The Rise and Fall of SPACs

The Effects of Regulatory Uncertainty on SPAC Performance

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Abstract

The recent rise and fall of SPAC markets raise questions about its sudden appearance and slowdown. This study aims to empirically investigate the effects of regulatory uncertainty on SPAC performance. This study focuses on U.S. SPACs at different stages in their lifecycle. Using three SEC announcements regarding SPACs, event studies are used to analyze cumulative abnormal returns compared to the Russell 2000 index. Overall, this study suggests that SEC announcements generate "uncertainty" in the form of abnormal returns surrounding the events even when controlling for firm- and deal-specific characteristics. As these events occurred recently long-term effects were not analyzed in this research. Due to the limited sample size, the results of this research should be interpreted with caution. This work hopes to contribute to the relatively underdeveloped area of academic literature on SPACs. The outcome of this study is of interest to academics, legislators, and businesses. To the authors' knowledge, this study is the first to provide insight into the effect of regulatory uncertainty on U.S. SPAC performance.

Personal Statement

I would like to thank Prof. dr. Verwijmeren for his guidance and advice and Mr. Gangaram-Panday for co-reading. Further acknowledgement goes out to my family, friends and loved ones for their support throughout my studies.

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1. Introduction

March 3rd, 2020. Nikola, a U.S. heavy-duty commercial producer of electric trucks, announced its intend to become publicly traded by merging with VectolQ Acquisition Corp. This "reverse merger" with the already publicly traded VectolQ, a Special Purpose Acquisition Company or "SPAC", soon became global news. In the months following the merger, Trevor Milton, Nikola's CEO, resigned following accusations of lying about the product's technology. Soon after the U.S. Department of Justice or "DoJ" and the U.S. Securities and Exchange Commission or "SEC" announced they launched investigations into Nikola. Nikola stock reached a record market capitalization close to that of the Ford Motor Company in June 2020 but had fallen four-fold by the end of 2020. The company ended up settling for $125 million on charges of defrauding investors. This case was supposed to send a warning to all companies hoping to enter public markets through a SPAC.

It is hard to ignore the astronomic rise of Special Purpose Acquisition Companies. While the concept of SPACs or "blank-check" companies has been around for over 40 years, as showed by Cumming, Haß and Schweizer (2014), SPACs started becoming a mainstream method of accessing equity capital markets. In the first quarter of 2021 SPAC IPOs represented over 70% of total IPO (Initial Public Offering) proceeds raised according to Bloomberg Law (2022). Displayed in Figure 1 is an overview of the development of SPAC IPOs over the last 13 years clearly showing the explosive growth witnessed recently.

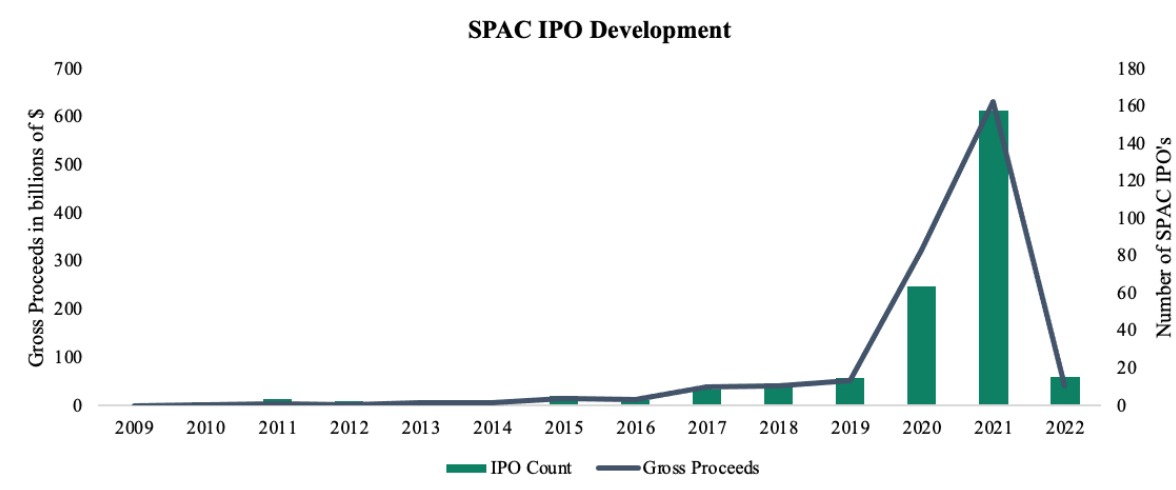

Figure 1: SPAC IPO Development – SPAC Insider, 2022 until 1 May.[1]

[1] White & Case US SPACs Data Hub.

It appears as if everybody that is "anyone" set up or sponsored a SPAC ranging from basketball star Shaquille O'Neal, Pershing Square CEO Bill Ackman and former U.S. house speaker Paul Ryan. As with most sudden financial market booms, questions are being raised whether this phenomenon could be a "bubble". This skepticism has been substantiated in recent years by academic literature such as that of Klausner, Ohlrogge and Ruan (2019), who argue that while SPAC creators do well, their investors do not. It cannot be ignored that SPACs offer a new financing opportunity to both investors and companies. The sudden rise of SPAC activity raises the question of why choose a SPAC listing. A brief overview provided by KPMG is displayed in Table 1 and helps to provide understanding of the pro's and con's of choosing to list through a SPAC merger compared to a traditional IPO.

Pro's	Con's
Faster Execution SPAC mergers tend to take 3-6 months on average vs. 12-18 months for regular IPOs.	**Shareholder Dilution** Initial SPAC sponsors can dilute other shareholders through warrants and earnouts.
Upfront Price Discovery IPO pricing is dependent on market conditions while SPAC pricing is agreed upon before the transaction closes.	**Capital Shortfall** Initial SPAC sponsors may redeem their shares forcing the SPAC to raise PIPE financing to fill the gap.
Additional Capital Raising Ability In addition to the original capital, debt and PIPE (private investment in public equity) is raised.	**Compressed Timelines / Readiness** Target companies often struggle to comply with all required SEC filings and other preparations such as setting up investor relations and internal control mechanisms.
Lower Marketing Costs No extensive "roadshows" are required. Although PIPE fundraising does require some form of roadshows.	**Narrower Financial Diligence** Requirements for SPAC (due) diligence is much less extensive compared to traditional IPOs leaving room for restatements and incorrect valuations.
Operational Expertise Access SPAC sponsors often are financial experts or captains of industry. They can and often will take a board or management seat in the newly formed company.	**Lack of Underwriting** In a traditional IPO the underwriter makes sure a company is compliant with all regulations whereas in a SPAC merger the SPAC is already listed and thus the company has no underwriter to do this.

Table 1: Pro's and con's of a SPAC listing compared to a traditional IPO[2] (KMPG)

[2] KPMG SPAC Intel Hub - Why so many companies are choosing SPACs over IPOs.

Some of the above mentioned "Cons" can be seen as advantages compared to an IPO for investors and targets. Narrower financial diligence and a lack of underwriting make it easier for investors and targets to become publicly listed. These two aspects also form a main reason for a larger calling for regulation to create a more level playing field between IPOs and SPACs. The loopholes in current SPAC structures create a form of "regulatory arbitrage".

Although SPAC volumes have reached record heights throughout 2021 the music seems to be slowing down. Figure 2 shows a record amount of SPAC IPOs that were cancelled in the first quarter of 2021.

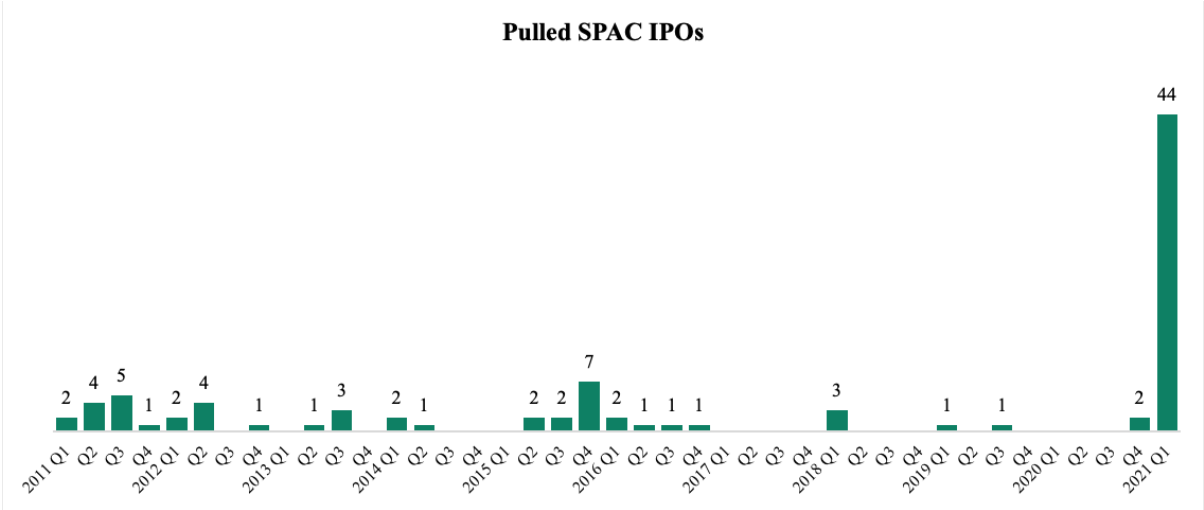

Figure 2: Pulled SPAC IPOs.[3]

In order to understand SPACs, it is important to understand who the stakeholders are and what drives each group to participate in SPAC transactions. The stakeholder groups are sponsors, investors and targets.

i. Sponsors

As mentioned previously, SPAC sponsors typically include successful entrepreneurs, executives and celebrities. Sponsors take on the initial risk as they provide the (nonrefundable) capital to pay for expenses such as those to lawyers, bankers and other operating expenses. If the sponsors fail to merge with a company within two years, the SPAC is dissolved and the funds are returned to the sponsors.

[3] Bloomberg - Awful SPAC Returns Mean More Frustration for Blank-Check Firms.

ii. Investors

Once the SPAC is listed other (public) investors can invest. These investors can be divided into two groups: retail and institutional investors. Klausner et. al. (2022) suggests that the public investor group are the ones that truly carry the costs of the SPAC, not the sponsors or target companies. Due to the recent popularity of SPACs, retail investors (individuals) participate in SPACs too. Banerjee and Szydlowski (2021) suggested that retail investors tend to overestimate their ability to process information in complicated SPAC markets. On the other hand, Howe & O'Brien (2012) find that higher degrees of institutional ownership are associated with a lower deal completion rate.

iii. Targets

The SPAC route to becoming listed is mainly interesting to companies that would not be considered appropriate (traditional) IPO targets. Some SPACs merged with companies in such an early stage they reported negative earnings or were even pre-revenue (Cembalest, 2021). Figure 3 shows the activity of de-SPAC (SPACs that merge with a target) deals by industry. As displayed, SPAC deals often happen in innovative and high-growth sectors such as healthcare and high-technology.

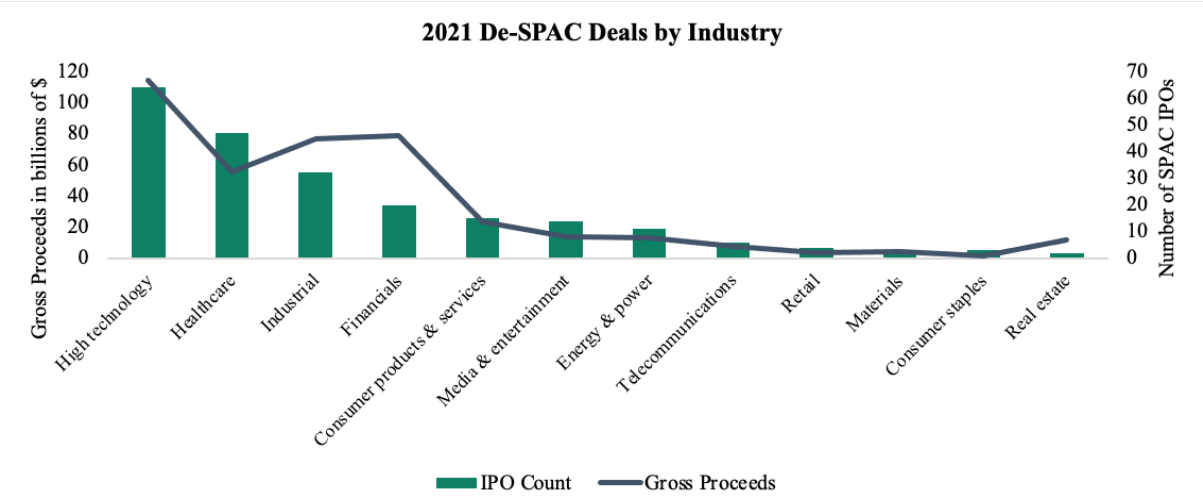

Figure 3: Number of De-SPAC deals by industry in 2021.[4]

[4] White & Case US SPACs Data Hub.

