

SPACQUISITIONS

ROUTE TO MARKET AND LONG-TERM PERFORMANCE

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Abstract

Special purpose acquisition companies (SPACs) have experienced a recent surge in interest and coverage from the finance community. At the same time, researchers state that the topic is vastly understudied compared to the attention it is generating. In this paper, we collect data on 167 SPAC acquisitions between 2003 and 2020 and compare these to 1453 IPOs performed during the same period. We find that small and highly leveraged firms with a high cost of capital are more likely to merge with a SPAC, compared to undertaking a traditional IPO process. SPACs significantly underperform the market 6, 12, 24, and 60 months after the acquisition date, and more severely so when SPAC sponsors get involved in the business execution when lacking relevant experience of the industry or geographic focus of the target firm. Additionally, we find that financial sponsors are increasingly using the SPAC route to market, and that the quality of SPAC firms appears to have improved over time. We add to previous research concerning the SPAC doorway to public markets and long-term underperformance by extending the research period and number of observations. Finally, we attempt to fill the gap on SPAC sponsor quality and how their involvement in the merged entity impact future performance.



Keywords

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Table of contents

1. Introduction	2
2. Overview of the SPAC market.....	3
2.1. SPAC characteristics.....	3
2.2. Regulatory development.....	5
3. Literature	8
4. Data.....	11
5. Likelihood of a SPAC acquisition	14
5.1. Hypothesis.....	14
5.2. Model and specification.....	15
5.3. Main results	16
6. Long-term performance.....	19
6.1. Hypothesis.....	19
6.2. Event-time analysis	19
6.2.1. Model and specification.....	19
6.2.2. Main results.....	20
6.3. Calendar-time analysis.....	23
6.3.1. Model and specification.....	23
6.3.2. Main results.....	23
7. Sponsor involvement and determinants for SPAC performance	26
7.1. Hypothesis.....	26
7.2. Regression model.....	26
7.2.1. Model and specification.....	26
7.2.2. Main results.....	27
7.3. Median and mean tests	29
7.3.1. Model and specification.....	29
7.3.2. Main results.....	29
8. Summary and conclusion	33
References	36
Appendix	38

1. Introduction

Special purpose acquisition companies (SPACs) have raised record amounts in the last few years, accounting for almost half of the money raised on US exchanges in 2020 so far¹. Although blank check companies have been around in different forms in US capital markets since the early 1920s, the new generation of SPACs started in 2003 when Millstream Acquisition Corporation successfully completed its initial public offering (IPO) (Lakicevic et al., 2014). After a period of low activity, SPACs became very popular in the US before the recent financial crisis. They accounted for nearly a quarter of IPO volume in 2007, with a total of 66 IPOs. In 2008 the number of SPAC IPOs dropped to 17, and in 2009 it was close to zero (Kolb and Tykvová, 2016). Comparing these numbers to the 200 SPAC IPOs already seen in 2020², SPACs are undeniably on the rise. This boom in IPOs has ramped up the competition in the hunt for acquisition targets, why studying their firm characteristics and post-merger performance has become a topic of great interest.

In this paper, we examine the characteristics of private firms, that have been acquired by SPACs, with the objective to understand why these firms choose this non-traditional route to going public, as well as study their long-term performance. We first analyze how different market, firm, and deal-specific variables are related to how firms choose to go public. Second, we compare long-term performance between firms that have been acquired by a SPAC (“SPAC firms”) and firms having used the traditional IPO route (“IPO firms”), adjusting for various factors further explained in Section 6. Additionally, we study intra-group performance of SPAC firms, dividing the sample into subsets based on sponsor involvement and expertise, explained in detail in Section 7. We add to the existing SPAC literature by extending the research period and increasing the number of observations, as well as conducting additional performance analyses within the SPAC sample. We also make a distinction between the period prior to and succeeding the JOBS Act to study the effects of the deregulation on performance and route to market. Including more recent SPACs and their acquisitions is important because, in addition to surging in popularity, the SPAC market has undergone substantial changes over the past decades (Lakicevic et al., 2014). An overview of the regulatory development is outlined in Section 2.2.

Within the sample period, ranging from August 2003 to April 2020, we identify 555 SPAC IPOs and 167 SPAC acquisitions. The number of acquisitions is substantially lower than the number of SPAC IPOs because some SPACs fail to find an appropriate target and some, the more recently listed, are still in the process of searching for a firm to acquire.

¹ ² As of November 26, 2020. Retrieved from <https://www.spacanalytics.com/>.

The remainder of this paper is structured as follows: in Section 2, we describe the characteristics and regulatory development of SPACs. Section 3 is a review of previous literature. In Section 4, we present our data and descriptive statistics. In Section 5, we examine how market, deal, and firm-specific characteristics affect the route to going public. In Section 6, we analyze the long-term performance of SPAC and IPO firms. In Section 7, we analyze the relative performance of SPAC firms based on firm, market, and deal-specific variables. Section 8 concludes.

2. Overview of the SPAC market

2.1. SPAC characteristics

SPACs are shell companies created to raise capital through an IPO with the sole purpose of acquiring one or more private companies. SPACs are typically formed by experienced business executives who are confident that their reputation and experience will help them identify a profitable company to acquire. The founders, often referred to as sponsors³, follow a classic IPO process with investor roadshows, prospectuses, and SEC registrations when listing the SPAC. The securities sold during the IPO are offered at a unit price, usually representing one share and a fraction of a warrant to purchase more stock at a later date. Most of the proceeds from the IPO, generally around 96%, are transferred into a trust account which earns risk-free interest until the time of the acquisition (Cumming et al., 2014). Remaining proceeds are used to cover costs related to finding a target company, although no wages as SPAC managers usually do not receive any salary prior to an acquisition.

Most SPACs specify an industry or geographic focus for their target business when filing for an IPO, even though they are typically not prohibited from pursuing businesses outside their focus area. The initial registration form, i.e. the S-1 filing, discloses the previous experience and expertise of the SPAC sponsors. Generally, sponsors want to capitalize on the transaction and industry experience within the management team and their affiliates. As SPACs do not have any operations during the IPO process, the only firm quality signaling feature is the management quality and expertise (Kim, 2009). Sponsors could use their well-developed networks to source attractive investment opportunities, why their experience may be worthwhile to consider before committing any capital.

The acquisition is financed by the capital raised from the IPO and must be completed within a predetermined period, usually 24 months. Additionally, the fair market value of the target company must equal 80% or more of the SPAC's trust assets. If the SPAC needs additional capital to pursue the business combination or pay its other expenses, the sponsors may loan additional funds to the SPAC. In advance of signing an acquisition agreement, the SPAC will often

³ The terms sponsor, founder, and manager are used interchangeably throughout this paper.

arrange committed debt or equity financing, such as a private investment in public equity (PIPE) commitment, to finance a portion of the business combination and thereafter publicly announce both the acquisition agreement and the committed financing (Lenahan et al., 2018).

When SPACs announce a merger, shareholders can either accept stock in the new company or redeem their shares for a pro-rata portion of the cash held in the trust account. If the business combination is approved by the shareholders, and the financing and other conditions specified in the acquisition agreement are satisfied, the business combination will be consummated. After a successful acquisition, the company is instantly listed via a reverse merger. If, however, the sponsors are unable to either find a suitable target in time, or get approval of the acquisition, the SPAC is liquidated and the money held in trust is transferred back to the investors (Shachmurove and Vulanovic, 2018).

By merging with a SPAC, companies benefit from having wider access to capital, liquidity, and experienced managers as well as greater market certainty. It is an attractive way to go public for companies looking for money, speed, and certainty as it only requires negotiations with one investor, i.e. the SPAC. Whether this lowers the IPO price, which otherwise would be determined during a roadshow with multiple investors, has been debated but remains unclear. Dimitrova (2017) instead points to the fact that the 80% threshold could lead to sponsors overpaying for the target, as they may find it more convenient to overpay for a smaller target rather than diluting their ownership in the bid for a larger company.

A potential explanation for the recent boom in SPAC IPOs is the lucrative opportunity this kind of structure provides for SPAC founders. On average, they receive 20% of the SPAC's equity, referred to as *sponsor shares*, *founder shares*, or *promote*, for a nominal fee of US\$25,000 in a private placement before the SPAC goes public (Cumming et al., 2014). Sponsors are generally expected to also purchase heavily discounted warrants at the time of the IPO (Lewellen, 2009). Important to note is that the sponsor shares, as well as any warrants, become worthless in case the SPAC is liquidated. This particular setup may cause misaligned incentives between sponsors and outside investors. Dimitrova (2017) argues that the contractual features associated with SPACs give sponsors incentive to pursue *any* acquisition over no acquisition. She finds that performance is worse when deals are completed just before the contractually specified deadline, suggesting that as the deadline approaches, sponsors become desperate to acquire any company, even a bad one, to avoid having to liquidate the SPAC. Jog and Sun (2007) report that during the period between 2003 and 2006, the sponsors' return on investment was 1900% if the merger took place, clearly creating incentives to avoid liquidation. Lewellen (2009), as well, concludes that sponsors have an extremely strong economic incentive to complete an acquisition before the expiration date.

Some sponsors purchase additional shares in the open market, typically around the time of the IPO or just before the shareholder vote. Shares purchased in the open market carry the same rights as shares held by outside investors, including the right to vote on any proposed acquisition and the right to receive the value held in trust in the event of liquidation (Lewellen, 2009). Given management's strong incentives to complete an acquisition, Jenkinson and Sousa (2011) state that it should come as no surprise that managers or their affiliates frequently purchase large blocks of shares in the open market, vote these shares in favor of their proposed acquisition, and subsequently sell their shares once the deal has been completed. This type of behavior could pose an additional cost to remaining shareholders, although difficult to measure.

SPAC advocates argue that SPACs are cheaper than traditional IPOs due to systematic underpricing. The abundant supply of SPACs recently is leading to competition, improving terms for target companies, and offering an overall lower cost of capital (Gurley, 2020). When accounting for the sponsor shares, however, SPAC fees are about a quarter of the money raised, three or four times as much as for a traditional IPO if not taking the underpricing into account (Levine, 2020). Important to note is that the true cost of choosing the SPAC route is yet to be documented, and at this stage, it could merely be considered as speculations and personal opinions. The traditional route to going public is, however, too slow for companies that want to cash in on hype, why SPACs are oftentimes considered as an alternative. The target companies acquired by SPACs avoid the lengthy process of doing a traditional IPO, as they are not required to supply the detailed financial statements and other disclosures that usually accompany IPOs (Dimitrova, 2017). All things considered, SPACs are very attractive when it is difficult, either because of bad market conditions or lack of attractiveness of the company itself, to take the traditional route to going public. Additionally, some argue that the SPAC route is in fact the cheaper option, although debated.

2.2. Regulatory development

The Security and Exchange Commission (SEC) classifies SPACs as *blank check* companies, defined as “a development stage company that has no specific business plan, or purpose, or has indicated in its business plan is to engage in a merger or acquisition with an unidentified company or companies, other entity, or person”. Blank check companies often fall within the SEC's definition of *penny stocks*, typically highly speculative and subject to additional rules and requirements (Shachmurove and Vulcanovic, 2018). Penny stocks are usually associated with small companies and trade infrequently, meaning they have a lack of liquidity or ready buyers in the marketplace. While in the 1980s most SPACs were classified as penny stocks, every modern SPAC has raised more than US\$5 million, thereby being exempt from the penny stock rule (SEC Rule 3a-51-1) and additional scrutiny (Kolb and Tykvová, 2016).

The typical behavior of a blank check company management team during the 1980s was to exercise its warrants after announcing the acquisition, expecting the market to react positively to the news. Once the stock price jumped, the management team would dump its shares and hoard profits, a strategy known as a “pump-and-dump” scheme (Shachmurove and Vulcanovic, 2018). As a response to the immense fraud in the blank check market, the US Congress passed the Penny Stock Reform Act in 1990, attempting to provide better disclosure and transparency as well as impose stringent regulations on dealers (Dodd, 1990). The act instructed the SEC to impose regulations, governing registration statements filed by blank check companies issuing penny stocks. These penny stocks were generally traded in over-the-counter (OTC) markets, with little or no requirements to disclose financial information to the public. The SEC acted as instructed and in 1992 introduced Rule 419-a, which established regulations of the blank check market.

