Leave no Money on the Table: Venture Capitalists' SPAC Exits

by

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Abstract:
Taking ventures public is commonly considered the most rewarding exit alternative for venture capitalists (VCs) in terms of financial returns and reputational gains. However, in recent years, special purpose acquisition companies (SPACs) have served to bring companies public without the delay and bureaucratic burden of an IPO process. VCs have increasingly used this exit channel which combines characteristics of IPOs and secondary transactions (i.e., selling to financial intermediaries). We refer to prominent theory about VCs' IPO and secondary market exits but detect that SPAC exits do not match the theory predictions. We find that VC-backed SPAC merger targets are not younger and neither shorter nor longer in VCs' portfolios compared to their IPO peers. They also do neither require more nor less aggregate capital contributions or financing rounds, and neither have statistically different numbers of investors. Nevertheless, they are smaller in book values, less profitable, have lower market capitalizations, and lower Tobin's Qs. Regarding financial performance, we find an 8.1% average announcement day return for SPACs merging with VC-backed companies. However, the boost dissipates quickly. There is no statistically detectable stock market reaction on the SPAC merger day itself, but the aftermarket performance is dreadful, on average. This means that no NPV from the average SPAC merger gets distributed to public shareholders and leads us to conclude that VCs' SPAC exits are motivated by opportunism: They exploit the SPAC window of opportunity and leave no money on the table.

JEL classification: D81, G24, G32, L26
Key words: SPAC, Venture Capital, Exit, IPO

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" Over the past two years, the U.S. public securities markets have experienced an unprecedented surge in the number of initial public offerings by SPACs. The rapid increase has heightened investor protection concerns about various aspects of the SPAC structure and the increasing use of shell companies as mechanisms for private operating companies to become public companies. The surge in SPAC initial public offerings also has renewed concerns about the use of projections, particularly with respect to business combination transactions in which projections about private operating companies may lack a reasonable basis. As the SPAC market has grown, concerns also have arisen about whether some SPACs may be investment companies that are subject to the requirements of the Investment Company Act."
SEC, public announcement: https://www.sec.gov/files/33-11048-fact-sheet.pdf.

On March 30, 2022, the SEC has proposed changes to the regulation of special purpose acquisition companies (SPACs) that would make them more like IPOs, diminishing advantages of blank-check companies. Critics of SPACs have long argued that deals involving blank-check firms frequently mislead investors and contain inherent conflicts of interest as well as opaque dilution structures. As currently drafted, the rules aim to curb the practice of too optimistic revenue projections, increase disclosure of SPAC sponsors' incentives and allow investors to more easily sue entities involved in blank-check deals. Companies would be required to provide clear rationales for their projections, and the financial and accounting data disclosure standards would be more strictly regulated. The proposals are a response to past SPAC mergers with companies that, despite having little or no revenue, issued forecasts of explosive growth in investor presentations. The rules would also require additional disclosures from SPAC sponsors, including their compensation, lock-up agreements and any conflicts of interests related to the deal. Dealmakers and underwriters would be made accountable for the accuracy of registration documents.

A SPAC is a blank-check company created by a sponsor who holds part of its common stock and eventually additional preferred and contingent claims. The SPAC goes public as shell vehicle with a standard prospectus. It issues additional common stock to raise capital. Its single purpose is

to find a non-listed target firm to merge with for which it typically has two years' time. The merger is also called the de-SPAC event. This way, the target becomes a public company without the delay and regulative burden of a standard going public process. Cumming et al. (2014) refer to this as "fast track IPO".

The recent rise of SPACs has also gained substantial academic interest. Gahng et al. (2021) provide a description of SPACs and the market since 2010. Klausner et al. (2022) comprehensively discuss legal perspectives, conflicts of interest, and cost of SPAC transactions, comparing them with standard IPOs. Feng et al. (2022) elaborate on information asymmetries among SPAC sponsors, targets, and SPAC investors. Lin et al. (2021) focus on the networks of SPAC sponsors which is even called the "SPAC Mafia" in Gahng et al. (2021).

SPACs bring VCs advantages because they allow to divest their exposure quickly without the necessity to pursue long term listing procedures. Our own data shows that more than one third of the completed de-SPACs involve VC exits. Combining IPO and secondary transaction (i.e., selling to a financial intermediary) characteristics, SPAC mergers constitute an exit channel which could be of particular interest especially for funds in their liquidation period, or for "fire sales". SPACs facilitate VC exits and thus lower the asset class's liquidity discount to the benefit of investors, investees, and entrepreneurs. Yet, the question could rise why a VC would still envisage an IPO given that the fast-track exit alternative exists. If divesting to a SPAC increases reputation and turns out to be financially successful, then why going the long way to IPO? Hence, the degree of success of SPAC exits depends on exit values, transaction cost and aftermarket performance. While SPAC literature elaborates on transaction cost and financial success, it does not discuss exit values and VC involvement.

SPAC transaction cost are complex to determine. Preferential and contingent claims of the SPACs' sponsors and the possibility to redeem or add capital prior to the de-SPAC event may dilute common shareholders and affect the total raised capital. This can also distribute transaction cost unevenly. Gahng et al. (2021) calculate transaction costs as the difference between the market value of issued/transferred shares and the net proceeds to the SPAC entities, respectively IPO firms and selling shareholders. They report a median of 47.6% transaction cost for SPACs, more than double the median cost of IPOs. However, they note that transaction cost could be driven by self-selection. It is possible that companies filing for IPOs are not of the same kind as those which go through a SPAC merger. Klausner et al. (2022) therefore differentiate high- and low-quality SPACs via league tables of the SPACs' promoters and decompose total fees into pre-merger and de-SPAC transaction cost. Even for high-quality SPACs the median transaction cost is 30% of the pre-merger equity in addition to 13% of the post-merger equity. Such levels of transaction fees seem prohibitive and question their transparency to the market participants who bear them. However, the referenced papers only focus on the transaction cost born by the SPAC. Expectedly, there are additional sellers' M&A fees for the exiting VCs. Such fees are usually not disclosed but lower the net proceeds. Summarizing, VCs' divestments to SPACs are charged by large amounts of transaction fees, larger than for IPOs.

Literature about the financial success of SPACs discourages investments for "normal" common stockholders, explains the SEC taking initiative, and thus questions the future of the SPAC market. Early contributions, such as Jenkinson and Sousa (2011) and Kolb and Tykvova (2016) elaborate on the first SPAC market wave and already detect disappointing returns to common stockholders. Focusing on the recent SPAC wave, Gahng et al. (2021) find an equally weighted average one-year buy-and-hold return of the merged companies' common shares of -

7.3%, while the value-weighted CRSP return is 13.6% for the matched period. This turns into 21% underperformance relative to the index. Kiesel et al. (2022) determine -14.1% one year and -18% two years CARs. Klausner et al. (2022) calculate a -38% mean long-term return for 47 SPACs relative to the Russell 2000 index.

However, we do not know much yet about the SPAC targets themselves and the role of VCs in this market. No contribution has yet investigated differentials of VCs' SPAC and IPO exits with respect to the underlying companies, to exit values, and especially, the rationale of VCs selling to SPACs. The SPAC targets are privately held companies with restricted data availability. This limits the research ability and requires matching several data sets.

Our paper aims to explain the kind of ventures that VCs divest via SPACs compared to bringing them public in a standard IPO process. We question if Gompers' (1996) grandstanding theory could also be applicable for the SPAC market. Alternatively, we analyze if the possibility of "strategic exits" proposed in Faure-Grimaud and Gromb (2004) and based on Admati and Pfeiderer (1994), could motivate VCs to channel transactions into the SPAC market. "Strategic exits" are possible under information asymmetry and either motivated by sellers' liquidity constraints or by intentions to sell lemons.

We gather data on 354 SPAC mergers and 1,257 IPOs in the US between January 2016 and March 2022. Among these, we record 129 SPAC mergers with VC-backed ventures and 757 IPOs of VC-backed companies. We find that VCs channel companies to SPACs if they are smaller, less profitable, and if they have lower market capitalizations and Tobin's Qs compared to their peers which are brought public. They are neither younger, nor do they receive more, or less capital contributions or are kept in the VCs' portfolio for a longer, respectively shorter period. They are also not different with respect to the overall number of investors they have on their capitalization

tables. While many additional idiosyncratic characteristics of the un-listed firms are unfortunately unobservable for SPAC targets, lower market capitalizations and Tobin's Qs express a lower quality and less growth expectations for VC-backed SPAC target companies compared to IPOs.

First day SPAC announcement effects are positive and could indicate underpricing in the sense of Gompers' (1996) grandstanding hypothesis. However, cumulative abnormal returns relative to the S&P 500 dissipate quickly and turn negative prior to the average or median duration of the de-SPAC event. There is no abnormal first day return on the SPAC merger day, but the aftermarket is dreadful. This rules out reputational gains for VCs. VC-backed IPOs, however, create positive cumulative abnormal returns over the first 240 trading days, and, in this respect, fulfill Gompers' (1996) propositions about reputational gains.