While the magnitude varies widely due to different methodologies almost all SPAC literature suggests the same result. SPACs underperformance compared to IPOs. This result is surprising to say the least as both fulfill the same function in the going-public market. A study by Kolb and Tykvová (2016) showed that indeed SPACs underperform in the long run even when accounted for firm specific characteristics like size ratios. Jenkinson and Sousa (2011) found that SPACs have negative cumulative returns post-merger. Dimitrova (2017) found a negative underperformance of -51.9% (using the buy-and-hold abnormal return approach or "BHAR") four years post-merger. A recent finding by Lin, Lu, Michaely and Qin (2021) indicate negative, but smaller BHAR of -16.6% and -29.9% (for a 1-year and 2-year average period respectively).

The focus of this study is to analyze how cumulative abnormal returns around three SEC announcements using the Russell 2000 index as a benchmark impacts SPAC returns. The study starts by providing an understanding of the mechanics behind SPACs as they are non-typical investment vehicles. The (regulatory) history of SPACs is discussed followed by an overview of SPAC return drivers identified to date. Recent controversial studies such as that of Klausner et. al. (2020) suggested that SPACs are overall value destroying which is why a section dedicated to research on this subject is discussed. Then an overview of international regulatory differences is presented. Finally other literature studying regulatory uncertainty are discussed.

This research is subject to several limitations. Due to the lack of data availability sample sizes are smaller compared to those of traditional IPO and M&A research. Apart from smaller sample sizes specific SPAC variables such as redemption rates are not (freely) publicly available to academic researchers. Due to the recent nature of regulatory uncertainty, it is not yet possible to study long-term effects. As no previous similar research exists no comparisons can be made. These limitations provide room for future research in this area. Overall, this study suggests that SEC announcements generate "uncertainty" in the form of abnormal returns surrounding the events even when controlling for firm- and deal specific characteristics.

This work hopes to contribute to the relatively underdeveloped area of academic literature on SPACs. The outcome of this study is of interest to academics, legislators and business. This paper uses recent data (i.e., 2019-2022) compared to existing SPAC literature. To the authors knowledge, this study is the first to provide insight into regulatory uncertainty effects on SPAC performance.

2. The SPAC Mechanism

To understand the main focus of this paper, SPACs, it is of essence to fully understand how SPACs operate. This chapter elaborates on the creation of a SPAC, its IPO, merging with the target and the closing structure. This is also illustrated in Figure 4.

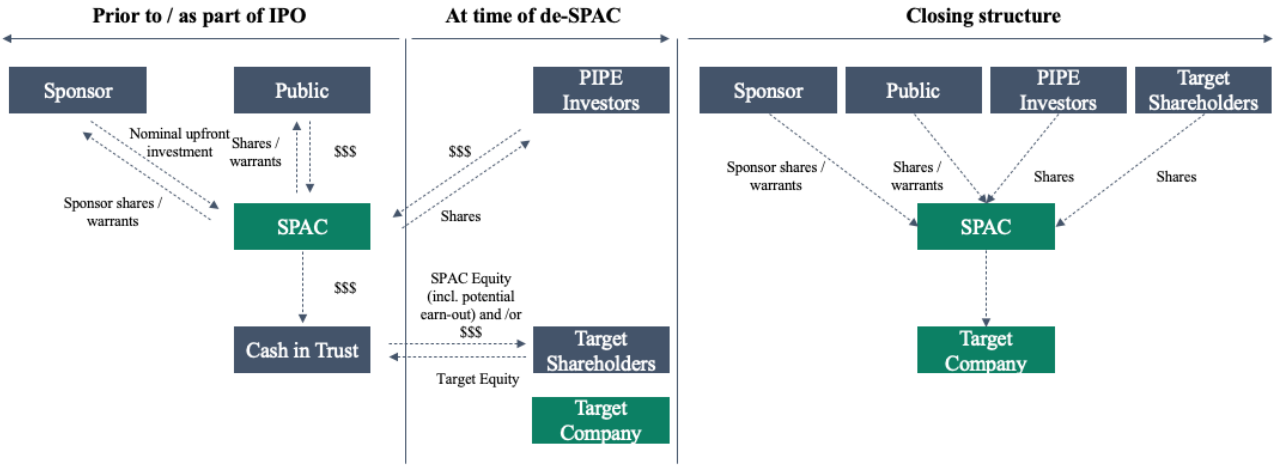

Figure 4: Visual overview of the SPAC process.

2.1. The Pre-IPO Period

The first step in the creation of a SPAC, as it is for many companies, is for a group of so called “sponsors” to come together with the intention of forming a SPAC to ultimately merge with a private company. As shown by Bai et. al. (2021) these sponsors typically have a background as entrepreneurs or in private equity and hedge funds. As for any entity seeking to list on a public stock exchange in the U.S. the entity will have to file a prospectus with the SEC. Management of the SPAC will have to outline the company’s focus for example in terms of industry or geography and the expected timeframes (Cumming et al., 2014). The sponsors acquire shares at a nominal price prior to the IPO representing a 20% stake (Dimitrova, 2017). These shares are known as the “Sponsor promote”. This is seen as the compensation for establishing the SPAC. Simultaneously with the SPAC IPO sponsors can buy additional shares and/or warrants at prices they find fair at that moment.

2.2. SPAC IPO

When the SPAC seeks to become listed through an IPO the costs made for this process are funded from the Sponsor’s investment. In the IPO a SPAC will offer to sell both a share and a warrant. By set of convention SPAC shares are priced at $10.00 and the number of shares that can be purchased by use of the warrant is between one quarter and one share thus

the warrant ratio is between 4:1 and 1:1 according to Klausner, Ohlrogge & Ruan, 2020. The warrant is typically set at an exercise price at a premium compared to the $10.00 (Gahng et. al., 2021). The (net) IPO proceeds are held in a trust account (Chatterjee et al., 2016) and are invested in Treasury Notes (Dimitrova, 2017). The proceeds from the trust fund (including any result from the investment in Treasury Notes) can only be released if i) the SPAC merges with a company, ii) the SPAC acquires a company, iii) in case of liquidation, it will be returned to shareholders pro-rata, iv) in order to redeem shares (Klausner et al., 2020). Interestingly, in recent years the percentage of IPO proceeds held in these trust accounts increased from 80% to 100% (Gahng et. al., 2021). This increase reduces downside risk for investors in the case of a failed merger (Rodrigues & Stegemoller, 2014).

2.3. Target Search

Once the SPAC is listed a typical 18-month period commences (with an additional 6-month grace period which usually requires shareholder approval) during which the SPAC must find the target company it intends to merge with (Dimitrova, 2017). In the case the company fails to find a target and/or merge within this timeframe the company will be liquidated and the funds from the trust will be returned pro-rata to the IPO investors (Savitz, 2005). These time restraints create pressures to quickly find a suitable target forcing the company to consider many potential targets (Tran, 2010). In the prospectus filed during the IPO the SPAC will have indicated certain industries and geographies it intends to focus on. As shown by Dimitrova (2017) another important requirement for SPACs is the fact that at least 80% of the net asset value of the to be created business combination must be spent in the transaction. It is interesting to note that during both the initial listing as well as the search for and eventual merger the SPAC depends on its advisors who along the way collect significant fees.

2.4. Merger Announcement

As soon as the company announces that it has found a suitable merger target the “De-SPAC” process begins. The company files an 8-K filing with the SEC, notifying the public of events such as in this case a merger or acquisition. It is at this point that one of the main advantages of listing through a SPAC becomes clear. Different from a regular company going public through an IPO the target company is protected under the Private Securities Litigation Reform Act (PSLRA) from private litigation from forward looking statements (Klausner et

al., 2020). However, this safe harbor was questioned by John Coates, Acting Director of the SEC's Division of Corporation Finance, giving early indications that the SEC might be looking to change this mechanism which would impact the attractiveness of SPAC transactions negatively. This type of regulatory uncertainty is the specific focus of this paper.

2.5. Shareholder Vote or Tender Offer

Before proceeding to merge the companies, the SPAC must gain shareholder approval. The proposed transaction will be approved if i) a majority of shareholders votes in favor of the transaction, ii) the percentage of shareholders choosing to redeem their shares is below the threshold. This threshold is a maximum percentage, a number that has been increasing in recent years. An alternative is the use of tender offers whereby shareholders who are not in favor of the transaction can return their shares to the SPAC (Rodrigues & Stegemoller, 2012). As shown by both Klausner et al. (2020) and Gahng et al. (2021) most initial Sponsors exit before completion of the merger. They show that, on average, two thirds of shares are redeemed eventually. Implying that the capital delivered to the target is (much) lower than initial IPO proceeds lead to believe. This is a first example of how the different shareholder groups can benefit differently from the same transaction.

2.6. Vote or Offer Outcome

Due to the uncertainty of funds brought forward by the option for shareholders to redeem their shares during the shareholder vote, target firms will often negotiate a minimum amount of cash that the SPAC will need to bring forward in order for the transaction to be completed (Gahng et al., 2021). As mentioned, typical redemption rates are quite high leaving the SPAC no other choice but to find additional funding to close the gap. This is typically done through a PIPE investment or by use of debt financing. PIPE investments popularity increased in the recent SPAC bubble both in terms of general usage and size. Klausner et. al. (2021) found that between January 2019 to June 2020 the average PIPE proceeds were equal to 30% of the total money raised in a SPAC IPO but that this number increase to 85% between Q4 2020 and Q1 2021.

3. Literature Review

3.1. (Regulatory) History of SPACs

The first appearance of SPACs is thought to be in the 1980s. They were hardly regulated which resulted in the occurrence of penny-stock fraud using "pump-and-dump" schemes. This cost investors significant amounts of money leading up to $2 billion a year in the early 1990s[5]. Following this the SEC issued Rule 419 followed by the U.S. Congress Securities Enforcement and Penny Stock Reform Act (PSRA). This forced the blank-check companies to deposit IPO proceeds in escrow accounts preventing them from being used until a merger is complete. Following this change in regulation these blank-check companies became known as SPACs[5].

Following the creation of SPACs three major trends drove the SPAC markets forward[6]:

i. SPAC 2.0

Following PSRA and Rule 419, SPACs disappeared from penny stock markets and returned in 2003. First on unregulated markets (over the counter or "OTC") and later on the American Stock Exchange ("AMEX") followed by appearances on regulated markets such as the New York Stock Exchange ("NYSE") and NASDAQ. In compliance with Rule 149 the funds were held in trust accounts and minimum capitalization requirements were met. This development became known as SPAC 2.0.

ii. SPAC 3.0

In 2015 the right to vote was de-coupled further from the right to redeem shares. Previously only shareholders who voted against the proposed transaction were able to redeem their public shares. From 2015 onwards the right became valid for all public shareholders. This change meant investors voting in favor of the transaction can redeem their shares but keep their warrants. This is commonly referred to as SPAC 3.0.

iii. SPAC 3.5

Throughout 2019 and 2020 the concept of "fractional warrants" increased in popularity despite being introduced in 2007 already in the SPAC of Liberty Media

[5] Harvard Business Review - SPACs: What You Need to Know.
[6] Duke University - SPAC of everything: Challenging financial regulation in times of crisis.

Acquisition Corp. This structure promotes buying more shares in order to own a full warrant. This development is known as SPAC 3.5.

Before 2010 SPAC sponsors had to pay a small amount for founder shares creating incentives to complete mergers regardless of the quality of the transaction (Rodrigues & Stegemoller, 2012). From 2010 onwards SPAC sponsors are required to purchase warrants ahead of the IPO that are deposited in trust accounts thus making them put "skin in the game" (Gahng et al., 2021).

