SPAC is faster than a traditional IPO depending on negotiations and thus requires less significant management time and resources (Pinedo & Choi, 2020).

Since a traditional IPO takes some time before investors can buy shares it is hard to time the market, while the reverse merger with a SPAC can be completed within a shorter time frame

which makes going public through SPAC a lot more attractive during years with weak IPO activity and volatile markets (Kolb & Tykvova, 2016).

The final major advantage is that usually, the private target companies are still young companies that need to grow. The sponsors are industry veterans and often keep involved with the company after the reverse merger took place, helping the young companies (Gahng, Ritter & Zhang, 2021).

Possible disadvantages are that the SPAC investors are not in favor of the proposed merger. This is still not the problem of the target company though, since the sponsor of the SPAC is incentivized to try his best to convince those investors or buy them out before the deal.

# Chapter 3. Literature review

In this chapter the literature about SPACs and M&A will be discussed.

## Chapter 3.1 Performance SPACs

### Chapter 3.1.1 Short term

When the sponsor announces the proposed merger, the SPAC moves from the phase without a target to the phase with a target. This results in a seven-day (-3;3) CAR of 2.4% according to Lewellen (2009), that researched SPACs from the period ranging from 2003 till 2008.

Floros & Sapp (2011) even found an eleven-day (-5;5) mean CAR of 35.70% for reverse merger announcement. Their study includes all the shell companies from 2006-2008 however and could influence the ability to compare their results with research that consist only of SPACs.

Both researches stated above are already seriously outdated since their datasets make use of reverse mergers that were announced prior to the structural changes in the third phase of SPACs as described in chapter 2.2.

### Chapter 3.1.2 long term

Kolb & Tykvova (2016) look at the long-term performance of SPACs ranging from 2003-2015 and find that they severely underperform the market, industry, and firms of similar sizes and book-to-market ratios as well as IPO firms. Their research is based on the analysis of 127 SPAC acquisitions and 1,128 IPOs that mostly occur during the second phase of SPACs as described

in chapter 2.2. The possible explanation for the long-term underperformance is the fact that the companies that make use of going public through SPAC are particularly small, levered firms with low growth opportunities (Kolb & Tykvova, 2016).

## Chapter 3.2 Difference between traditional M&A and SPACs reverse merger

The reverse merger with a SPAC differs from traditional M&A on a couple of different aspects that could influence merger announcement effects.

Firstly, SPACs are certain of their intent to perform a merger since their sole purpose is to find a target to do a reverse merger with, while traditional companies do not have this feature. The buildup to a merger could thus be different since investors are sure SPACs will try to do a merger within the predefined period while this is not a given for traditional companies.

Secondly, the predefined period is the second point of difference. SPACs are designed with a limited time frame within which the sponsor needs to find a suitable target, while traditional companies do not have this limited time frame. This gives a certain pressure on finding a target for the sponsor since their only compensation is given if a merger is completed while this is not the case for traditional companies (Jenkinson & Sousa, 2009).

Thirdly, the value creation/destruction gained from M&A is significantly different for SPACs than for traditional M&A. SPACs are shell companies without operating assets while traditional companies are often complex structures. For these complex structures, the acquirer can have multiple incentives such as synergies, economies of scale or gaining power in their market or a different market. All of the above can create or destroy value to some extent for investors after merger completion. For a reverse merger, this is different since the listed incentives above are not present. There is a merger between a private company and a shell company, obtaining no additional value creation/destruction except the value of transferable shares for the target company and the difference between the trust value of the SPAC and the value of the target company and the added value of the expertise of the sponsor if they stay involved.

Fourth, the merger announcement effect could be out of line with traditional M&A for a reverse merger with a SPAC. Traditional M&A consists of a lot of the effects of a merger announcement from merger arbitrageurs that long the target and short the acquirer. In order to be able to use this strategy, both companies must be listed publicly which is not the case with a SPAC reverse merger, where the target is a private company. There is already evidence that

this effect is different for the above-described cases. When the acquisition includes a private company there are higher abnormal bidder returns (Fuller, Netter & Stegemoller, 2002).

Fifthly, when investors want to buy a stock, they often suffer from the attention effect. There are a few attention-drawing events like extreme past performance, news announcements, and media coverage. Engelberg and Parsons (2011) find that media effects improve the buy and sell-side, but the buy-side significantly more. SPACs are shell companies with publicly sold stock and with more and more SPACs doing their IPO it could be harder to track their stock since SPACs have little to no news to report except their potential merger making it more important to have good media coverage.

As stated in chapter 2.3 going public through SPAC is more wanted by target companies during volatile markets, this could result in some difference in traditional M&A and SPACs, since the motive for the target is to go public instead of being taken over.

Lastly, the benchmark to estimate the merger announcement effects is never perfect but for SPACs it is more certain to use a more correct benchmark compared to traditional M&A. This is more certain since the returns of a SPAC are not driven by operating assets, making a benchmark more reliable as there is less variation between SPACs.

## Chapter 3.3 Measuring reverse merger announcement effects

The merger announcement effects are measured by abnormal returns through an event study. Event studies include measuring the effects of a merger announcement on the share price of a particular firm and provide evidence for understanding corporate decisions (Kothari & Warner, 2007).

To measure abnormal returns, a benchmark is needed. There seems not one perfect benchmark in the literature for the SPACs event study as multiple benchmarks are used. Jog and Sun (2007) use the Russell 2000 index, an index that consists of 2000 small-cap stocks, as a benchmark. Lewellen (2009) uses Fama and French factors to depict a monthly portfolio abnormal return after the merger announcement. Lewellen (2009) also uses the Russell 2000 index for their event study like Jog and Sun (2007).

Floros and Sapp (2011) use zero as the benchmark since they assume that shell companies have no operating assets and thus should earn zero returns.

# Chapter 4. Data

In this third chapter, the collected data and the corresponding data transformations performed will be described. The data on the SPACs are retrieved from a database called Spactrax. According to Paige (2021), Spactrax is the leading SPAC research site. The platform does not make investment recommendations but has a lot of valuable data for this research. The data ranges from July 2017 to March 2021 consisting of 851 different SPACs from the United States.

The stock price data on these SPACs is retrieved from WRDS Compustat by matching the SEC CIK code from the Spactrax dataset. This code is the Central Index Key, which is used as a unique identifier with the Security and Exchange Commission of the USA (Security and Exchange Commission of the USA, n.d.). This gave multiple price data on each individual SPAC since there are multiple products linked to a SPAC. This research will only focus on the stock performance, the other products namely, the units, warrants, and rights were manually removed from the dataset by looking at the ticker symbol of the product.

In the following sub-chapters, the data and the required data transformations for each hypothesis will be explained in more detailed followed by a summary of the data.

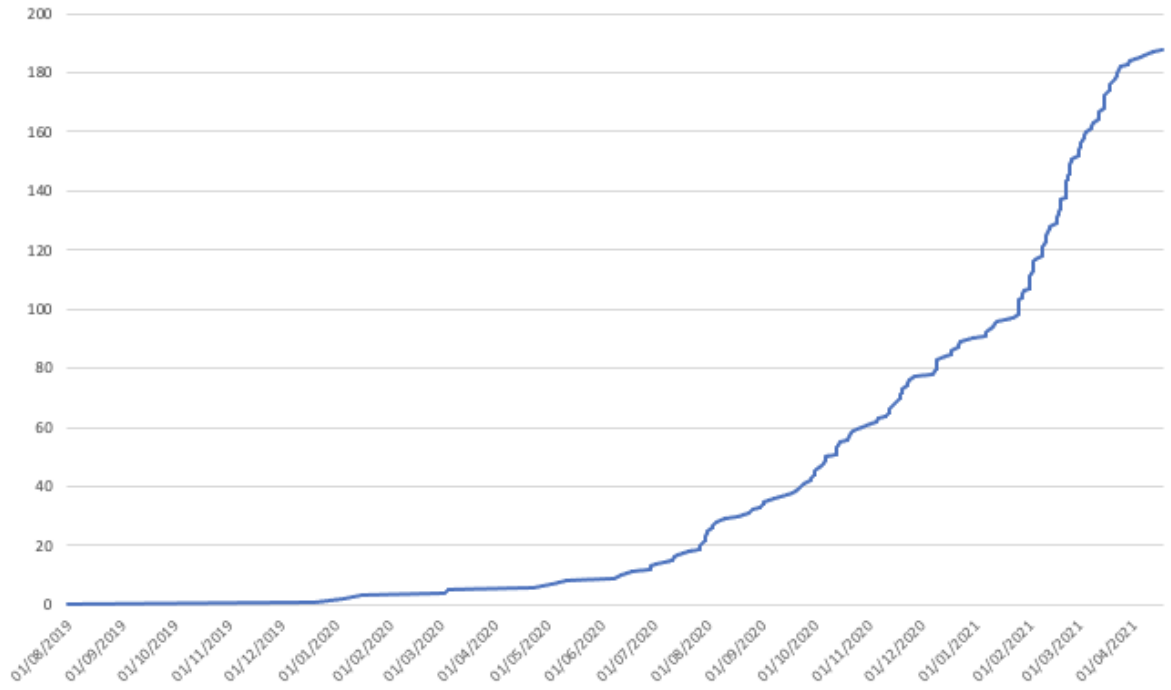
## Chapter 4.1 Hypothesis 1 Event study

The first hypothesis is about two different phases of SPACs. The SPACs that identified a target, and the SPACs that did not identify a target. The descriptive statistics of these two groups can be seen in panel A of Table 1 in the appendix A. A SPAC also can be in the phase of a withdrawn acquisition or a completed acquisition but that is not within the scope of this research. The interest is namely in the merger announcement effects.

Since SPACs do not identify a target at the same date, it is important to include the target announcement date. As can be seen in Figure 2 below, and Table 2 in the appendix A, only till recently, at the start of 2020, SPAC merger announcements were very limited, but they grew immensely.

*Figure 2: Descriptive statistics sum of SPAC announcements*

This graph plots the total amount of SPACs that announced a target within the dataset over the range of the dataset. The x-axis displays the dates, and the y-axis displays the total number of announcements of the dataset.




The Spactrax dataset did not include the merger announcement dates but included a variable on which SPACs identified a target. This allowed collecting the announcement dates more efficiently manually by searching each separate deal. The Factiva database was very limited in providing this information, resulting in the need to look up these dates in articles on financial websites. The announcement dates were retrieved by looking on the website of the sponsor and at articles on Bloomberg, Businessweek and Yahoo Finance. Each date was validated by comparing the dates stated in multiple articles and requiring an exact match of the announcement date.

The data on the daily stock prices of the SPACs to determine the returns are retrieved from WRDS Compustat by matching the SIC CIK codes from the Spactrax dataset. Matching on the ticker symbol was not reliable since, after the reverse merger, the ticker symbol will almost certainly change. As already stated above the retrieved data from WRDS Compustat had also information on each SPAC their other trading products which were deleted manually.

Since the data consists of spot stock prices, the return will be calculated by setting the individual companies as daily panel data and calculating the return for the individual companies

based on the spot stock prices following the close-to-close or daily total return methodology as described in the Formula 1 below.

(1) $Return_t = (Price_t - Price_{t-1})/Price_{t-1}$

Where $Return_t$ – returns on the date t;

$Price_t$ - closing price on date t;

$Price_{t-1}$ – closing price on date t-1.

To combine these two datasets, matching based on the SIC CIK code took place. This resulted in one dataset including the different SPACs and the corresponding prices for each date.

Multiple benchmarks will be used during the event study as the literature till this point suggests not one perfect benchmark. Four benchmarks will be used. For the zero benchmark, no additional data or data transformation is needed. For the average return benchmark, the average return of all the SPACs that did not identify a target during a date is calculated.

For the Russell 2000 index and Fama-French three factor benchmark additional data is needed.

The daily price data of the Russell 2000 index is downloaded from Yahoo Finance and will follow the close-to-close or daily total return methodology for their return as described in Formula 1. These daily returns are then merged into the existing dataset on their dates. In Figure 3 in Appendix A, both the price and the return of the Russell 2000 Index can be found.

The Fama-French three factors are retrieved from the website of French. Since the SPACs from this dataset are American, the American factors will be used and are merged with the existing dataset based on their date.

## Chapter 4.2 Hypothesis 2 OLS regression

The second hypothesis is on the effect of high sentiment on the merger announcement effect and is tested through five variables which are all discussed below. The descriptive statistics can be found in panel B of Table 1 in the appendix A.

The first three variables, have information on the sponsor. Spactrack is the database that includes multiple information on the sponsor that could raise the sentiment for an investor. Both whether the sponsor included a ‘famous/well-known’ individual in the team and if the

sponsor has experience by having achieved a completed merger with a SPAC prior to the deal were used for this hypothesis.

The famous/well-known filter on spactrack.net is described as having a prominent/recognizable founder or sponsor group. Whenever the SPAC that identified a target from the former dataset matches one of the 'well-known sponsor' SPACs it was given a value of 1.

The completion of a SPAC merger prior to announcing was added in two steps. Since some of the sponsors had completed more than just one deal prior to announcing a deal from our dataset the total number of completed SPAC mergers prior to a deal is noted. Additionally, a dummy is made if the sponsor completed any merger prior to announcing independently if that is more than 1.