The new regulation brought order to the market, and only 15 blank check companies entered public markets in the early 1990s (Heyman, 2007). In 1992, the most closely related predecessor to the modern SPAC was established. The concept failed in mid-1990s, mainly because accessing capital markets via traditional IPOs was quite easy during the period (Heyman, 2007). An additional drawback for the blank check market occurred in 1997 when the National Association of Securities Dealers (NASD) revoked the licenses of 29 brokers and the chief executive officer of GKN Securities Corporation, the main promoter of blank check companies at the time. After the NASD ruling, activity in the blank check market completely ceased until 2003 when Millstream Acquisition Corporation entered the market. The IPO was underwritten by EarlyBirdCapital, a small investment bank where many of the former GKN Securities Corporation employees were employed. Millstream Acquisition Corporation, the first new-generation SPAC, complied with all rules previously imposed by the SEC to govern the blank check market. As the company also raised more than US\$5 million, and thereby was exempt from the penny stock rule mentioned earlier, it was separated from penny stock issuers. This distinction from penny stocks marked the beginning of a new era, causing a surge in SPAC IPOs during the years leading up to the financial crisis _.

SPACs used to trade exclusively on the American Stock Exchange (AMEX) and the OTC Bulletin Board (OTCBB). Since 2008, however, SPAC shares are also listed on the New York Stock Exchange (NYSE) and the National Association of Securities Dealers Automated Quotations (NASDAQ) (Lakicevic et al., 2014). Because of the increase in volume and occurrence of SPACs in capital markets, Lewellen (2009) called for the recognition of SPACs as a new financial asset class. However, concurrently with Lewellen’s suggestion, SPAC activity almost ceased with only one SPAC completing an IPO in 2009. After a period of low activity following the financial crisis, the number of SPACs entering public markets started to increase again, and firm characteristics simultaneously changed. Lakicevic et al. (2014) find that more recent SPACs have a vastly

different corporate structure than when they entered capital markets in 2003, particularly in terms of size, characteristics of the units issued, and number of underwriters in each syndicate. In May 2010, 57th Street Acquisition Company went public with a materially redesigned corporate structure, abandoning the mandatory shareholder vote on acquisitions and replacing it with an issuer tender offer. In the tender offer structure, the SPAC is required to make a tender offer for the shares held by certain SPAC shareholders, prior to completing an acquisition. The IPO of 57th Street Acquisition Company started a new wave of investments in SPACs in US capital markets, partly driven by this new structure (Lakicevic et al., 2014). Rodrigues and Stegemoller (2014) also examine the changes in voting mechanisms for mergers and report significant changes in the SPAC structure, where recent SPACs require a significantly lower number of shareholders to approve a merger.

The Jumpstart Our Business Startups (JOBS) Act is a reform designed to encourage funding of small businesses, classified as emerging growth companies (EGCs), in the US by easing many of the country's securities regulations (Kolb and Tykvová, 2016). In addition to making the traditional IPO route easier, the Act created an exemption under the federal securities laws so that crowdfunding could be used to offer and sell securities to the general public. The JOBS Act was signed into law by President Barack Obama on April 5, 2012. Before 2012, it was nearly impossible for anyone of average wealth to gain access to private investments, as you had to be an accredited investor⁴. The growing pressure to let the general public into private equity was driven by two forces, first, public investors eager to invest in private securities, and second, private firms in need of capital. The reform was intended to ease regular companies' route to going public, unwittingly, it also made it easier for the average investor to get a taste of private equity via SPACs (Rodrigues, 2012). Regulations aiming to make it easier for small firms to go public could unquestionably have posed a threat to SPAC sponsors seeking to make a profit from doing the same thing. Nonetheless, within two months after passing the Act, over a dozen of the companies taking advantage of the eased regulations were SPACs, seemingly not negatively affected by the new Act (Rodrigues, 2012).

Opponents of the JOBS Act have criticized it for going too far in removing the protections provided to investors following recent financial crises, particularly the Sarbanes-Oxley Act⁵ and the Dodd-Frank Act⁶. Lynn Turner, former SEC Chief Accountant, stated that the JOBS Act “*would*

⁴ An accredited investor is an individual or a business entity that is allowed to trade securities that may not be registered with financial authorities. To qualify as an accredited investor in the US, one must have a net worth of at least \$1 million, excluding the value of one's primary residence, or annual income exceeding \$200,000 (\$300,000 with a spouse) for the last two years with the expectation of earning the same or a higher income in the current year.

⁵ The Sarbanes-Oxley Act of 2002 came in response to financial scandals in the early 2000s, involving publicly traded companies such as Enron Corporation, Tyco International plc, and WorldCom, aiming to protect investors by improving the accuracy and reliability of corporate disclosures.

⁶ The Dodd-Frank Wall Street Reform and Consumer Protection Act targeted the sectors of the financial system that were believed to have caused the 2008 financial crisis, including banks, mortgage lenders, and credit rating agencies.

be better known as the Bucket-Shop and Penny-Stock Fraud Reauthorization Act of 2012” (Hamilton and Mattingly, 2012). Although heavily debated, it remains uncertain whether the Act has actually helped or hindered private investors in the hunt for returns. Clear beyond doubt, on the other hand, is that SPACs have coevolved with the regulatory environment since long before the modern era of SPAC firms. Future legislation will continue to shape the SPAC market, why critics and advocates alike should be attentive to the changes, and potential challenges, that may arise with new regulations.

3. Literature

Why some stocks earn higher returns than others has been a topic of interest among researchers for decades. The Capital Asset Pricing Model (CAPM) (Sharpe, 1964; Lintner, 1965) has played an important role in the field of asset pricing, relating a stock’s expected return to its exposure to a market factor representing systematic risk. Fama and French (1993) find that the size (SMB) and value (HML) factors, in addition to the market factor, explain the cross-section of stock returns in the US. More specifically, they find that value stocks outperform growth stocks and, similarly, that small-cap stocks tend to outperform large-cap stocks. Carhart (1997) proposes a fourth factor, momentum (MOM), where MOM is the average return on two high prior return portfolios minus the average return on two low prior return portfolios. More recently, literature on SPAC performance has been entering the field, often with these models serving as a foundation for further research.

Dimitrova (2017) finds that SPAC performance is worse for acquisitions announced near the predetermined two-year deadline, for acquisitions with deferred IPO fees, and for acquisitions with market values close to the required 80% threshold. She also finds that SPAC performance is significantly worse than that of traditional IPOs. Jog and Sun (2007) explain the structure of SPACs using a sample from the earlier period of the new generation SPACs. They highlight the conflict of interest between investors and sponsors, as well as show that between 2003 and 2006, investors experienced a negative annual abnormal return of approximately 3%. Rodrigues and Stegemoller (2014) also compare SPACs with traditional IPOs, although focusing on acquisition announcement returns rather than long-term performance. Kolb and Tykvová (2016) investigate the drivers behind SPAC acquisitions and find that SPACs provide smaller, more levered, and low-growth firms, which may not succeed in traditional IPOs, with the opportunity to enter public markets. They also observe that SPAC acquisitions tend to occur more often in volatile markets and that SPAC firms are associated with severe underperformance when tracking buy-and-hold abnormal returns. Finally, they use factor regressions to account for the exposure to risk factors and to address the cross-sectional dependence problem when analyzing long-term performance, finding significant and negative alphas (Kolb and Tykvová, 2016).

Although SPAC firms have repeatedly been found to significantly underperform in the long run, more SPACs than ever are entering public markets. Mitchell and Pulvino (2012) provide evidence that investing in SPAC IPOs was a dominant strategy for hedge funds in the years preceding 2009. Between 2003 and the financial crisis, the SPAC funds held in escrow yielded slightly positive returns between the IPO date and acquisition announcement. The hedge funds could redeem their shares before any acquisition had taken place or, had the value gone up, sell their shares in the public market. This payoff was equivalent to holding a risk-free bond plus a call, thus the hedge funds could make a low-risk profit about 4% higher than that of a T-Bill (Shachmurove and Vulcanovic, 2018). Consistent with this view, SPAC advocates suggest that the SPAC vehicle makes private equity and venture capital investment available to a larger group of investors, with the additional benefit of having an unlimited upside and a limited downside (Hale, 2007). Meanwhile, Mitchell and Pulvino (2012) present evidence that the post-acquisition performance of SPACs is value-destroying for the remaining shareholders, and researchers are puzzled as to why investors continue to contribute capital to the SPAC asset class when the upside has yet to materialize.

While the long-term performance of SPACs was only recently introduced in the academic finance literature, a substantial amount of research on IPO and merger performance exists. Agrawal et al. (1992) examine 937 US mergers from 1955 to 1987 and find that mergers are followed by significant abnormal returns of -1.5% the first year and -10.3% over a five-year period after the effective date. Ritter (1991) uses a sample of 1,526 firms that went public through an IPO in the US from 1975 to 1984 and finds that IPO firms significantly underperform comparable firms, when matched by size and industry, over a three-year period.

There is an abundance of research on firm and market-specific characteristics dictating the *if* and *when* a firm goes public. Schill (2004) examines how market volatility affects corporate financing transactions. He finds that higher market volatility dampens IPO activity and disproportionately much so for unseasoned firms. Chemmanur and Fulghieri (1999) describe that the cost of going public includes the cost of more dispersed ownership. They state that firms are more capable to shoulder these costs when they have reached a larger size and maturity, i.e. later in their “life-cycle”. Plagborg-Møller and Holm (2017) report how operating performance has become more important in private equity firms’ exit decisions. They describe how virtually all research on the topic finds that exits through IPOs progressively encompasses larger and more profitable companies. They find evidence that, since the financial crisis, firms are required to be far more mature to be exited through an IPO, and that secondary sales is the most common exit strategy when the firms are smaller and have not yet reached full maturity and profitability. Ritter (1987) examines how the cost of going public differs between small, more speculative firms and

large, more established firms and finds that the average transaction costs are 31.9% and 21.2%, respectively.

Chaplinsky et al. (2017) study the effects of the JOBS Act on the measurable transaction costs of going public. They examine a sample of 312 emerging growth companies that filed for an IPO following April 5, 2012 and find that the new legislation did not reduce the costs of going public in the three subsequent years. Additionally, they find that a large portion of the EGCs is substantially younger and less profitable compared to the ones that went public prior to April 5, 2012. They suggest that this imposes a challenge for the issuer as the limited near-term prospects and low revenue recognition will make it more difficult to survive the rigors of public markets. Simultaneously, SPACs have exploited the JOBS Act and subsequent deregulation of transparency. Rodrigues (2012) describes how four months after the JOBS Act was signed into law, one out of every nine EGCs was a SPAC. More SPACs in the public markets has ramped up the competition for suitable targets, and it remains unclear to what extent this has caused junk-firms to reach the market using the SPAC route. Meanwhile, Rodrigues and Stegemoller (2014) provide insights into how the pressure from investors has caused sponsors to increase their monetary interest in SPACs. They call it *skin in the game* and suggest that stakeholders' dissatisfaction with earlier performance has pushed sponsors to acquire larger stakes. Lakicevic et al. (2014) show similar results where sponsors between 2003 and 2009 typically only deposited US\$25,000, or about 2.8%, of the funds in escrow. However, after 2009, the management portion of funds in escrow exceeded US\$5 million for almost all SPACs. Research suggests that a higher sponsor stake should improve acquisition quality, whereas the JOBS Act has the potential to make it worse. The ambiguity remains whether increased skin in the game or the effects from the JOBS Act have influenced SPAC acquisitions most in recent years.

Documentation on SPAC sponsor involvement and quality is limited. Kim (2009) observes that SPAC managers have longer industry experience compared to IPO managers. He also suggests that the marginal effect of sponsor experience and quality is positively correlated with market valuation, and increases the probability of an acquisition. Cumming et al. (2014) find that sponsor experience and board involvement do not increase the likelihood of an acquisition to be approved in the shareholder vote. Their results instead suggest that younger sponsor teams more frequently experience acquisition approvals. Both Kim (2009) and Cumming et al. (2014) exclusively look at sponsor quality, experience, and involvement in the context of attaining approval for the acquisition proposal. Dimitrova (2017), on the other hand, looks at the subsequent performance of the merged entity and finds that sponsor involvement, in the form of a sponsor being appointed as chairman, is positively correlated with long-term performance. All things considered, the nature of the sponsor team is argued to be incremental to the success of the SPAC IPO, subsequent acquisition, and the long-term performance of the merged entity.

Therefore, it remains a prime concern to unveil the consequences and marginal effects of sponsor experience, quality, and involvement.

4. Data

To identify the SPAC acquisitions within the sample period from 2004⁷ to 2020, we first use the paper published by Dimitrova (2017) for acquisitions between 2004 and 2010. For the remaining time period until April 30, 2020, we use SDC Platinum and Refinitiv Eikon. We complement our data with market and firm-specific variables primarily drawn from Refinitiv Eikon. Additional deal-specific data is hand-collected from the Electronic Data Gathering and Retrieval (EDGAR) database run by the SEC, predominantly from the *S-1* and *DEFM14A* filings provided by the companies. We also compile a list of all SPAC IPOs over the same period with data from SDC Platinum and Refinitiv Eikon, although our paper only studies the SPACs that have completed an acquisition. Between August 2003 and April 2020, we identify 555 SPAC IPOs and 167 SPAC acquisitions in the US.