More recently, the SEC is looking more closely at SPACs given the uprise of SPAC IPOs and de-SPACs over the past few years. On March 10th, 2021, SEC Investor Education officer Paul Munter tried to warn investors that they should not base their investment decision solely on the endorsement of a celebrity. Later that year on April 8th the Acting Director of Corporate Finance at the SEC, John Coates, indicated that the SEC is "continuing to look carefully at filings and disclosures by SPACs and their private targets" reminding SPACs of their liability in the case of misstating their filings. Concurrently Munter and Coates issued guidelines that would make SPAC warrants liabilities instead of equity instruments.

On March 30th 2022, the SEC presented a set of rules for "greater transparency and more robust investor protections". The rules were accepted in a 3 to 1 vote in what was described by the only voter against as to be "designed to stop SPACs in their tracks". Some of the major rules proposed include[7]:

i. <u>Underwriter Liability</u>

   Force anyone that takes "steps to facilitate" in a (de-)SPAC transaction to underwrite the SPAC IPO. This increases the liability greatly for (investment) banks involved in (de-)SPAC transactions.

ii. <u>Projections</u>

   Forward looking projections will be subject to rules similar to that of an IPO. This will be in terms of the material bases used for projections as well as whether or not the board or management' view is in line at the time of filing. The current safe harbor under the PSLRA is widely thought to be a main advantage of going public through a de-SPAC transaction.

[7] Davis Polk: SEC proposes new SPAC rules that are expected to significantly reduce SPAC activity.

iii. Enhanced Disclosures

Several changes to disclosure requirements are proposed further harmonizing SPACs and IPOs. This includes, but is not limited to, disclosing conflicts of interests between sponsors, dilution that might happen following the de-SPAC, disclosure of outside reports on fairness of the transaction.

The SEC has clearly set out on a path to try and eliminate "regulatory arbitrage" that contributed to a SPAC boom. Even-Tov, Patatoukas, and Yoon (2021) find that retail investors are hurt disproportionately by the SPACs safe harbor protection. These results match research by Klausner et. al. (2020) suggesting that retail investors are the ones carrying the cost of SPAC underperformance. The proposed changes by the SEC are in line with their main objective of protecting "Main Street" investors. These three announcements all have in common that they create uncertainty in SPAC markets. Depending on the stage of a firm it may have more or less impact. For example, firms seeking to IPO as a SPAC might not do so due to this regulatory uncertainty while firms already listed as SPAC might have more difficulty finding a merger target. For target firms proposed changes to disclosure and diligence standards might create more difficulty. Building on these events this paper will perform events studies around recent regulatory events and see if they have an impact on SPAC returns. To prevent using the wrong date for each event robustness checks need to be performed. The announcement dates by the SEC might not be the correct date to use for an event study if the news previously leaked to the media or was expected. For this reason, an overview of each event and mentions in the news can be found in Table 2. While for two events rumors of potential SEC rules became public before the announcement date this paper will proceed to use the SEC announcement dates for the event study as this is still the best proxy for market reactions to regulatory uncertainty. As all three events increase the likelihood of regulation the assumed direction of impact of regulatory uncertainty in negative on cumulative abnormal returns.

Event	Media Coverage
March 10th, 2021 SEC warns investors to not base investment decision on celebrity endorsements. **April 8th, 2021** SEC reminds SPACs of their liability in the case of misstating filings. **March 30th, 2022** SEC presents rules for "greater transparency and more robust investor protections" that could be "designed to stop SPACs in their tracks".	**No coverage** No coverage before the announcement date of rumors or expectations. **March 25h, 2021** Rumors "SEC opens inquiry into Wall Street's blank check IPO frenzy" reported by Reuters. **December 9th, 2021** Several major news providers (CNBC, Bloomberg etc.) covered a story that SEC Chair Gary Gensler floated several potential SPAC rules brining IPO and SPAC markets closer.

Table 2: Media coverage of announcements per event.

3.2. Drivers of SPAC Returns

Overall, it is widely accepted that academic literature to date show SPACs (long-term) underperformance relative to IPOs (Jog and Sun (2007), Lewellen (2009), Jenkinson and Sousa (2011), Floros and Sapp (2011), Kolb and Tykvová (2016), Dimitrova (2017), Klausner et al. (2020), Gahng et al. (2021)). One of the most recent studies by Kolb and Tykvová (2016) showed that SPACs underperform markets despite accounting for firm specific characteristics such as size metrics. This confirms findings by Jenkinson and Sousa (2011) who found post-merger (de-SPAC) cumulative returns to be negative.

Cummings et. al. (2014) studied success factors driving SPAC share price growth using a logit model to analyze success factors for the dependent variable acquisition approval. A wide array of explanatory variables (twenty-three) were used that can be categorized into four topics: structure, IPO process, ownership structure and operations and performance. Key takeaways include that board and managerial experience does not increase deal approval probability, prestigious or large underwriter syndicates affect acquisition approval adversely.

Because SPACs do not operate assets prior to merging with the target company investors can base their decisions mainly on the quality of a SPACs management. Several studies (Chauviere and Tan (2020), Klausner et al. (2020), Lin et al. (2021)) suggest that high-quality SPAC management positively effects post-merger performance. Gahng et al. (2021) argues that the importance of high quality management is due to their networking

ability. Sponsors access to fundraising and deal flow could contribute to outperformance compared to SPAC management without prior experience. Earlier research by Kim (2009) showed that SPACs whose management have more experience tend to close deals faster and show superior long-term performance.

As identified by Jenkinson and Sousa (2011) redemption rates could impact long-term performance although they did not find significant evidence. Because of the redemption options and sponsor promote dilution is inherent to SPAC deals. Klausner et al. (2020) argue that SPAC structures create a bias towards value-destructing deals due to this inherent dilution. Klausner et. al. (2020) found a significant negative correlation between post-merger returns and redemption ratios. Another driver of dilution is the involvement and size of PIPE financing. Stanfill (2021, p. 6) and Goldman Sachs (2021, p. 13) argue that PIPE financing is an important signal towards other investors validating the proposed transaction and valuation.

Other explanatory variables need to be included to isolate firm-specific effects. Gahng et al. (2021) for instance showed that larger SPAC transactions generate higher abnormal returns. Other research shows a negative "time pressure effect". Mergers that are announced close to the final deadline (before the SPAC is liquidated) generate lower abnormal returns (Kolb and Tykvova, 2016; Dimitrova, 2017; Gahng et al., 2021).

The main hypothesis for this research follows from existing literature and the research question of this study: SPACs in the IPO (no target found yet) or Announced (target found but not merged yet) are negatively impacted by the SEC announcements in terms of cumulative abnormal returns for different event windows.

3.3. Value Creating or Destroying?

An important question for any SPAC investor, both sponsors and public investors, is whether or not SPACs are generally value creating or destroying. When thinking from a target companies' perspective, alternatives that can be considered to a SPAC deal are either a traditional IPO or engaging in a regular M&A transaction. Dimitrova (2016) finds that SPACs destroy value due to misaligned incentives by managers who favor any acquisition over no acquisition. Dimitrova (2016) also finds that when SPAC IPO underwriter fees are linked to a merger successfully closing this negatively impacts performance. This adds to the idea of rather doing any acquisition compared to none. Proposed rules by the SEC would address this specific misalignment of interest between underwriters and SPACs.

While SPAC performance seem to be value destroying in terms of long-term returns, Klausner et. al. (2020) finds that SPACs that completed value destroying deals still yield lucrative (multimillion) returns for SPAC sponsors. Klausner et. al. (2020) argues that another issue when comparing SPACs to a traditional IPO is the seemingly high costs. While Klausner et. al. (2020) find a median 5.5% fee typically 3.5% of that is depending upon a merger being completed. In the case that 50% of public shares are redeemed at the time of merger this would imply a fee of 11%, significantly higher compared to an IPO. He continues to show that there is a discrepancy in total SPAC costs between high and low quality SPACs. While the total cost is between 30 and 40% (of pre-merger equity) for high quality SPACs this is between 77 and 80% for low-quality SPACs. It seems that SPACs seem to create value for one group (sponsors) which is paid by public investors. Klausner et. al. (2020) finds that the total cost of the sponsors promote, IPO investor warrants and underwriting fees is $4.30 of the $10.00 value per share. This cost is born by public investors and the target company. Overall, it seems that for these groups SPAC deals seem to be value destroying.

3.4. International Regulatory Differences

Although this research will focus on U.S. markets due to the data constraints international regulatory differences provide insight into where U.S. regulators might look to for inspiration. Major differences compared to the U.S. are listed in Table 3 below.

	U.S.	**U.K.**	**Netherlands**	**Singapore**	**Hong-Kong**
Market Share[8] %	***87.9%***	***0.8%***	***0.2%***	***0.8%***	***2.6%***
IPO Proceeds	>90% held in trust account	No specific requirement	Percentage held in escrow account at SPAC discretion	>90% held in escrow account	100% held in ring-fenced escrow account
De-SPAC Approval	Mandatory if share issuances involved / SPAC promoters generally allowed to vote	Majority of public shareholders (excluding founders / sponsors) required	Shareholder approval required but quorum at discretion of the SPAC	Majority approval required (excluding sponsors / management)	Approval by shareholders required (excluding promoter)
Share Redemption	Option to redeem at pro-rata share of amount held in trust	Option to redeem specified fixed amount or pro-rata share	Option at discretion of SPAC regardless of vote for or against	Can elect to redeem at pro-rata share of amount held in trust	Shareholders are given option to redeem prior to de-SPAC
Time Limit	IPO + 2 years + optional 12 months (pending vote)	IPO + 2 years + optional 12 months (pending vote)	At discretion of SPAC, typically 2 years + extension	IPO + 2 years + optional 12 months (pending vote)	Announce within 2 years of IPO, complete within 3 years

[8] White & Case US SPACs Data Hub.

Table 3: Major regulatory differences between major SPAC hubs.[9]

3.5. Regulatory Uncertainty

This paper aims to contribute to the field of studying the effects that the SEC (and thus regulators in general) has on public markets. While this study focusses on SPACs the academic background on researching regulatory uncertainty is discussed in this section.

Cumming, Johan & Pant (2019) research the impact of regulation on the crypto-economy. This is specifically interesting compared to the purpose of this paper as the crypto economy, like booming SPAC markets, are a new type of asset class with unknown characteristics and challenges for both investors and regulators. Their work shows that using existing regulatory frameworks is problematic when applying this to innovative and new markets / ecosystems. They argue that on the positive side a lack of regulation is the driving force behind innovative entrepreneurial financing but on the other side this leaves ample room from fraud and significant capital loss for investors. These principles apply to regulating SPAC markets too.

Akyol, Lim, & Verwijmeren (2012) researched the wealth effects of the impact of SEC's proposals to facilitate director nominations. Their research found that the SEC proposals do not create value while it should empower shareholders. They identify 17 events related to proxy access and define whether or not a positive impact on proxy access is expected. Following this reasoning this paper assumes a positive impact of the three identified events on the found cumulative abnormal returns.

Schipper & Thompson (1983) researched the impact of merger-related regulation on the acquiring firms' shareholders. Their methodology defined that an important event is one that significantly changes the market expectation of outcomes or changes the market expectation of a specific outcome. This underpins the importance of the selected SEC announcements as they change the market expectation of outcomes with regard to SPACs.

[9] Allen & Overy - SPACs listings in Hong Kong – a comparison among different jurisdictions

4. Data & Methodology

4.1. Methodology

This section outlines the methods used to see whether there is an effect of regulatory uncertainty on SPAC performance following SEC announcements. First an event study is conducted following the methodology of MacKinlay (1997). To investigate the short-term effects cumulative abnormal returns ("CARs") around regulatory announcements will be calculated. The events used for this are:

i. March 10th, 2021 – SEC warns investors to not base investment decision on celebrity endorsements.
ii. April 8th, 2021 – SEC reminds SPACs of their liability in the case of misstating filings.
iii. March 30th, 2022 – SEC presents rules for "greater transparency and more robust investor protections" that could be "designed to stop SPACs in their tracks".