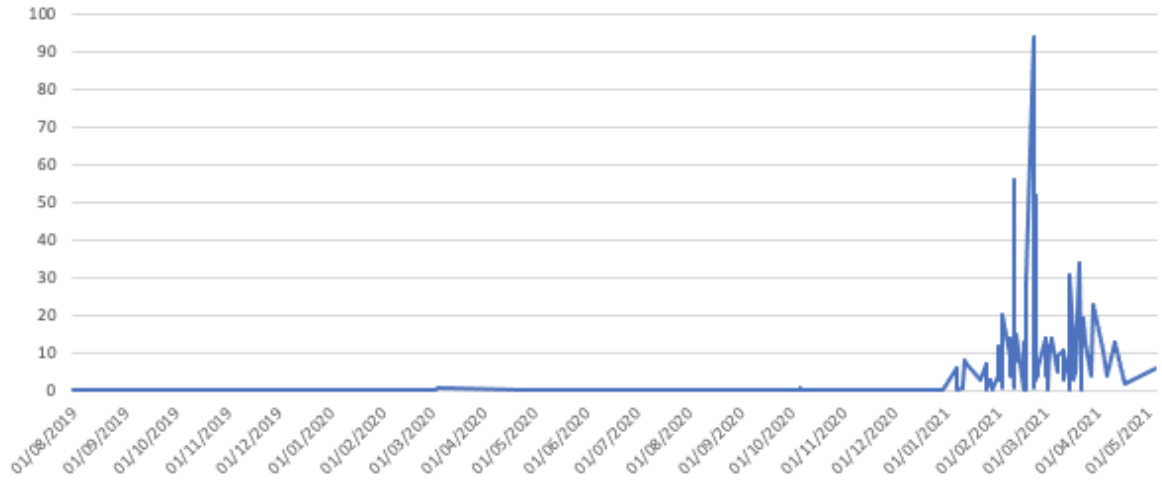
For the fourth variable on the effect of high sentiment on the abnormal returns of a merger announcement effect, a test with the amount of media coverage will be performed. The Factiva database is consulted to manually retrieve the amount of attention regarding a deal. Factiva is an information collection tool where different news sources from over the world come together.

A relatively wide time frame of thirty days prior to the merger announcement is used to look at the media attention regarding the merger announcement. During the merger announcement, the news becomes public for the whole world. This measure range of thirty days prior to the announcement thus implies that there was already focus on the SPAC due to rumors. The media attention was counted by looking up multiple search terms in this time frame viz the SPAC name, SPAC ticker, and the target company name numbering a variable of the number of articles on each separate deal.

In Figure 5 below can be seen that SPACs got more and more media attention during the last couple of months, in other words since the start of 2021. The media attention regarding a deal before this point was very limited in the earlier target announcement dates of the dataset.

*Figure 5: Factiva attention over the range of time of the dataset*

This graph plots the media coverage prior to announcing the merger by the SPAC according to Factiva over the range of the dataset. The x-axis displays the dates, and the y-axis displays the number of articles that discuss the SPAC prior to the announcement.




The fifth variable that will be regressed is the Index of Consumer Sentiment (Hereafter: ICS). The consumer sentiment is being indexed by Michigan University on a monthly basis. These index scores are valued on five questions (University of Michigan, n.d.).

The index scores were matched with the announcement date's month. In Figure 6 in the Appendix A, the index scores per announcement date are plotted.

## Chapter 3.3 Hypothesis 3 OLS regression

The third hypothesis is divided into two sub-hypotheses. These hypotheses are about the time between the Initial Public Offering (hereafter: IPO) and the merger announcement relative to the available time for the SPAC to find a target to merge with.

The Spactrax dataset included most of the IPO dates but had some missing dates. These missing dates were retrieved manually via SEC.GOV where the S-1 prospectus is filed that stated the IPO date. As previously noted, the merger announcement dates were manually added to the dataset. A variable stored the calculated value of the difference in months between these two dates, providing insight in the time past before a merger announcement occurred.

The Spactrax dataset also included information on the initial term and the possible extension in months. Again, some information was missing so these were manually added by retrieving the initial term and possible extension via the S-1 prospectus. Since assumed that an investor of a SPAC will always vote in favor of the extension so that their stock keeps the option to a

reverse merger, a variable that includes the sum of the initial term and the extension gives insight into the months a SPAC has before their due date.

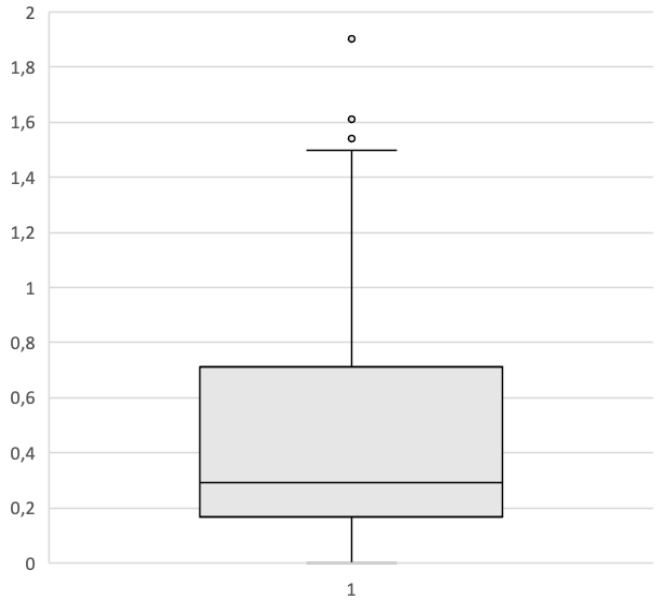
Table 3 in the Appendix A shows that not all SPACs have the same duration before they need to finish their goal to find an appropriate target. That is why ratios of the months between the IPO date and the target announcement date, and the initial term plus the possible extension are made. These ratios allow this research to assess the relative past time to compare the different SPACs. The descriptive statistics for the ratios can be found in panel B of Table 1 in Appendix A.

In Table 3 in Appendix A, there also is a clear view of the number of SPACs that announce a deal after their predetermined period, as those cells are marked. Although according to their S-1 prospectus, liquidation should have taken place after this predetermined period, this did not happen. All these SPACs were manually checked for mistakes in the data and were approved as correct. Shareholders voted for the extension of the SPAC instead of liquidation either once or multiple times for a limited period of a few months.

As can be seen in the boxplot in Figure 7 below, there are some outliers based on the ratios. All those outliers were checked manually and approved as correct values. Since these values are correct and could influence the results, it was decided to keep the outliers in the dataset in order to achieve a correct reflection of reality.

*Figure 7: Boxplot of ratio SPACs*

This graph plots the ratio values in a boxplot. The ratio is based on the months passed after IPO during the announcement date and the predefined period. The y-axis displays the ratio values. When the value is above 1, this means that the SPAC extended their duration and did not liquidate. The dots are three outliers according to Excel and have been checked manually together with every value above 1.




# Chapter 5. Methodology

In this chapter, the methodology to test the different hypotheses will be discussed. For the first hypothesis, an event study is conducted to estimate the CARs for several time frames, followed by Ordinary Least Squares (Hereafter: OLS) regressions for the second hypothesis and the third hypothesis.

## Chapter 5.1 Hypothesis 1 Event study

The interest of this hypothesis lies in the short-term stock price reaction to the merger announcement. According to Ding, Lam, Cheng & Zhou (2018), the most widely used tool to quantify the impact of a specific event on a firm's shareholders value is the short-term event study method that is grounded in the Efficient Market Hypothesis. The Efficient Market Hypothesis assumes that new information will be incorporated in the price as soon as the market gets the news. Since merger announcements are assumed to be a surprise event there should be a detectable abnormal return (MacKinley, 1997).

This possible sudden effect after the merger announcement on the stock price can be noted as an excess return or abnormal return. The event study methodology that will be followed is from Brown & Warner (1985) as this approach studies stock returns for a sample of corporations, or in this study SPACs, that all experience a merger announcement at different points in time (Khotari and Warner, 2007)

The simple regression formula is:

(2) $Abnormal\ return_{it} = Realized\ return_{it} - Expected\ return_{jt}$

Where $Abnormal\ return_{it}$ – Abnormal return for SPAC i on the date t;

$Realized\ return_{it}$ – Realized return of SPAC i on date t;

$Expected\ return_{jt}$ – Expected return according to benchmark j on date t.

The event study will be conducted for several event windows, where the abnormal returns will be cumulated, namely the three-day (-1;1), five-day (-2;2), and eleven-day (-5;5) CARs where t=0 is the merger announcement date. These different event windows are chosen since our interest is in the short term and the market can react inefficiently to news (Panagiotaki, 2015).

The estimation window will be neglected if the estimation window misses the SPAC merger announcement. This is because a lot of the SPACs from the dataset have a very limited possible estimation window since the time passed between IPO and announcement as can be seen in Table 3 in Appendix A.

As discussed before four different benchmarks are used in the event study, namely the Russel 2000 index benchmark, the zero benchmark, the SPAC without target benchmark, and the Fama-French three factor benchmark.

For the first event study, the Russell 2000 index is used to calculate the benchmark. The formula for the abnormal return for SPAC i at time t is displayed below.

(3) $Abnormal\ return_{it} = Realized\ return_{it} - Return\ Russell\ 2000\ Index_t$

Where $Abnormal\ return_{it}$ – Abnormal return for SPAC i on the date t;

$Realized\ return_{it}$ – Realized return of SPAC i on date t;

$Return\ Russell\ 2000\ Index_t$ – Return Russell 2000 index on date t.

For the second event study, ‘zero’ is used as a benchmark meaning that each return for the SPAC is said to be abnormal. The formula for the abnormal return for SPAC i at time t is displayed below.

(4) $Abnormal\ return_{it} = Realized\ return_{it}$

Where $Abnormal\ return_{it}$ – Abnormal return for SPAC i on the date t;

$Realized\ return_{it}$ – Realized return of SPAC i on date t.

For the third event study, a new benchmark is used that has not been used in literature before, the average return, at time t, of the SPACs that did not identify a target is used. As stated in chapter 2.1 the net proceeds of the SPAC their IPO are placed in an escrow account and invested in low-risk securities. By taking the average of SPAC returns that do not have a target at a certain date, and thus are assumed to have no additional returns except the return of the low-risk securities their effect on the SPAC stock, it is expected to be a good additional benchmark.

The formula for the abnormal return for SPAC i at time t is displayed below.

(5) $Abnormal\ return_{it} = Realized\ return_{it} - Average\ return\ SPACs\ without\ target_t$

Where $Abnormal\ return_{it}$ – Abnormal return for SPAC i on the date t;

$Realized\ return_{it}$ – Realized return of SPAC i on date t;

$Average\ return\ SPACs\ without\ target_t$ – Average return of the SPACs without a target on date t.

For the fourth event study, the Fama and French three factors are used to depict the abnormal returns. The formula for the abnormal return for SPAC i at time t is displayed below.

(6) $Abnormal\ return_{it} = Realized\ return_{it} - (rf_t + \beta 1 \cdot (rmkt_t - rf_t) + \beta 2 \cdot SMB_t + \beta 3 \cdot HML_t)$

Where $Abnormal\ return_{it}$ – Abnormal return for SPAC i on the date t;

$Realised\ return_{it}$ – Realized return of SPAC i on date t;

$rf_t$ – Risk free rate on date t;

$(rmkt_t - rf_t)$ – Excess market return on date t;

$SMB_t$ – Small-Minus-Big market capitalization on date t;

$HML_t$ – High-Minus-Low market-to-book ratio on date t.

Once the abnormal returns are calculated the cumulative abnormal returns for each window can be calculated by taking the sum of the abnormal returns within the time window. These abnormal effects are per SPAC. By taking the mean of the cumulative abnormal returns all the SPACs that identified a target their cumulative abnormal returns are taken together which gives a good estimate for the rejection or acceptance of the hypothesis. This treats all the events for the different SPACs as a group and makes it able to test the significance with robust standard errors. The significance rate is calculated by testing if the CARs are significantly different from the value of zero. To control for time variance the methodology of Correia (2016) is followed by absorbing the yearly fixed effects.

The hypothesis will be tested by researching the significance rate, sign, and magnitude of the cumulative abnormal returns.

## Chapter 5.2 Hypothesis 2 OLS regression

For the second hypothesis, an analysis of four variables through the performance of OLS regressions is conducted to measure the effect of sentiment on the cumulative abnormal returns. These regression models describe the causal relationship of the independent sentimental variables on the dependent variable CARs. To control for time variance the methodology of Correia (2016) is followed by absorbing the yearly fixed effects.

The following continuous and dummy variables are added to the regression to analyze the effect of different sentimental factors on the cumulative abnormal returns: famous/well-known sponsor, completed SPAC mergers before the announcement, dummy of completed SPAC mergers before the announcement, index of consumer sentiment and Factiva news articles. For a more in-depth review of what the variables mean reference is made to chapter 4.2. Since both the completed SPAC mergers and the Factiva variable is skewed, I will regress the log of 1 + the values of the variables.

Cumulative abnormal returns are based on the four benchmarks j from the event study and thus can yield different results for each benchmark.

This results in the following regression formulas:

(7) $Cumulative\ abnormal\ return_{ije} = a + \beta 1 \cdot Dummy\ famous/well\text{-}known_i + \varepsilon$

(8) $Cumulative\ abnormal\ return_{ije} = a + \beta 1 \cdot Log\ (1 + Completed\ SPAC\ mergers_i) + \varepsilon$

(9) $Cumulative\ abnormal\ return_{ije} = a + \beta 1 \cdot Dummy\ completed\ SPAC\ mergers_i + \varepsilon$

(10) $Cumulative\ abnormal\ return_{ije} = a + \beta 1 \cdot Index\ of\ Consumer\ Sentiment_i + \varepsilon$

(11) $Cumulative\ abnormal\ return_{ije} = a + \beta 1 \cdot Log\ (1 + Factiva_i) + \varepsilon$

Finally, all factors are combined in two final regressions, which is as follows:

(12) $Cumulative\ abnormal\ return_{ije} = a + \beta 1 \cdot Dummy\ famous/well\text{-}known_i + \beta 2 \cdot Log\ (1 + Completed\ SPAC\ mergers_i) + \beta 3 \cdot Index\ of\ Consumer\ Sentiment_i + \beta 4 \cdot Log\ (1 + Factiva_i) + \varepsilon$

(13) $Cumulative\ abnormal\ return_{ije} = a + \beta 1 \cdot Dummy\ famous/well\text{-}known_i + \beta 2 \cdot Dummy\ completed\ SPAC\ mergers_i + \beta 3 \cdot Index\ of\ Consumer\ Sentiment_i + \beta 4 \cdot Log\ (1 + Factiva_i) + \varepsilon$

Where $Cumulative\ abnormal\ return_{ij}$ – Cumulative abnormal return for SPAC i, benchmark j and event window e;

$Dummy\ famous/well\text{-}known_i$ – Dummy famous/well-known sponsor member for SPAC i;

$Completed\ SPAC\ mergers_i$ – Number of completed SPAC mergers by sponsor of SPAC i;

$Dummy\ completed\ SPAC\ mergers_i$ – Dummy of completed SPAC mergers by sponsor of SPAC i;

$Index\ of\ Consumer\ Sentiment_i$ – Score of Index of Consumer Sentiment at SPAC announcement date of SPAC i;

$Factiva_i$ – Number of media coverage according to Factiva on SPAC i.