As a control sample, we retrieve similar data on all non-SPAC IPOs over the same period, except for the deal-specific variables from the EDGAR database as they only concern SPACs. Since we want to compare only operating firms, we exclude shell companies, carve-outs, demutualizations, direct listings, mutual funds, bank conversions, best-effort basis agreements, unit offerings, and offerings including warrants from the control sample. The final control sample includes 1453 non-SPAC IPOs.

Following previous SPAC literature, particularly Kolb and Tykvová (2016) and Dimitrova (2017), we use the Russell 2000 index as a benchmark. Russell 2000 is a small-cap stock market index of the smallest 2,000 stocks in the Russell 3000 Index, which is made up of 3,000 of the largest U.S. stocks.

Table 1 presents the definitions of variables we use and the sources from which they were gathered.

⁷ Millstream Acquisition Corporation completed its acquisition in September 2004.

Table 1

Variables, descriptions, and sources

Variable Name	Unit	Description	Source
Market specific variables			
<i>Market volatility</i>	σ^2	6 months average lagged variance of S&P 500 returns at the announcement date*.	Eikon
<i>Cost of debt</i>	%	US treasury bills bid price at the announcement date*.	Eikon
Deal specific variables			
<i>Time to resolution</i>	Days	Time period from announcement date* to effective date (SPACs) or listing date (IPOs).	SDC, Eikon
<i>Time to acquisition</i>	Days	Time period from SPAC S-1 date to effective date.	SDC, Eikon
<i>CEO</i>	Dummy	1 if the CEO of the merged entity is a SPAC sponsor, 0 otherwise.	EDGAR
<i>Chairman</i>	Dummy	1 if the Chairman of the merged entity is a SPAC sponsor, 0 otherwise.	EDGAR
<i>Portion of board</i>	%	Percentage of the board seats occupied by SPAC sponsors.	EDGAR
<i>Focus match</i>	Dummy	1 if the SPAC acquired a firm operating within an industry or geography specified as a focus in the S-1 filing, 0 otherwise.	EDGAR
Firm specific variables			
<i>Assets</i>	US\$	Total assets six months after effective date (SPACs) or listing date (IPOs).	SDC, Eikon, EDGAR
<i>Return on assets</i>	%	Six months EBIT after effective date (SPACs) or listing date (IPOs) divided by total assets.	SDC, Eikon, EDGAR
<i>Price-to-book</i>	Ratio	Market value of equity divided by book value of equity.	SDC, Eikon, EDGAR
<i>Debt ratio</i>	%	Total liabilities six months after effective date (SPACs) or listing date (IPOs) divided by total assets.	SDC, Eikon, EDGAR
<i>Financial sponsor</i>	Dummy	1 if the firm has been backed by a financial sponsor, e.g. VC or PE investor, 0 otherwise.	SDC, Eikon

* For SPAC firms: date of merger announcement, for IPO firms: date of IPO filing

Table 2 summarizes the full sample of SPAC and IPO firms. We test all variables used in the regressions to distinguish which deal, market, and firm-specific characteristics are statistically different for SPAC firms and IPO firms. Debt ratio, book-to-market, previously backed by a financial sponsor, as well as time to resolution, are such characteristics, meaning that the SPAC population should be significantly different in terms of financial sponsor backing, debt, book-to-market, and time to resolution compared to the IPO population. Worth mentioning is that the time to resolution variable appears to be significantly larger for SPACs compared to IPOs. This is counterintuitive as previous research suggests that one of the prime benefits of SPACs is the speed at which they can give firms access to public markets. We have defined the time to resolution variable in similar fashion to Kolb and Tykvová (2016), which will underestimate the time that goes into the IPO preparatory work prior to the listing announcement. Hence, we will be careful when interpreting the results from this variable in Section 5. Kolb and Tykvová (2016)

also find that financial sponsors are reluctant to exit their investments through the SPAC vehicle. We see the same tendencies in our dataset with only approximately 23% of SPACs being backed by a financial sponsor, compared to 72% for IPOs. Remaining variables, i.e. assets, return on assets, market volatility, and cost of debt are not statistically different between the two groups.

Table 2

Summary statistics for SPAC and IPO firms

Variable	SPAC					IPO					p-value
	N	Median	Mean	Min	Max	N	Median	Mean	Min	Max	
Assets	167	5.30	5.26	1.62	7.47	1453	5.27	5.35	2.48	8.16	0.584
Return on assets	167	-0.00	-0.03	-1.73	0.43	1453	0.00	-0.05	-2.50	0.46	0.669
Debt ratio	167	0.62	0.62	0.00	2.64	1453	0.36	0.45	0.00	3.74	<0.001
Price-to-book	167	1.86	6.56	-81.8	326.8	1453	3.06	4.27	-260	217	<0.001
Financial sponsor	167	0.00	0.23	0.00	1.00	1453	1.00	0.72	0.00	1.00	<0.001
Time to resolution	167	171	228	55	1133	1453	91	121	0.00	2444	<0.001
Market volatility	167	15.31	17.65	10.66	52.06	1453	15.12	16.91	10.62	51.06	0.929
Cost of debt	167	2.92	3.17	1.46	5.15	1453	3.30	3.31	0.63	5.15	0.202

This table shows the summary statistics for the whole data sample grouped by SPAC and IPO firms. All variables are defined in Table 1 in this section. The p-values relate to the *t*-test performed on group means.

Table 3 describes the variables of the SPAC subsamples. The variables are tabulated in accordance with the SPAC merger being effective pre or post the passing of the JOBS Act. The observations are evenly distributed with 80 observations before April 5, 2012, and 87 observations after the same date. The variables having a statistically significant difference in mean include appointing a SPAC sponsor as CEO, the portion of board seats held by SPAC sponsors, and the cost of debt. Market volatility, where a slight disparity exists in both median and mean if not at a significant level, and cost of debt, capture the calmer market conditions between 2012 and 2020, compared to the period including the financial crisis. SPAC sponsors held on average more board seats, and were appointed as CEOs more frequently, in the years leading up to the JOBS Act, as opposed to the years succeeding the legislation. Most of the variables, however, exhibit no statistical difference in mean value depending on whether the SPAC acquired a target before or after April 5, 2012.

Table 3

Summary statistics for SPAC firms

Variable	Pre-JOBS					Post-JOBS					p-value
	N	Median	Mean	Min	Max	N	Median	Mean	Min	Max	
Assets	80	5.11	5.02	1.63	6.34	87	5.49	5.45	2.87	7.37	0.584
Return on assets	80	0.00	-0.02	-1.73	0.43	87	-0.01	-1.16	-10.82	0.14	0.669
Debt ratio	80	0.58	0.62	0.00	2.64	87	0.67	0.94	0.00	27.87	0.345
Price-to-book	80	1.56	7.81	-1.02	326.78	87	2.06	5.42	-81.78	148.48	0.450
Financial sponsor	80	0.00	0.113	0.00	1.00	87	0.00	0.33	0.00	1.00	< 0.001
Time to acquisition	80	690	727	340	1177	87	631	649	246	1605	0.161
CEO	80	0.00	0.31	0.00	1.00	87	0.00	0.13	0.00	1.00	0.007
Chairman	80	0.00	0.51	0.00	1.00	87	0.00	0.45	0.00	1.00	0.408
Portion of board	80	0.35	0.44	0.00	1.00	87	0.29	0.32	0.00	1.00	0.009
Focus match	80	1.00	0.68	0.00	1.00	87	1.00	0.71	0.00	1.00	0.677
Market volatility	80	15.58	20.16	11.46	52.06	87	15.31	15.34	10.66	23.95	0.214
Cost of debt	80	4.37	4.15	2.22	5.15	87	2.17	2.27	1.46	3.16	< 0.001

This table shows summary statistics for the SPAC sample, grouped by SPACs completing an acquisition prior to and succeeding the passing of the JOBS Act on April 5, 2012. All variables are defined in Table 1 in this section. The p-value relates to *t*-test performed on group means.

Table A3 and A4 in appendix show the correlation coefficients between variables in the two datasets. The dataset consisting of observations from both SPAC and IPO firms exhibit some correlation between the balance sheet metrics. Additionally, volatility and cost of debt show a correlation of 20%. The dataset with solely SPAC firms exhibits slightly higher autocorrelation problems with a few variables showing a correlation of approximately 20%. Overall, the datasets exhibit neglectable autocorrelation problems.

5. Likelihood of a SPAC acquisition

5.1. Hypothesis

In this section we examine how market, deal, and firm-specific characteristics affect the likeliness of a firm to seek a public listing through a SPAC merger. In line with previous research, we hypothesize that firms normally finding it difficult to access public capital will be more likely to choose the SPAC route to market. We believe these are small, more heavily indebted, and less profitable firms. In addition to size, leverage, and profitability, we hypothesize that SPAC acquisitions should increase in times of market turmoil, i.e. when market volatility is high, as previous literature illustrates how the number of IPOs shrinks when the market is in a general state of upheaval (Schill, 2004). Firms in need of public capital to finance various opportunities might therefore seek to merge with a SPAC, rather than raising capital through an IPO, when timing is bad (Ritter and Welch, 2002). Dimitrova (2017) finds no evidence that financial sponsor-

backed firms are more likely to seek listing through a SPAC merger. However, we would expect that the likeliness of financial sponsor-backed firms going public through SPACs has increased over time, as it has become more difficult for these intermediaries to exit their investments through traditional IPOs (Plagborg-Møller and Holm, 2017). Similarly, we would have hypothesized that shorter time to resolution would increase the likeliness of being acquired by a SPAC, as firms wanting to go to market fast should be hesitant to go through the lengthy process of a traditional IPO. However, as presented in Section 4, we have systematically underestimated the length of the IPO process, why we instead expect the likeliness of being acquired by a SPAC to increase with time to resolution. Lastly, we make a distinction between the period prior to and succeeding the passing of the JOBS act. We believe that the JOBS Act's subsequent deregulation of the market should have caused more junk-firms to enter public markets. If this is true, we expect to find significantly larger marginal effects on likeliness of smaller sized, more highly leveraged, and less profitable firms being acquired by a SPAC after April 5, 2012. To control for potential differences in how firms make their way to public markets, we also examine how IPO firms' market, deal, and firm-specific characteristics have changed post-JOBS. We hypothesize that firm quality should remain largely unchanged. Although there has been an increase in EGCs reaching the market through IPOs, we believe this should not have significantly affected the IPO population at large.

5.2. Model and specification

To model the probability of a SPAC acquisition and the probability of an IPO taking place after the passing of the JOBS Act, we employ logistic models with $P(SPAC)$ and $P(post-JOBS IPO)$ as the dependent variables. The dependent variables are binary and equal 1 for SPAC firms and 0 for IPO firms, as well as 1 for IPOs listed after the passing of the JOBS Act and 0 otherwise. The first and second base specifications are as follows:

$$P(SPAC)_i = 1/(1 + e^{-(\alpha + \beta_1 Assets_i + \beta_2 Return\ on\ assets_i + \beta_3 Price\ to\ book_i + \beta_4 Debt\ ratio_i + \beta_5 Financial\ sponsor_i + \beta_6 Market\ volatility_i + \beta_7 Cost\ of\ debt_i + \beta_8 Time\ to\ resolution_i + \sum \beta_j Year\ fixed\ effects_{i,j} + \sum \beta_j Region\ fixed\ effects_{i,j} + \sum \beta_j Industry\ fixed\ effects_{i,j} + u_i)}), \quad (1a)$$

$$P(post - JOBS\ IPO)_i = 1/(1 + e^{-(\alpha + \beta_1 Assets_i + \beta_2 Return\ on\ assets_i + \beta_3 Price\ to\ book_i + \beta_4 Debt\ ratio_i + \beta_5 Financial\ sponsor_i + \beta_6 Market\ volatility_i + \beta_7 Cost\ of\ debt_i + \beta_8 Time\ to\ resolution_i + \sum \beta_j Region\ fixed\ effects_{i,j} + \sum \beta_j Industry\ fixed\ effects_{i,j} + u_i)}), \quad (1b)$$

where individual firms are represented by i . All variables are presented and defined in Section 4. We incorporate time fixed effects by including 17 year-dummies. The time fixed effects are included to control for time-specific trends that may have an influence on firms' route to market,

and without which could have wrongfully influenced the regressors. We also incorporate industry fixed effects by using 49 industry-dummies retrieved from Kenneth French's website⁸. These effects control for differences in specific industries' route to market. Lastly, we include region fixed effects consisting of 37 different country-dummies, controlling for differences across countries.