In the case that SPAC markets receive these announcements positively a jump in stock prices is expected upon announcement. Typically, studies use expected returns based on the Capital Asset Pricing Model ("CAPM"). This requires estimates of beta, as pre-merger SPACs do not operate assets, they have no relevant pricing history. Beta is highly likely to change significantly post-merger as it the company takes on the risk profile of the target company. MacKinlay (1997) recommends using market-adjusted abnormal return models in the case of limited data availability in line with other SPAC research (Jenkinson and Sousa, 2009).This market-adjusted model assumes alpha to be zero and the market beta to be one. As the focus of this paper is on SPACs based in the US, the Russell 2000 index is used in line with Dimitrova (2017), Kolb and Tykvova (2016), Klausner et al. (2020). This benchmark reflects the relatively smaller companies with generally higher risk profiles in line with typical SPAC targets (Bai et al., 2021). As defined by Brown and Warner (1985) and Ritter (1991), short-term market-adjusted return is:

$$(1)\ ar_{it} = r_{it} - r_{mt}$$

Where r_{it} are returns for stock *I* and r_{mt} is the return of the benchmark on day *t*.
The weighed arithmetic average of the market-adjusted returns is defined by MacKinlay (1997) as:

$$(2)\ AR_t = \left(\frac{1}{n}\right) \sum_{t=1}^{t} ar_{it}$$

Summing the average market adjusted returns gives the CAR:

$$\text{(T)}\quad CAR_{ti} = \sum_{t=1}^{t} AR_{it}$$

The CARs are computed for different event windows ranging from 3-days to 21-days event windows which is in line with other SPAC research. To avoid bias due to the chosen benchmark, robustness checks for alternative benchmarks will be performed. For each event, a negative CAR effect is expected on an overall level. Specifically, negative effects are expected for IPO and Announced firms. This leads to the hypothesis that for each event i:

$$H_1: CAR_{i,Overall} < 0$$
$$H_2: CAR_{i,IPO,Announced} < 0$$

Long-term effects would typically be analyzed with a timeframe between 1 and 36 months. The regulatory announcements are recent and the maximum timeframe analyzed is (significantly) shorter than 36 months. For this reason, this study will not focus on long-term effects. However, it would be interesting for future research purposes to include long-term effects analysis.

To better understand the impact of regulatory uncertainty on SPAC performance measured by cumulative abnormal returns, several regressions using control variables will be performed. Firstly, to examine which deal- and firm specific characteristics might drive these cumulative abnormal returns an ordinary least squares or "OLS" regression is performed. The used regression is:

$$\text{(T)}\quad CAR_i = \alpha_i + \beta_1(Time\ to\ announcement) + \beta_2(Time\ to\ completion) + \beta_3(IPO\ proceeds) + \beta_4(Transaction\ value) + \beta_5(Relative\ size) + \beta_6(Large\ SPAC) + \beta_7(Pre-Revenue) + \beta_8(Not\ profitable)$$

Here the dependent variable is the sum of the cumulative abnormal returns for firm I across all three events. This paper analysis the effects on the CARs for the 3 and 21 event windows. The explanatory variables used are the time between the SPAC IPO and the merger announcement and the time between the merger announcement and time to completion. Other deal specific variables include the total IPO proceeds, the transaction value and the natural logarithm of the relative size (defined as transaction value over IPO proceeds). Finally, three dummy variables are included: Large SPAC (1 if IPO proceeds exceed $250m), pre-revenue

(1 if the target has not yet realized revenue at the time of the merger) and not profitable (1 if the target is not profitable at the time of the merger). As this paper focusses on determining whether these CARs are driven by regulatory uncertainty the predicted signs of all variables is:

$$H_3: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 = 0$$

This implies that deal- and firm specific characteristics do not drive the CARs surrounding the events.

In order to test the effects of specific events and firm status on CARs two panel data regressions are performed. These regressions use the same control variables as in the OLS regressions but instead use the three separate CAR values per event per firm. The formulae used for these regressions are:

$$(5)\ CAR_i = \alpha_i + \beta_1(Event\ 1) + \beta_2(Event\ 2) + \beta_3(Time\ to\ announcement) + \beta_4(Time\ to\ completion) + \beta_5(IPO\ proceeds) + \beta_6(Transaction\ value) + \beta_7(Relative\ size) + \beta_8(Large\ SPAC) + \beta_9(Pre-Revenue) + \beta_{10}(Not\ profitable)$$

Where Event 1 and Event 2 are dummy variables that equal 1 if the CAR belongs to that specific event. From regression 5 the effects of the regulator uncertainty impact can be found through the hypothesis:

$$H_4: \beta_1 \neq \beta_2 \neq 0$$

$$(6)\ CAR_i = \alpha_i + \beta_1(IPO) + \beta_2(Announced) + \beta_3(Time\ to\ announcement) + \beta_4(Time\ to\ completion) + \beta_5(IPO\ proceeds) + \beta_6(Transaction\ value) + \beta_7(Relative\ size) + \beta_8(Large\ SPAC) + \beta_9(Pre-Revenue) + \beta_{10}(Not\ profitable)$$

Here IPO and Announced are 1 if the firm status during the event belonging to the CAR equals 1. Regression 6 aims to determine if the difference in firm status has an impact on CARs. No impact is expected on merged firms but there should be an effect on IPO and Announced firms the hypothesis is:

$$H_5: \beta_1 \neq \beta_2 \neq 0$$

4.2. Data

This section describes how the data used in this study was gathered and obtained. The sample of companies analysed was selected using the ThomsonONE database. In order to identify SPACs a combination of IPO and M&A data must be combined. SPACs that have not yet found, or merged with, a target can be identified in IPO databases. Post-merger, the SPACs can be identified in M&A databases. Table 4 shows that the data was collected between January 1st 2019 and May 31st 2022. Firstly, all M&A transactions are identified after which corrections are made for non-listed acquirors, non-US acquirors, M&A transactions without SPAC involvement, non-US targets and targets in the financial service industries based on SIC classification codes 6000-6999. This leaves 326 firms identified to have been acquired by a SPAC. For all transactions the original SPAC IPO date, merger announcement date and merger effective date are collected as well as the transaction value. Next, all US IPOs between January 1st 2019 and May 31st 2022 are identified. Using ThomsonONE's SPAC filter all IPOs without SPAC involvement are removed leaving 1,191 SPAC IPOs in the sample. For all IPOs the proceeds and offer price are computed.

Sample Selection SPAC M&A Transactions	
All completed M&A transactions 01/01/2019-31/05/2022	202,144
Less: Non listed acquirors	*154,550*
Less: Non-US acquirors	*37,121*
Less: M&A without SPAC involvement	*10,009*
Less: Non-US targets	*100*
Less: Targets in financial service industries (SIC 6000-6999)	*38*
# SPAC Firms in Analyses	326
Sample Selection SPAC IPO Firms	
All completed US IPOs 01/01/2019-31/05/2022	2,904
Less: IPOs without SPAC involvement	*1,713*
# SPAC Firms in Analyses	1,191

Table 4: Sample selection.

As this study will perform an event study based on three different events a distinction between the SPAC "status" at the time of the event will be made. For this purpose of this study three types of status will be recognised. If the SPAC has not yet announced it has found

a target it will be classified as “IPO”, the SPAC has announced its intent to merge with a target it is classified as “Announced” and lastly when the merger is completed the status is “Merged”. Table 5 depicts a correction for duplicates and firms that could not be matched for data collection due to them failing for example.

All SPACs in Sample	
Identified companies	1.517
Less: Not able to match due to data unavailability	*842*
Less: Duplicates	*13*
# SPAC Firms in Analyses	662

Table 5: Final sample.

Table 6 shows the status of the firm at the time of the three different events. Because some firms were yet to IPO or ceased to exist at the time of the events the sample size varies.

SPAC Status at time of event	**IPO**	**Announced**	**Merged**	**Sum**
Event 1 – 10/03/2021	305	48	20	**373**
Matched	*195*	*5*	*20*	***220***
Event 2 – 08/04/2021	357	51	*24*	***432***
Matched	236	40	*45*	***321***
Event 3 – 30/03/2022	481	54	*121*	***656***
Matched	404	52	*121*	***577***

Table 6: Firm Status at time of event.

For all identified firms in the final sample daily stock closing prices were obtained using Compustat, also for the period between January 1st 2019 and May 31st 2022. From this, daily stock returns were calculated. Based on the gathered data other variables were computed. For a full description and overview including sources of all variables please refer to Appendix 8.1.

4.3. Descriptive Statistics

Table 7 shows the distribution of the data by year and industry. The data is sorted by SPAC IPO date. It should be noted that the data for 2022 is until May 31st and therefore is not a full year compared to the other years. The majority of IPOs in the dataset became public in

2021 in line with the "SPAC boom" witnessed that year. The second part of the table gives some insight into the distribution across industries. As a majority of the SPACs have not yet found a target they are classified as "Blank Check" companies. This falls under the "Finance, Insurance & Real Estate" Standard Industrial Classification or "SIC" code. To provide insight into what target companies the SPACs merged with for the purpose of this table these SPACs have been listed as not merged yet. The majority of merged companies are in the services, manufacturing and transportation & public utilities industry.

Distribution of Sample by Year (by IPO date)	N	%
2019	39	5,9%
2020	168	25,4%
2021	420	63,4%
2022	35	5,3%
Total	662	100%
Distribution of Sample by Industry (based on SIC codes)	N	%
Not merged yet	*487*	*73,6%*
Agriculture, Forestry & Fishing	2	0,3%
Mining	0	0,0%
Construction	2	0,3%
Manufacturing	68	10,3%
Transportation & Public Utilities	12	1,8%
Wholesale Trade	5	0,8%
Retail Trade	4	0,6%
Finance, Insurance & Real Estate	0	0,0%
Services	81	12,2%
Public Administration	1	0,2%
Total	662	100%

Table 7: Data distribution by year and industry.

Table 8 provides descriptive statistics for all variables used in the regression analysis. The time to announcement is measured as the difference between the IPO and merger announcement date. The time to completion if the difference between the merger announcement and merger effective date. The IPO proceeds and transaction value are size indicators. The relative size variable is the transaction value divided by the IPO proceeds showing that merger value is almost 6.5 times more than IPO proceeds on average. The large SPAC variable is a dummy variable where large SPACs are defined if the IPO proceeds are larger than $250 million. To check for multicollinearity the second part of Table 8 shows the correlation coefficients between control variables. The majority of coefficients is below 0.3 and thus multicollinearity does not appear to be an issue.

Descriptive Statistics All Variables				
Variable	Median	Mean	Std	N
Time to announcement (days)	275,0	288,9	140,3	55
Time to completion (days)	105,0	90,9	78,0	55
IPO Proceeds ($m)	200,0	226,9	152,2	55
Transaction Value ($m)	804,0	1.190,9	1.209,2	55
Relative size (%)	388,9%	575,9%	632,6%	55
Large SPAC (1 if IPO>$250m, else 0)	n.a.	0,3	0,5	55
Pre-revenu	n.a.	0,1	0,3	55
Not profitable	n.a.	0,6	0,5	55

Correlation Matrix

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Time to announcement (days)	-	-0,24	-0,16	-0,19	0,04	-0,03	0,14	-0,11
(2) Time to completion (days)	-0,24	-	0,11	0,12	0,09	0,07	0,10	0,25
(3) IPO Proceeds ($m)	-0,16	0,11	-	0,29	-0,12	0,28	-0,12	-0,05
(4) Transaction Value ($m)	-0,19	0,12	0,29	-	0,40	0,46	-0,01	0,18
(5) Relative size (%)	0,04	0,09	-0,12	0,40	-	-0,06	0,00	-0,27
(6) Large SPAC (1 if IPO>$250m, else 0)	-0,03	0,07	0,28	0,46	-0,06	-	-0,10	-0,05
(7) Pre-revenue	0,14	0,10	-0,12	-0,01	0,00	-0,10	-	0,28
(8) Not profitable	-0,11	0,25	-0,05	0,18	-0,27	-0,05	0,28	-

Table 8: Descriptive statistics and correlation matrix for control variables.

The regression analysis focusses on post-merger SPAC performance. Since transaction specific variables such as time to completion, transaction value, pre-revenue and not profitable are only available after SPACs have successfully merged. For this reason, the SPACs that have not yet merged are excluded from the sample. Due to unavailability of data some other firms are excluded leaving 55 firms in the sample.