## Chapter 5.3 Hypothesis 3 OLS regression

For the third hypothesis, also an analysis through the performance of OLS regression is performed to measure the effect of the different sentimental factors on the cumulative abnormal returns. To control for time variance the methodology of Correia (2016) is followed by absorbing the yearly fixed effects.

As explained in the theoretical framework the expected relation between ratio and cumulative abnormal return is a concave parabola. To estimate the different parameters for this parabola a quadratic function based on the ratio is set up as displayed in the regression formula below.

CARs are based on the four benchmarks j and event windows e from the event study and thus can yield different results for each benchmark and event window.

This results in the following regression formula:

$$(14)\ Cumulative\ abnormal\ return_{ije} = a + \beta 1 \cdot Ratio_i + \beta 1 \cdot Ratio^2_i + \varepsilon$$

Where $Cumulative\ abnormal\ return_{ij}$ – Cumulative abnormal return for SPAC i, benchmark j and event window e;

$Ratio_i$ – Ratio of SPAC i;

$Ratio^2_i$ – Squared ratio of SPAC i.

# Chapter 6. Results

In this chapter the results of the explained methodology of the previous chapter will be discussed per hypothesis, resulting in three sub-chapters about the event study, the sentimental OLS regressions, and the ratio OLS regression.

## Chapter 6.1 Hypothesis 1 Event study

For the first hypothesis, an event study is conducted with four different benchmarks and three different event windows to analyze whether SPACs that identified a SPAC outperform those that do not. In Table 4 in Appendix B the cumulative abnormal returns are noted. As can be seen, the market believes that announcing a merger raises the value of the SPAC, having multiple benchmarks and event windows that show a similar highly significant effect of

approximately 9% following a reclassification from ‘No target’ to ‘Target found’. This means that the first hypothesis is accepted.

Firstly, the Russell 2000 Index. As can be seen in Figure 3 in Appendix A, there is a lot of fluctuation happening in the returns of the Russell 2000 Index which influence the obtained abnormal returns. This could be the reason that this benchmark makes the most conservative prediction of the CARs. For the second benchmark being the zero benchmark, there are no fluctuations in the benchmark as it is constant. However, the expectation was that this benchmark would estimate the largest CARs but the new benchmark that was calculated by taking the SPACs without a target their average return at a certain date yielded higher CARs for each event window, meaning that SPACs without target yielded negative returns on dates where SPACs with a target yielded positive returns, resulting in higher CARs. The Fama-French benchmark shows similar results, but the new benchmark is expected to be a closer prediction to a normal return for a SPAC since it is a non-operating company and thus the Fama-French factors have limited explanatory power in the regression model.

The announcement effect is different from both Fuller, Netter and Stegemoller (2002) and Lewellen (2009) since they find a cumulative abnormal return of approximately 2.1% in the five days surrounding the announcement (-5;5). Lewellen (2009) makes use of the Russell 2000 index as a benchmark, for their measuring of the abnormal returns of the SPAC announcements, which limits the difference just slightly if compared to the conducted event study of this research. The difference between both studies remains impressive even in the most conservative valuation of the abnormal effects with the Russell 2000 index as a benchmark.

Another major difference between Lewellen (2009) and this research is interesting to see that most of the returns earned during a reclassification occur almost instantly during the announcement as can be seen in Figures 8 and 9 and Tables 5 and 6 in appendix B, while for the returns from Lewellen (2009) most of the returns do not occur immediately. This can be explained by the different periods the research has been done. Lewellen (2009) uses a dataset ranging from 2003-2008 while this research uses data ranging from 2017-2021. This difference in period has some fundamental differences that could influence the speed of the gained CARs surrounding a merger announcement. News reaches investors sooner, through the ability to be constantly online, and the ability to quickly respond to this news, through online brokers offering mobile applications where one can buy a stock with one click.

## Chapter 6.2 Hypothesis 2 OLS regression

To test the second hypothesis multiple OLS regressions were performed for the four different benchmarks and three different event windows. The results of those regressions are displayed in Tables 7 till 10 in Appendix B. The different benchmark and event windows show similar results but with some minor differences in some significance rates, signs, and magnitudes where the important differences will be pointed out per variable.

The first model that estimates the effect of having a sponsor with a famous or well-known member on the CARs shows a non-significant negative effect, which implies that the market does not give an expected higher valuation to sponsors with a famous/well-known team member but that the valuation of a proposed merger is more affected by other factors. Having a team member with fame as a sponsor is not helpful in this stage and situation of the SPAC but could be in other situations or during an IPO for instance. As can be seen in Table 4 in the appendix B, almost a fourth of all the SPACs that identified a target had a famous or well-known team member in the sponsor. If the fame of this member does not influence the CARs surrounding the merger announcement their use should come from somewhere else.

The second and third model estimates the experience of the SPAC sponsor. The counted SPAC mergers completed before announcing the specific deal have a non-significant mixed effect that is sometimes negative but most often positive. The same effect is observable for the dummy for completed SPAC mergers. This was surprising as sponsors rely on their reputation to gain trust from investors. Having completed more SPAC deals before announcing another proposed deal would increase this trust, but apparently, this does not affect the CARs surrounding the merger announcement. This could mean that once a merger is announced investors are not just blindly trusting the sponsor anymore but look more into deal-specific factors regarding the target.

From these results, it can be derived that high sentiment on the view of the sponsor of a SPAC does not have any significant effect on the obtained CARs surrounding a SPAC merger announcement.

For the fourth model, the counted articles on Factiva before a specific SPAC deal were regressed as independent variables against the different obtained CARs as dependent variables.

There was a small negative effect observed which was not significant. The negative effect was not what was expected since Engelberg and Parsons (2011) find that media coverage improves

the buy and sell-side, but significantly influences the buy-side more. The effect found was however the opposite direction to their results and not significant as described above. This could be explained due to no classification of the contents of the articles, that could be in favor or against the SPAC deal. Therefore, the second sub hypothesis is rejected as well.

For the fifth model, the Index of Consumer Sentiment is regressed as an independent variable against the different CARs as a dependent variable. The effect on its own is not significant except for the Fama-French benchmark for the three- and eleven-day event windows. The effect found is negative and when this variable is combined in the regression with all the independent sentimental variables it becomes significant at either the 5% or 10% significance level.

The effect found could be caused by the target companies that are willing to go public through SPAC as described by Kolb and Tykvova (2016). Going public through SPAC is more attractive during volatile markets, usually, when the stock market is volatile, the ICS is also going to be lower (Charoenrook, 2005). When there is a less volatile market, and the index is higher, fewer potential good targets will be wanting to make use of a SPAC to go public and will choose one of the other possibilities as described in chapter 2.3.

This model estimates an effect that is opposite to what was expected, that in combination with the results from the other models results in rejecting the second hypothesis that investors are especially willing to pay for SPACs that identified a target and have high sentiment.

## Chapter 6.3 Hypothesis 3 OLS regression

For the third hypothesis, the expected relation between the independent variable ratio and the dependent variable CARs was a second-order quadratic polynomial. The results of the regression can be seen in Table 11 in Appendix B.

The second-order quadratic polynomial is highly significant at the 1% significance level but shows a relationship that is exactly opposite to what was hypothesized. This becomes more visible when looking at Figure 10 till 21 in Appendix B. The expected relation was a concave parabola, but a valley parabola is found as can be seen in the prediction in the above-stated Figures. These results remain similar over the different benchmarks and event windows, meaning that the out or underperformance of a merger announcement indeed depends on the time relative to the termination of the SPAC but in a different manner than was hypothesized in the sub hypotheses.

What is interesting to see, in the Figures referred to above, is that there is a serious downtrend in the CARs when moving closer to the ratio value of 1 as expected according to hypothesis 3a. When moving further above a ratio of 1, meaning that the SPAC did not follow their initial structure concerning their termination date, the CARs are moving up again.

This can be caused by the new structure implemented around 2010 as described in chapter 2.2. This structure gave shareholders the ability to vote in favor of decisions and still redeem their shares since voting and redemption rights became separate decisions (Gahng, Ritter & Zhang, 2011). Releasing the time pressure of the sponsor towards the end of their predetermined period makes the market believe that the sponsors will pick a more appropriate target resulting in higher CARs after the ratio value of 1 than just before.

Nonetheless the ability to extend the predetermined period is concerning as not all the investors have the same incentives to vote in favor as initial investors receive units and investors at a later stage only receive stock, implying that there could be agency problems between the sponsor and investors of purely the stock of the SPAC.

Hypothesis 3b, can be rejected since SPACs with a relatively low ratio are expected to have the highest CARs. This becomes most clear from the figures stated above and implies that the trust that the sponsor will find an appropriate target relatively soon is well settled among investors.

# Chapter 7. Conclusion & discussion

In this master thesis the following research question was addressed:

*How do takeover announcements impact the short-term stock performance of Special Purpose Acquisition Companies and how do sentiment and time influence this?*

By conducting an event study, with four different benchmarks, on American SPAC data ranging from 2017 till 2021, evidence was found that takeover announcements have a significant positive impact on the stock price that is larger and obtained more immediate compared to previous research on CARs of takeover announcements of SPACs.

This result could be different since in 2010 the structure of SPACs changed resulting in a different phase of SPACs and previous research on CARs of takeover announcements of SPACs is only in the second phase while currently, SPACs are in the third phase.

Another explanation comes from the better connectivity for investors, the news is spreading at a faster speed and investors can execute orders at a faster pace through mobile applications compared to the period of the second phase.

More obvious could be the larger pool of private companies that are willing to go public through SPAC since the pandemic. As described in chapter 2.3, volatile markets make SPACs more attractive for private companies. This could influence the quality of the proposed merger and thus the CARs obtained during the announcement. This can only be tested however in the long run, by finding out whether the long-term performance of the pool of SPACs of our dataset is performing better compared to the known underperformance as described in chapter 3.1.2.

Sentimental factors that commonly influence stock prices in operating companies show little to no significance on the CARs of takeover announcements of SPACs. Having a famous/well-known team member in the sponsor did not influence the CARs significantly. This shows that investors are not more attracted to SPACs with a famous/well-known team member but seem to look more towards other factors. This could imply that as more and more famous/well-known individuals are bounding themselves to a SPAC, it is not helpful for the sponsor to do so as it probably does cost more than what this person is yielding. The sponsor can decide to keep a famous/well-known person on board for different reasons but for more attention to positively influence CARs surrounding merger announcements they should not do so.

An experienced sponsor, defined as one that already completed a SPAC prior to announcing a new proposed merger, also has no significant effect on the CARs. Both as a dummy variable and as a total count of the completed deals. This came as a surprise since the sponsor relies on their reputation to gain trust from investors and completing a SPAC deal is expected to increase this trust. The implication is that investors are not trusting the sponsor blindly on their past performance but are looking at a specific deal to decide if the merger is good. This could show a twofold approach in the trust in a sponsor from investors. At the IPO investors only use the reputation of the sponsor to depict them to invest, but once a merger is announced it seems that the reputation is not as important anymore. In future research, it is interesting what impact this factor of completed SPACs has on the IPO of a SPAC.

More media coverage on Factiva prior to the merger announcement has a small negative effect that was not significant on the CARs and was not as hypothesized. This effect can possibly be

investigated more accurately in future research if the news coverage will be categorized as good news and bad news.

Lastly, there was a different effect obtained for the SPAC stock market compared to the traditional operating companies stock market. There was a negative significant relationship between the CARs and the ICS. Meaning that the lower the index the better the CARs, which could imply that during volatile times with uncertainty, better targets are picked by sponsors or there is a larger pool of companies including better targets compared to less volatile times.

The third hypothesis testing shows some interesting results as there is indeed a significant quadratic relation obtained, but not entirely as expected. Near the ratio value of 1, meaning the end of the predefined period, the CARs are indeed relatively lower as hypothesized. Near the ratio value of 0 and the ratio values above 1, the returns are however higher. Having a ratio above 1 means that the sponsors obtained an (additional) extension of their predefined period from shareholders. These results can thus be explained in two ways. There is either more attention vested on the SPAC again or there is no time pressure anymore that incentivizes the sponsor to propose value-destroying mergers. The possibility to extend comes from structural changes that occurred in 2010 and implies that there is a difference between incentives of initial investors receiving units and later investors that will just receive stock which should be considered before investing in SPACs since this could cause agency problems between the sponsor and the investor.

To conclude the above, there is a significant positive effect obtained by merger announcements that not affected by the sponsor's fame or SPAC experience but are affected negatively by news coverage and the ICS. Furthermore, SPACs without the pressure of time, either due to announcing a merger near the start or due to extending their predefined period are receiving higher CARs than SPACs that are near the end of their predefined period while announcing a merger.

The contribution of this research lies in multiple factors.

First, a different benchmark is created that takes the average return of all the SPACs without a target at a certain date. By comparing the results of this new benchmark with the results of the benchmarks of existing literature the reliability of the event study is of a high value. This new benchmark is closer to the real expected return since all the previous benchmarks in the

literature do not control for the special feature of the SPAC where the net proceeds of the IPO are put in an escrow account invested in minimal risk securities.