5.3. Main results

Table 4 depicts the results from the logistics regressions. The results show how the likeliness of choosing the SPAC route to market does increase with smaller size, higher leverage, and in times of greater market uncertainty. Interestingly, we also see that the likeliness of merging with a SPAC increases with higher cost of debt. When firms are more heavily indebted, high cost of debt corresponds to both a higher cost of capital as well as an increased risk of financial distress. We anticipate that these firms will be more willing to merge with a SPAC, rather than going through the lengthy process of an IPO. Consequently, we believe there are two general reasons why firms would choose the SPAC route to market over an IPO:

1. Low firm quality, and
2. Unfavorable market conditions,

whereof the first is based upon commonly observed firm characteristics. Small, highly indebted, and unprofitable firms, that generally have been unable to access public capital, are provided with an opportunity to do so by merging with a SPAC. The second reason relates to growth firms in need of financing in times when market volatility is high, i.e. when equity trades at an average discount and fewer IPOs are conducted, and high cost of debt, i.e. when capital is expensive. We believe that these two drivers could be at play at varying degrees, both in isolation and in combination.

We do not find *return on assets* or *price-to-book* to have any significant correlation with the choice of route to market. Furthermore, the marginal effects on likeliness of *time to resolution* have counterintuitive signs compared to the theoretical background, stating that SPACs are the faster route to market. Instead, we find that longer time to resolution increases the likeliness of a SPAC acquisition compared to an IPO. However, as mentioned in Section 4, as well as in the hypothesis in Section 5.1, the construction of the time to resolution variable should generate results contradictory to prior beliefs. Consequently, we are unable to draw any definite conclusions in regards to this variable. In regressions (4) and (5) we include an interaction term of the years succeeding the JOBS Act. We find that being backed by a financial sponsor decreases the likeliness of being acquired by a SPAC, but that the likeliness has increased in recent years.

⁸ http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

We believe this to be an effect of VC and PE firms having a more difficult time exiting their growth company investments through an IPO. We find no significant difference in time to resolution in the years following the JOBS Act. This suggests that the speed at which a firm reaches public markets does neither become more nor less important over time.

Table 4

Logit regressions

	First base specification	Pre-JOBS	Post-JOBS	Financial sponsor: regulation	Time to resolution: regulation	Second base specification
	(1)	(2)	(3)	(4)	(5)	(6)
Assets	-0.381** (0.174)	-0.923*** (0.258)	0.319 (0.283)	-0.380** (0.174)	-0.368** (0.175)	1.253 (2.019)
Return on assets	1.038 (0.715)	0.116 (0.736)	0.974 (1.156)	1.068 (0.706)	0.995 (0.708)	-9.986 (6.318)
Price-to-book	0.007 (0.005)	0.001 (0.007)	0.006 (0.007)	0.007 (0.005)	0.007 (0.005)	-0.067* (0.040)
Debt ratio	1.408*** (0.285)	1.516*** (0.394)	1.020** (0.426)	1.449*** (0.291)	1.416*** (0.285)	-6.242 (4.803)
Financial sponsor	-1.885*** (0.256)	-2.862*** (0.496)	-1.699*** (0.344)	-2.628*** (0.423)	-1.889*** (0.258)	1.152 (2.615)
Volatility	0.059*** (0.020)	0.146*** (0.035)	0.056 (0.065)	0.075*** (0.027)	0.070*** (0.026)	-3.063*** (0.991)
Cost of debt	1.437*** (0.211)	1.630*** (0.415)	0.802** (0.399)	1.518*** (0.254)	1.535*** (0.253)	-22.231*** (6.966)
Time to resolution	0.003*** (0.001)	0.004*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.004*** (0.001)	-0.012 (0.009)
Financial sponsor: regulation				1.260* (0.712)		
Time to resolution: regulation					-0.001 (0.699)	
Year fixed effects	Yes	No	No	Yes	Yes	No
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,620	962	658	1,620	1,620	1,453
Log Likelihood	-294.782	-136.511	-159.798	-291.361	-294.106	-8.303
Akaike Inf. Crit.	689.564	365.021	409.595	686.721	692.212	112.605

This table presents the marginal effects of the logistic regressions. The dependent variables *SPAC* and *post-JOBS IPO* are binary variables where 1 equals a SPAC firm and 0 equals an IPO firm, as well as 1 equals IPO firms post-JOBS and 0 equals IPO firms pre-JOBS. Regression (1) is the first base specification. Regressions (2) and (3) are the base specification divided into two subsamples whereof the first includes all observations with effective/listed date before April 5, 2012, and the second includes observations with effective/listed date after this date. Regression (4) and (5) has the additional interaction term between financial sponsor and time to resolution with the dummy variable *regulation*. Regulation equals 1 when the observation has an effective/listing date after April 5, 2012, and 0 otherwise. Regression (6) is the second base specification. All variables, with the exception of the regulation dummy, are defined in Section 4. Robust standard errors are provided in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Regression (3), including only observations of SPAC acquisitions and IPOs following the JOBS Act, deviates slightly from the other regression results by having an asset variable

insignificantly different from zero. This could imply that other effects from the legislation outweighs the hypothesized effect, i.e. that smaller, less mature firms would enter public markets through SPACs. Other methods of financing for smaller firms, e.g. crowdfunding, were also made accessible by the JOBS Act. This could have made it less appealing for small firms to merge with a SPAC and, hence, explain the insignificant asset variable. Similar to the size proxy, the marginal effect of debt ratio on the likeliness of choosing the SPAC route to market is smaller. In contrast to what was hypothesized, i.e. that firms would be even smaller, more highly leveraged, and less profitable after the introduction of the JOBS Act, we see indications that firm quality amongst SPAC targets have either gone up or the IPO quality gone down. Regardless, the results suggest that the JOBS Act has *not* coincided with a great number of junk-firms entering public markets through the SPAC doorway. A potential explanation could be that the SPAC asset class has reached a new level of maturity. Previous research describes it as puzzling how investors keep investing in SPACs when performance is severely below that of comparable asset classes. As such, we reason that the improvement in SPAC firm quality could be related to higher pressure on sponsors from its stakeholders. Previous research proposes that sponsors have been required to contribute more of the SPAC's funds, suggesting that more skin in the game will encourage SPACs to acquire targets of higher quality. Another possibility is that the quality of IPO firms has eroded. With the JOBS Act, the required reporting diminished for growth firms. This was exploited by SPACs but may just as well have caused a surge in the number of growth firms going public through IPOs. We examine this in regression (6) but find that the marginal effects from most of the relevant firm-specific variables, i.e. assets, debt, and return on assets, have not changed for the IPO firms succeeding the JOBS Act. Price-to-book is the only variable exhibiting a significant marginal effect, and only at the 10% level. This implies that the IPO firms after April 5, 2012, are trading at somewhat lower levels compared to the firms prior to the same date. However, we are careful to draw any definite conclusions about whether this is due to a significant increase in growth firm IPOs. The variables *market volatility* and *cost of debt* are exhibiting large and significant marginal effects. Both market volatility and cost of debt are significantly lower for the years succeeding the JOBS Act, which is intuitive as these years have coincided with a rather consistent bull market and low interest rate environment. Overall, we are led to believe that there has been a sequential improvement in the quality of SPAC firms. In Section 6, we will study the implications of these results on long-term performance.

6. Long-term performance

6.1. Hypothesis

In this section, we investigate how SPAC and IPO firms perform over time. If lower-quality firms enter the public market via a SPAC acquisition, as our findings in Section 5 indicate, we expect SPAC firms to underperform. Similar to the research of Kolb and Tykvová (2016), we use two alternative methods of measuring long-term performance: event-time analysis and calendar-time analysis. To perform these analyses we use buy-and-hold abnormal returns (BHAR) and the Carhart four-factor regression model (Carhart, 1997), respectively. By performing the calendar-time analysis, using the four-factor model, we overcome the cross-sectional dependence problem that may arise with event-time analysis (Fama, 1998). In addition to the research of Kolb and Tykvová (2016), we also make a distinction of the period prior to and succeeding the passing of the JOBS Act. Our findings in Section 5 suggest that the quality of firms acquired by SPACs, compared to the quality of IPO firms, has not become worse in the years succeeding the JOBS Act, instead we see a slight improvement in firm quality. By looking at performance before and after the JOBS Act, we further test whether a larger number of junk-firms have entered public markets after the deregulation, or if the results in Section 5 are inherent also in the long-term performance. If the deregulation has in fact caused more low-quality firms to become listed, we expect to find significantly lower returns for the SPACs that have completed an acquisition after April 5, 2012.

6.2. Event-time analysis

6.2.1. Model and specification

We calculate buy-and-hold abnormal returns of SPAC and IPO firms adjusted 1) for the market (Russel 2000 index), 2) for size, and 3) for the industry. In line with previous research, we use equal-weighted portfolios. We use end-of-day stock prices and indices, which include dividends and are adjusted for stock splits, obtained from Refinitiv Eikon. Return data of 100 size and book-to-market portfolios and 49 industry portfolios are retrieved from Kenneth R. French's website⁹. We match each SPAC or IPO firm with a corresponding size and book-to-market portfolio as well as an industry portfolio to calculate abnormal returns. To match firms with the size and book-to-market portfolios, we first calculate the average factor for the 10x10 portfolios from Kenneth R. French to generate 10 size portfolios. We then design 10 size categories to which the sample-firms are assigned, depending on the magnitude of each firm's assets. Finally, we adjust the buy-and-hold return with the return of the corresponding size-group. For the industry portfolios, we use the four-digit SIC codes obtained from SDC and Refinitiv Eikon and group the SIC codes into

⁹ http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

the same 49 industry categories used by Kenneth R. French. Thereafter, the buy-and-hold returns are adjusted by subtracting the relevant industry return for the specific period. We calculate BHARs for periods of 6, 12, 24, and 60 months after the effective date or the IPO date according to the following formula:

$$BHAR(t_1, t_2) = \prod_{t=t_1}^{t_2} [(1 + R_{it})] - \prod_{t=t_1}^{t_2} [(1 + R_{bt})], \quad (2)$$

where R_{it} is the return on a SPAC firm or an IPO firm and R_{bt} is the return on the benchmark portfolio in t . We calculate BHARs from t_1 , which is the effective date for SPAC firms and the first day of trading for IPO firms. The BHARs are calculated until t_2 , which is either the end of each measurement period or the delisting date if the firm has been delisted prior to the end of the period.

6.2.2. Main results

Consistent with previous literature (Loughran and Ritter, 1995; Kolb and Tykvová, 2016; Dimitrova, 2017) we find that both SPAC and IPO firms significantly underperform the market, the size, and the industry-matched portfolios in all periods under consideration. Looking at a 24-month period, we find that IPO firms underperform the benchmark portfolios by 18%, 24%, and 25%, respectively, based on median values. In line with our expectations, we find that the underperformance of SPAC firms is even greater, with BHARs of -51%, -61%, and -59%, respectively, for the same time interval. We also observe that performance seems to get worse over time: the six-month market-adjusted BHAR for SPAC firms is -19%, while the 60-month market-adjusted BHAR is -80%. As we do not use logarithmic returns, our sampling distribution will be positively skewed, why we choose to focus on median values. The results are summarized in Table 5.

Table 5

Buy-and-hold abnormal returns

		SPAC BHAR			IPO BHAR			WMW test p-value	t-test p-value
		Median	Mean	N	Median	Mean	N		
6 months	<i>Market adjusted</i>	-0.19***	-0.15***	167	-0.05**	0.01	1433	<0.001	<0.001
	<i>Size adjusted</i>	-0.12***	-0.17***	167	-0.07***	0.04	1433	<0.001	<0.001
	<i>Industry adjusted</i>	-0.19***	-0.19***	167	-0.06***	0.03	1433	<0.001	0.001
12 months	<i>Market adjusted</i>	-0.36***	-0.27***	138	-0.09***	0.03	1407	<0.001	<0.001
	<i>Size adjusted</i>	-0.39***	-0.31***	138	-0.12***	0.05	1407	<0.001	<0.001
	<i>Industry adjusted</i>	-0.37***	-0.35***	138	-0.13***	0.02	1407	<0.001	<0.001
24 months	<i>Market adjusted</i>	-0.51***	-0.41***	120	-0.18***	-0.00	1359	<0.001	<0.001
	<i>Size adjusted</i>	-0.61***	-0.48***	120	-0.24***	-0.08**	1359	<0.001	<0.001
	<i>Industry adjusted</i>	-0.59***	-0.54***	120	-0.25***	-0.13***	1359	<0.001	<0.001
60 months	<i>Market adjusted</i>	-0.80***	-0.66***	102	-0.35***	0.07	1261	<0.001	<0.001
	<i>Size adjusted</i>	-0.96***	-0.87***	102	-0.64***	-0.21***	1261	<0.001	<0.001
	<i>Industry adjusted</i>	-0.92***	-0.92***	102	-0.70***	-0.34***	1261	<0.001	<0.001

This table presents median and mean buy-and-hold abnormal returns for SPAC and IPO firms, the p-values of the Wilcoxon-Mann-Whitney (WMW) test, and the p-values of the *t*-test. The WMW test and *t*-test were run to show the statistical difference of median and mean return of the two groups. We also indicate which median and mean values are significantly different from zero. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

The event-time analysis results for the SPAC sample are presented in Table 6. We measure median and mean returns for the SPACs depending on whether the effective date took place before or after the passing of the JOBS Act. Again, since we do not use logarithmic BHARs we focus on median values. We find that the SPACs significantly underperform the market, the size, and the industry-matched portfolios in all periods under consideration, regardless of the SPAC making an acquisition before or after the JOBS Act. Furthermore, we observe that the pre-JOBS SPACs perform significantly worse. This further supports the results in the logistic regressions in Section 5, which suggest that the quality of the SPAC acquisitions has not deteriorated as we initially hypothesized. Instead, it implies that there has been a slight improvement in firm quality. Looking at a 24-month period, we find that pre-JOBS SPACs underperform the benchmark portfolios by 55%, 65%, and 76%, respectively, based on median values. Meanwhile, we find that the underperformance of post-JOBS SPACs is less extreme, yet still large and significantly negative, with BHARs of -44%, -43%, and -46%, respectively, for the same time interval.