It is hardly possible to address the role of liquidity shocks along the lines of Faure-Grimaud and Gromb (2004) as driver of SPAC exits. The reason is that the respective VC-backed IPO and SPAC targets have received many financing rounds over their lifecycle with a median of 8 investors on their capitalization tables. Some of them invested in earlier stages some of them shortly prior to the SPAC/IPO event. It is not clear which VC is in the lead and in liquidity shortage, e.g., caused by the end of a particular fund's lifecycle. The problem is similar with respect to which VCs are selling to SPACs. There is a distinct group as part of Gahng et al. (2021)'s "SPAC Mafia" of VCs who divest their portfolio exclusively via SPAC mergers. Therefore, VC fixed effects yield perfect collinearity in the analyses which aim to differentiate IPO and SPAC exits. However, the second aspect of "strategic exits" is overwhelmingly supported by our data anyway. Faure-Grimaud and Gromb (2004) argue that selling lemons is possible under information asymmetry if the market is also fueled by promising ventures sold under liquidity constraints and buyers cannot infer the true reason of selling. Our calculations of the aftermarket performance of

VCs SPAC exits in addition to what we already know from other literature about SPAC performance in general let us conclude that VCs rather channel lemons into the SPAC market. Their opportunistic behavior will probably dry it out and this is in line with current signals about the SPAC market's fate.

The paper is structured as follows. We first discuss theory on potential rationales for VCs to utilize SPAC mergers as alternative exit channel. Subsequently, we describe our data set, matching procedures, and illustrate the descriptive statistic. Further, we address SPAC merger announcement and merger day closing returns, as well as the aftermath. In a next step, we present analyses about characteristics of the SPAC mergers with compared to IPOs of VC-backed companies before we conclude.

1 Theory on SPACs as VC Exits and Hypotheses Building

We refer to two theories that could explain why VCs refer to SPAC mergers as exit channel. The first one is based on the performance pressure of VCs to build up reputation and to raise a new fund. The second one elaborates on asymmetric information in financial markets and how this asymmetry can cause "strategic exits".

1.1 Grandstanding

Gompers (1996) argues that the most effective way of signaling ability or the value of portfolio companies for a VC is to bring them public. If investors believe that high-ability VCs are more likely to fund companies that eventually go public, then taking a portfolio company public can be interpreted as a signal for skills at financing young ventures. This effect increases reputation and fundraising abilities especially for young funds. Such funds have therefore an incentive to "grandstand". However, the grandstanding theory also predicts that companies brought to market

by young VCs are less mature. The cost incurred by bringing companies to the public market early is greater underpricing. Muscarella and Vetsuypens (1989) show that the older the IPO company, the lower the underpricing. Rock (1986) argues that older firms have longer track record reducing asymmetric information and thus, underpricing. Welch (1989), Grinblatt and Hwang (1989), and Allen and Faulhaber (1989) view underpricing as a cost to signal an IPO company's quality. Gompers (1996) remarks that when underpricing is examined in regressions, the age of the IPO company and the length of the VC's board service should explain some of the difference in underpricing. It is not the presence itself of a young VC per se but rather the early timing of the IPO which is important.

The grandstanding theory provides a potential rationale for the rise of VC SPAC exits. VCs could have an incentive to grandstand and to exit investments early via SPACs – even much earlier than it would be possible in the IPO market. One may argue that merging with a SPAC is similar to going public and thus, the players would incur the underpricing cost but this way benefit from gaining reputation with its long-term benefits for fund raising.

> *Gompers' grandstanding theory lets us predict the following hypotheses:*
>
> *H1: Ventures that VCs merge with SPACS are rather young and have shorter holding periods compared to IPO exits. VCs take the cost of underpricing of SPAC exits but therefore benefit from building up long-term reputation.*
>
> *H1 A: VC SPAC exits result from opportunistic behavior.*

1.2 Liquidity Constraints and Information Asymmetries

Prior to the existence of a liquid SPAC market, VCs needed to bring good quality ventures to maturity and to abandon lemons in a timely fashion. With the rise of SPACs, VCs now have the option of divesting exposure prematurely as described in Cumming and MacIntosh (2003), Cumming (2008) and Cumming and Johan (2008a and 2008b). From a VC's perspective, SPAC

exits are a type of secondary transactions. In such “secondaries” the VCs’ claims are sold to a financial but not a strategic investor.

It is obvious that the possibility of obtaining liquidity is appealing to VCs because it reduces the asset class inherent illiquidity premium. However, Aghion et al. (2004) note that the possibility to gain liquidity contradicts the economic virtue of VC at the same time. This virtue stems from tight and long-term financing relationships with innovative ventures. The nature of these relationships is highly illiquid. It has further been pointed out, e.g., by Black and Gilson (1998), that VC exposure only generates appropriate returns if a venture reaches “maturity" and can be divested via an initial public offering or by selling to a strategic investor. Cumming and MacIntosh (2003) and Cumming et al. (2006) prove this empirically.

Nevertheless, as VC funds aim to generate high returns and to build reputation via IPOs, they would probably not engage in a SPAC transaction if the investee were successful unless there is a particular reason. It is therefore important to understand the drivers and characteristics of VCs’ deal flow into the SPAC VC market. There may be several reasons for a VC to prematurely dispose of ventures, even if they are successful. Shafi et al. (2019) comprehensively discuss, for example, the fact that investment discontinuation decisions can also be motivated by financial constraints caused by crisis situations, shifts in industry or geographic investment focus, or a fund's focus on seed-stage transactions, thus avoiding style drifts. The key feature is that all these causes are based on private information and, hence, outsiders cannot infer, even after due diligence, the true reason for a premature disposal in a SPAC transaction. VC funds are not required to disclose any information on potential liquidity constraints to the public. Furthermore, it is common practice not to disclose such information for competitive reasons. Such reporting behavior of VC funds is

discussed in Johan and Zhang (2016). Their paper emphasizes that VC fund managers tend to be opaque even towards their own investors.

Summarizing, there can only be two causes for a VC to exit a portfolio company via SPAC. The first one is that the VC needs to sell off a promising venture because it is facing a liquidity or other type of above discussed constraint. The second reason is that the VC is trying to dispose of a lemon, passing it off as a good quality venture. This is possible, because SPAC transactions exhibit substantial information asymmetries with little opportunity to overcome them.

Following Admati and Pfeiderer (1994), a lemon can be sold in a SPAC transaction if the insider is able to hide the true reason for his disposal. Accordingly, acquirers in secondary transactions cannot infer the quality of the venture unless they know whether the originator is facing a liquidity constraint or not.

A liquid SPAC market incentivizes opportunistic behavior, called “strategic exits” in Faure-Grimaud and Gromb (2004). VCs can use their insider information on the quality of a project to dispose of lemons. Acquirers cannot infer why the VC fund is selling to a SPAC rather than bringing the venture to an initial public offering. The buying rationale of SPAC investors is that although the venture is a prospective good quality, the seller has a financial constraint and is therefore required to divest.

Andrieu and Groh (2021) propose a model which helps explaining VCs’ deal flow into the SPAC market. The model predicts some characteristics of the respective ventures and of the sellers. First, we should expect divestment behavior related to VC funds' financial constraints. Funds that are more likely to liquidate assets quickly for their investors, e.g., because they are structured as limited partnerships, should have a lower propensity for abandoning unsuccessful transactions and would instead engage in the SPAC market. Conversely, investors with a large

pool of resources or VC funds structured in a different way (e.g., corporate, affiliated, quoted, open end, government, or simply large funds) are expected to be less financially constrained and, hence, less active in the SPAC market. They should have a higher propensity for either abandoning transactions, even if liquidation proceeds are low, or keeping non-successful exposures on their books without taking any action. In a perfect world, an unconstrained VC would not sell a good project to a SPAC but would rather develop it to maturity. The VC would liquidate it in a timely fashion if it were bad. However, if a fund is constrained, then the VC may engage in a SPAC transaction independent of the project's quality. The SPAC market should therefore be fueled by financial constraints and VC SPAC exits should include both promising ventures and lemons at average levels. Nevertheless, VCs' liquidity constraints are not equally distributed over the lifetime of the funds, but instead increase with their age and decrease with investment performance. Therefore, older vintage year funds and "bad performers" are expected to engage in SPACs more frequently.

Further, increasing competition among VC funds and tighter monitoring by their limited partners may yield higher pressure on VC managers. Such increasing pressure could incentivize short-termism and stage specialization in the VC industry and thus spur SPAC transactions. VCs find a sufficiently liquid demand to divest exposure prematurely and to return proceeds to their limited partners. This signals deal making and professional capabilities and allows them to devote their attention and management capacity to early-stage transactions. For example, early-stage funds can therefore benefit from a clear cut with respect to their investment stage orientation and the inherent "typical" risk profile. Therefore, the rise of VC SPAC exits could also be driven by a higher liquidity demand of institutional investors and the resulting pressure on VC managers who search for stronger investment stage orientation.

The above-described liquidity constraints and information asymmetries let us predict the following hypotheses:

H2: VC exits via SPAC mergers are more frequently observable for funds in advanced stages of their lifetime, for "bad" performers, for limited partnership fund types. The respective ventures should be of the average level of quality as for the IPO exit channel.

H2 A: VC SPAC exits result from opportunistic behavior

2 Sample Description

We gather data on de-SPAC transactions, on IPOs and on VCs' portfolio exits to address the proposed hypotheses. We start the description of the full data set on SPACs and IPOs, and then refer to more granular data on the sub-sample of VC-backed companies, which went either through a SPAC or IPO exit.