Second, this research investigated the merger announcements for the third phase of SPACs, while previous literature only showcases research based on the second phase of SPACs. The third phase event study found a positive CAR like the second phase research, but the positive CAR was significantly greater for the third phase. The difference in magnitude of the CAR could imply that research on the second phase of SPACs might not hold for the third phase of SPACs, but to accept this statement, additional research must be conducted that will compare these two periods for long term performance for instance.

Lastly, this research used ratios for the relative period elapsed to the SPACs total predetermined period according to their S-1 prospectus. Since not all the SPACs have the same predetermined period, using the ratio instead of the absolute months it became reliable to compare all the SPACs to each other. To my best knowledge, this has not been done before, since previous research assumes that each SPAC has the same predetermined period.

This research offers a valuable contribution to existing literature and academics by analyzing third-phase SPAC merger announcements and the factors influencing their CARs.

During the intent to plan a SPAC, the sponsor can make use of these results as well, by not attracting a famous/well-known person to their team that except for a few cases would cost more than yield. Also, the sponsor could make use of the timing of their announcement, to gain larger CARs.

There were some limitations in this research that should be noted to interpret the results appropriately. The Fama-French factors for the benchmark could only be matched on date, since all the SPACs are in the same industry code as being a blank check company. This made estimates from the event study less accurate. However, as the results remain similar for all the four benchmarks, this does not seem like a big implication to interpret the results from the event study.

Furthermore, this research involved SPACs, companies that have no operating assets, and did not have control variables that made the estimations from the OLS regressions less accurate meaning that the conclusions from those results should be interpreted with care.

Also, SPAC IPO investors receive units of multiple products of which the stock is just one product. In this research, only the effect of a merger announcement on the stock price of the SPAC is analyzed, but there could be a certain interaction between the products that could influence the reliability of the effect on the stock price found.

Lastly, the Factiva database showed fewer results on specific deals than what I initially was expecting. This could imply that using the Factiva database is not a good predictor of the amount of attention a specific SPAC deal receives.

As of these limitations above, I would suggest that future research can be done in multiple ways, such as adding deal-specific control variables like size, using another predictor for deal-specific attention like Google trends, using different products of the units sold by a SPAC during IPO or testing the effect of additional factors on the CARs surrounding the merger announcement. One can also extend the research on SPACs on other announcements such as acquisition completion or acquisition withdrawn. More interestingly however would be to test if the long-term performance of SPACs from the third phase shows similar results as the second phase of SPACs. If there is an underperformance for this third phase like there is found for the second phase, could this be influenced by the CEO of the target company, who seems risk-averse by going public through SPAC in volatile times, or do other factors influence this underperformance? Finally, a quick test done on the data of this research shows that when the SPACs are split into a group that extends their predetermined period, so the ratio becomes larger than 1, and a group that does not do this, the completed SPACs variable has a significant impact. This could imply that there is a difference between those groups. This research however is constrained to not test what these differences are and what factors influence the ability to extend their predetermined period.

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# Appendix A: Descriptive statistics

*Figure 3: Price and return of the Russell 2000 Index*

This graph plots the daily price and return of the Russell 2000 Index over the range of the dataset. The primary y-axis displays the price in US dollars while the secondary y-axis displays the return in percentages based on the calculation of formula (1). The x-axis displays the dates.

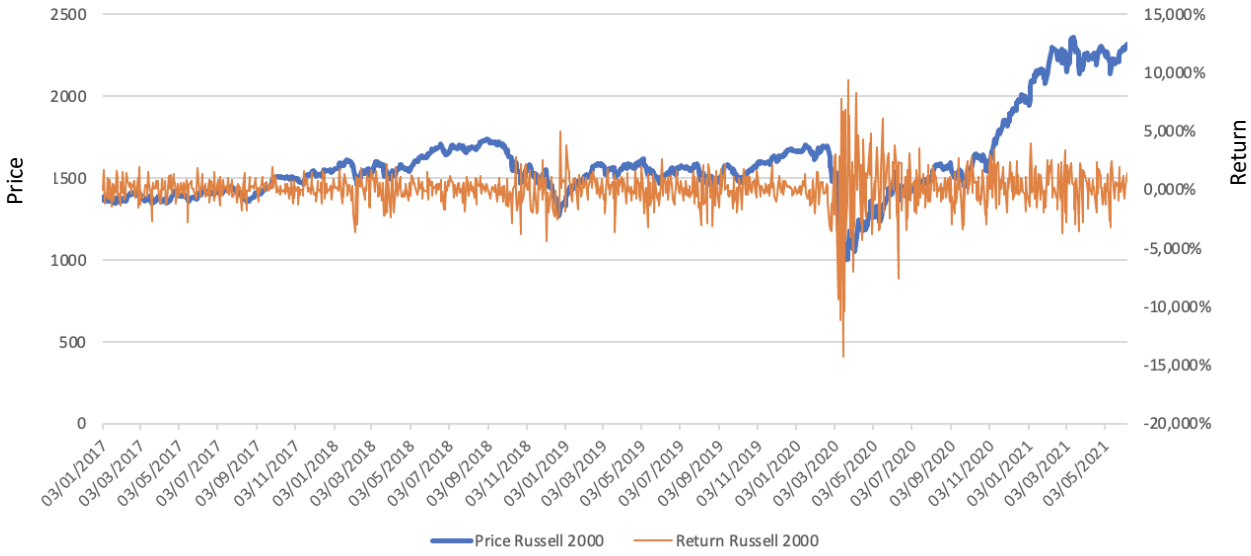


*Figure 4: Descriptive statistics Factiva*

This graph plots the news coverage on a SPAC according to Factiva prior to the announcement. The x-axis displays the number of articles that are discussing an individual SPAC and the y-axis displays the frequency on how many SPACs this occurs.

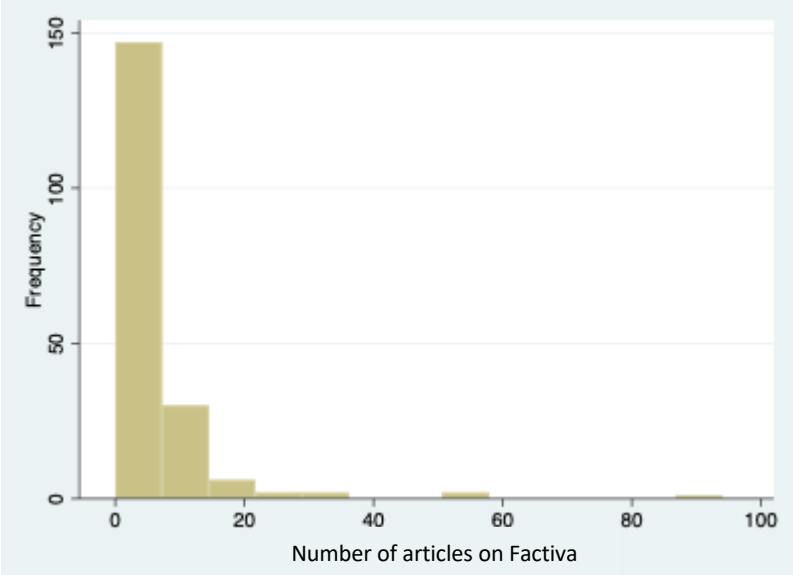

*Figure 6: Index of Consumer Sentiment over the range of time of the dataset*

This graph plots scores of the Index of Consumer Sentiment during all the different announcement dates of the SPACs. The x-axis displays the dates, and the y-axis displays the index scores.

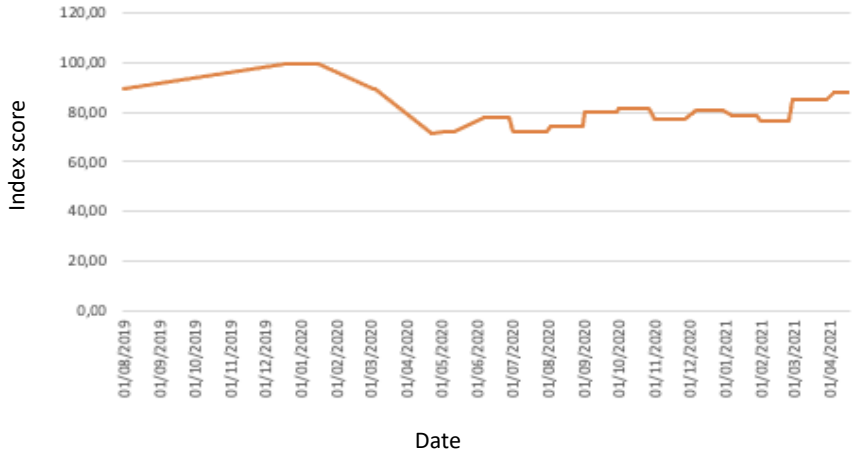

*Table 1: Summary descriptive statistics*

*This table presents descriptive statistics for the main variables used in the analysis. Panel A reports all the SPACs, Panel B reports the variables used for the second and third hypothesis for the group of SPACs that identified a target, all defined in chapter 4.*

| | Frequency | Percent |
|---|---|---|
| *Panel A: All SPACs, N = 851* | | |
| Target identified | 189 | 77.8 |
| Target not identified | 662 | 22.2 |

*Panel B: SPACs with identified target, N = 189*

| | Frequency | Mean | Standard Deviation | Min | First quartile | Median | Third quartile | Max |
|---|---|---|---|---|---|---|---|---|
| Dummy = 1 if sponsor has famous/well-known member | 44 | 0.2328 | 0.4237 | 0 | 0 | 0 | 0 | 1 |
| Completed SPACs | - | 0.2698 | 0.6966 | 0 | 0 | 0 | 0 | 3 |
| Dummy = 1 if Completed SPACs > 0 | 29 | 0.1534 | 0.3614 | 0 | 0 | 0 | 0 | 1 |
| Factiva | - | 4.8624 | 10.2688 | 0 | 0 | 0 | 6 | 94 |
| Index of Consumer Sentiment | - | 79.6700 | 4.7987 | 71.8 | 76.8 | 79.00 | 81.8 | 99.8 |
| Ratio | - | 0.4714 | 0.4085 | 0 | 0.1667 | 0.2917 | 0.7083 | 1.905 |

*Table 2: Descriptive statistics sum of SPAC announcements per IPO year and announcement year*

*This table presents descriptive statistics for the SPACs from this dataset that found their target. Both their IPO year and the year of announcing the merger are observable.*

| | Announcement year | | | |
|---|---|---|---|---|
| | 2019 | 2020 | 2021 | |
| IPO year | | | | Total: |
| 2017 | 0 | 3 | 1 | 4 |
| 2018 | 1 | 21 | 1 | 23 |
| 2019 | 1 | 35 | 10 | 46 |
| 2020 | 0 | 30 | 83 | 113 |
| 2021 | 0 | 0 | 3 | 3 |
| Total: | 2 | 89 | 98 | 189 |

*Table 3: Descriptive statistics total predetermined period and passed months before merger announcement after IPO*

*This table presents descriptive statistics for the two variables used to calculate the ratio values. Both the total term possible as the time passed before announcing the merger are noted in months. Whenever the SPAC has a longer time passed than the total term possible, the cell is marked grey.*

| | Total term possible | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 12 | 18 | 21 | 22 | 24 | 27 | 30 | |
| Months after IPO till the merger announcement | | | | | | | | Total: |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 1 | 0 | 0 | 0 | 1 | 3 | 1 | 0 | 5 |
| 2 | 0 | 1 | 0 | 0 | 12 | 1 | 1 | 15 |
| 3 | 0 | 1 | 1 | 0 | 18 | 2 | 0 | 22 |
| 4 | 0 | 2 | 1 | 0 | 13 | 2 | 0 | 18 |
| 5 | 0 | 3 | 0 | 0 | 17 | 2 | 0 | 22 |
| 6 | 0 | 3 | 1 | 0 | 5 | 1 | 0 | 10 |
| 7 | 0 | 1 | 1 | 0 | 10 | 0 | 0 | 12 |
| 8 | 0 | 2 | 1 | 0 | 3 | 0 | 0 | 6 |
| 9 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 4 |
| 10 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 3 |
| 11 | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 4 |
| 12 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 13 | 0 | 0 | 1 | 0 | 5 | 0 | 0 | 6 |
| 14 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 4 |
| 15 | 0 | 3 | 1 | 0 | 5 | 1 | 0 | 10 |
| 16 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 3 |
| 17 | 0 | 3 | 0 | 0 | 2 | 0 | 0 | 5 |

*Table 3 (Continued): Descriptive statistics total predetermined period and passed months before merger announcement after IPO*

| | Total term possible | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 12 | 18 | 21 | 22 | 24 | 27 | 30 | |
| Months after IPO till the merger announcement | | | | | | | | Total: |
| 18 | 0 | 1 | 1 | 0 | 3 | 0 | 0 | 5 |
| 19 | 0 | 1 | 0 | 0 | 3 | 1 | 0 | 5 |
| 20 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 4 |
| 21 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 |
| 22 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 5 |
| 23 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 4 |
| 24 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 3 |
| 26 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 3 |
| 28 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 29 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| 34 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 36 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 37 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 40 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Total: | 1 | 41 | 15 | 1 | 119 | 11 | 1 | 189 |

# Appendix B: Results

*Figure 8: Abnormal Return per day per benchmark from event study*

*This graph plots the Abnormal Return per day per benchmark from the event study. The Abnormal Return is calculated using four different benchmarks where each benchmark has their own line. Each Abnormal Return for the day ranging from -5 to 5 are observable, where t=0 is the announcement date. The x-axis displays the different days and y-axis displays the Abnormal Return in percentages.*