Table 6

Buy-and-hold abnormal returns

		SPAC BHAR pre-JOBS			SPAC BHAR post-JOBS			WMW test p-value	t-test p-value
		Median	Mean	N	Median	Mean	N		
6 months	<i>Market adjusted</i>	-0.24***	-0.24***	80	-0.13**	-0.07	87	0.022	0.010
	<i>Size adjusted</i>	-0.28***	-0.27***	80	-0.15**	-0.08	87	0.011	0.006
	<i>Industry adjusted</i>	-0.29***	-0.30***	80	-0.09**	-0.09	87	0.003	0.003
12 months	<i>Market adjusted</i>	-0.43***	-0.40***	80	-0.29***	-0.16**	58	0.072	0.009
	<i>Size adjusted</i>	-0.45***	-0.45***	80	-0.33***	-0.18**	58	0.030	0.003
	<i>Industry adjusted</i>	-0.48***	-0.51***	80	-0.32***	-0.20***	58	0.005	<0.001
24 months	<i>Market adjusted</i>	-0.55***	-0.53***	80	-0.44***	-0.29***	40	0.144	0.022
	<i>Size adjusted</i>	-0.65***	-0.67***	80	-0.43***	-0.31***	40	0.004	<0.001
	<i>Industry adjusted</i>	-0.76***	-0.76***	80	-0.46***	-0.34***	40	<0.001	<0.001
60 months	<i>Market adjusted</i>	-1.00***	-0.93***	80	-0.60***	-0.42***	22	<0.001	0.0001
	<i>Size adjusted</i>	-1.42***	-1.32***	80	-0.65***	-0.45***	22	<0.001	<0.001
	<i>Industry adjusted</i>	-1.41***	-1.40***	80	-0.58***	-0.47***	22	<0.001	<0.001

This table presents median and mean buy-and-hold abnormal returns for SPAC firms completing an acquisition before and after the passing of the JOBS act on April 5, 2012, the p-values of the Wilcoxon-Mann-Whitney (WMW) test, and the p-values of the *t*-test. The WMW test and *t*-test were run to show the statistical difference of median and mean return of the two groups. We also indicate which median and mean values are significantly different from zero.

*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

In non-tabulated results, we fail to find any significant difference in the performance of IPO firms pre and post-JOBS. In Section 5 we discussed whether the fact that smaller firms were less likely to take the SPAC route to market was correlated with junk-firms going public through IPOs after the deregulation. The results from regression (6) in Section 5, suggest that the characteristics of IPO firms have not changed in the years succeeding the JOBS Act. The fact that we do not find any significant changes in abnormal returns in the latter period further suggests that firm quality has not significantly decreased among IPO firms. Rather, the combined result points to increased firm quality among SPAC acquisitions. Table A1 and A2 (see appendix) further support this. The tabulated results show the difference between long-term performance after the legislation was passed into law between SPAC and IPO firms. In Table A1 (pre-JOBS), SPACs perform significantly worse compared to IPOs for all intervals. Looking at the 60-month interval, we find that SPACs underperform the benchmark portfolios by 100%, 142%, and 141%, respectively. Meanwhile, IPOs underperform by 41%, 63%, and 76%, respectively. In Table A2 (post-JOBS) the difference in performance for all intervals appears to be decreasing, and for the 60-month size and industry adjusted abnormal return, the statistical difference is insignificant. Overall, our findings suggest that the quality of SPACs have improved over time.

6.3. Calendar-time analysis

6.3.1. Model and specification

For the calendar-time analysis, we download monthly values of the three Fama-French factors (1993) and the momentum factor (Carhart, 1997) from Kenneth R. French's website¹⁰. We then regress the monthly calendar-time portfolio excess returns on the four risk factors as follows:

$$r_{it} - r_{ft} = \alpha_i + \beta_i(r_{mt} - r_{ft}) + s_iSMB_t + h_iHML_t + m_iMOM_t, \quad (3)$$

where r_{it} is the return of a portfolio of SPAC or IPO firms, r_{ft} is the T-Bill return, α_i is the portfolio excess return, r_{mt} is the value-weighted return of all firms listed on NYSE, AMEX or NASDAQ, s_iSMB_t is the difference between the return of three portfolios of small firms and three portfolios of large firms, h_iHML_t is the difference between the return of two value portfolios and two growth portfolios, and m_iMOM_t is the difference between the return of two high-prior-return portfolios and two low-prior-return portfolios¹¹. In line with previous research, we use equal-weighted portfolios of SPAC and IPO firms. We run the regression for periods of 6, 12, 24, and 60 months following the effective date or IPO date. Additionally, we run the regression for the same time periods, this time with a distinction between SPAC and IPO firms with an effective or listing date before and after the JOBS Act was signed into law.

6.3.2. Main results

Consistent with previous literature, the portfolio of SPAC firms has significant and negative alphas in all periods when looking at the entire sample period. Kolb and Tykvová (2016) find that also IPO firms have significant and negative alphas in all time periods. While we, too, find negative alphas for IPO firms, they are not statistically significant. Interestingly, while the IPO firms appear to have a market beta exceeding one, i.e. being more volatile than the overall market, SPAC firms have market beta less than one except for the 60-month interval. This suggests that SPACs would be less risky compared to the market portfolio. We find no significant correlation between SPAC firms and the size portfolio, whereas the IPO firms exhibit a strong positive correlation with the same portfolio. However, the sign is consistently positive which supports our findings in Section 5, suggesting that SPAC firms are usually small and should thus exhibit a positive correlation with the return of small firms. Both SPAC and IPO firms are negatively correlated with the value portfolio, which can be interpreted as both groups on average consisting of growth firms. However, the SPAC sample is only significantly correlated with the value portfolio for the six-month interval. The correlation with the momentum portfolio for SPACs is similar to that of IPO

¹⁰ http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

¹¹ A more detailed explanation of the factors and the construction of the portfolios is available on Kenneth R. French's website.

firms, but the magnitude of the coefficients is larger, suggesting that SPACs are more strongly correlated with worse-performing firms. Overall, we find that the four-factor model is better suited to explain the IPO sample compared to the SPAC sample. However, this could also be an effect of the SPAC sample being significantly smaller. The results for the entire sample period are summarized in Table 7.

Table 7
Carhart four-factor model

	All SPACs				All IPOs			
	6 months (1)	12 months (2)	24 months (3)	60 months (4)	6 months (5)	12 months (6)	24 months (7)	60 months (8)
<i>Intercept</i>	-0.030*** (0.008)	-0.031*** (0.006)	-0.024*** (0.006)	-0.021*** (0.006)	-0.004 (0.005)	-0.004 (0.003)	-0.005 (0.003)	-0.003 (0.002)
<i>RMRF</i>	0.729*** (0.212)	0.672*** (0.151)	0.912*** (0.165)	1.227*** (0.159)	1.049*** (0.119)	1.025*** (0.081)	1.135*** (0.088)	1.047*** (0.053)
<i>SMB</i>	0.412 (0.370)	0.190 (0.267)	0.188 (0.293)	0.448 (0.278)	1.419*** (0.212)	1.221*** (0.145)	1.204*** (0.156)	1.153*** (0.094)
<i>HML</i>	-0.639** (0.319)	-0.067 (0.232)	-0.259 (0.254)	-0.061 (0.240)	-0.501*** (0.184)	-0.510*** (0.125)	-0.561*** (0.135)	-0.329*** (0.081)
<i>MOM</i>	-0.128 (0.206)	-0.220 (0.149)	-0.327** (0.161)	-0.229 (0.154)	0.039 (0.117)	-0.058 (0.080)	-0.176** (0.086)	-0.184*** (0.052)
<i>R-sq</i>	0.113	0.177	0.230	0.373	0.509	0.667	0.673	0.837
<i>Adj. R-sq</i>	0.091	0.158	0.213	0.359	0.499	0.660	0.666	0.834

This table shows the calendar-time analysis of SPAC and IPO firms between September 2004 and April 2020, using a four-factor model. The dependent variable is the monthly equal-weighted calendar-time excess return for 6, 12, 24 and 60 months following the acquisition or IPO date. The four-factor model is described in section 6.3.1. Standard errors are provided in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

We also perform the same analyses with the JOBS Act as a breaking point on the isolated SPAC sample. The results for the periods prior to and succeeding the JOBS Act are summarized in Table 8 and suggest that SPAC firms still underperform in both periods under consideration. However, the magnitude of underperformance seems to be lower, in the short-term, for firms merged after the JOBS Act came into effect, but higher for the longer time intervals. Over a six-month period, SPAC firms with an effective date before the JOBS Act had a monthly alpha of -3.9%, while it was -2.0% for firms that merged after the Act came into effect. Conversely, over the 60-month period, SPAC firms with an effective date before the JOBS Act have an insignificant alpha of -0.9% whereas post-JOBS SPACs have a significant -2.6% alpha. Again, we also find that the market beta coefficients are less than one for all time intervals except for the pre-JOBS six-month and post-JOBS 60-months return. In like manner to the four-factor regression in Table 7, we find little significant correlation between the SPAC portfolio's performance and the performance of the size, value, and momentum portfolio. This indicates that the model does not explain the performance of this small sample very well, and we are careful to draw any definite conclusions

from this test. In comparison to the event-time analysis in Section 6.1. where it is suggested that SPAC performance has improved in recent years, this calendar-time analysis does not support the same conclusion. Instead, we find significant negative alphas for the longer intervals in the post-JOBS sample, but not in the pre-JOBS sample. This would imply that performance has deteriorated in recent years. However, we believe the four-factor regressions' general inability to explain the performance, potentially due to the size of the sample, should be taken into consideration. We propose that future researchers should revisit this question when more observations are available, especially since the longer time intervals for the post-JOBS observations, e.g. 60 months are only available for SPAC firms with an effective date before October 30, 2015, effectively making the sample small.

Table 8

Carhart four-factor model

	SPAC pre-JOBS Act				SPAC post-JOBS Act			
	6 months (1)	12 months (2)	24 months (3)	60 months (4)	6 months (5)	12 months (6)	24 months (7)	60 months (8)
<i>Intercept</i>	-0.039*** (0.012)	-0.032*** (0.009)	-0.018** (0.009)	-0.009 (0.007)	-0.020* (0.012)	-0.029*** (0.008)	-0.027*** (0.009)	-0.026** (0.010)
<i>RMRF</i>	1.044*** (0.303)	0.754*** (0.221)	0.981*** (0.236)	0.841*** (0.200)	0.339 (0.309)	0.670*** (0.220)	0.989*** (0.250)	1.607*** (0.284)
<i>SMB</i>	0.798 (0.575)	0.021 (0.418)	-0.422 (0.447)	0.346 (0.355)	0.151 (0.493)	0.364 (0.358)	0.666 (0.406)	0.779* (0.440)
<i>HML</i>	-0.935* (0.474)	-0.424 (0.351)	-0.403 (0.376)	-0.134 (0.318)	-0.504 (0.459)	0.356 (0.330)	-0.044 (0.375)	0.613 (0.408)
<i>MOM</i>	-0.071 (0.237)	-0.334* (0.178)	-0.360* (0.191)	-0.326* (0.178)	-0.312 (0.418)	0.142 (0.291)	-0.157 (0.330)	0.271 (0.371)
<i>R-sq</i>	0.244	0.234	0.242	0.231	0.036	0.152	0.246	0.389
<i>Adj. R-sq</i>	0.199	0.195	0.209	0.208	-0.008	0.116	0.213	0.362

This table shows the calendar-time analysis of SPAC firms between September 2004 and April 2020, using a four-factor model. The regression output is grouped by SPAC firms completing an acquisition before and after the passing of the JOBS Act on April 5, 2012, where specifications (1)-(4) contain the observations prior to, and specifications (5)-(8) contain the observations succeeding the JOBS Act. The dependent variable is the monthly equal-weighted calendar-time excess return for 6, 12, 24 and 60 months following the acquisition date. The four-factor model is described in section 6.3.1. Standard errors are provided in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

In non-tabulated results, we fail to find a significant difference in the performance of IPOs pre and post-JOBS. For the pre-JOBS sample, the alphas are only significantly negative for the 24 and 60-months intervals, but similar in terms of magnitude to the other intervals and across the two samples. If anything, this result suggests that there might have been a slight improvement in IPO quality. All tests performed in Sections 5 and 6 suggest that SPACs underperform the market and that the underperformance is sizable. We also find indications that SPAC quality has improved over time while the performance for IPOs has largely remained the same.