5. Results

In this section the empirical results of the analysis are discussed. The results will be compared to the hypothesis and overall research question of this study. While typically results would be compared to those of other similar studies, no related research has been performed so far.

5.1. Event Study

To determine whether or not regulatory uncertainty has an effect on SPAC performance event studies are conducted using three SEC announcements as described earlier. Event studies measuring cumulative abnormal returns ("CARs") for different event windows ranging from 3 to 21 days are measured. The dataset used includes SPACs at different stages in their cycle. For each event the status at the time of that event is determined and classified as either IPO (no target found), Announced (target identified and merger announcement has taken place) and Merged (the merger is completed). The hypothesis for this event study is that regulatory uncertainty, generated by SEC announcements, negatively affect SPAC returns specifically for companies in the "SPAC" stage in this case defined as IPO or Announced. Figure 5 shows an overall positive CAR for the days following the SEC announcement. Specifically for the IPO and Announced firms an underperformance compared to the benchmark (Russell 2000 in this case) can be seen up to 6 days past the announcements.

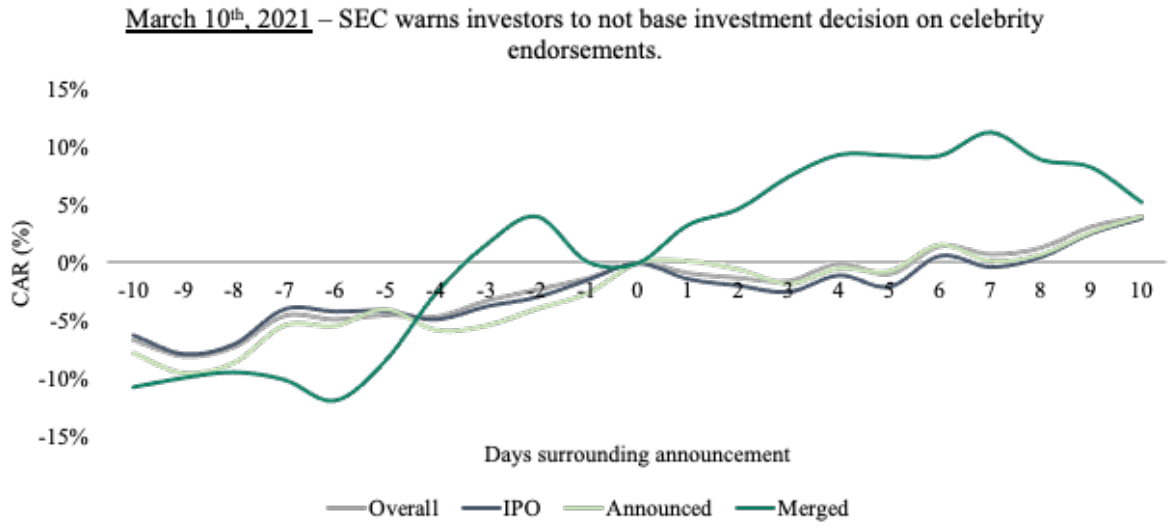

Figure 5: CARs around March 10th, 2021 SEC announcement.

Figure 6 displays the same results for the second event. While the hypothesis implies that no effect is expected on companies that already successfully completed their merger a clear negative effect is seen following the SEC announcement. Perhaps this could be contributed to the fact that companies, even those that completed mergers are liable when misstating (forward looking) filings. Their does not seem to a clear positive or negative effect following the announcement on IPO or Announced firms.

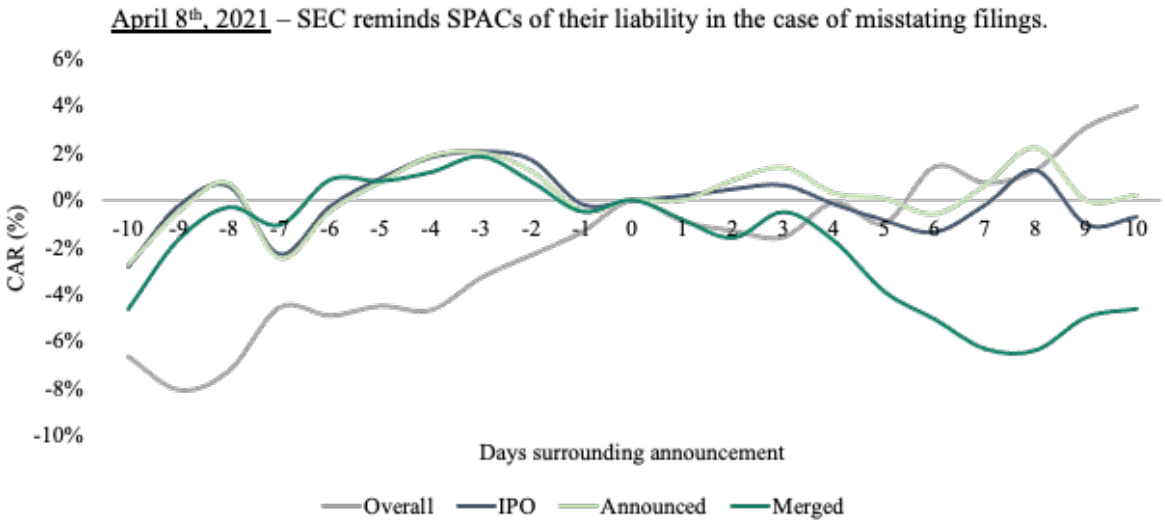

Figure 6: CARs around April 8th, 2021 SEC announcement.

Figure 7 shows the results for the final event study. This announcement is the most rigorous of the events studied in the sense that it proposes new rules that would drastically change the SPAC landscape. However, again a negative trend can only be identified for companies already merged. The IPO and Announced firms show no clear positive or negative pattern.

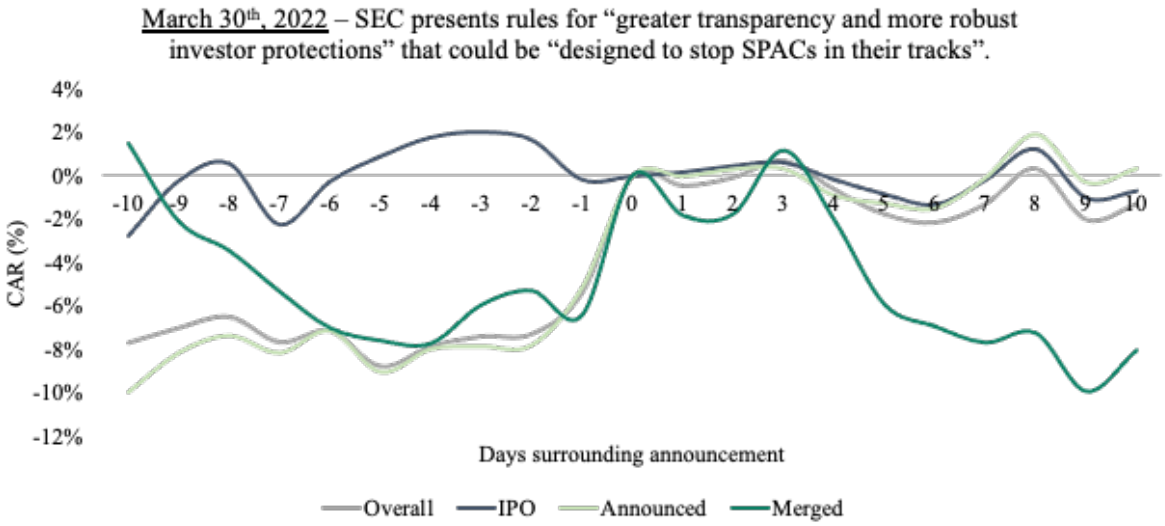

Figure 7: CARs around March 30th, 2022 SEC announcement.

To determine whether these SEC announcements have a statistically significant effect CARs over the event windows ranging from 3 to 21 days will be analyzed. The short term, 3-day event window returns for all events by firm status are displayed in Table 9. Event 1 shows a clear negative effect for IPO and Announced firms that are significant (at a 1% confidence-level) confirming the hypothesis. Merged firms show a positive reaction to the announcement however these results are not significant. Event 2 shows that there is a small negative effect for Announced firms that is significant (at a 1% confidence-level) but no significant results can be found for IPO firms. Surprisingly a negative significant (at a 1% confidence-level) effect is found for firms that already completed their merger. As mentioned, this might be because this SEC announcement also applies to firms already merged. This means that for event 2 the results are partially in line with the hypothesis. For the CARs surrounding the final event a positive and significant (at a 1% confidence-level) effect of 3% is found for both IPO and Announced firms.

Descriptive Statistics of 3-day CAR Around SEC Announcements by Firm Status (Russell 2000 as benchmark)							
Event 1 – March 10th, 2021							
Firm Status	Mean	Median	Max	Min	SD	N	T-stat
Overall	-2,3%	-3,6%	22,1%	-22,8%	4,8%	220	-7,03***
IPO	-2,9%	-3,7%	22,1%	-14,0%	3,7%	195	-10,92***
Announced	-2,5%	-3,2%	0,3%	-4,9%	2,4%	5	-2,35**
Merged	3,6%	3,6%	17,5%	-22,8%	9,2%	20	1,75
Event 2 – April 8th, 2021							
Firm Status	Mean	Median	Max	Min	SD	N	T-stat
Overall	-0,2%	-0,6%	83,3%	-8,1%	5,1%	321	-0,76
IPO	0,1%	-0,5%	83,3%	-6,6%	5,8%	236	0,13
Announced	-0,5%	-0,6%	2,9%	-1,9%	0,8%	40	-3,78***
Merged	-1,4%	-0,6%	1,6%	-8,1%	2,3%	45	-3,86***
Event 3 – March 30th, 2022							
Firm Status	Mean	Median	Max	Min	SD	N	T-stat
Overall	2,3%	3,0%	70,1%	-30,8%	4,7%	577	11,89***
IPO	3,0%	3,0%	5,3%	-1,7%	0,6%	404	104,66***
Announced	3,0%	3,0%	5,8%	-0,3%	0,8%	52	25,77***
Merged	0,0%	-0,7%	70,1%	-30,8%	9,9%	121	-0,03

, **, * indicate statistical difference from zero (two-tailed) at the <0.05, <0.02, and <0.01 levels, respectively*

Table 9: Descriptive statistics of 3-day CARs by firm status for all events.

The described results look at a three-day event window. However the effect of longer event windows should be taken into account. To study the effects per event please refer to Appendices 8.2, 8.3 and 8.4 for event 1, 2 and 3 respectively. Here the CARs for each event window length are shown per firm status.

Event 1 – March 10th, 2021 SEC warns investors not to base investment decision on celebrity endorsements.

In line with the hypothesis, significant negative returns across all event windows can be seen for both IPO and Announced firms. The largest negative impact in both groups is seen around the 9-to-15-day event window surrounding the SEC announcements. It should be noted that only 5 firms are included in the "Announced" group so the results should be taken with caution.

Event 2 – April 8th, 2021 SEC reminds SPACs of their liability in the case of misstating filings.

The results surrounding the 2nd event show a mix of positive and negative but mostly positively (significant) results for different event windows surrounding the announcement for IPO and Announcement firms. For Merged firms little significant results are found apart from a few showing negative impact. As mentioned, this could be due to the fact that this particular announcement also impacts merged firms.

Event 3 – March 30th, 2022 SEC presents rules for "greater transparency and more robust investor protection" that could be "designed to stop SPACs in their tracks".

The most surprising results are found surrounding the 3rd event. The magnitude and impact of this announcement far exceeds the other in terms of concrete actions proposed. However, the results show that for both IPO and Announced firms most event windows show significant positive reactions to the announcement. For Merged firms, no statistically significant results are found. The hypothesis for the event study is that for each event i:

$$H_1: CAR_{i,Overall} < 0$$

$$H_2: CAR_{i,IPO,Announced} < 0$$

Based on these results H_1 can be:

i. Event 1 – Not rejected at a significance level of 1%
ii. Event 2 – No significant results are found thus the hypothesis cannot be accepted or rejected.
iii. Event 3 – The hypothesis is rejected at a significance level of 1%.

Based on these results H_2 can be:

i. Event 1 – Not rejected at a significance level of 1% and 2% for IPO and Announced firms respectively.
ii. Event 2 – No significant results are found thus the hypothesis cannot be accepted or rejected for IPO firms. For Announced firms the hypothesis is accepted at a 1% significance level.
iii. Event 3 – The hypothesis is rejected for both IPO and Announced firms at a significance level of 1%.