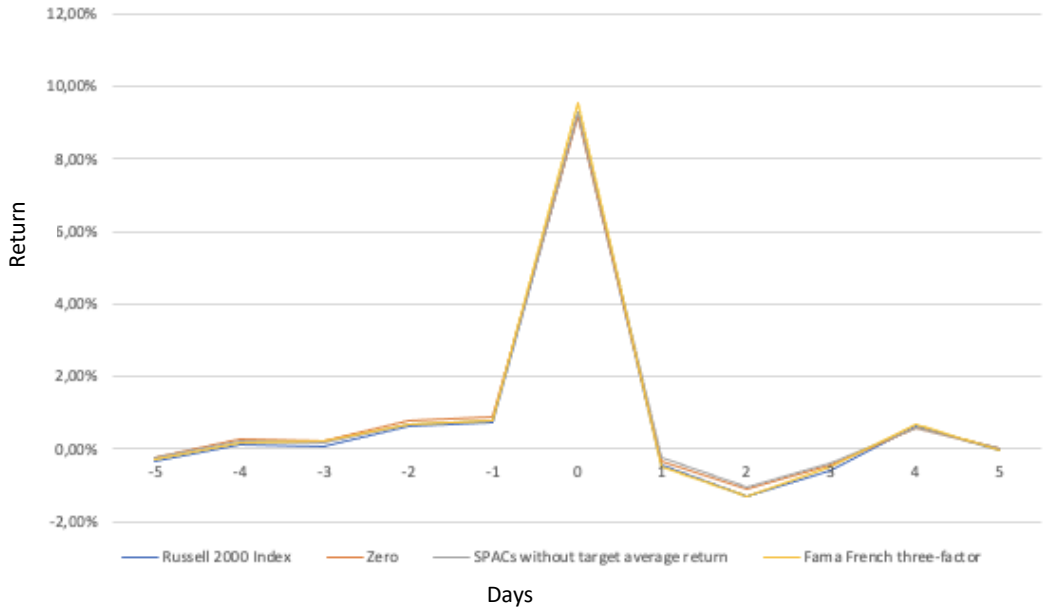


*Figure 9: Cumulative Abnormal Return per day per benchmark from event study*

*This graph plots the Cumulative Abnormal Return per day per benchmark from the event study. The Cumulative Abnormal Return is calculated using four different benchmarks where each benchmark has their own line. Each Cumulative Abnormal Return for the day ranging from -5 to 5 is observable, where t=0 is the announcement date. The x-axis displays the different days and y-axis displays the Cumulative Abnormal Return in percentages.*

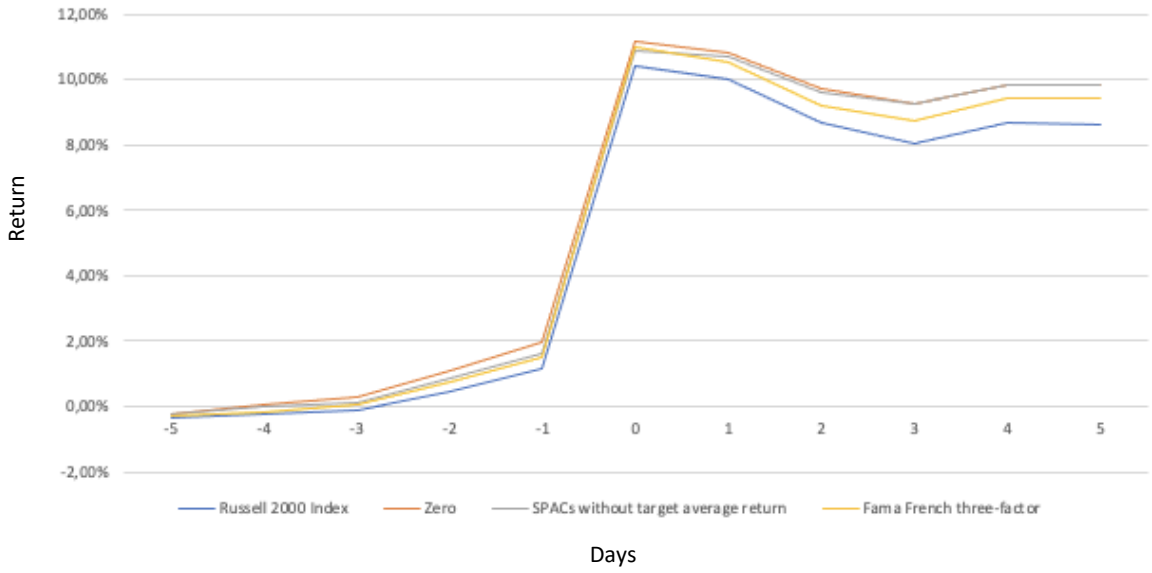

*Figure 10: Linear prediction CARs (-1;1) and ratio for Russell 2000 Index benchmark*

*This graph plots the three-day (-1;1) Cumulative Abnormal Return of the individual SPACs, where t=0 is the announcement date derived from the event study using the Russell 2000 Index as the benchmark. The plotted line is the estimation of the regression model (14) as described in chapter 4.3. of per day per benchmark from the event study. The x-axis displays the ratio values and y-axis displays the Cumulative Abnormal Return in decimals.*

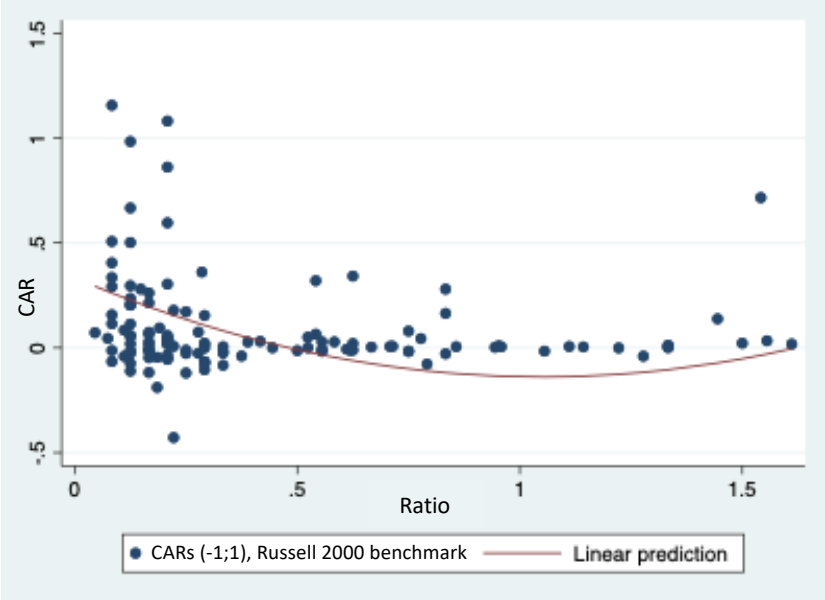


*Figure 11: Linear prediction CARs (-2;2) and ratio for Russell 2000 Index benchmark*

*This graph plots the five-day (-2;2) Cumulative Abnormal Return of the individual SPACs, where t=0 is the announcement date derived from the event study using the Russell 2000 Index as the benchmark. The plotted line is the estimation of the regression model (14) as described in chapter 4.3. of per day per benchmark from the event study. The x-axis displays the ratio values and y-axis displays the Cumulative Abnormal Return in decimals.*

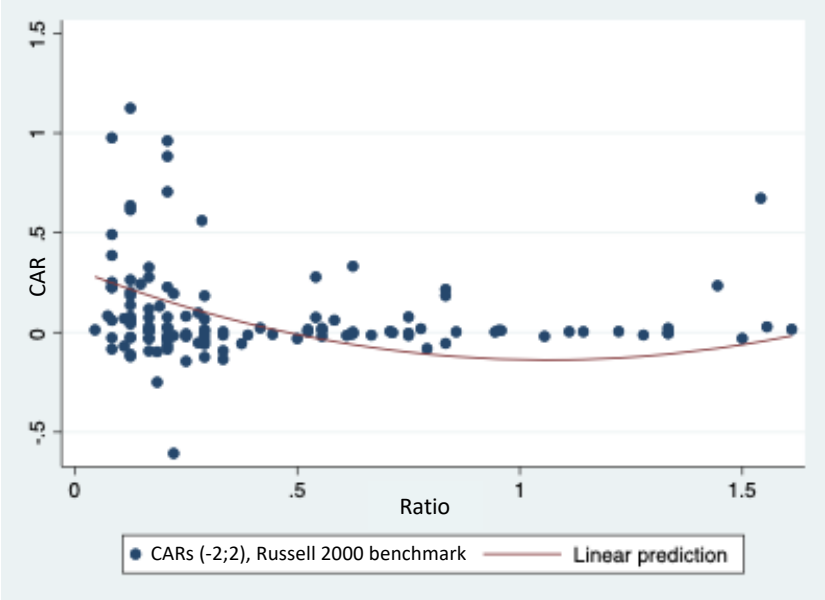

*Figure 12: Linear prediction CARs (-5;5) and ratio for Russell 2000 Index benchmark*

*This graph plots the eleven-day (-5;5) Cumulative Abnormal Return of the individual SPACs, where t=0 is the announcement date derived from the event study using the Russell 2000 Index as the benchmark. The plotted line is the estimation of the regression model (14) as described in chapter 4.3. of per day per benchmark from the event study. The x-axis displays the ratio values and y-axis displays the Cumulative Abnormal Return in decimals.*

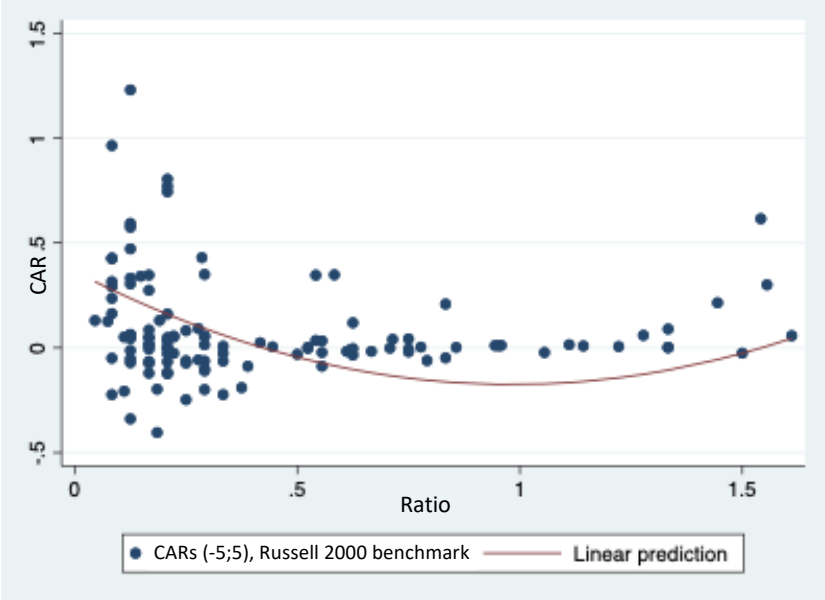


*Figure 13: Linear prediction CARs (-1;1) and ratio for zero benchmark*

*This graph plots the three-day (-1;1) Cumulative Abnormal Return of the individual SPACs, where t=0 is the announcement date derived from the event study using Zero as the benchmark. The plotted line is the estimation of the regression model (14) as described in chapter 4.3. of per day per benchmark from the event study. The x-axis displays the ratio values and y-axis displays the Cumulative Abnormal Return in decimals.*

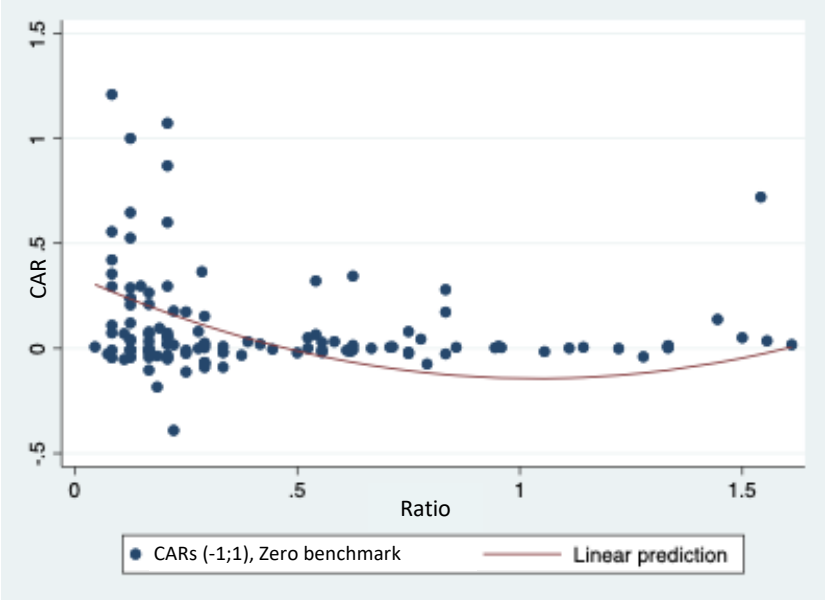

*Figure 14: Linear prediction CARs (-2;2) and ratio for zero benchmark*

*This graph plots the five-day (-2;2) Cumulative Abnormal Return of the individual SPACs, where t=0 is the announcement date derived from the event study using Zero as the benchmark. The plotted line is the estimation of the regression model (14) as described in chapter 4.3. of per day per benchmark from the event study. The x-axis displays the ratio values and y-axis displays the Cumulative Abnormal Return in decimals.*