7. Sponsor involvement and determinants for SPAC performance

7.1. Hypothesis

Our main contribution to the field consists of hand-collecting deal-specific variables related to SPAC acquisitions. Dimitrova (2017) finds that SPAC sponsor involvement improves the performance of SPACs after the merger. We hypothesize that firms with relatively inexperienced management teams may choose their route to market via SPAC to tap in on the SPAC sponsors' extensive experience. In an attempt to measure this, we collect data on whether the SPAC sponsors are assigned CEO or chairman as well as total SPAC sponsors as a portion of the board. Additionally, we compare the industry or geographic focus of the SPAC, stated in the initial S-1 filing, with the industry or geographic location of the target company. In case the SPAC has acquired a target within their aforementioned area of expertise, we consider there to be a *focus match*. Lastly, we hypothesize that larger size, higher return on assets, lower leverage, and higher price-to-book will correlate positively with buy-and-hold returns.

7.2. Regression model

7.2.1. Model and specification

To test market, deal, and firm-specific characteristics' correlation with SPAC long-term performance, we run linear regressions on the 6, 12, 24, and 60 months buy-and-hold returns. Regressions are made according to the following specification:

$$\begin{aligned} BHR(t_1, t_2) = & \alpha + \beta_1 Assets_i + \beta_2 Return\ on\ assets_i + \beta_3 Price\ to\ book_i + \beta_4 Debt\ ratio_i \\ & + \beta_5 Financial\ sponsor_i + \beta_6 Market\ volatility_i + \beta_7 Cost\ of\ debt_i \\ & + \beta_8 Portion\ of\ the\ board_i + \beta_9 CEO_i + \beta_{10} Chairman_i + \beta_{11} Focus\ match_i \\ & + \beta_{12} Time\ to\ acquisition_i + \beta_{13} CEO: Focus\ match_i \\ & + \beta_{14} Chairman: Focus\ match_i + \beta_{15} Portion\ of\ the\ board: Focus\ match_i \\ & + u_i, \end{aligned} \quad (4)$$

where individual firms are represented by i . All variables are presented and defined in Section 4. We include three interaction terms to measure the effect of sponsor involvement when the SPAC acquires a target within an industry or geography within which the sponsors have prior experience. In line with previous research, we use equal-weighted portfolios for the BHRs. We use end-of-day stock prices, which include dividends and are adjusted for stock splits, obtained from Refinitiv Eikon. In this test, we use non-abnormal buy-and-hold returns and are thus unable to draw any conclusion on the performance in like manner to Section 6. The regression focuses on the regressors' effect on performance, rather than the performance itself. Thereby, we hope to

draw conclusions about the firm, deal, and market-specific characteristics' correlation with SPAC returns.

7.2.2. Main results

Table 9 presents the regression output of the SPAC sample. The results confirm the general hypothesis that larger size, lower leverage, and higher price-to-book correlates with higher returns. Counterintuitively, return on assets is significantly negatively correlated with 12, 24, and 60 months BHRs. We also see significant and negative coefficients for cost of debt, suggesting performance is worse when a SPAC acquisition takes place in a high interest rate environment. We believe that this, in combination with the fact that firms acquired by SPACs more often exhibit higher indebtedness and smaller size (see Section 5), provides one explanation for the observed underperformance. This has been well documented in IPO research and is often referred to as the life-cycle theory. We propose that firms merging with a SPAC due to higher cost of capital and more immediate threat of financial distress experience lower returns in the years following the merger, due to the firm not being ready for a market introduction. In other words, firms seeking public capital solely because they have a sub-optimal capital structure may not be in the right place of their life-cycle to access public capital. Similarly, the firm's accumulation of debt may be a function of its past inability to recognize profits, wherefore it would have a hard time keeping pace with the rigors of the public market. Lastly, speculative growth companies are often reflected by a smaller size. According to the life-cycle theory, these have not yet reached the appropriate stage in their life-cycle, why small firms should on average be less capable to bear the costs of being public, and struggle as a consequence.

Looking at the variables measuring sponsor involvement and expertise, the results are more ambiguous. The results suggest that sponsor CEO is somewhat negatively correlated with returns, although only significant in the regression on 60-months buy-and-hold returns. This means that over a five-year period, firms with a SPAC sponsor appointed as CEO significantly correlates with negative returns. However, the returns appear to improve when the SPAC has acquired a firm operating in an area within which the sponsors have previous experience. These coefficients are significant for the 24 and 60-months buy-and-hold returns and the effect of a sponsor being CEO *and* having previous experience improves returns by 124% and 154%, respectively. Chairman from SPAC is only significantly positively correlated with buy-and-hold returns for the first six months after the effective date. The sign of the coefficient on sponsor chairman and the sponsor having previous experience in the industry or geography is similarly only significant, and negative, for the six-month interval, whereafter it is negative but insignificant. This indicates, although weakly, that sponsor involvement in the form of acting as

chairman is negative for the long-term performance and opposes the view of Dimitrova (2017). We will look further into this in the following Section 7.3.

Table 9

Regressions on SPAC characteristics and performance

Dependent variable:	BHR 6 months	BHR 12 months	BHR 24 months	BHR 60 months
	(1)	(2)	(3)	(4)
Intercept	-0.509 (0.348)	-1.248 (0.847)	-4.044*** (1.187)	-6.185*** (1.381)
Assets	0.059 (0.043)	0.238* (0.132)	0.684*** (0.181)	1.003*** (0.212)
Return on assets	-0.221 (0.166)	-0.745* (0.412)	-1.117** (0.484)	-1.093* (0.655)
Price-to-book	0.001** (0.0005)	0.002** (0.001)	0.003*** (0.001)	0.004 (0.004)
Debt ratio	-0.085 (0.065)	-0.307* (0.160)	-0.360* (0.188)	-0.324 (0.255)
Financial sponsor	0.080 (0.079)	0.083 (0.149)	-0.061 (0.269)	0.277 (0.342)
Market volatility	-0.00003 (0.005)	0.016* (0.010)	0.012 (0.016)	0.019 (0.025)
Cost of debt	-0.063* (0.038)	-0.214*** (0.061)	-0.287*** (0.109)	-0.350** (0.162)
Portion of board	-0.399 (0.336)	-0.263 (0.625)	0.825 (0.974)	0.907 (1.453)
CEO	-0.151 (0.244)	-0.377 (0.347)	-0.814 (0.555)	-1.306** (0.610)
Chairman	0.294** (0.141)	0.396 (0.292)	0.217 (0.359)	0.534 (0.621)
Focus match	0.188 (0.157)	0.359 (0.267)	0.579 (0.389)	0.399 (0.613)
Time to acquisition	0.0001 (0.0002)	-0.001 (0.0004)	-0.0002 (0.001)	-0.0003 (0.001)
CEO:Focus match	-0.006 (0.285)	0.488 (0.403)	1.244* (0.696)	1.543* (0.833)
Chairman:Focus match	-0.425** (0.166)	-0.592 (0.366)	-0.480 (0.539)	-0.717 (0.770)
Portion of board:Focus match	0.582 (0.381)	0.442 (0.721)	-1.138 (1.299)	-0.657 (1.802)

This table shows the OLS regression coefficients, where the regression follows the specification defined in equation (4). The dependent variables are the 6, 12, 24 and 60 months (log) BHRs. The regressors are defined in Section 4, Table 1. Robust standard errors are provided in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

7.3. Median and mean tests

7.3.1. Model and specification

The hand-collected variables show low variation, wherefore we expect weaker regression results for these specific regressors in Table 9. To further measure sponsor involvement and long-term performance, we perform additional median and mean tests on buy-and-hold abnormal returns. We specify buy-and-hold abnormal returns in the same way as described in Section 6. For the median and mean test, we make cruder groupings depending on the variables *focus match*, *CEO* and *chairman*. Thereafter, we compare the market, size, and industry adjusted buy-and-hold abnormal returns.

7.3.2. Main results

Table 10 shows the difference in mean and median returns for two subsets of SPAC acquisitions. The groupings were made based on whether the SPAC did or did not acquire a target operating within an industry or geography within which the sponsors had previous experience. The results from the test indicate that SPACs buying a target within their area of expertise perform significantly better compared to SPACs buying outside their area of expertise. Potential reasons for this include:

1. Sponsors are better at finding good targets in industries and geographies in which they have previous experience.
2. Acquisitions of companies outside their area of expertise only happen when the acquisition deadline is approaching. At that point, SPAC sponsors will acquire any company, regardless of its long-term performance outlook, to avoid liquidation.

The test does not distinguish on causality, nor does it control for any other variables known to influence long-term performance. Nevertheless, this test should offer some insights to SPAC investors. Prior to a SPAC acquisition, the proposed acquisition must typically be approved in a shareholder vote. Knowing that acquisitions unrelated to the sponsors' previous experience significantly underperform its control group should make investors hesitant to pass such an acquisition in the vote.

Table 10

Buy-and-hold abnormal returns

		Focus match accomplished			Focus match not accomplished			WMW test p-value	t-test p-value
		Median	Mean	N	Median	Mean	N		
6 months	<i>Market adjusted</i>	-0.16	-0.12	106	-0.31	-0.26	47	0.019**	0.093*
	<i>Size adjusted</i>	-0.18	-0.14	106	-0.28	-0.27	47	0.027**	0.143
	<i>Industry adjusted</i>	-0.18	-0.18	106	-0.30	-0.25	47	0.098*	0.393
12 months	<i>Market adjusted</i>	-0.29	-0.22	91	-0.50	-0.43	39	0.031**	0.026**
	<i>Size adjusted</i>	-0.32	-0.26	91	-0.50	-0.46	39	0.043**	0.031**
	<i>Industry adjusted</i>	-0.35	-0.32	91	-0.55	-0.45	39	0.113	0.174
24 months	<i>Market adjusted</i>	-0.44	-0.34	76	-0.68	-0.57	37	0.019**	0.037**
	<i>Size adjusted</i>	-0.51	-0.42	76	-0.87	-0.66	37	0.025**	0.043**
	<i>Industry adjusted</i>	-0.56	-0.51	76	-0.80	-0.64	37	0.127	0.308
60 months	<i>Market adjusted</i>	-0.74	-0.59	67	-1.01	-0.86	33	0.013**	0.075*
	<i>Size adjusted</i>	-0.82	-0.81	67	-1.22	-1.09	33	0.031**	0.098*
	<i>Industry adjusted</i>	-0.89	-0.88	67	-1.13	-1.07	33	0.121	0.303

This table presents median and mean buy-and-hold abnormal returns (BHARs) for SPAC firms. BHARs are defined in equation (2) in Section 6.2.1. The sample is grouped by whether the target company is operating within an industry or geographic region which the SPAC in its S-1 document stated that they would be targeting. The table also shows the p-values of the Wilcoxon-Mann-Whitney (WMW) test and *t*-test, which were run to show the statistical difference of median and mean return of the two subsamples. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Table A5 (see appendix) contains the results from the median and mean test on whether a SPAC sponsor was appointed chairman of the board, compared to if someone from the target was appointed chairman of the board. Opposite to the findings by Dimitrova (2017), who finds that sponsor involvement in the form of holding the position as chairman improves the long-term performance of a SPAC, we find no such evidence. Table A6 and A7 (see appendix) present two additional versions of median and mean tests on the same variables. Table A6 shows the statistical difference between companies that have a SPAC chairman and have made an acquisition in the aforementioned focus area, against companies that have a SPAC chairman but have not bought a target within the focus area. This test does not support any statistical differences in performance, both groups perform equally poorly. Table A7 shows the statistical difference between companies that have a SPAC chairman and have acquired a company in the aforementioned focus area, against companies that have a chairman from the target company. In like manner to the previous test, this test does not support any difference in performance, regardless of which entity the chairman originated from.