Overall, this leads to conclude that event 1 appears to have a negative (and significant) effect on cumulative abnormal returns surrounding the announcement which is also specifically true for IPO and Announced firms at the time of the announcement. While for event 2 no significant results are found, event 3 shows results opposing the hypothesis. For event 3 a positive relation to CARs is found, also specifically for IPO and Announced firms.

To see if the used benchmark, the Russell 2000, yields fair results two other benchmarks have been used for robustness: the S&P 500 and the Renaissance IPO Index. Table 10 provides an overview of the 3-day CARs for all three events by firm status. The results for the first event are comparable in terms of sign, magnitude and significance when looking at the IPO and Announced firms for the Russell 2000 and Renaissance IPO Index. The S&P 500 does not yield significant results except for Merged companies. When looking at the second event, the Renaissance IPO Index does find a negative and significant effect for IPO firms. All three benchmarks find negative and significant results for Announced and merged firms. For the third event the results are unanimous: positive, significant and of the same magnitude effects for both IPO and Announced firms. None of the benchmarks find a significant result for Merged firms.

Benchmark Comparison for 3-Day Event Window CARs			
	Russell 2000	S&P500	Renaissance IPO
Event 1	Mean CAR(-1,1)	Mean CAR(-1,1)	Mean CAR(-1,1)
Overall	-2,3%***	0,3%	-2,8%***
IPO	-2,9%***	-0,3%	-3,4%***
Announced	-2,5%**	0,0%	-3,1%***
Merged	3,6%	6,1%***	3,1%
Event 2			
Overall	-0,2%	-0,5%	-1,0%***
IPO	0,1%	-0,2%	-0,8%*
Announced	-0,5%***	-0,8%***	-1,3%***
Merged	-1,4%***	-1,6%***	-2,2%***
Event 3			
Overall	2,3%***	1,6%***	4,2%***
IPO	3,0%***	2,2%***	4,8%***
Announced	3,0%***	2,2%***	4,9%***
Merged	0,0%	-0,8%	1,8%

, **, * indicate statistical difference from zero (two-tailed) at the <0.05, <0.02, and <0.01 levels, respectively*

Table 10: Mean CARs(-1,1) by firm status for all events using different benchmarks.

5.2. Regression Analysis

To determine whether the CARs found in the event study are caused by regulatory uncertainty or firm- and deal specific characteristics several regressions are performed. The first regression looks to find a relation between the sum of CARs for a given event window (e.g. the 3-day and 21-day event windows) and firm- and deal specific controls. Table 11 shows the results of the OLS regression on the control variables for the 3- and 21-day event window based on formula (4). The hypothesis is that none of the control variables influences the found CARs, suggesting these abnormal returns are caused by regulatory uncertainty.

$$H_3: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 = 0$$

Statistically significant coefficients are found for the control pre-revenue and not-profitable. Whether or not firm i has realized revenue and/or a profit impacts the 3-day CAR by factor 1,5x-3,1x. Thus, for the 3-day event window we reject H_3. For the 21-day event window a positive and statistically significant coefficient is found for the control variable transaction value and relative size. The relative size, defined as the deal value over the IPO proceeds, impacts the CARs by almost factor 4.

Robust OLS Regression Results

	CAR (-1,1)				CAR (-10,10)			
CAR (-1,1)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Time to announcement	-0,12	-0,07	-0,09		0,00	0,00	0,00	
T-stat	*-0,51*	*-0,31*	*-0,49*		*1,05*	*0,87*	*-0,41*	
Time to completion	-0,31	0,57	-1,26		-0,01	-0,01	0,00	
T-stat	*-0,39*	*0,91*	*-2,27*		*-1,19*	*-0,94*	*-0,32*	
IPO Proceeds ($m)	0,24	0,56		0,04	0,02	0,02**		0,01
T-stat	*0,23*	*0,87*		*0,05*	*1,52*	*2,30*		*0,76*
Transaction Value ($m)	-0,04	-0,03		-0,02	-0,01**	-0,01**		0,00*
T-stat	*-0,64*	*-0,50*		*-0,47*	*-2,49*	*-2,34*		*-1,70*
Relative size (%)	32,34	43,04		23,34	4,81**	4,63**		3,24
T-stat	0,47	*0,68*		*0,38*	*2,29*	*2,22*		*1,38*
Large SPAC	118,30			137,12	4,81			1,05
T-stat	*0,77*			*1,07*	*0,99*			*0,47*
Pre-Revenue	-68,31		-160,65**	-81,37	0,00		0,00	0,00
T-stat	*-0,61*		*-1,98*	*-0,83*	*0,00*		*0,00*	*0,00*
Not-Profitable	264,70**		306,53***	240,94**	1,68		0,60	1,21
T-stat	*2,15*		*3,52*	*2,38*	*1,08*		*0,41*	*0,78*
		-	-	-	-	-		
Constant	-559,98***	524,23***	398,49***	582,87***	9,55***	9,21***	-1,81	-6,00*
T-stat	*-2,99*	*-3,03*	*-4,46*	*-3,46*	*-2,88*	*-2,81*	*-1,13*	*-1,84*
Observations	55	55	55	55	55	55	55	55
R-squared	0,44	0,15	0,25	0,41	0,51	0,37	0,03	0,38

, **, * indicate statistical difference from zero (two-tailed) at the <0.15, <0.05, and <0.01 levels, respectively. The dependant variable is the natural logarithm of the 3- and 21-day event windows respectively. The coefficients are scaled by factor 100. For example, a coefficient of factor 1,00 implies a 1,00% change in CAR.*

Table 11: Robust OLS regression results.

In Appendix 8.7 the Robust Cross-Sectional Regression Results per event are presented. Contrary to the OLS regression three separate CAR values per event per firm are used. The same control variables are used, based on formula (5) the hypothesis is:

$$H_4: \beta_1 \neq \beta_2 \neq 0$$

Which would suggest that both events 1, 2 and 3 have a significant effect on CARs. Based on the results no significant results are found for either event 1, event 2 or any of the control variables. This implies that no significant effect of both events on the 3- and 21-day event window CARs can be found. In Appendix 8.8 the Robust Cross-Sectional Regression Results per firm status are presented. Based on formula (6) the hypothesis is:

$$H_5: \beta_1 \neq \beta_2 \neq 0$$

The results show that a significant result is found for Announced firms in the 3-day event window but not for IPO firms. This suggests that whether a firm announced a merger positively influenced the CARs surrounding the event announcements. Based on these results the hypothesis cannot be rejected.

6. Discussion & Conclusion

This study set out to find out how recent regulatory uncertainty in the U.S. has impacted SPAC performance. It is clear that the "boom" in SPAC IPOs has come to halt in the first half of 2022. Regulatory uncertainty is measured using event studies around three SEC announcements in 2021 and 2022. By measuring cumulative abnormal returns around those events using the Russell 2000 index as a benchmark this study set out to find whether such announcements negatively impact SPAC returns.
Firstly, this study indeed finds a significant negative effect around the first 2 events. Surrounding the first event CARs of -2,9% and -2,5% respectively for IPO and Announced firms are found for a 3-day event window. Around the second event a negative CAR of -0,5% for Announced firms is found as well as a negative effect of -1,4% for SPACs that already completed their merger. For the final event, the most rigorous in terms of proposed regulation, surprising results are found. The market responded positively with 3-day CARs of 3% for both IPO and Announced firms. While the direction of this result contradicts the hypothesis it still shows a significant market reaction to regulatory changes.
Secondly, regressions were performed to see how firm- and deal specific control variables might impact these CARs. No significant results were found for their impact apart from that of large SPACs defined as those that raised more than $250 million in IPO proceeds. Overall, this study suggests that SEC announcements generate "uncertainty" in the form of abnormal returns surrounding the events even when controlling for firm- and deal specific characteristics.

The results of this study are interesting for academia because no studies of regulatory uncertainty have been performed to date in the field of SPACs. This study hopes to provide a basis for future research as it provides insight into the effectiveness of legislators view of SPACs as an alternative to IPOs. While the boom in SPAC IPOs seems to have slowed down recently a record number of SPACs are still looking for target companies and thus the topic remains relevant today. The positive market reaction following the SEC's proposed set of rules in 2022 might point to a long-awaited intervention by legislators adding further investor protection.

While this study presents solid results it is subject to several limitations and there are suggestions for further research. Firstly, due to the recent boom in SPAC markets the long-term effects of regulatory uncertainty cannot yet be measured. For that reason, it would be interesting for future researchers in this area to see if long-term effects are in line with short-term effects. A more general limitation when researching SPACs is the limited amount of data available. This is caused by a combination of i) sample sizes are small compared to IPO and M&A markets as SPACs only recently took on serious volumes ii) SPAC specific measurements such as redemption rates, PIPE financing rates etc. are not publicly (and freely) available. SPAC research would benefit from a publicly available database for academics. This lack of data also implies that the results of this study should be looked at with caution and should be replicated as sample sizes increase going forward. Another limitation of this study is comparability. As no previous literature on regulatory uncertainty effects on SPAC exists the results found cannot be compared or benchmarked to other studies. Going forward other research methodologies and samples should be compared to these results to validate their authority. Another interesting aspect for future research is conducting similar event studies in different regulatory environments. Major SPAC markets like Europe and Asia are characterised by similar but different changes. European and Asian SPAC market research is even scarcer than U.S. focussed research.

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8. Appendix

8.1. Appendix I – Overview of Variables

Variable	Definition	Source
IPO proceeds	IPO Proceeds in USD millions.	ThomsonOne
Transaction Value	Reported transaction volume of the merger.	ThomsonOne
Large SPAC	Dummy variable. 1if IPO proceeds exceed $250 million, 0 else.	n.m.
Relative size	Transaction value relative to the total IPO proceeds in %	n.m.
Time to acquisition	Amount of days between IPO and announcement date.	ThomsonOne
Time to completion	Amount of days between announcement and merger completion date.	ThomsonOne
Pre-Revenue	Dummy variable. 1 if target has not yet realized revenue at the time of merger.	EDGAR - S1
Not-Profitable	Dummy variable. 1 if target is not yet profitable at the time of merger.	EDGAR - S1