2.1 Complete Data Set of SPACs and IPOs

We match several data sets for the analyses presented in this paper. We refer to the *SPAC Research* platform (www.spacresearch.com) for a list of completed SPAC mergers. This data base is also used, e.g., in Gahng et al. (2021). We use *Refinitiv Eikon* for information on IPOs, to identify VC exits among the sample of companies, to retrieve stock prices, analyst forecasts, accounting figures, and additional information. We further complement the data with accounting information and analyst estimates from *Factset* and run reference checks using *Crunchbase* and *Google* searches.

A caveat for gathering our data set is that providers of public capital market data usually track SPACs from their own IPO date. However, they do not cover the un-listed target companies they merge with. These are privately held entities and information on those companies is usually scarce. In addition, the smaller SPACs, small cap, and pink sheet IPOs are relatively poorly

covered by analysts and by commercial data providers. Therefore, their tracking is even poor when being a public company, or after the de-SPAC event. While accounting data and analyst forecasts are available for larger transactions, information becomes thinner with decreasing IPO issuing or SPAC merger volume.

However, our focus on VC exits comes with an advantage: Data coverage is better if the IPO company or the SPAC merger target is VC-backed. In these cases, specialized data providers or search facilities, e.g., *Crunchbase* or the "VC/PE deals" section in *Eikon Refinitiv*, are appropriate sources of information. Nevertheless, using different data sets creates matching problems because the SPAC merger targets, or VC portfolio companies going public do not have a unique identifier which could detect them across the respective repositories. Matching is only possible by company name, but names unfortunately differ across data providers. Therefore, we apply a fuzzy matching algorithm to complement the SPAC/IPO data set with SPAC target and pre-IPO company information. After going public, respectively the de-SPAC, the stock market tickers serve as unique identifiers. Fuzzy matching by company name requires some data cleaning-up to increase matching success. For example, string manipulations including the deletion of abbreviations and sub-strings, upper case transformation, removal of special characters, beginning, and ending blanks are necessary.[1] Fuzzy matching yields similarity scores of company names from different data sets. We manually verify all matches and run additional queries on *Crunchbase* and *Google* to increase the number of observations if the similarity scores do not provide clear matching recommendations.

[1] The required manipulations and the matching process is documented in the "do-files" of the online appendix to this paper.

In a first step, we identify 354 SPACs that merged with a target corporation between 1 January 2016 and 7 March 2022 (i.e., the day of the final SPAC data update).[2] We do not include any SPAC that failed to merge or was still in the searching/negotiating phase until the final data collection date. While SPACs have emerged prior to 2016, as e.g., documented on J. Ritter's website http://site.warrington.ufl.edu/ritter, or in Jenkinson and Sousa (2011), and Kolb and Tykvova (2016), they gained their strongest momentum only in recent years. Therefore, we do not extend our observations further back.

We gather IPO information accordingly, for all IPOs at all US stock exchanges and market segments from 1 January 2016 until 10 February 2022 (i.e., the day of the final IPO data update). This yields a total number of 2,282 issues including the blank-check SPACs themselves, closed-end funds, Real Estate Investment Trusts (REITs), unit offers (typically composed of a share plus a warrant to buy a share), and American Depositary Receipts (ADRs) of foreign companies.[3] We clean up the data and discard all investment company type issues, e.g., the blank-check SPACs, REITS, and closed end funds, yielding a sample of 1,257 non-SPAC IPOs with issuing dates between 29 January 2016 and 29 January 2022. There is no restriction for the IPO companies neither for the SPAC merger targets to be domiciled in the US.

As described above, given the absence of a unique identifier in the different data sets, we subsequently fuzzy match the IPO and the SPAC data by company name with information on VC backing. The matching procedure detects 886 VC exits among our sample of companies, 129 via SPAC mergers and 757 via IPOs. Table 1 describes the complete sample of IPOs and SPACs.

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[2] The list of SPACs is available in the online appendix to this paper.
[3] The IPO data is available in the online appendix to this paper.

Insert Table 1 here

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The table reveals important differences between standard IPOs and IPOs via SPAC mergers and contingent if the respective companies are VC-backed or not. The distributions of size characteristics are right skewed towards larger issues. For example, the medians of total book assets of all categories, i.e., SPACs and standard IPOs, VC-backed or not, are at the same level of magnitude. However, there are some very large IPO companies shifting the means up. This effect is more pronounced in terms of the market capitalizations of the respective companies at issue/merger date, their sales, or numbers of employees.

Further, median sales of the SPAC merger targets at event date are $0, respectively, $0.04 million only. Hence, half of the companies that went into SPAC mergers did not generate sales revenues at that time. The table further reveals that the VC backed IPO companies are the largest, on average. Looking at the distribution of age of the IPO/SPAC-merger companies at the event date does not suggest meaningful differences among the groups. However, Tobin's Q across the groups propose higher valuations of "standard" IPOs compared to SPAC IPOs. It is further worthwhile to note that the EBITDA medians at event date of the VC-backed ventures are negative. This characteristic underlines the principle that VCs exit their portfolio companies early, even before they gain profitability.

It takes approximately 150 days from the SPAC merger announcement to deal closing, on average. There is no meaningful difference of the time to closing a deal between SPAC mergers with and with not VC-backed ventures. Hence, VC-backing does not increase merger speed. Figure 1 plots the time between announcement and closing for the two distributions.

2.2 Sub-Sample of VC-Backed Companies

Above observations warrant the paper's focus on the role of VCs when divesting their portfolios into the IPO and SPAC market. Therefore, we gather additional information on the VC backed sub-sample of corporations. From *Refinitiv Eikon*, and amended by *Factset* and *Crunchbase*, we retrieve additional characteristics as presented in Table 2.

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Insert Table 2 here

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The table distinguishes VC exits via SPAC mergers and standard IPOs. It does not suggest strong discriminative characteristics among the two sub-groups. For example, means and medians of the number of financing rounds, the number of investors who participated, the overall raised capital, or the VC holding period (calculated since the first investment received) do not differ (strongly) for both sub-groups. This is equivalent for profitability ratios, e.g., EBITDA margin or the Asset Turnover at event date. It is also in line with valuation metrics, such as enterprise value to EBITDA, to sales, or book value of assets, or for the price/earnings ratio. However, since more than half of the sample companies have zero or low sales, low or negative EBITDAs respectively earnings at the event date, and still have negative analyst forecasts, their valuation multiples do not provide useful information. One remaining reliable and eventually discriminant characteristic is the current EBITDA analyst forecast in absolute terms. While the medians for both groups are still at the same (negative) level of magnitude, the means are quite different. The average analyst EBITDA expectation for VC-backed companies that merged with a SPAC is $-32.7 million, while it is "only" $-3.7 million for VC-backed IPO companies.

Table 3 presents the descriptive statistics of all characteristics of the sub-sample of VC-backed companies, ordered according to the number of available observations. Several characteristics have skewed distributions and extreme values/outliers on both sides. Therefore, the respective data is transformed into logarithms, or the distributions are truncated to meaningful levels. The truncation levels are indicated in squared brackets.

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3 Analyses

3.1 SPAC Performance

We gather historic stock prices for our sample companies from *Refinitiv Eikon* and determine the cumulative abnormal returns (CARs) of buying one share each at the IPO issue prices, respectively on the SPAC merger announcement, or on the de-SPAC date. We refer to the stock market tickers as identifiers, however, the stock prices for 361 companies cannot be retrieved, caused by three reasons. The first reason is that some SPACs and IPOs are pink sheet listings and therefore not well covered by commercial data providers. The second one is that some tickers are wrong, missing, or lead to different companies. The third rationale is that the respective companies might meanwhile have ceased their listing. All three rationales could cause selection or survivorship bias which will be subsequently addressed.

The CARs are calculated via a simple market model referring to the S&P 500 index as benchmark.[4] In a first step, we focus on SPAC merger announcement effects. Such effects are mostly discussed for targets where uncertainty about the final merger closing divides the acquisition premium into an announcement and post announcement, or "markup" effect. However, insider trading and speculation (also called merger arbitrage) even drives stock prices prior to the announcements. Schwert (1996) analyzes the pre-bid runups and post-announcement markups of merger target company stock prices. Mitchell and Pulvino (2001) calculate a 4% excess return after transaction cost for M&A arbitrage strategies and argue that this is the compensation that investors receive for taking the (excessive) merger failure risk. Stock market reactions to buyers may also be positive and are exposed to the deal consummation risk. Although questioned by Ben-David et al. (2022), acquirer announcement returns are widely expected to be a market-based assessment of value creation in M&A transaction. In an efficient market, the stock price reaction should be equivalent to the net present value generated by the transaction. However, transaction costs are not negligible, and it is possible that remaining net present values are partly or fully captured by the sellers via the acquisition premia. Fang and Goyal (2006) only detect a 2.5% excess return for vertically integrating mergers in a three-day window surrounding the announcement. Faccio et al. (2006) finds that acquirers of privately held targets earn a significant CAR of 1.48% five days around the merger announcement, while Masulis et al. (2007) determine 0.76%.

The merger announcement returns for our sample of SPACs is 6.1% for mergers with not VC-backed companies and 8.1% if the targets are VC-backed. This seems large given the observations on acquirer returns in the M&A literature. However, it is the SPACs' only single

[4] The code calculating the cumulative abnormal returns and the required data is available in the online appendix to this paper.

purpose to acquire an un-listed firm which could explain the stronger effect. Nevertheless, the CARs dissipate quickly and turn negative as illustrated in Figure 2.