Interestingly, while chairman seems to be of little difference to the performance of the merged entity, the choice of CEO seems to be of greater importance. We have summarized the median and mean test of firms with SPAC sponsor CEO against firms with target CEO in Table 11. The results indicate that acquisitions where a SPAC sponsor is appointed CEO perform worse long-term, compared to when a person from the target is appointed CEO. Contradictory to our hypothesis, that sponsor involvement should enhance performance, sponsor involvement

appears to coincide with poor long-term performance. As this test only documents high-level correlation, we are careful not to draw any definite conclusions. Perhaps private companies seeking to go public via a SPAC merger, hoping to tap into the extensive experience of the SPAC sponsors, should reconsider their alternatives. It may also be the case that low-quality firms end up with a sponsor CEO because they are lacking other options.

Table 11
Buy-and-hold abnormal returns

		CEO from SPAC			CEO from target			WMW test p-value	t-test p-value
		Median	Mean	N	Median	Mean	N		
6 months	<i>Market adjusted</i>	-0.30	-0.30	36	-0.17	-0.11	128	0.043**	0.006***
	<i>Size adjusted</i>	-0.29	-0.32	36	-0.18	-0.13	128	0.038**	0.005***
	<i>Industry adjusted</i>	-0.33	-0.32	36	-0.17	-0.15	128	0.044**	0.018**
12 months	<i>Market adjusted</i>	-0.45	-0.45	36	-0.31	-0.23	101	0.087*	0.005***
	<i>Size adjusted</i>	-0.49	-0.51	36	-0.34	-0.25	101	0.037**	0.002***
	<i>Industry adjusted</i>	-0.51	-0.51	36	-0.35	-0.30	101	0.077*	0.025**
24 months	<i>Market adjusted</i>	-0.57	-0.54	33	-0.50	-0.37	87	0.431	0.067*
	<i>Size adjusted</i>	-0.63	-0.67	33	-0.52	-0.43	87	0.171	0.017**
	<i>Industry adjusted</i>	-0.76	-0.69	33	-0.56	-0.49	87	0.208	0.072*
60 months	<i>Market adjusted</i>	-1.00	-0.87	33	-0.77	-0.60	69	0.047**	0.055*
	<i>Size adjusted</i>	-1.33	-1.22	33	-0.80	-0.77	69	0.006***	0.005***
	<i>Industry adjusted</i>	-1.17	-1.16	33	-0.90	-0.85	69	0.090*	0.056*

This table presents median and mean buy-and-hold abnormal returns (BHARs) for SPAC firms. BHARs are defined in equation (2) in Section 6.2.1. The sample is grouped by whether the merged entity appointed a SPAC sponsor or a person from the target as CEO. The table also shows the p-values of the Wilcoxon-Mann-Whitney (WMW) test and *t*-test, which were run to show the statistical difference of median and mean return of the two subsamples. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Furthermore, we hypothesized that the success of sponsor involvement hinges on sponsors having expertise to offer the target. This should be true particularly when a SPAC acquires a target operating in an industry or geography that the SPAC sponsors have experience from. An extension of the previous test is tabulated below in Table 12. The test suggests that firms with a sponsor becoming CEO of the merged entity, although the target was outside the SPAC's area of expertise, significantly underperform 12, 24, and 60 months after the acquisition. Conversely, when the sponsors have knowledge of the industry or geography, sponsor involvement coincides with comparatively lower underperformance.

Table 12

Buy-and-hold abnormal returns

		CEO with focus match			CEO without focus match			WMW test p-value	t-test p-value
		Median	Mean	N	Median	Mean	N		
6 months	<i>Market adjusted</i>	-0.29	-0.25	23	-0.33	-0.38	13	0.253	0.238
	<i>Size adjusted</i>	-0.27	-0.29	23	-0.35	-0.38	13	0.312	0.362
	<i>Industry adjusted</i>	-0.36	-0.32	23	-0.30	-0.33	13	0.948	0.892
12 months	<i>Market adjusted</i>	-0.39	-0.35	23	-0.56	-0.62	13	0.012**	0.010**
	<i>Size adjusted</i>	-0.43	-0.42	23	-0.64	-0.67	13	0.020**	0.020**
	<i>Industry adjusted</i>	-0.47	-0.42	23	-0.65	-0.66	13	0.065*	0.059*
24 months	<i>Market adjusted</i>	-0.38	-0.42	20	-0.70	-0.76	13	0.009***	0.005***
	<i>Size adjusted</i>	-0.53	-0.55	20	-0.94	-0.88	13	0.012**	0.009***
	<i>Industry adjusted</i>	-0.57	-0.56	20	-0.89	-0.94	13	0.011**	0.010**
60 months	<i>Market adjusted</i>	-0.76	-0.68	20	-1.11	-1.23	13	0.005***	0.005***
	<i>Size adjusted</i>	-1.11	-1.03	20	-1.58	-1.56	13	0.011**	0.011**
	<i>Industry adjusted</i>	-0.88	-0.94	20	-1.62	-1.57	13	0.018**	0.013**

This table presents median and mean buy-and-hold abnormal returns (BHARs) for SPAC firms. BHARs are defined in equation (2) in Section 6.2.1. The sample is grouped by whether the merged entity appointed a SPAC sponsor as CEO and acquired a target operating within an industry or geographic region which the SPAC in its S-1 document stated that they would be targeting, compared to a SPAC sponsor as CEO, but outside the focus area stated in the S-1 document. The table also shows the p-values of the Wilcoxon-Mann-Whitney (WMW) test and *t*-test, which were run to show the statistical difference of median and mean return of the two subsamples. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Table 13 presents the test results on whether performance improves with sponsor involvement when there is a focus match, compared to when sponsors simply do not involve themselves in the business execution. Both median and mean tests show no significance for longer time frames than six months. The conclusion from these tests is that being CEO while having no particular expertise in the industry or geography at hand, damage long-term performance. Meanwhile, we see no improvement in performance with sponsor involvement even when the sponsors have knowledge, compared to when sponsors do not engage in the execution of the business. Similar to the practical implications of the test results in Table 10, these conclusions could offer some insights to SPAC investors. When voting on a SPAC acquisition, investors should interpret sponsors being appointed as CEO, without there being a focus match, as a strongly negative signal.

Table 13

Buy-and-hold abnormal returns

		CEO with focus match			CEO from target			WMW test p-value	t-test p-value
		Median	Mean	N	Median	Mean	N		
6 months	<i>Market adjusted</i>	-0.29	-0.25	23	-0.17	-0.11	128	0.249	0.064*
	<i>Size adjusted</i>	-0.27	-0.29	23	-0.18	-0.13	128	0.204	0.049**
	<i>Industry adjusted</i>	-0.36	-0.32	23	-0.17	-0.15	128	0.100	0.057*
12 months	<i>Market adjusted</i>	-0.39	-0.35	23	-0.31	-0.23	101	0.711	0.156
	<i>Size adjusted</i>	-0.43	-0.42	23	-0.34	-0.25	101	0.458	0.089*
	<i>Industry adjusted</i>	-0.47	-0.42	23	-0.35	-0.30	101	0.528	0.288
24 months	<i>Market adjusted</i>	-0.38	-0.42	20	-0.50	-0.37	87	0.631	0.632
	<i>Size adjusted</i>	-0.53	-0.55	20	-0.52	-0.43	87	0.927	0.293
	<i>Industry adjusted</i>	-0.57	-0.56	20	-0.56	-0.49	87	0.978	0.608
60 months	<i>Market adjusted</i>	-0.76	-0.68	20	-0.77	-0.60	69	0.670	0.655
	<i>Size adjusted</i>	-1.11	-1.03	20	-0.80	-0.77	69	0.223	0.192
	<i>Industry adjusted</i>	-0.88	-0.94	20	-0.90	-0.85	69	0.725	0.607

This table presents median and mean buy-and-hold abnormal returns (BHARs) for SPAC firms. BHARs are defined in equation (2) in Section 6.2.1. The sample is grouped by whether the merged entity appointed a SPAC sponsor as CEO and acquired a target operating within an industry or geographic region which the SPAC in its S-1 document stated that they would be targeting, compared to merged entities with a CEO from the target. The table also shows the p-values of the Wilcoxon-Mann-Whitney (WMW) test and *t*-test. These were run to show the statistical difference of median and mean return of the two subsamples. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Resonating with previous research, we are puzzled why investors continue to put money into SPACs. In contrast to the findings of Dimitrova (2017), we find no support of sponsor involvement improving the performance of SPACs, but rather that sponsors seeking influence in the executive decisions without any particular knowledge of the industry or geography worsen performance.

8. Summary and conclusion

Although blank check companies are not a new invention, this go-to-market vehicle has never generated as much interest from the financial community as it is right now. Since the dawn of the new generation SPACs in 2003 and the market introduction of Millstream Acquisition Corporation, 555 SPACs have entered US public markets. Over these 17 years, the asset class has coevolved with the regulatory environment as well as with the requirements from SPAC stakeholders. In agreement with previous research, we believe that the SPAC field of study remains severely understudied compared to the vast interest it has generated over the years. With this paper, we have attempted to both confirm what has previously been said about SPACs, and more importantly, fill the gap of SPAC sponsor quality and involvement and the value implications for investors.

Our findings indicate that SPACs allow smaller and more leveraged firms to enter public markets, as well as providing firms with an alternative route to market during difficult times. We observe how the quality of SPAC firms appears to have improved in the years after the JOBS Act, indicating that the deregulation did *not* cause an increase in junk-firms going public. Instead, we reason that the JOBS Act may have enabled small and less mature firms access to other sources of financing, e.g. crowdfunding. In concurrence with this, we also suggest that the pressure on SPAC sponsors from its investors should have increased sponsor efforts in finding a high-quality target. We believe these forces have contributed to the improved quality of SPAC firms. We find that financial sponsors generally do not favor SPACs as an exit strategy, but that it has increased over time. Investors today typically require firms to have reached a certain size and maturity before attempting an IPO. We believe the consequential decrease in IPOs of smaller and more speculative firms has increased financial sponsors' inclination of exiting their investments through SPAC mergers.

Looking at the long-term performance of SPAC firms, we see that they significantly underperform the market, industry, and firms of similar size and price-to-book ratios. The results are consistent between different methodologies and time periods, using both event-time and calendar-time approaches. We do not find significant proof that performance has deteriorated in recent years. This suggests that although a large number of SPACs have been competing for targets, this has not translated to more junk-firms entering public markets. The number of SPAC IPOs have increased drastically during 2020, and we are yet to see the long-term consequences of this surge. Similarly, we are only able to measure the long-term performance of 60 months for SPAC acquisitions completed at the end of 2015 at the latest. The full effect of the JOBS Act, as well as the 2020 surge of SPAC IPOs, will therefore call for further examination in the years to come.

Our primary contributions consist of examining the effects of sponsor involvement on long-term performance. We find significant differences in performance when the SPAC acquires a target operating in an industry or geography within which the sponsors have previous experience, referred to as a focus match, and our results suggest that long-term performance improves when a focus match has occurred. We reason that this is due to sponsors finding better targets when they have relevant experience and that sponsors only approach a target outside of their area of expertise when they are unable to find a high-quality firm with a focus match. In instances as such, the acquisition deadline might be approaching and since sponsors will favor any acquisition above no acquisition, they will even attempt to acquire a low-quality target, just to avoid liquidation. We also find that performance is worse for the firms where a SPAC sponsor is appointed CEO, but reason that this might be due to sponsors acquiring a low-quality firm might become CEO due to the lack of other options. The performance of the merged entity is significantly worse when the sponsor CEO lacks the relevant experience, compared to if the sponsor is CEO

and there is a focus match. Interestingly, we find no statistically significant difference in performance when the CEO is a sponsor with prior experience, compared when the sponsor is not involved with the operations of the firm, i.e. a person from the target is appointed CEO. This suggests that sponsors do not add value to the business after the acquisition, but that a sponsor could make a relatively better choice of target if they have prior experience within that business.

Our research has been limited to the data available and identifying the complete dataset for the SPAC acquisitions has been a challenging task. Moreover, there are multiple variables that have had a documented effect on the long-term performance of SPACs. These were mentioned in Section 3 and include for instance if the acquisition value is close to the 80% hurdle and when, during the 24-month acquisition period, the merger is made effective. Altogether, a variety of variables have shown to be important for the likeliness of an acquisition and the subsequent performance in previous literature. We have made an effort to answer both *which* firms chose the SPAC route to market, *how* they perform once taken public, and if there are any *differences in performance* depending on sponsor involvement and experience. Consequently, we have been forced to impose limitations and include only what we believe to be most material to the question at hand. A more narrowly focused paper could perhaps have offered a more universal answer to one of these three questions.