8.2. Event 1 - Descriptive Statistics of Event Study CARs around SEC Announcements (Russell 2000)

Event 1 - Descriptive Statistics of Event Study CARs around SEC Announcements (Russel 2000)							
Overall Sample	Mean	Median	Max	Min	SD	N	T-stat
CAR (-1,1)	-2,3%	-3,6%	22,1%	-22,8%	4,8%	220	-7,03***
CAR (-2,2)	-3,6%	-6,3%	32,0%	-23,5%	7,5%	220	-7,21***
CAR (-3,3)	-4,9%	-7,4%	37,6%	-17,8%	8,0%	220	-9,08***
CAR (-4,4)	-4,8%	-7,4%	52,6%	-14,6%	8,2%	220	-8,71***
CAR (-5,5)	-5,6%	-6,7%	31,4%	-30,5%	6,4%	220	-13,06***
CAR (-6,6)	-3,6%	-3,3%	26,1%	-29,5%	6,4%	220	-8,37***
CAR (-7,7)	-3,9%	-3,8%	47,6%	-30,3%	7,9%	220	-7,37***
CAR (-8,8)	-6,0%	-6,3%	46,8%	-34,4%	7,5%	220	-11,89***
CAR (-9,9)	-4,7%	-4,7%	47,3%	-37,2%	7,6%	220	-9,21***
CAR (-10,10)	-2,5%	-1,1%	38,7%	-35,8%	8,4%	220	-4,35***
IPO	Mean	Median	Max	Min	SD	N	T-stat
CAR (-1,1)	-2,9%	-3,7%	22,1%	-14,0%	3,7%	195	-10,92***
CAR (-2,2)	-5,0%	-6,5%	32,0%	-9,9%	5,2%	195	-13,30***
CAR (-3,3)	-6,3%	-7,7%	31,5%	-14,8%	5,2%	195	-16,86***
CAR (-4,4)	-6,0%	-7,6%	52,6%	-14,6%	6,7%	195	-12,49***
CAR (-5,5)	-6,2%	-6,8%	27,4%	-15,3%	4,6%	195	-18,84***
CAR (-6,6)	-3,6%	-3,4%	23,7%	-18,2%	4,7%	195	-10,79***
CAR (-7,7)	-4,3%	-3,9%	47,6%	-25,5%	6,1%	195	-9,93***
CAR (-8,8)	-6,5%	-6,4%	46,8%	-27,2%	5,7%	195	-15,96***
CAR (-9,9)	-5,0%	-4,7%	47,3%	-22,3%	5,7%	195	-12,30***
CAR (-10,10)	-2,2%	-1,0%	26,0%	-28,0%	6,3%	195	-4,80***
Announced	Mean	Median	Max	Min	SD	N	T-stat
CAR (-1,1)	-2,5%	-3,2%	0,3%	-4,9%	2,4%	5	-2,35**
CAR (-2,2)	-4,6%	-4,6%	-1,8%	-7,0%	2,1%	5	-4,92***
CAR (-3,3)	-7,4%	-7,3%	-6,1%	-8,6%	1,0%	5	-17,06***
CAR (-4,4)	-6,4%	-6,3%	-5,5%	-8,0%	1,0%	5	-14,42***
CAR (-5,5)	-4,9%	-4,8%	-2,5%	-6,6%	1,6%	5	-6,90***
CAR (-6,6)	-3,9%	-2,8%	-0,7%	-11,5%	4,4%	5	-2,00*
CAR (-7,7)	-5,2%	-3,7%	-0,3%	-17,1%	6,8%	5	-1,72
CAR (-8,8)	-7,9%	-6,5%	-3,1%	-16,3%	5,1%	5	-3,44***
CAR (-9,9)	-6,6%	-5,1%	-3,8%	-15,2%	4,8%	5	-3,06***
CAR (-10,10)	-3,5%	-1,7%	3,7%	-16,7%	7,7%	5	-1,01
Merged	Mean	Median	Max	Min	SD	N	T-stat
CAR (-1,1)	3,6%	3,6%	17,5%	-22,8%	9,2%	20	1,75
CAR (-2,2)	9,4%	12,1%	28,0%	-23,5%	13,1%	20	3,23***
CAR (-3,3)	9,7%	7,2%	37,6%	-17,8%	14,5%	20	2,98***
CAR (-4,4)	7,0%	3,2%	32,5%	-9,8%	12,5%	20	2,52**
CAR (-5,5)	0,2%	-0,2%	31,4%	-30,5%	14,6%	20	0,06
CAR (-6,6)	-3,4%	-2,7%	26,1%	-29,5%	15,5%	20	-0,98
CAR (-7,7)	0,3%	1,9%	36,4%	-30,3%	17,5%	20	0,08
CAR (-8,8)	-0,7%	-2,8%	28,6%	-34,4%	16,6%	20	-0,19
CAR (-9,9)	-1,5%	-2,9%	37,3%	-37,2%	18,0%	20	-0,38
CAR (-10,10)	-4,9%	-4,6%	38,7%	-35,8%	19,5%	20	-1,13

8.3. Event 2 - Descriptive Statistics of Event Study CARs around SEC Announcements (Russell 2000)

Event 2 - Descriptive Statistics of Event Study CARs around SEC Announcements (Russel 2000)

Overall Sample	Mean	Median	Max	Min	SD	N	T-stat
CAR (-1,1)	-0,2%	-0,6%	83,3%	-8,1%	5,1%	321	-0,76
CAR (-2,2)	1,7%	1,6%	64,8%	-15,5%	4,8%	321	6,34***
CAR (-3,3)	2,6%	2,1%	68,7%	-16,4%	6,2%	321	7,47***
CAR (-4,4)	1,4%	1,2%	57,5%	-15,9%	6,1%	321	4,09***
CAR (-5,5)	-0,2%	-0,5%	115,7%	-28,0%	9,1%	321	-0,46
CAR (-6,6)	-1,9%	-2,0%	117,6%	-29,5%	8,9%	321	-3,80***
CAR (-7,7)	-3,0%	-2,7%	107,9%	-33,2%	8,9%	321	-6,11***
CAR (-8,8)	0,8%	1,9%	101,1%	-37,1%	9,2%	321	1,63
CAR (-9,9)	-1,8%	-1,5%	160,2%	-36,7%	11,5%	321	-2,85***
CAR (-10,10)	-4,1%	-3,6%	122,7%	-47,4%	10,1%	321	-7,28***

IPO	Mean	Median	Max	Min	SD	N	T-stat
CAR (-1,1)	0,1%	-0,5%	83,3%	-6,6%	5,8%	236	0,13
CAR (-2,2)	2,2%	1,6%	64,8%	-7,2%	4,7%	236	7,08***
CAR (-3,3)	2,7%	2,1%	68,7%	-10,8%	5,2%	236	7,90***
CAR (-4,4)	1,6%	1,2%	50,2%	-10,2%	4,4%	236	5,71***
CAR (-5,5)	0,0%	-0,5%	54,8%	-17,2%	4,7%	236	0,12
CAR (-6,6)	-1,7%	-1,9%	48,6%	-18,3%	4,3%	236	-5,92***
CAR (-7,7)	-2,5%	-2,6%	43,8%	-30,1%	4,2%	236	-9,13***
CAR (-8,8)	1,8%	2,0%	37,5%	-18,5%	3,7%	236	7,40***
CAR (-9,9)	-1,3%	-1,4%	54,7%	-20,4%	4,7%	236	-4,36***
CAR (-10,10)	-3,6%	-3,6%	45,9%	-18,3%	4,3%	236	-12,84***

Announced	Mean	Median	Max	Min	SD	N	T-stat
CAR (-1,1)	-0,5%	-0,6%	2,9%	-1,9%	0,8%	40	-3,78**
CAR (-2,2)	2,0%	1,5%	13,9%	-0,9%	2,2%	40	5,93***
CAR (-3,3)	3,5%	2,3%	51,6%	0,1%	7,8%	40	2,82***
CAR (-4,4)	2,2%	1,3%	47,2%	-3,3%	7,4%	40	1,91***
CAR (-5,5)	0,9%	-0,5%	55,9%	-4,1%	9,0%	40	0,66***
CAR (-6,6)	-1,0%	-2,1%	44,7%	-7,6%	7,5%	40	-0,84*
CAR (-7,7)	-1,8%	-2,7%	35,7%	-8,9%	6,3%	40	-1,76
CAR (-8,8)	3,0%	2,4%	35,6%	-4,6%	5,5%	40	3,40***
CAR (-9,9)	-0,4%	-1,5%	44,9%	-7,0%	7,5%	40	-0,37***
CAR (-10,10)	-2,5%	-3,5%	37,8%	-8,3%	6,7%	40	-2,35

Merged	Mean	Median	Max	Min	SD	N	T-stat
CAR (-1,1)	-1,4%	-0,6%	1,6%	-8,1%	2,3%	45	-3,86***
CAR (-2,2)	-0,9%	1,5%	14,0%	-15,5%	6,3%	45	-1,00
CAR (-3,3)	1,1%	2,1%	38,0%	-16,4%	8,6%	45	0,88
CAR (-4,4)	-0,5%	1,0%	57,5%	-15,9%	10,9%	45	-0,32
CAR (-5,5)	-2,7%	-1,1%	115,7%	-28,0%	20,1%	45	-0,90
CAR (-6,6)	-3,8%	-2,5%	117,6%	-29,5%	20,4%	45	-1,25
CAR (-7,7)	-7,0%	-3,6%	107,9%	-33,2%	20,7%	45	-2,26*
CAR (-8,8)	-6,0%	0,8%	101,1%	-37,1%	21,5%	45	-1,87
CAR (-9,9)	-5,7%	-2,3%	160,2%	-36,7%	28,0%	45	-1,36
CAR (-10,10)	-8,4%	-4,4%	122,7%	-47,4%	24,1%	45	-2,32**

8.4. Event 3 - Descriptive Statistics of Event Study CARs around SEC Announcements (Russell 2000)

Event 3 - Descriptive Statistics of Event Study CARs around SEC Announcements (Russel 2000)

Overall Sample	Mean	Median	Max	Min	SD	N	T-stat
CAR (-1,1)	2,3%	3,0%	70,1%	-30,8%	4,7%	577	11,89***
CAR (-2,2)	-0,4%	-0,6%	64,1%	-43,4%	5,2%	577	-2,01*
CAR (-3,3)	-0,2%	-0,7%	66,3%	-44,8%	6,3%	577	-0,73
CAR (-4,4)	1,2%	1,5%	42,8%	-52,1%	6,7%	577	4,34***
CAR (-5,5)	1,1%	1,9%	66,6%	-46,9%	7,6%	577	3,39***
CAR (-6,6)	2,8%	4,0%	89,9%	-55,5%	9,7%	577	6,91***
CAR (-7,7)	2,6%	3,7%	91,1%	-68,2%	10,4%	577	6,02***
CAR (-8,8)	3,9%	5,3%	103,8%	-70,8%	10,7%	577	8,76***
CAR (-9,9)	3,0%	4,1%	81,1%	-70,5%	9,4%	577	7,61***
CAR (-10,10)	0,9%	0,7%	77,3%	-77,4%	10,3%	577	2,15*

IPO	Mean	Median	Max	Min	SD	N	T-stat
CAR (-1,1)	3,0%	3,0%	5,3%	-1,7%	0,6%	404	104,66***
CAR (-2,2)	-0,5%	-0,6%	5,0%	-8,8%	0,8%	404	-12,70***
CAR (-3,3)	-0,6%	-0,7%	11,1%	-6,3%	1,0%	404	-13,57***
CAR (-4,4)	1,7%	1,6%	6,7%	-1,4%	0,8%	404	42,16***
CAR (-5,5)	1,9%	1,9%	6,3%	-3,3%	0,8%	404	47,42***
CAR (-6,6)	4,1%	4,0%	9,8%	0,3%	0,9%	404	89,94***
CAR (-7,7)	3,7%	3,8%	11,4%	-49,8%	2,9%	404	26,08***
CAR (-8,8)	5,3%	5,4%	13,0%	-48,1%	2,9%	404	37,27***
CAR (-9,9)	4,1%	4,1%	13,2%	-49,4%	2,8%	404	28,72***
CAR (-10,10)	0,6%	0,7%	16,0%	-52,9%	3,0%	404	4,26***

Announced	Mean	Median	Max	Min	SD	N	T-stat
CAR (-1,1)	3,0%	3,0%	5,8%	-0,3%	0,8%	52	25,77**
CAR (-2,2)	-0,6%	-0,6%	3,6%	-8,0%	1,5%	52	-2,65***
CAR (-3,3)	-1,0%	-0,7%	3,3%	-23,0%	3,3%	52	-2,16*
CAR (-4,4)	0,9%	1,6%	5,5%	-32,7%	5,0%	52	1,27
CAR (-5,5)	1,4%	2,0%	6,6%	-31,6%	5,0%	52	2,04*
CAR (-6,6)	3,5%	4,2%	8,7%	-27,6%	4,8%	52	5,25***
CAR (-7,7)	3,3%	3,9%	8,8%	-28,4%	4,7%	52	5,09***
CAR (-8,8)	4,7%	5,5%	11,2%	-30,1%	5,3%	52	6,46***
CAR (-9,9)	3,8%	4,4%	10,2%	-23,5%	4,2%	52	6,55***
CAR (-10,10)	0,7%	0,9%	10,8%	-24,8%	4,3%	52	1,11

Merged	Mean	Median	Max	Min	SD	N	T-stat
CAR (-1,1)	0,0%	-0,7%	70,1%	-30,8%	9,9%	121	-0,03
CAR (-2,2)	-0,2%	-0,1%	64,1%	-43,4%	11,2%	121	-0,16
CAR (-3,3)	1,7%	1,9%	66,3%	-44,8%	13,4%	121	1,37
CAR (-4,4)	-0,1%	-0,5%	42,8%	-52,1%	14,2%	121	-0,11
CAR (-5,5)	-2,0%	-3,1%	66,6%	46,9%	15,9%	121	-1,38
CAR (-6,6)	-1,7%	-5,2%	89,9%	-55,5%	20,4%	121	-0,94
CAR (-7,7)	-1,4%	-5,3%	91,1%	-68,2%	21,4%	121	-0,72
CAR (-8,8)	-1,1%	-4,1%	103,8%	-70,8%	21,9%	121	-0,53
CAR (-9,9)	-1,0%	-2,9%	81,1%	-70,5%	19,2%	121	-0,60
CAR (-10,10)	2,0%	0,7%	77,3%	-77,4%	21,8%	121	1,01