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Insert Figure 2 here

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Figure 2 reveals that by the median time required among all SPACs to de-SPAC, which is 149 days, positive acquirer announcement returns to common shareholders of SPACs have turned strongly negative.

While the merger announcement day is a significant milestone in a SPAC's lifecycle, actual deal closing is more important, of course. The transaction resembles a firm commitment IPO in the respect that a SPAC takes over the shares of an un-listed firm and allows trading them the following day. In both cases, there is no deal execution risk anymore and the merger consideration, respectively the issuing prices are fixed. The companies get valued for the first time in the public stock market and pricing can be very different. Therefore, it is important to analyze the first day returns and the aftermath.

The average first day returns for the four sub-groups are 0.45% for VCs' SPAC exits, 0.49% for other de-SPACs, 26.12% for IPOs of VC-backed ventures, and 34.51% for IPOs of not VC-backed companies. The medians are -0.87%, 0.08%, 17.84%, and 3.47%, respectively. Figure 3 presents the CAR trajectories for IPOs and SPACs. Figure 4 distinguishes VC exits via SPAC mergers from other de-SPACs. The dots indicate the level of the issuing prices, or the last closing price prior to the de-SPAC event, respectively. All trajectories are indexed to one that date. Note that some trajectories terminate. This is caused by their observability until the data collection date.

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Insert Figures 3 and 4 here

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Figure 3 suggests a negative average trend of the SPAC CARs relative to "standard" IPOs. Figure 4 reveals that this trend is even stronger for the SPACs which merge with VC-backed companies. Differentiating VC-backed IPOs in the graphs does not improve discernibility and therefore, we rather present the group averages in Figure 5.

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Insert Figure 5 here

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To formally document the underperformance of SPACs and notably of VC SPAC exits, we first calculate CARs 100 trading days after the IPO/de-SPAC event and then regress them in various specifications on going public-type indicators and controls. The average CAR_{100} relative to the S&P500 of the four groups are: -23.5% for de-SPACs involving not VC-backed targets, -32.4% for de-SPACs with VC-backed ventures, 2.56% for IPOs of not VC-backed companies, and it is 22.37% for IPOs of VC-backed ventures.

Table 4 presents the regressions explaining the relative performance among the groups and controlling for confounding effects typically included in event studies.

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Insert Table 4 here

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The first specification of Table 4 regresses the CARs trading 100 days after the event date without additional controls on a dummy for SPAC mergers. It uses all observations for which we could gather historic stock prices, i.e., for 1250 tickers. The result is striking because the average

CAR_{100} of a SPAC merger is 41.7% below of that of an average IPO. The parameter coefficient is statistically significant at a 1% level. Robust standard errors are reported in squared brackets.

OLS 2 of Table 4 regresses the same dependent variable on a dummy for events related to VC exits. It documents that the average CAR_{100} is by 20.4% larger for VC backed ventures going public or merging with a SPAC compared to not VC backed ventures. Again, the statistical significance of the coefficient estimate is at 1% level. Hence, regarded independently, VCs channel more financially successful ventures into the public market either by SPACs or IPOs.

OLS 3 of Table 4 therefore adds an interaction term of both dummies to single out the effect of VCs' SPAC exits. The result is striking, again. Compared to the control group of IPOs of companies which are not VC-backed, the CAR_{100} is, on average, 26.1% lower for SPAC mergers, it is 19.8% higher if any type of event is related to a VC-backed company, but again 28.7% lower if the VC exit channel is a SPAC merger. All coefficient estimates are statistically significant at the 1% level. Adding them up yields the underperformance of de-SPACs with VC backed companies relative to IPOs of not VC-backed companies, which is -26.1% + 19.8% – 28.7% = -35%, as also visualized in Figure 3.

Results get worse for VC SPAC exits if controlled for some unobservable heterogeneity. OLS 4 of Table 4 adds underwriter, IPO company/SPAC target industry, a NASDAQ, and event quarter fixed effects. The number of observations decreases to 1150 because some fixed effects are not available. The CAR_{100} spread between de-SPAC events and all IPOs is -35.6%. It is +14%7% if the event is related to a VC exit. However, it is again -21.1% if the VC exit happens via a SPAC merger. The sum of the three point-estimates determines the underperformance of VC SPAC exits by 45% over the first 100 trading days after the event, relative to IPOs of not VC-backed companies.

The final specification (WLS) repeats OLS 4 but weighs each observation by the market capitalization of the respective company at issue/de-SPAC date. This controls for the economic importance of individual IPOs and de-SPAC events and eliminates concerns about selection or survivorship bias. Since we are only losing observations of pink sheet listings and rather small IPOs/SPACs, as described above, the value weighted least squares regressions verify that this does not impact the main result. The average CAR_{100} of de-SPACs is 37.1% lower than that of IPOs. The coefficient estimate for transactions of VC-backed companies is no longer significant. The size effect eliminates the significance because VC-backed companies have larger market capitalizations, in general, as documented in Table 1. However, if the event is a VC's exit via a SPAC merger, then the additional impact is even as strong as -33.2%.

3.2 VCs' IPO vs. SPAC Exits - Univariate Tests

To understand which part of their portfolio VCs divest via SPACs and which via IPOs, we search discriminating characteristics. In a first step, we run difference in means tests for the data presented in Table 4 for the two groups of VC IPO and SPAC exits. Results are presented in Table 5.

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Insert Table 5 here

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The table reveals that only a few characteristics distinguish VCs' IPO and SPAC exits. VCs tend to exit via IPO if the venture is large in terms of sales, book value of assets or market capitalization at the event date. The size effect is exemplified for market capitalization in Figure 6.

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Insert Figure 6 here

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Further, IPO ventures are more operationally efficient, as expressed by their asset turnover. However, many ventures do not have sales revenues at the event date, or they are growing from a low level yielding small ratios. Hence, the efficiency measure needs to be interpreted with caution. In addition, IPO exits have positive EBITDA forecasts on average at event date, compared to negative forecasts for the SPAC exits. Nevertheless, given the large standard deviations, the discriminant power of EBITDA forecasts is only limited with a t-statistic of 1.95. Figure 7 illustrates the stronger skewness of EBITDA forecasts for VC SPAC compared to IPO exits.

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Insert Figure 7 here

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The enterprise value to EBITDA at event date and the current price/earnings ratios have strong discriminative explanatory power. Both distributions are shifted to the right for IPO exits. However, there are many negative observations of the two metrics due to the lacking profitability of the respective ventures in terms of EBITDA or net earnings. In addition, small EBITDA or earnings levels turn the multiples to high and not meaningful (positive or negative) values. Therefore, we do not consider these multiples any further.

The problem of receiving negative multiples can be avoided with valuation metrics which cannot have negative outcomes, e.g., Tobin's Q, or the enterprise value to sales ratio. Nevertheless, since many ventures have no sales at the time of the event. Therefore, the enterprise value to sales ratio can only be calculated for 22 SPAC exits. This issue is exacerbated when referring to EBITDA margins, calculated as EBITDA in per cent of sales. The ratio can only be meaningfully

calculated for 10 SPAC exits. Thus, the only remaining and reliable valuation measure is Tobin's Q. The average multiple is 1.78 for SPAC exits at their event day and twice as high, 3.6, for IPO exits. This signals that market participants anticipate higher growth rates for VC-backed IPOs than for SPAC mergers with VC-backed companies. Figure 8 shows the valuation differences.

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Insert Figure 8 here

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Surprisingly, other characteristics, such as the amount of contributed capital, the number of financing rounds or investors involved, or company age do not have any discriminative power. It is further difficult to disentangle VC characteristics. The problem is that most ventures went through large numbers of financing rounds and have many VCs on their capitalization tables. It is not clear who is in the lead or who would have stronger sales pressure than others and therefore prefer a fast SPAC exist to a longer IPO process.

The absent discriminative power of other characteristics is illustrated for company age at event date and total funding received in Figures 9 and 10.

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Insert Figures 9 and 10 here

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3.3 VCs' IPO vs. SPAC Exits - Multivariate Analyses

This section analyzes the joint impact of the detected discriminative drivers for VCs' IPO and SPAC exits. We analyze if characteristics of portfolio companies allow an assessment of the likelihood to undergo a SPAC relative to an IPO exit. All IPO and de-SPAC events related to

companies which are not VC-backed are discarded from the subsequent analyses. The suggested econometric technique to address this question is a probit regression.

A probit regression is a binary response model which allows to address the response probability

$$P(y = 1|\boldsymbol{x}) = P(y = 1|x_1, x_2, \dots x_k).$$

The model can be estimated by a linear regression model of a function of the explanatory variables which strictly produces values between zero and one:

$$P(y = 1|\boldsymbol{x}) = G(\beta_0 + \boldsymbol{x\beta}).$$

In a probit model, G is the standard normal cumulative distribution function:

$$P(y = 1|\boldsymbol{x}) = \phi(\beta_0 + \boldsymbol{x\beta})$$

and can be estimated via maximum likelihood technique. However, except for the signs, the coefficient estimates themselves are not informative. To determine the causal effect of x_i on y, we need to resolve the marginal effects by calculating the partial derivatives for the individual variables.