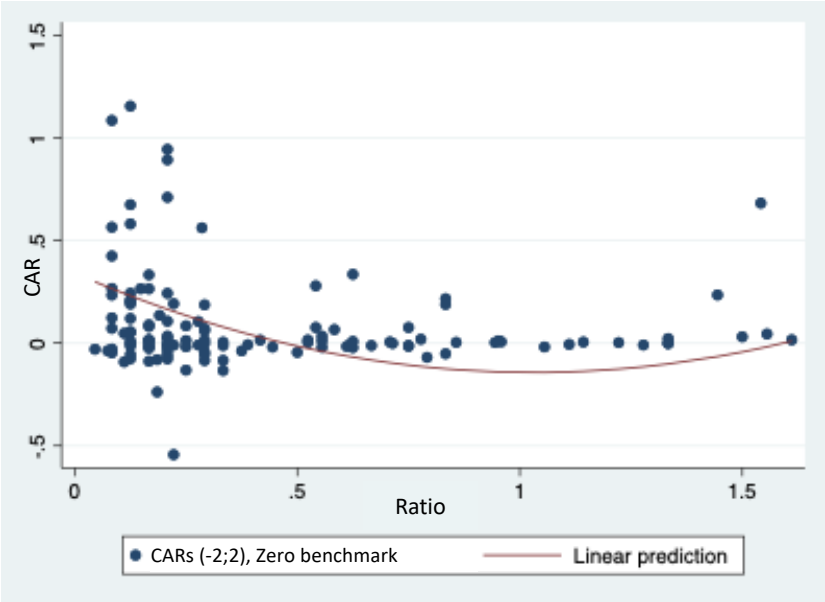


*Figure 15: Linear prediction CARs (-5;5) and ratio for zero benchmark*

*This graph plots the eleven-day (-5;5) Cumulative Abnormal Return of the individual SPACs, where t=0 is the announcement date derived from the event study using Zero as the benchmark. The plotted line is the estimation of the regression model (14) as described in chapter 4.3. of per day per benchmark from the event study. The x-axis displays the ratio values and y-axis displays the Cumulative Abnormal Return in decimals.*

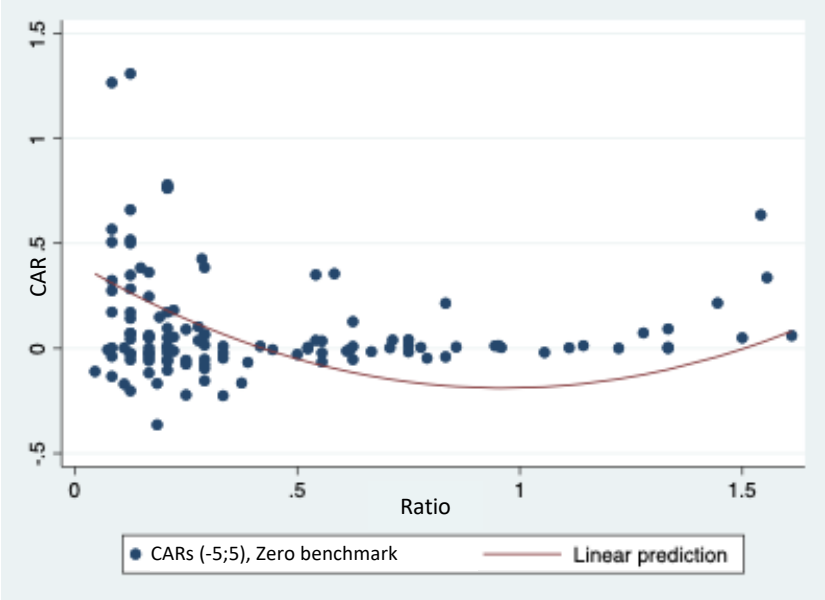

*Figure 16: Linear prediction CARs (-1;1) and ratio for average return SPACs without target benchmark*

*This graph plots the three-day (-1;1) Cumulative Abnormal Return of the individual SPACs, where t=0 is the announcement date derived from the event study using the Average Return of the SPACs without a target as the benchmark. The plotted line is the estimation of the regression model (14) as described in chapter 4.3. of per day per benchmark from the event study. The x-axis displays the ratio values and y-axis displays the Cumulative Abnormal Return in decimals.*

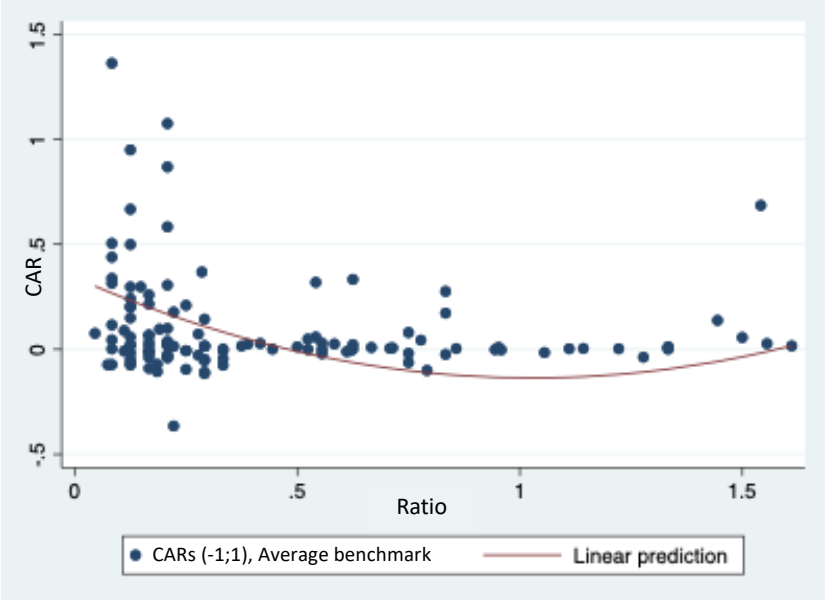


*Figure 17: Linear prediction CARs (-2;2) and ratio for average return SPACs without target benchmark*

*This graph plots the five-day (-2;2) Cumulative Abnormal Return of the individual SPACs, where t=0 is the announcement date derived from the event study using the Average Return of the SPACs without a target as the benchmark. The plotted line is the estimation of the regression model (14) as described in chapter 4.3. of per day per benchmark from the event study. The x-axis displays the ratio values and y-axis displays the Cumulative Abnormal Return in decimals.*

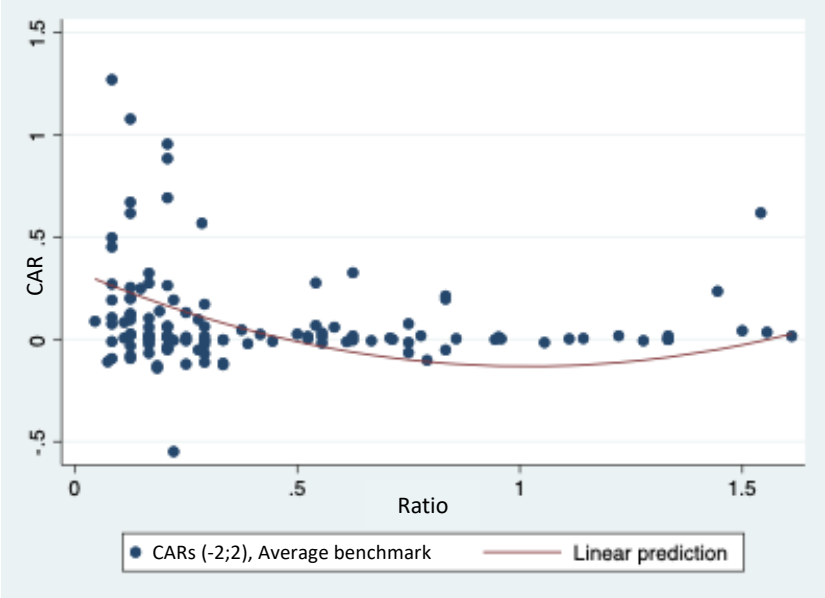

*Figure 18: Linear prediction CARs (-5;5) and ratio for average return SPACs without target benchmark*

*This graph plots the eleven-day (-5;5) Cumulative Abnormal Return of the individual SPACs, where t=0 is the announcement date derived from the event study using the Average Return of the SPACs without a target as the benchmark. The plotted line is the estimation of the regression model (14) as described in chapter 4.3. of per day per benchmark from the event study. The x-axis displays the ratio values and y-axis displays the Cumulative Abnormal Return in decimals.*

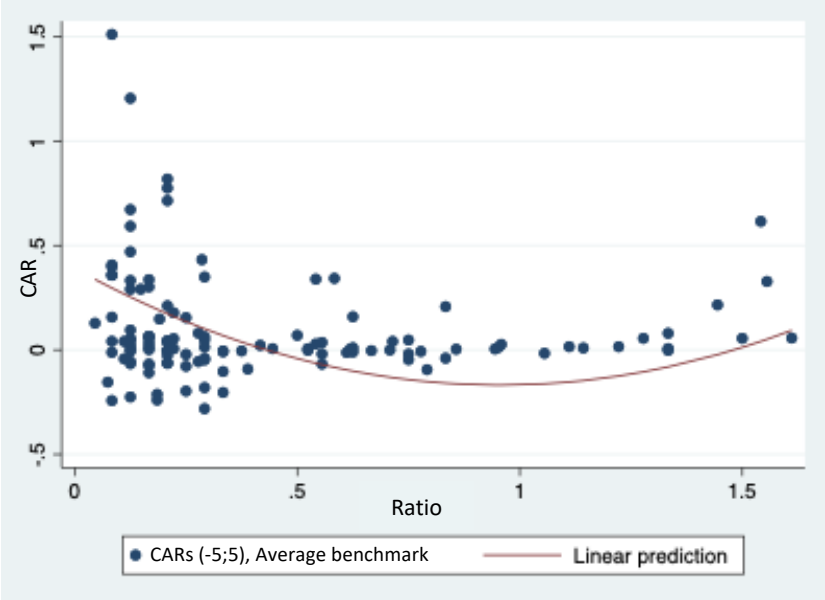


*Figure 19: Linear prediction CARs (-1;1) and ratio for Fama-French Three Factor benchmark*

*This graph plots the three-day (-1;1) Cumulative Abnormal Return of the individual SPACs, where t=0 is the announcement date derived from the event study using the Fama-French Three Factor model as the benchmark. The plotted line is the estimation of the regression model (14) as described in chapter 4.3. of per day per benchmark from the event study. The x-axis displays the ratio values and y-axis displays the Cumulative Abnormal Return in decimals.*

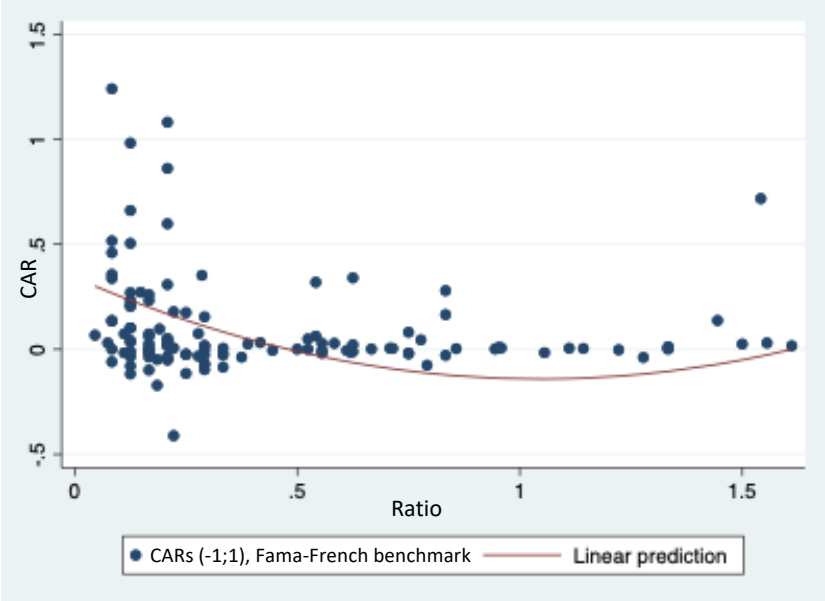

*Figure 20: Linear prediction CARs (-2;2) and ratio for Fama-French Three Factor benchmark*

*This graph plots the five-day (-2;2) Cumulative Abnormal Return of the individual SPACs, where t=0 is the announcement date derived from the event study using the Fama-French Three Factor model as the benchmark. The plotted line is the estimation of the regression model (14) as described in chapter 4.3. of per day per benchmark from the event study. The x-axis displays the ratio values and y-axis displays the Cumulative Abnormal Return in decimals.*

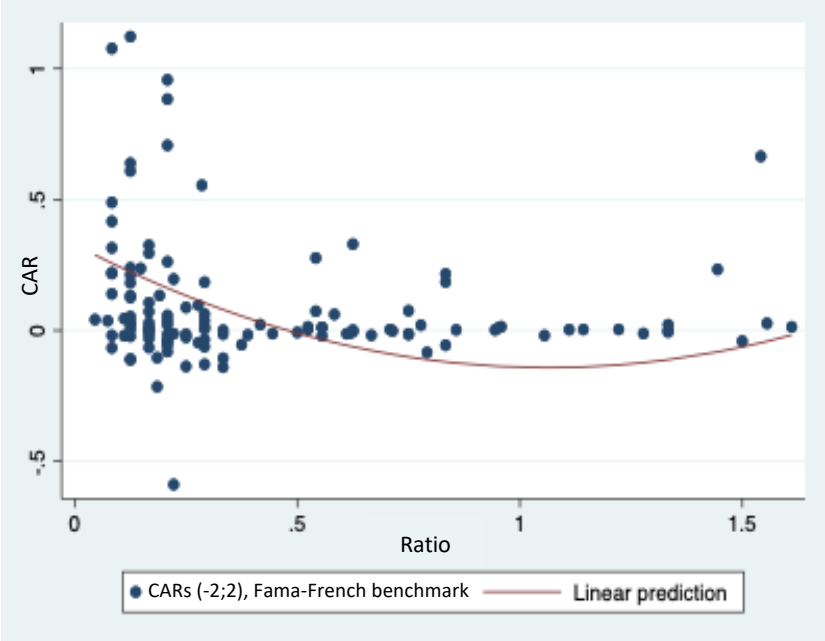


*Figure 21: Linear prediction CARs (-5;5) and ratio for Fama-French Three Factor benchmark*