8.5. Alternative Benchmark Descriptive Statistics

Descriptive Statistics of 3-day CAR Around SEC Announcements by Firm Status (S&P500 as benchmark)

Event 1 - March 10th, 2021

Firm Status	Mean	Median	Max	Min	SD	N	T-stat
Overall	0,3%	-1,1%	24,6%	-20,3%	4,8%	220	0,78
IPO	-0,3%	-1,2%	24,6%	-11,5%	3,7%	195	-1,31
Announced	0,0%	-0,7%	2,8%	-2,4%	2,4%	5	0,00
Merged	6,1%	6,1%	20,0%	-20,3%	9,2%	20	2,97***

Event 2 - April 8th, 2021

Firm Status	Mean	Median	Max	Min	SD	N	T-stat
Overall	-0,5%	-0,8%	83,0%	-8,4%	5,1%	321	-1,75
IPO	-0,2%	-0,8%	83,0%	-6,9%	5,8%	236	-0,61
Announced	-0,8%	-0,9%	2,7%	-2,2%	0,8%	40	-5,88***
Merged	-1,6%	-0,9%	1,3%	-8,4%	2,3%	45	-4,65***

Event 3 - March 30th, 2022

Firm Status	Mean	Median	Max	Min	SD	N	T-stat
Overall	1,6%	2,2%	69,3%	-31,6%	4,7%	577	7,98***
IPO	2,2%	2,2%	4,6%	-2,5%	0,6%	404	77,52***
Announced	2,2%	2,2%	5,0%	-1,1%	0,8%	52	19,17***
Merged	-0,8%	-1,5%	69,3%	-31,6%	9,9%	121	-0,88

Descriptive Statistics of 3-day CAR Around SEC Announcements by Firm Status (Renaissance IPO as benchmark)

Event 1 - March 10th, 2021

Firm Status	Mean	Median	Max	Min	SD	N	T-stat
Overall	-2,8%	-4,1%	21,6%	-23,3%	4,8%	220	-8,73***
IPO	-3,4%	-4,3%	21,6%	-14,5%	3,7%	195	-13,01***
Announced	-3,1%	-3,8%	-0,2%	-5,5%	2,4%	5	-2,86***
Merged	3,1%	3,0%	16,9%	-23,3%	9,2%	20	1,49

Event 2 - April 8th, 2021

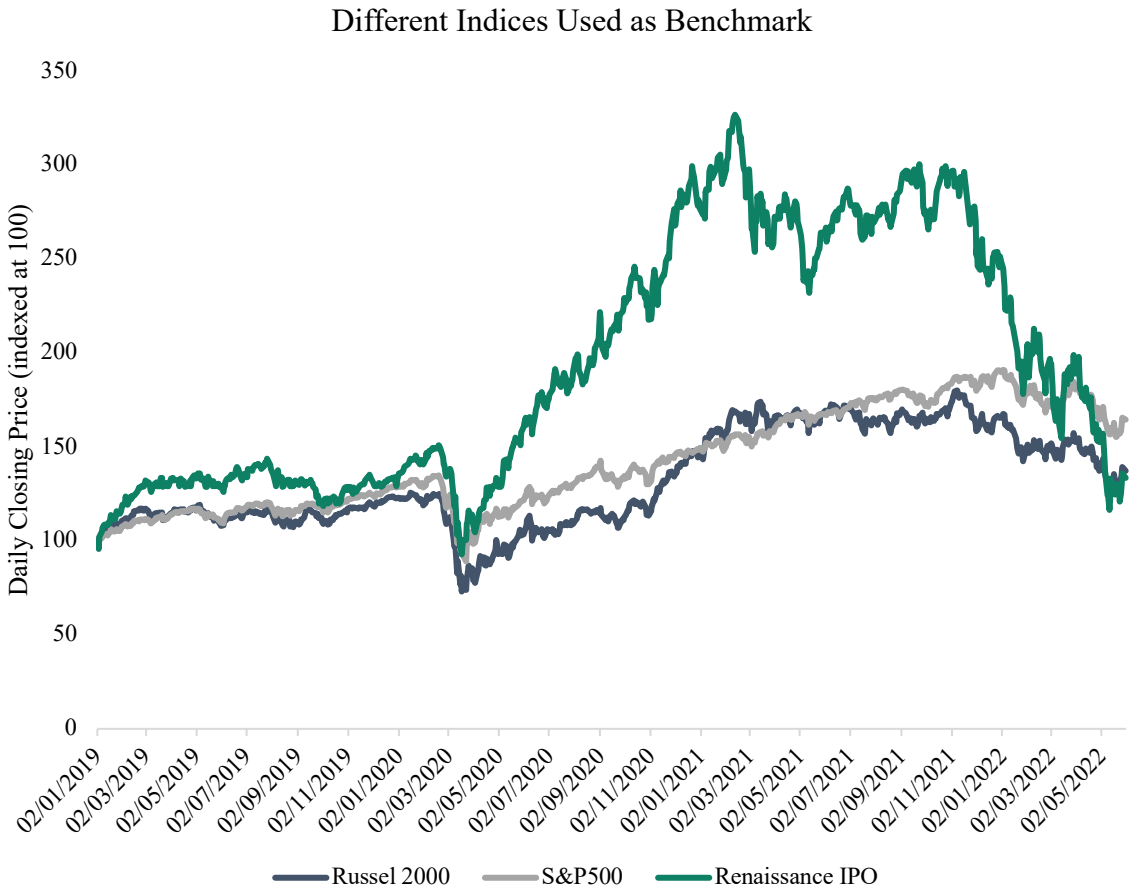
Firm Status	Mean	Median	Max	Min	SD	N	T-stat
Overall	-1,0%	-1,4%	82,5%	-8,9%	5,1%	321	-3,61***
IPO	-0,8%	-1,3%	82,5%	-7,4%	5,8%	236	-2,00*
Announced	-1,3%	-1,4%	2,1%	-2,7%	0,8%	40	-9,84***
Merged	-2,2%	-1,4%	0,8%	-8,9%	2,3%	45	-6,16***

Event 3 - March 30th, 2022

Firm Status	Mean	Median	Max	Min	SD	N	T-stat
Overall	4,2%	4,8%	71,9%	-29,0%	4,7%	577	21,36***
IPO	4,8%	4,8%	7,2%	0,1%	0,6%	404	170,58***
Announced	4,9%	4,8%	7,7%	1,5%	0,8%	52	41,79**
Merged	1,8%	1,2%	71,9%	-29,0%	9,9%	121	2,04

*, **, *** *indicate statistical difference from zero (two-tailed) at the <0.05, <0.02, and <0.01 levels, respectively*

8.6. Indexed Benchmark Comparison[10]



[10] Wall Street Journal Data

8.7. Robust Cros-Sectional Regression Results – Events

Robust Cross-Sectional Regression Results - Events

	CAR (-1,1)				CAR (-10,10)			
CAR (-1,1)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Event 1	-0,01	-0,01	-0,01	-0,01	-0,02	-0,02	-0,02	-0,02
Z-score	*-0,72*	*-0,72*	*-0,73*	*-0,72*	*-0,49*	*-0,49*	*-0,49*	*-0,49*
Event 2	-0,01	-0,01	-0,01	-0,01	-0,05	-0,05	-0,05	-0,05
Z-score	*-1,56*	*-1,58*	*-1,58*	*-1,57*	*-1,11*	*-1,12*	*-1,12*	*-1,11*
Time to announcement	0,00	0,00	0,00		0,00	0,00	0,00	
Z-score	*-0,45*	*-0,26*	*-0,49*		*-0,29*	*-0,67*	*-0,40*	
Time to completion	0,00	0,00	0,00		0,00	0,00	0,00	
Z-score	*-0,55*	*-0,10*	*-0,78*		*0,06*	*-0,84*	*0,25*	
IPO Proceeds ($m)	0,00	-0,01		0,00	-0,04	0,00		-0,03
Z-score	*-0,19*	*-0,42*		*-0,33*	*-0,63*	*-0,07*		*-0,60*
Transaction Value ($m)	0,00	0,00		0,00	0,02	0,01		0,02
Z-score	*0,27*	*0,52*		*0,49*	*0,97*	*0,24*		*0,98*
Relative size (%)	0,00	0,00		0,00	-0,01	0,00		-0,01
Z-score	*-0,04*	*-0,14*		*-0,13*	*-1,63*	*-1,24*		*-1,56*
Large SPAC	0,00			0,00	0,01			0,01
Z-score	*0,15*			*0,09*	*0,31*			*0,30*
Pre-Revenue	0,00		0,01	0,00	-0,14**		-0,12**	-0,14**
Z-score	*0,75*		*0,76*	*0,75*	*-2,31*		*-2,39*	*-2,38*
Not-Profitable	0,00		0,01	0,00	-0,02		-0,04	-0,01
Z-score	*0,53*		*0,82*	*0,17*	*-0,34*		*-0,84*	*-0,33*
Constant	0,00	0,01	0,01	0,00	0,11	0,04	0,02	0,10
Z-score	*0,11*	*0,14*	*0,51*	*0,01*	*0,44*	*0,16*	*0,84*	*0,43*
Observations	165	165	165	165	165	165	165	165
R-squared	0,02	0,01	0,02	0,02	0,09	0,04	0,07	0,09

, **, * indicate statistical difference from zero (two-tailed) at the <0.15, <0.05, and <0.01 levels, respectively*

8.8. Robust Cros-Sectional Regression Results – Firm Status

Robust Cross-Sectional Regression Results - Firm Status

	CAR (-1,1)				CAR (-10,10)			
CAR (-1,1)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
IPO	-0,01	-0,02	-0,01	-0,01	0,00	0,03	0,01	0,00
Z-score	*-0,91*	*-1,87*	*-1,20*	*-1,03*	*0,05*	*0,68*	*0,17*	*0,01*
Announced	0,03**	0,02**	0,03**	0,03**	0,02	0,05	0,03	0,02
Z-score	*2,00*	*2,28*	*2,42*	*1,98*	*0,56*	*1,36*	*0,74*	*0,50*
Time to announcement	0,00	0,00	0,00		0,00	0,00	0,00	
Z-score	*-0,33*	*-0,09*	*-0,37*		*-0,32*	*-0,77*	*-0,43*	
Time to completion	0,00	0,00	0,00		0,00	0,00	0,00	
Z-score	*-0,26*	*0,16*	*-0,31*		*0,09*	*-0,39*	*0,31*	
IPO Proceeds ($m)	0,00	0,00		0,00	-0,03	0,00		-0,03
Z-score	*0,08*	*-0,26*		*0,03*	*-0,52*	*0,06*		*-0,49*
Transaction Value ($m)	0,00	0,00		0,00	0,02	0,00		0,02
Z-score	*0,05*	*0,36*		*0,16*	*0,70*	*0,07*		*0,73*
Relative size (%)	0,00	0,00		0,00	-0,01	0,00		-0,01
Z-score	*0,07*	*-0,14*		*0,01*	*-1,38*	*-0,94*		*-1,35*
Large SPAC	0,00			0,00	0,01			0,01
Z-score	*-0,02*			*-0,07*	*0,34*			*0,32*
Pre-Revenue	0,01		0,01	0,01	-0,13**		-0,12**	-0,14**
Z-score	*0,81*		*0,85*	*0,78*	*-2,04*		*-2,13*	*-2,12*
Not-Profitable	0,01		0,01	0,00	-0,01		-0,03	-0,01
Z-score	*0,45*		*0,64*	*0,46*	*-0,25*		*-0,81*	*-0,30*
Constant	-0,02	-0,01	-0,01	-0,02	0,08	-0,02	0,00	0,06
Z-score	*-0,39*	*-0,13*	*-0,49*	*-0,46*	*0,28*	*-0,09*	*-0,04*	*0,24*
Observations	165	165	165	165	165	165	165	165
R-squared	0,06	0,06	0,06	0,06	0,08	0,04	0,06	0,08

, **, * indicate statistical difference from zero (two-tailed) at the <0.15, <0.05, and <0.01 levels, respectively*