The dependent variable of our probit regressions is the binary observation if the event is a VC exit via a SPAC [= 1] or an IPO [= 0]. The set of explanatory variables includes all possibly discriminating characteristics and controls. VC experience or reputation, as proxied by league tables, for example, is not among the controls because it levels out in the comprehensive capitalization tables of the ventures. Further, some VCs only divest into the SPAC market while others exclusively focus on IPOs. The number of their divestments might be limited, e.g., with only one or two observations. Consequently, VC fixed effects often produce perfect collinearities with the dependent variable and cannot be included. Anyway, the nature of regression models with binary dependent variables is sensitive to fine-grained fixed effects. Several observations need to

be discarded from the analyses due to collinearity of industry or time fixed effects with the dependent variable and thus, the number of observations varies among different regression specifications.

In a first step, we analyze the correlation structure of the covariates. Table 6 presents the pairwise correlation of the discriminant and relevant characteristics detected in the previous section.

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Insert Table 6 here

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Table 6 reveals significant levels of correlation between important covariates. Correlation coefficients above 0.3 are marked bold. The measures capturing size, i.e., sales, total assets, and market capitalization at the event date, are strongly correlated with each other. Asset turnover is correlated with sales because it is the nominator in that ratio. For the same reason, Tobin's Q correlates with market capitalization. Further, it is also plausible that analyst EBITDA forecasts correlate with sales because sales are the top line of a profit and loss statement. In analogy, estimated pre-tax income correlates with sales, and thus with total assets and market capitalization, and with EBITDA.

The observations point to the limit of multivariate regressions combining these covariates due to multicollinearity. Consequently, we propose regressions with only one independent variable at a time, and industry and event quarter fixed effects and finally a "horse race" among the not correlated covariates. Table 7, Panels A and B present these probit regressions. Table 8 illustrates the "horse race".

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Insert Table 7 Panels A and B here

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Table 7 Panels A and B present probit model specifications in which a dummy variable for a VC exit as SPAC merger is regressed on an independent variable, industry and event quarter fixed effects. The control group is always VCs' IPO exits. All events of not VC-backed companies are discarded for these analyses. The individual models are ordered according to their number of observations from high to low. The marginal effects are reported below the coefficient estimates and formatted in Italics. The third line denotes the covariates' means contingent on the respective sample of each regression in parentheses. Standard errors of the coefficient estimates are robust and illustrated in the fourth line in squared brackets.

Panel A of Table 7 verifies the impact of sales, total assets, asset turnover, and the ventures' market capitalization at the event date on a VC's decision to divest a portfolio company via a SPAC merger instead of pursuing a standard IPO. All parameter coefficient estimates except for asset turnover are statistically significant at the 1% level. The economic magnitude is important, as suggested by the documented marginal effects. For sales, for example, the economic impact can be calculated as follows. The mean of log(sales [$ M]) of the 420 remaining observations, given many of them with zero sales, in specification Probit1 is 2.91. This corresponds to a mean sales level at $ 18.36 M. An increase of 1 unit in log(sales [$ M]) from the mean to 3.91 is therefore equivalent to an increase of the sales level to $ 49.89 M. This difference of sales increases the likelihood for an IPO exit by 3.1%.

Calculations of the economic significance of the other covariates presented in Table 7, Panel A and B follow in analogy.

The regression presented in Table 8 selects the non-correlating covariates from Table 7 and sets up a “horse race” among them.

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Insert Table 8 here

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Given the correlation structure illustrated in the correlation matrix (Table 6), the only remaining discriminative covariates are the asset turnover, analysts’ EBITDA forecast, and Tobin’s Q, all at the event date. The regression in Table 8 reveals that only the coefficient estimates for analysts’ EBITDA forecast and Tobin’s Q remain significant at the 5%, respectively 1% statistical level. The model also demonstrates the decrease in the number of observations in the multivariate model. This is due to the observability of the covariates and various controls as well as perfect collinearities of some fixed effects with the dependent variable.

4 Conclusion

We have gathered data on 354 de-SPAC events and 1,257 IPOs between January 2016 and March 2022. The data reveals that substantial fractions of these events are fueled by VC exits. We record 129 SPAC mergers with VC-backed ventures and 757 VC-backed IPOs. We run numerous univariate and multivariate tests addressing the financial performance of de-SPACs and IPOs and on the characteristics of the respective ventures.

The results do neither support the grandstanding nor the hypothesis of “strategic exits” into secondary VC markets. We would need to detect underpricing in VC SPAC exits, positive aftermarket performance, and younger companies to become SPAC targets to accept hypothesis H1. We do not find any of these effects.

Accepting H2 requires that some of the SPAC exits are quality ventures where the reason for selling is a liquidity constraint, or an alternative issue discussed above, which is opaque to financial market participants. The aftermarket performance of these quality ventures needs to level that of lemon exits. Otherwise, the buyer rationale does no longer hold, and the SPAC market will dry out. While we do find lemons in terms of aftermarket performance, we miss a large enough number of high-quality ventures to level the SPAC average performance to an acceptable threshold. Hence, divesting quality ventures due to idiosyncratic unobservable shocks of VCs is not sufficiently happening.

The detected evidence rather supports the alternative hypothesis: VCs play opportunistically in the SPAC market. Our analyses reveal that, first, there is no underpricing in SPAC merger considerations. There are first day returns after the SPAC merger announcement, but they quickly dissipate. First day returns of SPACs after the de-SPAC event are zero, the CAR trend is even negative around the de-SPAC date. Zero underpricing is equivalent for de-SPACS with VC-backed and not VC-backed companies. Hence, VCs and other sellers to SPACs do not incur any cost of underpricing but merger considerations are as high as possible.

Second, the aftermath of SPAC mergers is dreadful. Once public companies, SPACs underperform the S&P 500 and their IPO peers dramatically. Figure 3 illustrates the underperformance. Expressed in numbers, the indexed average CAR_{100} de-SPACs involving not VC-backed companies is 0.765 relative to the S&P 500. It is even 0.676 for de-SPACs with VC-backed companies. This underlines again that the selling VCs did not leave money on the table. It also demonstrates that there is no reputational gain possible either.

Third, IPOs of VC-backed companies can be considered most successful in terms of the aftermarket. Therefore, the only segment to build up reputation is still the IPO market. However, VCs leave 26.1% of the issuing volume on the table if they exit at issuing day.

Fourth, VC portfolio companies sold to SPACs are not different than the ventures brought public with respect to characteristics predicted by the grandstanding theory. The ventures are not younger nor are they held for shorter periods in the VCs' portfolios. The ventures are also not exposed to a larger set of investors with conflicting interests that could warrant faster exits. Nevertheless, the variety of investors on the ventures' capitalization tables makes it hardly possible to single out liquidity constraints or quality characteristics of individual VCs. It is not clear, who is in the transaction lead and quality aspects and liquidity constraints average out.

Fifth, however, the ventures divested via SPAC mergers compared to IPO exits are smaller in terms of sales, total assets, and most importantly, market capitalization, analysts' EBITDA forecasts, and Tobin's Qs. This suggests that VCs tend to refer to the SPAC market as exit channel to dispose of less attractive ventures at lower valuations and lower expected growth opportunities.

Summarizing, selling ventures at lower multiples than their peers, with lower expected profitability, without taking the cost of underpricing, and without building up reputation rather characterizes VC SPAC exits as results of opportunistic investor behavior. Taking the quick opportunity not to leave money on the table instead of building up long-term reputation seems to be the preferred choice for the VCs acting in the SPAC market. As we currently observe, this choice will probably dry out the SPAC market prior to being more severely regulated.

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Tables

Table 1: Description of the full sample of SPACs and IPOs.

		Event Type			
		SPAC merger with a Company which is		IPO of a Company which is	
		VC-Backed	Not VC-Backed	VC-Backed	Not VC-Backed
Number of Observations	N	129	225	757	500
SPAC Merger or IPO Date	Min	05/13/2019	07/29/2016	02/02/2016	01/29/2016
	Max	03/07/2022	02/11/2022	01/29/2022	01/26/2022
Total Assets at Event Date [$ M]	Min	0.025	0.001	0.005	0.002
	Mean	603.98	413.2	918.65	1636.1
	Median	134.46	150.88	133.85	117.93
	Max	28011.65	14724.39	74686	235615
Market Capitalization at Event Date [$ M]	Min	1.24	1.04	2.15	13.67
	Mean	374.57	322.19	2798.30	1789.02
	Median	304.50	250.00	824.74	286.93
	Max	3207.57	4554.54	75213.00	46424.02
Tobin's Q at Event Date [#]	Min	0.42	0.72	0.37	0.36
	Mean	1.78	1.68	3.6	3.3
	Median	1.21	1.23	2.76	2.32
	Max	13	16.37	15.21	15.49
Sales at Event Date [$ M]	Min	0	0	0	0
	Mean	163.6	129.06	526.37	422.31
	Median	0.04	0	67.28	52.01
	Max	4740.58	4128.69	62455.1	12460
EBITDA at Event Date [$ M]	Min	-1174.99	-1517.56	-3708.98	-450.1
	Mean	-26.32	72.42	49.09	246.73
	Median	-38.3	21.7	-21.8	71.41
	Max	1021.63	1978.39	4849.59	6160.72
Number of Employees at Event Date [#]	Min	2	1	2	0
	Mean	720.59	357.38	2451.01	1890.67
	Median	3	3	310	215
	Max	15680	13415	270000	26119
Company Age at Event Date [days]	Min	458	661	38	92
	Mean	4064	5819	4689	4974
	Median	3515	3844	3376	2330
	Max	16708	26630	43118	34918
Time from Announcement to Merger [days]	Min	64	26		
	Mean	158	150		
	Median	156	144		
	Max	309	469		

Table 2: Additional information on VC exits.