*This graph plots the eleven-day (-5;5) Cumulative Abnormal Return of the individual SPACs, where t=0 is the announcement date derived from the event study using the Fama-French Three Factor model as the benchmark. The plotted line is the estimation of the regression model (14) as described in chapter 4.3. of per day per benchmark from the event study. The x-axis displays the ratio values and y-axis displays the Cumulative Abnormal Return in decimals.*

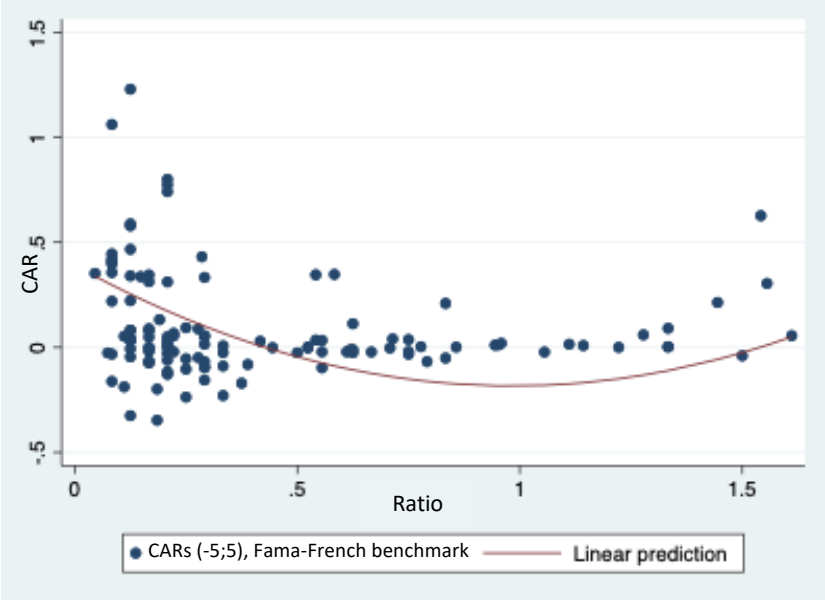

*Table 4: Cumulative Abnormal Return absorbing for year fixed effects*

*This table presents results for the event studies. In model (1) the benchmark is the Russell 2000 Index, in model (2) the benchmark is zero, in model (3) the benchmark is the SPACs without a target their average return and in model (4) the benchmark is the Fama-French three factor model. The specification of (-1;1) means the three-day Cumulative Abnormal Return, the specification of (-2;2) means the five-day Cumulative Abnormal Return and the specification of (-5;5) means the eleven-day Cumulative Abnormal Return where t=0 is the announcement date. There is controlled for year fixed effects and robust standard errors are used. Below the estimates the robust standard errors are reported in the parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.*

| | **N** | **(1)** | **(2)** | **(3)** | **(4)** |
|---|---|---|---|---|---|
| **(-1;1)** | 122 | 0.0906058*** | 0.0928495*** | 0.0941574*** | 0.0932632*** |
| | | (0.0209052) | (0.0210849) | (0.0213965) | (0.0212031) |
| **(-2;2)** | 122 | 0.0841107*** | 0.0902192*** | 0.0913552*** | 0.0874102*** |
| | | (0.0215168) | (0.021746) | (0.0219812) | (0.0217274) |
| **(-5;5)** | 121 | 0.0817249*** | 0.0939407*** | 0.0942353*** | 0.0897466*** |
| | | (0.0223237) | (0.0232824) | (0.0236401) | (0.0227299) |

*Table 5: Abnormal Return per day per benchmark from event study*

*This table presents results for the Abnormal Return per day from the event studies. In model (1) the benchmark is the Russell 2000 Index, in model (2) the benchmark is zero, in model (3) the benchmark is the SPACs without a target their average return and in model (4) the benchmark is the Fama-French three factor model. The specification of -5 till 5 is the day within the event study where t=0 is the announcement date.*

| t | **N** | **(1)** | **(2)** | **(3)** | **(4)** |
|---|---|---|---|---|---|
| **-5** | 121 | -0.34% | -0.21% | -0.24% | -0.29% |
| **-4** | 121 | 0.13% | 0.28% | 0.23% | 0.15% |
| **-3** | 122 | 0.07% | 0.21% | 0.15% | 0.21% |
| **-2** | 122 | 0.61% | 0.80% | 0.70% | 0.67% |
| **-1** | 122 | 0.71% | 0.89% | 0.79% | 0.76% |
| **0** | 122 | 9.23% | 9.20% | 9.26% | 9.51% |
| **1** | 122 | -0.43% | -0.35% | -0.22% | -0.50% |
| **2** | 122 | -1.31% | -1.11% | -1.05% | -1.32% |
| **3** | 122 | -0.62% | -0.46% | -0.37% | -0.47% |
| **4** | 121 | 0.60% | 0.59% | 0.57% | 0.70% |
| **5** | 121 | -0.05% | 0.00% | 0.02% | -0.01% |

*Table 6: Cumulative Abnormal Return per day per benchmark from event study*

*This table presents results for the Cumulative Abnormal Return per day from the event studies. In model (1) the benchmark is the Russell 2000 Index, in model (2) the benchmark is zero, in model (3) the benchmark is the SPACs without a target their average return and in model (4) the benchmark is the Fama-French three factor model. The specification of -5 till 5 is the day within the event study where t=0 is the announcement date.*

| t | N | (1) | (2) | (3) | (4) |
|---|---|---|---|---|---|
| **-5** | 121 | -0.34% | -0.21% | -0.24% | -0.29% |
| **-4** | 121 | -0.21% | 0.07% | -0.01% | -0.15% |
| **-3** | 122 | -0.14% | 0.28% | 0.14% | 0.07% |
| **-2** | 122 | 0.47% | 1.08% | 0.84% | 0.74% |
| **-1** | 122 | 1.19% | 1.97% | 1.64% | 1.50% |
| **0** | 122 | 10.42% | 11.17% | 10.90% | 11.01% |
| **1** | 122 | 9.99% | 10.82% | 10.68% | 10.52% |
| **2** | 122 | 8.67% | 9.71% | 9.63% | 9.20% |
| **3** | 122 | 8.06% | 9.24% | 9.26% | 8.73% |
| **4** | 121 | 8.66% | 9.83% | 9.83% | 9.43% |
| **5** | 121 | 8.61% | 9.84% | 9.85% | 9.42% |

*Table 7: Results OLS regression with cumulative abnormal return, with Russell 2000 index benchmark, as dependent variable and sentimental factors as independent variable.*

*This table presents results for OLS regressions with the Cumulative Abnormal Returns with the Russell 2000 Index benchmark from the event study as the dependent variable. In the specification (-1;1) the dependent variable is the three-day Cumulative Abnormal Return, in specification (-2;2) the dependent variable is the five-day Cumulative Abnormal Return and in specification (-5;5) the dependent variable is the eleven-day Cumulative Abnormal Return where t=0 is the announcement date. In models (1) to (5), the independent variables are regressed individually and in models (6) and (7) all the independent variables are combined in the regressions. There is controlled for year fixed effects and robust standard errors are used. Below the estimates the robust standard errors are reported in the parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.*

| (-1;1) | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
|---|---|---|---|---|---|---|---|
| **Intercept** | 0.0963*** (0.0250) | 0.0837*** (0.0191) | 0.0862*** (0.0191) | 0.1305*** (0.0441) | 0.1686*** (0.0594) | 0.2421*** (0.0721) | 0.2407*** (0.0728) |
| **Famous/well-known** | -0.0187 (0.0569) | | | | | -0.0338 (0.0577) | -0.0330 (0.0585) |
| **Completed SPACs** | | 0.0210 (0.0641) | | | | 0.0211 (0.0614) | |
| **Dummy completed SPACs** | | | 0.0340 (0.1020) | | | | 0.0325 (0.0974) |
| **Factiva** | | | | -0.0220 (0.0197) | | -0.0219 (0.0202) | -0.0218 (0.0200) |
| **Consumer Sentiment Index** | | | | | -0.0086 (0.0053) | -0.0117* (0.0060) | -0.0115* (0.0060) |
| N | 122 | 122 | 122 | 122 | 122 | 122 | 122 |
| $r^2$ | 0.0209 | 0.0227 | 0.0221 | 0.0348 | 0.0523 | 0.0889 | 0.0895 |

*Table 7 (Continued): Results OLS regression with cumulative abnormal return, with Russell 2000 index benchmark, as dependent variable and sentimental factors as independent variable.*

| (-2;2) | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
|---|---|---|---|---|---|---|---|
| **Intercept** | 0.0961*** (0.0260) | 0.0828*** (0.0200) | 0.0847*** (0.0200) | 0.1166*** (0.0427) | 0.1596*** (0.0614) | 0.2409*** (0.0713) | 0.2410*** (0.0721) |
| **Famous/well-known** | -0.0395 (0.0581) | | | | | -0.0536 (0.0580) | -0.0536 (0.0587) |
| **Completed SPACs** | | -0.0040 (0.0656) | | | | -0.0014 (0.0654) | |
| **Dummy completed SPACs** | | | -0.0042 (0.1021) | | | | 0.0022 (0.1022) |
| **Factiva** | | | | -0.0181 (0.0202) | | -0.0187 (0.0212) | -0.0187 (0.0211) |
| **Consumer Sentiment Index** | | | | | -0.0083 (0.0053) | -0.0117* (0.0059) | -0.0117** (0.0059) |
| N | 122 | 122 | 122 | 122 | 122 | 122 | 122 |
| $r^2$ | 0.0208 | 0.0161 | 0.0156 | 0.0255 | 0.0655 | 0.0514 | 0.0514 |

*Table 7 (Continued): Results OLS regression with cumulative abnormal return, with Russell 2000 index benchmark, as dependent variable and sentimental factors as independent variable.*

| (-5;5) | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
|---|---|---|---|---|---|---|---|
| **Intercept** | 0.0844*** (0.0282) | 0.0736*** (0.0224) | 0.0732*** (0.0224) | 0.1061** (0.0417) | 0.1635*** (0.0613) | 0.2070*** (0.0733) | 0.2037*** (0.0736) |
| **Famous/well-known** | -0.0089 (0.0601) | | | | | -0.0353 (0.0637) | -0.0341 (0.0638) |
| **Completed SPACs** | | 0.0380 (0.0535) | | | | 0.0411 (0.0522) | |
| **Dummy completed SPACs** | | | 0.0645 (0.0858) | | | | 0.0655 (0.0840) |
| **Factiva** | | | | -0.0126 (0.0181) | | -0.0112 (0.0178) | -0.0108 (0.0177) |
| **Consumer Sentiment Index** | | | | | -0.0090 (0.0056) | -0.0112* (0.0060) | -0.0109* (0.0060) |
| N | 121 | 121 | 121 | 121 | 121 | 121 | 121 |
| $r^2$ | 0.0097 | 0.0172 | 0.0173 | 0.0138 | 0.0117 | 0.0401 | 0.0392 |

*Table 8: Results OLS regression with cumulative abnormal return, with Zero benchmark, as dependent variable and sentimental factors as independent variable.*

*This table presents results for OLS regressions with the Cumulative Abnormal Returns with Zero as a benchmark from the event study as the dependent variable. In the specification (-1;1) the dependent variable is the three-day Cumulative Abnormal Return, in specification (-2;2) the dependent variable is the five-day Cumulative Abnormal Return and in specification (-5;5) the dependent variable is the eleven-day Cumulative Abnormal Return where t=0 is the announcement date. In models (1) to (5), the independent variables are regressed individually and in models (6) and (7) all the independent variables are combined in the regressions. There is controlled for year fixed effects and robust standard errors are used. Below the estimates the robust standard errors are reported in the parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively*

| (-1;1) | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
|---|---|---|---|---|---|---|---|
| **Intercept** | 0.0994*** (0.0249) | 0.0862*** (0.0193) | 0.0860*** (0.0193) | 0.1313*** (0.0450) | 0.1708*** (0.0591) | 0.2379*** (0.0713) | 0.2357*** (0.0720) |
| **Famous/well-known** | -0.0215 (0.0577) | | | | | -0.0451 (0.0587) | -0.0439 (0.0596) |
| **Completed SPACs** | | 0.0313 (0.0648) | | | | 0.0330 (0.0624) | |
| **Dummy completed SPACs** | | | 0.0522 (0.1027) | | | | 0.0500 (0.0991) |
| **Factiva** | | | | -0.0200 (0.0199) | | -0.0188 (0.0205) | -0.0186 (0.0202) |
| **Consumer Sentiment Index** | | | | | -0.0086 (0.0053) | -0.0113* (0.0060) | -0.0110* (0.0060) |
| N | 122 | 122 | 122 | 122 | 122 | 122 | 122 |
| $r^2$ | 0.0235 | 0.0276 | 0.0275 | 0.0338 | 0.0508 | 0.0608 | 0.0596 |

*Table 8 (Continued): Results OLS regression with cumulative abnormal return, with Zero benchmark, as dependent variable and sentimental factors as independent variable.*

| (-2;2) | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
|---|---|---|---|---|---|---|---|
| **Intercept** | 0.1030*** (0.0257) | 0.0876*** (0.0202) | 0.0872*** (0.0201) | 0.1214*** (0.0441) | 0.1639*** (0.0607) | 0.2384*** (0.0701) | 0.2373*** (0.0708) |
| **Famous/well-known** | -0.0422 (0.0593) | | | | | -0.0647 (0.0597) | -0.0641 (0.0605) |
| **Completed SPACs** | | -0.0122 (0.0668) | | | | 0.0164 (0.0666) | |
| **Dummy completed SPACs** | | | -0.0227 (0.1041) | | | | 0.0247 (0.1042) |
| **Factiva** | | | | -0.0163 (0.0205) | | -0.0154 (0.0214) | -0.0153 (0.0212) |
| **Consumer Sentiment Index** | | | | | -0.0081 (0.0053) | -0.0113* (0.0059) | -0.0112* (0.0059) |
| N | 122 | 122 | 122 | 122 | 122 | 122 | 122 |
| $r^2$ | 0.0260 | 0.0210 | 0.0212 | 0.0276 | 0.0621 | 0.0535 | 0.0532 |