Over the last few years, SPAC activity has skyrocketed. In the first 10 months of 2020, 200 SPACs have gone public, raising a total of US\$69 billion. Given the poor long-term performance of SPAC firms, this development is fascinating, although not surprising. We, as well as previous researchers, have found that SPAC activity benefits from uncertain market conditions, which evidently has been the case during 2020. In the years to come, this surge in SPAC IPOs will enable much-needed insights into this peculiar asset class and researchers will benefit from what will accumulate to, hopefully, an abundance of observations. We believe that further research is needed, especially to uncover why investors continue to contribute capital to SPAC IPOs when the long-term performance is value-destroying to the investors in question. Moreover, we suggest that more effort should be directed towards examining what type of SPAC firms underperform. We find it hard to believe that all SPAC firms are bad apples, why understanding what industries, countries, and management teams are best suited for this asset class would further the maturing of SPACs and benefit the currently swindled investors.

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Appendix

Table A1

Buy-and-hold abnormal returns

		SPAC BHAR pre-JOBS			IPO BHAR pre-JOBS			WMW test p-value	t-test p-value
		Median	Mean	N	Median	Mean	N		
6 months	Market adjusted	-0.24***	-0.24***	80	-0.06***	-0.00	882	<0.001	<0.001
	Size adjusted	-0.28***	-0.27***	80	-0.07***	0.07	882	<0.001	0.001
	Industry adjusted	-0.29***	-0.30***	80	-0.07***	0.05	882	<0.001	0.001
12 months	Market adjusted	-0.43***	-0.40***	80	-0.08***	0.02	882	<0.001	<0.001
	Size adjusted	-0.45***	-0.45***	80	-0.10***	0.08	882	<0.001	<0.001
	Industry adjusted	-0.48***	-0.51***	80	-0.12***	0.05	882	<0.001	<0.001
24 months	Market adjusted	-0.55***	-0.53***	80	-0.18***	-0.02	882	<0.001	<0.001
	Size adjusted	-0.65***	-0.67***	80	-0.23***	-0.08***	882	<0.001	<0.001
	Industry adjusted	-0.76***	-0.76***	80	-0.28***	-0.17***	882	<0.001	<0.001
60 months	Market adjusted	-1.00***	-0.93***	80	-0.41***	-0.02	882	<0.001	<0.001
	Size adjusted	-1.42***	-1.32***	80	-0.63***	-0.28***	882	<0.001	<0.001
	Industry adjusted	-1.41***	-1.40***	80	-0.76***	-0.49***	882	<0.001	<0.001

This table presents median and mean buy-and-hold abnormal returns (BHARs) for SPAC acquisitions and IPOs before the passing of the JOBS act April 2012. BHARs are defined in equation (2) in Section 6.2.1. The table also show the p-values of the Wilcoxon-Mann-Whitney (WMW) test and *t*-test. These were run to show the statistical difference of median and mean return of the two groups. We also indicate which median and mean values are significantly different from zero. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Table A2

Buy-and-hold abnormal returns

		SPAC BHAR post-JOBS			IPO BHAR post-JOBS			WMW test p-value	t-test p-value
		Median	Mean	N	Median	Mean	N		
6 months	Market adjusted	-0.13**	-0.07	87	-0.04	0.02	552	0.045	0.109
	Size adjusted	-0.15**	-0.08	87	-0.07**	0.00	552	0.060	0.132
	Industry adjusted	-0.09**	-0.09	87	-0.03**	-0.00	552	0.121	0.139
12 months	Market adjusted	-0.29***	-0.16**	58	-0.11	0.05	528	0.002	0.012
	Size adjusted	-0.33***	-0.18**	58	-0.16***	-0.01	528	0.009	0.047
	Industry adjusted	-0.32***	-0.20***	58	-0.13***	-0.01	528	0.011	0.019
24 months	Market adjusted	-0.44***	-0.29***	40	-0.19***	0.03	484	0.001	0.001
	Size adjusted	-0.43***	-0.31***	40	-0.27***	-0.08*	484	0.028	0.022
	Industry adjusted	-0.46***	-0.34***	40	-0.21***	-0.05	484	0.007	0.004
60 months	Market adjusted	-0.60***	-0.42***	22	-0.30***	0.21**	383	0.017	<0.001
	Size adjusted	-0.65***	-0.45***	22	-0.67***	-0.04	383	0.936	0.005
	Industry adjusted	-0.58***	-0.47***	22	-0.52***	0.01	383	0.402	0.001

This table presents median and mean buy-and-hold abnormal returns (BHARs) for SPAC acquisitions and IPOs after the passing of the JOBS act April 2012. BHARs are defined in equation (2) in Section 6.2.1. The table also show the p-values of the Wilcoxon-Mann-Whitney (WMW) test and *t*-test. These were run to show the statistical difference of median and mean return of the two groups. We also indicate which median and mean values are significantly different from zero. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Table A3

Correlation matrix full sample

Variable	Assets	ROA	Debt ratio	Price-to-book	Financial sponsor	Time to resolution	Volatility	Cost of debt
Assets	1.00							
ROA	0.45	1.00						
Debt ratio	0.27	-0.07	1.00					
Price-to-book	-0.10	-0.04	-0.11	1.00				
Financial sponsor	0.04	-0.05	-0.15	-0.02	1.00			
Time to resolution	0.04	-0.03	-0.16	0.01	0.24	1.00		
Volatility	0.06	0.10	0.01	0.05	-0.04	-0.13	1.00	
Cost of debt	-0.01	0.14	0.05	-0.03	-0.01	-0.01	-0.24	1.00

This table shows the pairwise correlation matrix of the variables used in Section 5. All variables are defined in Section 4, Table 1.

Table A4

Correlation matrix SPAC sample

Variable	Assets	ROA	Debt ratio	Price-to-book	Time to acquisition	Focus dummy	CEO	Chairman	Portion of board	Volatility	Cost of debt
Assets	1.00										
ROA	0.30	1.00									
Debt ratio	-0.25	-0.97	1.00								
Price-to-book	-0.05	0.03	-0.01	1.00							
Time to acquisition	-0.21	-0.03	0.02	0.08	1.00						
Focus dummy	0.12	-0.02	0.04	0.10	-0.12	1.00					
CEO	-0.01	0.04	-0.06	-0.10	-0.04	-0.07	1.00				
Chairman	0.04	0.05	-0.07	-0.09	-0.18	-0.08	0.49	1.00			
Portion of board	-0.05	-0.05	0.03	-0.08	-0.03	-0.00	0.68	0.52	1.00		
Volatility	-0.08	0.08	-0.03	0.12	0.27	-0.03	-0.11	-0.16	-0.13	1.00	
Cost of debt	-0.25	0.01	-0.00	-0.03	0.06	0.04	0.23	0.01	0.28	-0.14	1.00

This table shows the pairwise correlation matrix of the variables used in Section 7. All variables are defined in Section 4, Table 1.

Table A5

Buy-and-hold abnormal returns

		Chairman from SPAC			Chairman from target			WMW test p-value	t-test p-value
		Median	Mean	N	Median	Mean	N		
6 months	<i>Market adjusted</i>	-0.22	-0.22	78	-0.14	-0.09	86	0.142	0.063*
	<i>Size adjusted</i>	-0.27	-0.24	78	-0.17	-0.12	86	0.176	0.084*
	<i>Industry adjusted</i>	-0.25	-0.23	78	-0.17	-0.15	86	0.281	0.250
12 months	<i>Market adjusted</i>	-0.39	-0.33	67	-0.32	-0.23	71	0.421	0.278
	<i>Size adjusted</i>	-0.43	-0.37	67	-0.34	-0.25	71	0.235	0.223
	<i>Industry adjusted</i>	-0.47	-0.38	67	-0.34	-0.32	71	0.424	0.553
24 months	<i>Market adjusted</i>	-0.52	-0.44	60	-0.50	-0.37	60	0.955	0.515
	<i>Size adjusted</i>	-0.61	-0.53	60	-0.53	-0.44	60	0.655	0.448
	<i>Industry adjusted</i>	-0.61	-0.54	60	-0.57	-0.53	60	0.988	0.950
60 months	<i>Market adjusted</i>	-0.83	-0.69	54	-0.78	-0.63	48	0.646	0.635
	<i>Size adjusted</i>	-1.08	-0.94	54	-0.86	-0.81	48	0.395	0.395
	<i>Industry adjusted</i>	-0.96	-0.96	54	-0.89	-0.87	48	0.492	0.584

This table presents median and mean buy-and-hold abnormal returns (BHARs) for SPAC firms. BHARs are defined in equation (2) in Section 6.2.1. The sample is grouped by whether the merged entity appointed a SPAC sponsor as chairman, compared to merged entities with a chairman from the target. The table also shows the p-values of the Wilcoxon-Mann-Whitney (WMW) test and *t*-test, which were run to show the statistical difference of median and mean return of the two subsamples. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Table A6

Buy-and-hold abnormal returns

		Chairman with focus match			Chairman without focus match			WMW test p-value	t-test p-value
		Median	Mean	N	Median	Mean	N		
6 months	<i>Market adjusted</i>	-0.22	-0.22	48	-0.30	-0.26	27	0.420	0.599
	<i>Size adjusted</i>	-0.24	-0.24	48	-0.28	-0.27	27	0.426	0.736
	<i>Industry adjusted</i>	-0.23	-0.25	48	-0.30	-0.25	27	0.788	0.992
12 months	<i>Market adjusted</i>	-0.39	-0.30	43	-0.48	-0.41	22	0.590	0.333
	<i>Size adjusted</i>	-0.43	-0.35	43	-0.49	-0.44	22	0.627	0.427
	<i>Industry adjusted</i>	-0.36	-0.36	43	-0.53	-0.44	22	0.443	0.502
24 months	<i>Market adjusted</i>	-0.45	-0.38	36	-0.64	-0.58	22	0.154	0.099*
	<i>Size adjusted</i>	-0.55	-0.46	36	-0.87	-0.68	22	0.148	0.101
	<i>Industry adjusted</i>	-0.55	-0.49	36	-0.80	-0.68	22	0.115	0.186
60 months	<i>Market adjusted</i>	-0.76	-0.61	33	-0.99	-0.88	21	0.115	0.116
	<i>Size adjusted</i>	-0.98	-0.85	33	-1.33	-1.15	21	0.085*	0.136
	<i>Industry adjusted</i>	-0.92	-0.88	33	-1.16	-1.16	21	0.180	0.191

This table presents median and mean buy-and-hold abnormal returns (BHARs) for SPAC firms. BHARs are defined in equation (2) in Section 6.2.1. The sample is grouped by whether the merged entity appointed a SPAC sponsor as chairman and acquired a target operating within an industry or geographic region which the SPAC in its S-1 document stated that they would be targeting, compared to SPAC sponsor as chairman, but outside the focus area stated in the S-1. The table also shows the p-values of the Wilcoxon-Mann-Whitney (WMW) test and *t*-test. These were run to show the statistical difference of median and mean return of the two subsamples. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Table A7

Buy-and-hold abnormal returns

		Chairman with focus match			Chairman from target			WMW test p-value	t-test p-value
		Median	Mean	N	Median	Mean	N		
6 months	<i>Market adjusted</i>	-0.22	-0.22	48	-0.14	-0.09	86	0.204	0.097*
	<i>Size adjusted</i>	-0.24	-0.24	48	-0.17	-0.12	86	0.241	0.105
	<i>Industry adjusted</i>	-0.23	-0.25	48	-0.17	-0.15	86	0.283	0.225
12 months	<i>Market adjusted</i>	-0.39	-0.30	43	-0.32	-0.23	71	0.544	0.522
	<i>Size adjusted</i>	-0.43	-0.35	43	-0.34	-0.25	71	0.319	0.410
	<i>Industry adjusted</i>	-0.36	-0.36	43	-0.34	-0.32	71	0.593	0.733
24 months	<i>Market adjusted</i>	-0.45	-0.38	36	-0.50	-0.37	60	0.663	0.972
	<i>Size adjusted</i>	-0.55	-0.46	36	-0.53	-0.44	60	0.888	0.891
	<i>Industry adjusted</i>	-0.55	-0.49	36	-0.57	-0.53	60	0.618	0.735
60 months	<i>Market adjusted</i>	-0.76	-0.61	33	-0.78	-0.63	48	0.945	0.890
	<i>Size adjusted</i>	-0.98	-0.85	33	-0.86	-0.81	48	0.787	0.812
	<i>Industry adjusted</i>	-0.92	-0.88	33	-0.89	-0.87	48	0.828	0.964

This table presents median and mean buy-and-hold abnormal returns (BHARs) for SPAC firms. BHARs are defined in equation (2) in Section 6.2.1. The sample is grouped by whether the merged entity appointed a SPAC sponsor as chairman and acquired a target operating within an industry or geographic region which the SPAC in its S-1 document stated that they would be targeting, compared to merged entities with a chairman from the target. The table also shows the p-values of the Wilcoxon-Mann-Whitney (WMW) test and *t*-test. These were run to show the statistical difference of median and mean return of the two subsamples. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.