		VC IPO Exit	VC SPAC Exit
Number of Observations	N	757	129
Number of Financing Rounds Received [#]	Min	1	1
	Mean	5.38	5.58
	Median	4	4
	Max	35	22
Number of Investors on the Capitalization Table [#]	Min	1	1
	Mean	8.81	9.15
	Median	8	8
	Max	33	35
Total Capital Raised [$ M]	Min	0.35	0.5
	Mean	353.3	498.93
	Median	159.21	179
	Max	11362.61	12052.72
Holding Period from First Round to Exit [days]	Min	58	280
	Mean	2381.8	2340.2
	Median	1951	1878
	Max	12794	8603
EBITDA Margin at Event Date [#]	Min	-0.82	-0.52
	Mean	-0.01	-0.06
	Median	0	-0.02
	Max	0.68	0.21
Current Price/Earnings Ratio (Average Analyst Forecast) [#]	Min	-41.21	-37.16
	Mean	0.68	-6.66
	Median	-1.74	-5.2
	Max	63.26	58.21
Asset Turnover at Event Date [#]	Min	0	0
	Mean	0.46	0.24
	Median	0.26	0
	Max	2.18	2.12
EV to Sales Multiple at Event Date [#]	Min	0.12	0.14
	Mean	2.63	3.1
	Median	2.08	2.47
	Max	9.38	8.07
EV to Assets Multiple at Event Date [#]	Min	0.3	0.34
	Mean	3.02	3.26
	Median	1.77	1.56
	Max	28.61	24.29
EV to EBITDA Multiple at Event Date [#]	Min	-90.07	-117.78
	Mean	-5.27	-14.85
	Median	-5.12	-6.35
	Max	33.25	31.78
Current EBITDA Estimate (Average Analyst Forecast) [$ M]	Min	-284.35	-272.75
	Mean	-3.65	-32.7
	Median	-46.05	-58.84
	Max	733.38	712

Table 3: Descriptive statistic of all characteristics potentially discriminating between VCs' SPAC and IPO Exits after logarithmic transformation or truncation and ordered according to the number of their availability.

	N	Min	Mean	Median	Max	Std. Dev.
Sales at Event Date [log($ M)]	839	-4.02	3.26	3.86	11.04	2.84
Total Assets at Event Date [log($ M)]	838	-5.3	4.92	4.9	11.22	2.11
Number of Financing Rounds Received [#]	816	1	5.41	4	35	4.16
Number of Investors on Capitalization Table [#]	816	1	8.86	8	35	5.78
Market Capitalization at Event Date [log($ M)]	815	.22	6.64	6.49	11.23	1.54
Holding Period from First Round to Exit [days]	814	58	2375.33	1943.5	12794	1872.94
Asset Turnover at Event Date [#]	800	0	0.43	.23	2.18	.52
Company Age at Event Date [log(days)]	746	3.64	8.09	8.13	10.67	.82
Analyst EBITDA Forecast at Event Date [$ M]	744	-3708.98	37.33	-23.98	4849.59	384.34
Total Capital Raised [log($)]	711	12.77	18.88	18.9	23.21	1.27
Tobin's Q at Event Date [#], Truncated [05 95]	693	.37	3.44	2.62	15.21	2.73
EV/Book Value of Assets at Event Date [#], Truncated [05 95]	654	.3	3.04	1.75	28.61	4.18
EV/EBITDA at Event Date [#], Truncated [05 95]	625	-117.78	-5.91	-5.19	33.25	17.15
Analyst Pre-Tax Income Forecast at Event Date [$ M]	619	-469.81	360.53	131.42	18386.18	1071.78
Current Price/Earning Ratio, Average Analyst Forecast [#]	618	-41.21	-0.49	-2.32	63.26	14.93
Current EBITDA Estimate (Average Analyst Forecast) [$ M]	578	-284.35	-8.47	-48.38	733.38	171.86
Number of Employees at Event Date [#]	438	2	2344.34	282.5	270000	14007.03
EBITDA Margin at Event Date [#], Truncated [10 90]	419	-.82	-0.01	0	.68	.22
EV/Sales Ratio at Event Date [#], Truncated [00 80]	390	.12	2.66	2.1	9.38	2.07

Table 4: OLS regressions, dependent variable is CAR 100, standard errors are robust. Specification 5 is a weighted least squares regression, using the companies' stock market capitalizations after the merger/issue as weights.

	OLS1 β [S.E.]	OLS2 β [S.E.]	OLS3 β [S.E.]	OLS4 β [S.E.]	WLS β [S.E.]
Event is a SPAC Merger/IPO [1/0]	-0.417*** [0.034]		-0.261*** [0.053]	-0.356*** [0.073]	-0.371*** [0.128]
Respective Company is VC Backed [1/0]		0.204*** [0.041]	0.198*** [0.052]	0.147*** [0.053]	0.100 [0.082]
Interaction Term: Event is a SPAC Merger X Company is VC Backed [1/0]			-0.287*** [0.069]	-0.211** [0.086]	-0.332** [0.152]
Constant	1.149*** [0.025]	0.941*** [0.031]	1.026*** [0.043]	1.299** [0.507]	1.249** [0.611]
Number of Obs.	1250	1250	1250	1150	1040
R-Squared	0.057	0.019	0.072	0.215	0.431
Adj. R-Squared	0.056	0.019	0.069	0.166	0.391
Underwriter Fixed Effects	no	no	no	yes	yes
Industry Fixed Effects	no	no	no	yes	yes
Nasdaq Fixed Effect	no	no	no	yes	yes
Event Quarter Fixed Effects	no	no	no	yes	yes

P-values as of * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Difference in means test of all characteristics potentially discriminating between VCs' SPAC and IPO Exits.

	IPO Exits	SPAC Exits	Mean IPOs	Mean SPACs	Diff.	SE	t stat	p value
Sales at Event Date [0 or log($ M)]	724	115	3.46	1.94	1.52	.28	5.45	0
Total Assets at Event Date [log($ M)]	723	115	5.07	3.95	1.12	.21	5.4	0
Market Capitalization at Event Date [log($ M)]	705	110	6.88	5.2	1.67	.15	11.25	0
Number of Financing Rounds Received [#]	689	127	5.38	5.58	-.21	.4	-.5	.61
Number of Investors on Capitalization Table [#]	689	127	8.81	9.15	-.34	.56	-.6	.54
Holding Period from First Round to Exit [days]	688	126	2381.77	2340.18	41.59	181.6	.25	.82
Asset Turnover at Event Date [#]	689	111	0.46	.24	.21	.05	4.1	0
Company Age at Event Date [log(days)]	631	115	8.09	8.11	-.02	.08	-.25	.79
Analyst EBITDA Forecast at Event Date [$ M]	628	116	49.09	-26.32	75.41	38.77	1.95	.05
Total Capital Raised [log($)]	603	108	18.86	18.96	-.1	.13	-.75	.44
Tobin's Q at Event Date [#], Truncated [05 95]	634	59	3.60	1.78	1.82	.36	4.95	0
EV/Book Value of Assets at Event Date [#], Truncated [05 95]	614	40	3.02	3.26	-.24	.68	-.35	.73
EV/EBITDA at Event Date [#], Truncated [05 95]	583	42	-5.27	-14.86	9.59	2.72	3.55	0
Analyst Pre-Tax Income Forecast at Event Date [$ M]	515	104	402.86	150.96	251.89	114.87	2.2	.03
Current Price/Earning Ratio, Average Analyst Forecast [#]	520	98	0.68	-6.66	7.34	1.62	4.55	0
Current EBITDA Estimate (Average Analyst Forecast) [$ M]	482	96	-3.65	-32.7	29.05	19.19	1.5	.13
Number of Employees at Event Date [#]	411	27	2451.01	720.59	1730.42	2784.75	.6	.53
EBITDA Margin at Event Date [#], Truncated [10 90]	409	10	-0.01	-.06	.05	.07	.65	.5
EV/Sales (for Sales ≠ 0) Ratio at Event Date [#], Truncated [00 80]	368	22	2.63	3.1	-.47	.46	-1.05	.3

Table 6: Pairwise correlations of all characteristics discriminating between VCs' SPAC and IPO Exits.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Sales at Event Date [log($ M)]	1.00						
(2) Total Assets at Event Date [log($ M)]	**0.68**	1.00					
(3) Market Capitalization at Event Date [log($ M)]	**0.46**	**0.48**	1.00				
(4) Asset Turnover at Event Date [#]	**0.65**	0.21	0.13	1.00			
(5) Analyst EBITDA Forecast at Event Date [$ M]	**0.39**	**0.32**	0.13	0.12	1.00		
(6) Tobin's Q at Event Date [#], Truncated [05 95]	0.09	0.02	**0.43**	0.15	-0.05	1.00	
(8) Analyst Pre-Tax Inc. Forecast at Event Date [$ M]	**0.41**	**0.40**	**0.39**	0.10	**0.55**	0.00	1.00

Table 7 – Panel A: Probit regressions, dependent variable is a dummy variable indicating that a VC divested a portfolio company via a SPAC merger [1] compared to bringing it public [0]. Marginal effects are reported below the parameter coefficient estimates, formatted in Italics, and calculated at means. The covariates' means are reported in the third line in parentheses. Standard errors of the coefficient estimates are robust and reported in the fourth line in squared brackets.