*Table 8 (Continued): Results OLS regression with cumulative abnormal return, with Zero benchmark, as dependent variable and sentimental factors as independent variable.*

| (-5;5) | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
|---|---|---|---|---|---|---|---|
| **Intercept** | 0.0958*** (0.0276) | 0.0774*** (0.0226) | 0.0778*** (0.0226) | 0.1177** (0.0479) | 0.1674*** (0.0606) | 0.2012*** (0.0705) | 0.1954*** (0.0707) |
| **Famous/well-known** | -0.0062 (0.0644) | | | | | -0.0372 (0.0675) | -0.0344 (0.0678) |
| **Completed SPACs** | | 0.0772 (0.0580) | | | | 0.0812 (0.0550) | |
| **Dummy completed SPACs** | | | 0.1222 (0.0951) | | | | 0.1249 (0.0904) |
| **Factiva** | | | | -0.0123 (0.0204) | | -0.0082 (0.0193) | -0.0077 (0.0191) |
| **Consumer Sentiment Index** | | | | | -0.0081 (0.0056) | -0.0107* (0.0059) | -0.0102* (0.0060) |
| N | 121 | 121 | 121 | 121 | 121 | 121 | 121 |
| $r^2$ | 0.0209 | 0.0500 | 0.0466 | 0.0245 | 0.0210 | 0.0683 | 0.0630 |

*Table 9: Results OLS regression with cumulative abnormal return, with average return SPACs without target benchmark, as dependent variable and sentimental factors as independent variable.*

*This table presents results for OLS regressions with the Cumulative Abnormal Returns with the average return of the SPACs without a target as a benchmark from the event study as the dependent variable. In the specification (-1;1) the dependent variable is the three-day Cumulative Abnormal Return, in specification (-2;2) the dependent variable is the five-day Cumulative Abnormal Return and in specification (-5;5) the dependent variable is the eleven-day Cumulative Abnormal Return where t=0 is the announcement date. In models (1) to (5), the independent variables are regressed individually and in models (6) and (7) all the independent variables are combined in the regressions. There is controlled for year fixed effects and robust standard errors are used. Below the estimates the robust standard errors are reported in the parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.*

| (-1;1) | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
|---|---|---|---|---|---|---|---|
| **Intercept** | 0.0986*** (0.0249) | 0.0844*** (0.0189) | 0.0870*** (0.0190) | 0.1362*** (0.0485) | 0.1702*** (0.0587) | 0.2414*** (0.0729) | 0.2391*** (0.0736) |
| **Famous/well-known** | -0.0148 (0.0592) | | | | | -0.0311 (0.0607) | -0.0299 (0.0616) |
| **Completed SPACs** | | 0.0346 (0.0679) | | | | 0.0344 (0.0637) | |
| **Dummy completed SPACs** | | | 0.0549 (0.1093) | | | | 0.0525 (0.1024) |
| **Factiva** | | | | -0.0232 (0.0208) | | -0.0223 (0.0209) | -0.0221 (0.0206) |
| **Consumer Sentiment Index** | | | | | -0.0084 (0.0054) | -0.0115* (0.0032) | -0.0113* (0.0062) |
| N | 122 | 122 | 122 | 122 | 122 | 122 | 122 |
| $r^2$ | 0.0245 | 0.0320 | 0.0298 | 0.0407 | 0.0477 | 0.0675 | 0.0663 |

*Table 9 (Continued): Results OLS regression with cumulative abnormal return, with average return SPACs without target benchmark, as dependent variable and sentimental factors as independent variable.*

| (-2;2) | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
|---|---|---|---|---|---|---|---|
| **Intercept** | 0.1008*** (0.0256) | 0.0860*** (0.0197) | 0.0879*** (0.0196) | 0.1305*** (0.0481) | 0.1617*** (0.0602) | 0.2412*** (0.0718) | 0.2400*** (0.0726) |
| **Famous/well-known** | -0.0313 (0.0607) | | | | | -0.0458 (0.0616) | -0.0453 (0.0625) |
| **Completed SPACs** | | 0.0155 (0.0705) | | | | 0.0165 (0.0681) | |
| **Dummy completed SPACs** | | | 0.0265 (0.1114) | | | | 0.0258 (0.1077) |
| **Factiva** | | | | -0.0215 (0.0215) | | -0.0211 (0.0221) | -0.0210 (0.0219) |
| **Consumer Sentiment Index** | | | | | -0.0077 (0.0054) | -0.0111* (0.0061) | -0.0110* (0.0061) |
| N | 122 | 122 | 122 | 122 | 122 | 122 | 122 |
| $r^2$ | 0.0241 | 0.0236 | 0.0224 | 0.0350 | 0.0622 | 0.0564 | 0.0562 |

*Table 9 (Continued): Results OLS regression with cumulative abnormal return, with average return SPACs without target benchmark, as dependent variable and sentimental factors as independent variable.*

| (-5;5) | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
|---|---|---|---|---|---|---|---|
| **Intercept** | 0.0913*** (0.0279) | 0.0793*** (0.0221) | 0.0793*** (0.0221) | 0.1227** (0.0540) | 0.1647*** (0.0599) | 0.1936** (0.0753) | 0.1883** (0.0757) |
| **Famous/well-known** | 0.0097 (0.0657) | | | | | -0.0166 (0.0703) | -0.0144 (0.0707) |
| **Completed SPACs** | | 0.0697 (0.0643) | | | | 0.0708 (0.0588) | |
| **Dummy completed SPACs** | | | 0.1130 (0.1065) | | | | 0.1110 (0.0974) |
| **Factiva** | | | | -0.0147 (0.0221) | | -0.0117 (0.0205) | -0.0111 (0.0201) |
| **Consumer Sentiment Index** | | | | | -0.0077 (0.0057) | -0.0095 (0.0063) | -0.0091 (0.0064) |
| N | 121 | 121 | 121 | 121 | 121 | 121 | 121 |
| $r^2$ | 0.0173 | 0.0403 | 0.0385 | 0.0222 | 0.0172 | 0.0556 | 0.0525 |

*Table 10: Results OLS regression with cumulative abnormal return, with Fama-French Three Factor benchmark, as dependent variable and sentimental factors as independent variable.*

*This table presents results for OLS regressions with the Cumulative Abnormal Returns with the Fama-French Three Factor model as a benchmark from the event study as the dependent variable. In the specification (-1;1) the dependent variable is the three-day Cumulative Abnormal Return, in specification (-2;2) the dependent variable is the five-day Cumulative Abnormal Return and in specification (-5;5) the dependent variable is the eleven-day Cumulative Abnormal Return where t=0 is the announcement date. In models (1) to (5), the independent variables are regressed individually and in models (6) and (7) all the independent variables are combined in the regressions. There is controlled for year fixed effects and robust standard errors are used. Below the estimates the robust standard errors are reported in the parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.*

| (-1;1) | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
|---|---|---|---|---|---|---|---|
| **Intercept** | 0.0981*** (0.0252) | 0.0860*** (0.0192) | 0.0882*** (0.0192) | 0.1334*** (0.0461) | 0.1749*** (0.0595) | 0.2467*** (0.0733) | 0.2451*** (0.0740) |
| **Famous/well-known** | -0.0159 (0.0582) | | | | | -0.0327 (0.0595) | -0.0319 (0.0603) |
| **Completed SPACs** | | 0.0239 (0.0661) | | | | 0.0241 (0.0628) | |
| **Dummy completed SPACs** | | | 0.0389 (0.1053) | | | | 0.0369 (0.1000 |
| **Factiva** | | | | -0.0221 (0.0202) | | -0.0218 (0.0206) | -0.0217 (0.0203) |
| **Consumer Sentiment Index** | | | | | -0.0090* (0.0053) | -0.0120* (0.0061) | -0.0118* (0.0061) |
| N | 122 | 122 | 122 | 122 | 122 | 122 | 122 |
| $r^2$ | 0.0219 | 0.0243 | 0.0242 | 0.0353 | 0.0519 | 0.0617 | 0.0612 |

*Table 10 (Continued): Results OLS regression with cumulative abnormal return, with Fama-French Three Factor benchmark, as dependent variable and sentimental factors as independent variable.*

| (-2;2) | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
|---|---|---|---|---|---|---|---|
| **Intercept** | 0.0982*** (0.0261) | 0.0859*** (0.0200) | 0.0875*** (0.0199) | 0.1190*** (0.0448) | 0.1667*** (0.0611) | 0.2446*** (0.0718) | 0.2445*** (0.0726) |
| **Famous/well-known** | -0.0357 (0.0590) | | | | | -0.0513 (0.0595) | -0.0513 (0.0603) |
| **Completed SPACs** | | -0.0020 (0.0675) | | | | 0.0010 (0.0668) | |
| **Dummy completed SPACs** | | | -0.0005 (0.1057) | | | | 0.0015 (0.0060) |
| **Factiva** | | | | -0.0175 (0.0207) | | -0.0181 (0.0215) | -0.0181 (0.0214) |
| **Consumer Sentiment Index** | | | | | -0.0087 (0.0053) | -0.0120** (0.0060) | -0.0120** (0.0060) |
| N | 122 | 122 | 122 | 122 | 122 | 122 | 122 |
| $r^2$ | 0.0218 | 0.0172 | 0.0176 | 0.0258 | 0.0637 | 0.0515 | 0.0515 |

*Table 10 (Continued): Results OLS regression with cumulative abnormal return, with Fama-French Three Factor benchmark, as dependent variable and sentimental factors as independent variable.*

| (-5;5) | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
|---|---|---|---|---|---|---|---|
| **Intercept** | 0.0903*** (0.0285) | 0.0823*** (0.0227) | 0.0820*** (0.0226) | 0.1128*** (0.0442) | 0.1901*** (0.0619) | 0.2316*** (0.0753) | 0.2285*** (0.0757) |
| **Famous/well-known** | -0.0019 (0.0612) | | | | | -0.0321 (0.0652) | -0.0311 (0.0653) |
| **Completed SPACs** | | 0.0346 (0.0560) | | | | 0.0382 (0.0538) | |
| **Dummy completed SPACs** | | | 0.0603 (0.0901) | | | | 0.0617 (0.0870) |
| **Factiva** | | | | -0.0119 (0.0186) | | -0.0111 (0.0181) | -0.0107 (0.0180) |
| **Consumer Sentiment Index** | | | | | -0.0110* (0.0057) | -0.0130** (0.0061) | -0.0128** (0.0062) |
| N | 121 | 121 | 121 | 121 | 121 | 121 | 121 |
| $r^2$ | 0.0126 | 0.0188 | 0.0192 | 0.0163 | 0.0146 | 0.0471 | 0.0465 |

*Table 11: Results OLS regression with cumulative abnormal return as dependent variable and Ratio and Ratio2 as independent variable.*

*This table presents results for OLS regressions with the Cumulative Abnormal Returns from the event study as the dependent variable. In the specification (-1;1) the dependent variable is the three-day Cumulative Abnormal Return, in specification (-2;2) the dependent variable is the five-day Cumulative Abnormal Return and in specification (-5;5) the dependent variable is the eleven-day Cumulative Abnormal Return where t=0 is the announcement date. In model (1) the benchmark is the Russell 2000 Index, in model (2) the benchmark is Zero, in model (3) the benchmark is the SPACs without target their average return and in model (4) the benchmark is the Fama-French three factor model. The independent variables are the ratio and the ratio2. The ratio definition is found in chapter 4.3. There is controlled for year fixed effects and robust standard errors are used. Below the estimates the robust standard errors are reported in the parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.*

| | **(1)** | **(2)** | **(3)** | **(4)** |
|---|---|---|---|---|
| (-1;1) | | | | |
| **Intercept** | 0.3334*** | 0.3463*** | 0.3425*** | 0.3425*** |
| | (0.0849) | (0.0870) | (0.0914) | (0.0878) |
| **Ratio** | -0.8988*** | -0.9450*** | -0.9307*** | -0.9248*** |
| | (0.2695) | (0.2768) | (0.2937) | (0.2801) |
| **Ratio²** | 0.4277*** | 0.4556*** | 0.4524*** | 0.4420*** |
| | (0.1406) | (0.1442) | (0.1533) | (0.1462) |
| N | 122 | 122 | 122 | 122 |
| $r^2$ | 0.1107 | 0.1192 | 0.1144 | 0.1141 |
| (-2;2) | | | | |
| **Intercept** | 0.3173*** | 0.3409*** | 0.33545*** | 0.3278*** |
| | (0.0824) | (0.0863) | (0.0905) | (0.0852) |
| **Ratio** | -0.8575*** | -0.9378*** | -0.9201*** | -0.8835*** |
| | (0.2602) | (0.2734) | (0.2900) | (0.2709) |
| **Ratio²** | 0.4033*** | 0.4547*** | 0.4520*** | 0.4153*** |
| | (0.1375) | (0.1430) | (0.1520) | (0.1438) |
| N | 122 | 122 | 122 | 122 |
| $r^2$ | 0.0951 | 0.1099 | 0.1043 | 0.1003 |
| (-5;5) | | | | |
| **Intercept** | 0.3645*** | 0.4106*** | 0.3894*** | 0.3905*** |
| | (0.0866) | (0.0976) | (0.1038) | (0.0886) |
| **Ratio** | -1.09701*** | -1.2447*** | -1.1662*** | -1.1667*** |
| | (0.28129) | (0.3179) | (0.3415) | (0.2889) |
| **Ratio²** | 0.5578*** | 0.6459*** | 0.6099*** | 0.5931*** |
| | (0.1541) | (0.1702) | (0.1822) | (0.1596) |
| N | 121 | 121 | 121 | 121 |
| $r^2$ | 0.1237 | 0.1524 | 0.1289 | 0.1369 |