	Probit1	Probit2	Probit3	Probit4
	β	β	β	β
	dy/dx	*dy/dx*	*dy/dx*	*dy/dx*
	(Mean)	(Mean)	(Mean)	(Mean)
	[S.E.]	[S.E.]	[S.E.]	[S.E.]
Sales at Event Date [log($ M)]	-0.106***			
	*-0.031****			
	(2.906)			
	[0.029]			
Total Assets at Event Date [log($ M)]		-0.116***		
		*-0.035****		
		(4.774)		
		[0.035]		
Asset Turnover at Event Date [#], Truncated [05 95]			-0.420*	
			*-0.127**	
			(0.351)	
			[0.216]	
Market Capitalization at Event Date [log($ M)]				-0.640***
				*-0.157****
				(6.617)
				[0.078]
Constant	-0.358	-0.218	-0.655	4.259***
	[0.592]	[0.609]	[0.604]	[0.659]
Number of Obs.	420	420	400	396
Psuedo R-Squared	0.236	0.233	0.211	0.428
Industry Fixed Effects	yes	yes	yes	yes
Event Quarter Fixed Effects	yes	yes	yes	yes

p-values as of * p < 0.10, ** p < 0.05, *** p < 0.01

Table 7 – Panel B: Probit regressions, dependent variable is a dummy variable indicating that a VC divested a portfolio company via a SPAC merger [1] compared to bringing it public [0]. Standard errors are robust. Marginal effects are reported below the parameter coefficient estimates, formatted in Italics, and calculated at means. The covariates' means are reported in the third line in parentheses. Standard errors of the coefficient estimates are robust and reported in the fourth line in squared brackets.

	Probit5 β *dy/dx* (Means) [S.E.]	Probit6 β *dy/dx* (Means) [S.E.]	Probit7 β *dy/dx* (Means) [S.E.]
Analyst EBITDA Forecast at Event Date [$ M]	-0.0008*** *-0.0003**** (25.268) [0.000]		
Tobin's Q at Event Date [#], Truncated [05 95]		-0.365*** *-0.055**** (3.383) [0.105]	
Analyst Pre-Tax Income Forecast at Event Date [$ M]			-0.0009*** *-0.0003**** (402.098) [0.000]
Constant	-0.353 [0.623]	1.124* [0.678]	-0.158 [0.574]
Number of Obs.	378	309	299
Psuedo R-Squared	0.189	0.345	0.223
Industry Fixed Effects	yes	yes	yes
Event Quarter Fixed Effects	yes	yes	yes

p-values as of * p < 0.10, ** p < 0.05, *** p < 0.01

Table 8: Probit regressions, "horse race" among the uncorrelated covariates. Dependent variable is a dummy variable indicating VC exits by SPAC mergers [1] relative to IPOs [0]. Marginal effects are reported below the parameter coefficient estimates, formatted in Italics, and calculated at means. The covariates' means are reported in the third line in parentheses. Standard errors of the coefficient estimates are robust and reported in the fourth line in squared brackets.

	Probit8
	β
	dy/dx
	(Means)
	[S.E.]
Asset Turnover at Event Date [#], Truncated [05 95]	0.056
	0.008
	(0.3667)
	[0.274]
Analyst EBITDA Forecast at Event Date [$ M]	-0.0005**
	*-0.0001**
	(20.388)
	[0.000]
Tobin's Q at Event Date [#], Truncated [05 95]	-0.346***
	*-0.051****
	(3.449)
	[0.111]
Constant	0.163
	[0.672]
Number of Obs.	223
Psuedo R-Squared	0.305
Industry Fixed Effects	yes
IPO/Merger Quarter Fixed Effects	yes

p-values as of * p < 0.10, ** p < 0.05, *** p < 0.01

Figures

Figure 1:

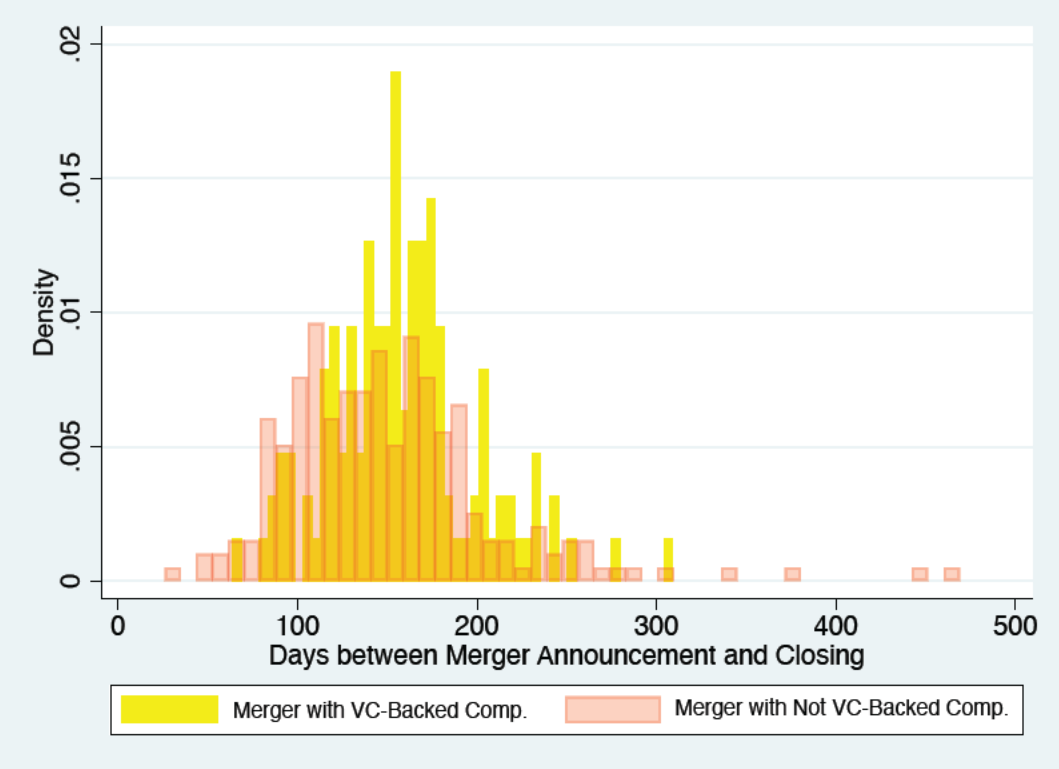


Figure 2:

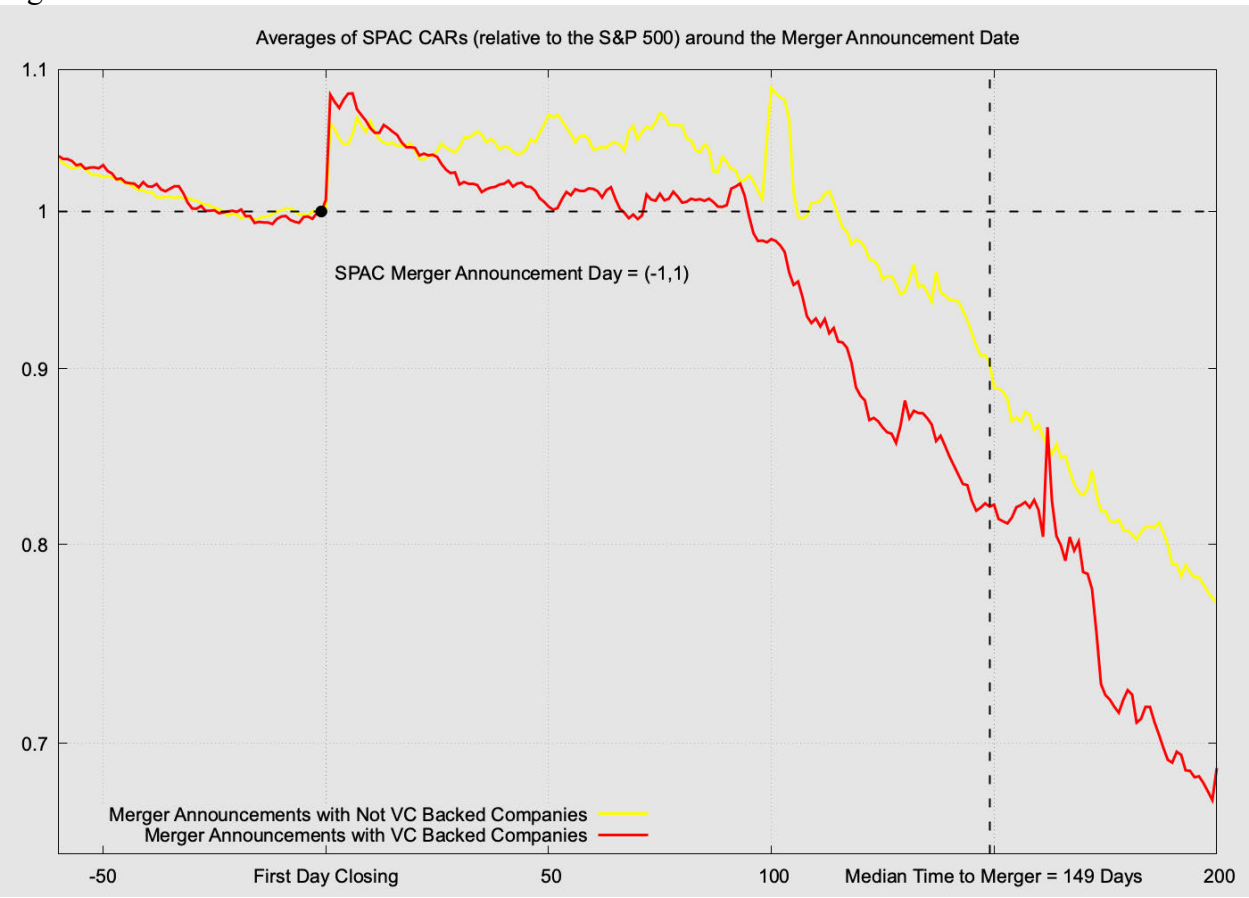

Averages of SPAC CARs (relative to the S&P 500) around the Merger Announcement Date
1.1
1
0.9
0.8
0.7
SPAC Merger Announcement Day = (-1,1)
Merger Announcements with Not VC Backed Companies
Merger Announcements with VC Backed Companies
-50
First Day Closing
50
100
Median Time to Merger = 149 Days
200

Figure 3:

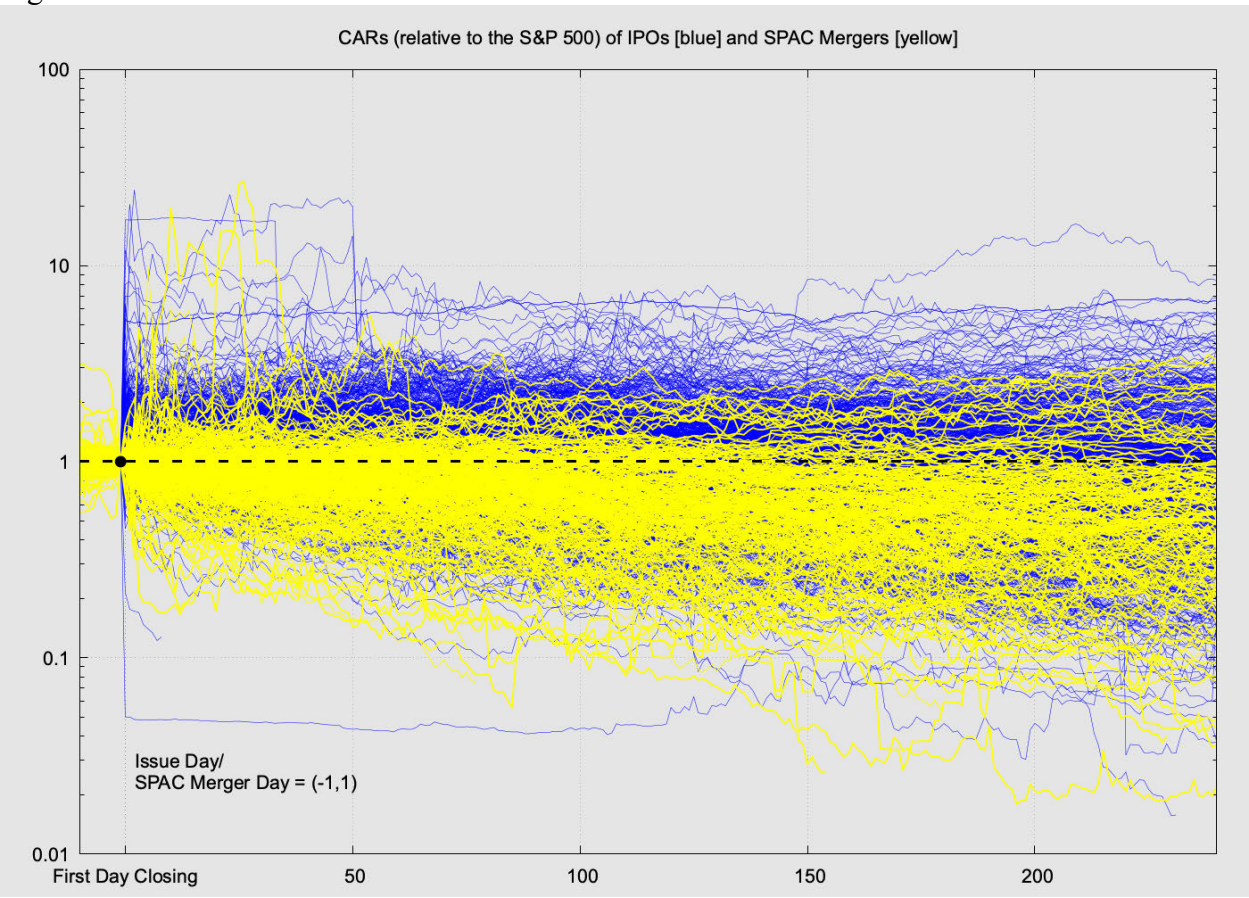

CARs (relative to the S&P 500) of IPOs [blue] and SPAC Mergers [yellow]
100
10
1
0.1
0.01
Issue Day/
SPAC Merger Day = (-1,1)
First Day Closing
50
100
150
200

Figure 4:

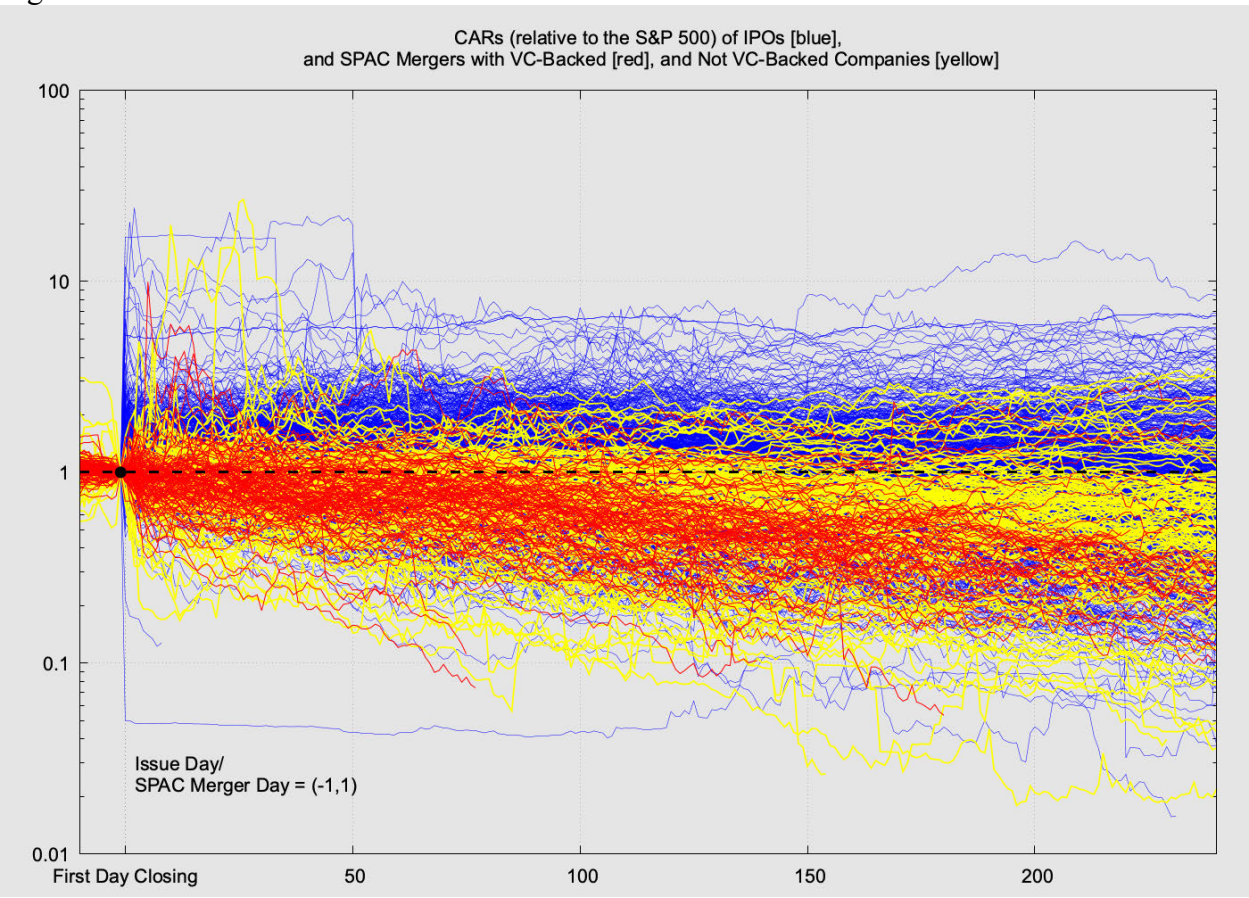

CARs (relative to the S&P 500) of IPOs [blue],
and SPAC Mergers with VC-Backed [red], and Not VC-Backed Companies [yellow]
100
10
1
0.1
0.01
Issue Day/
SPAC Merger Day = (-1,1)
First Day Closing
50
100
150
200

Figure 5:

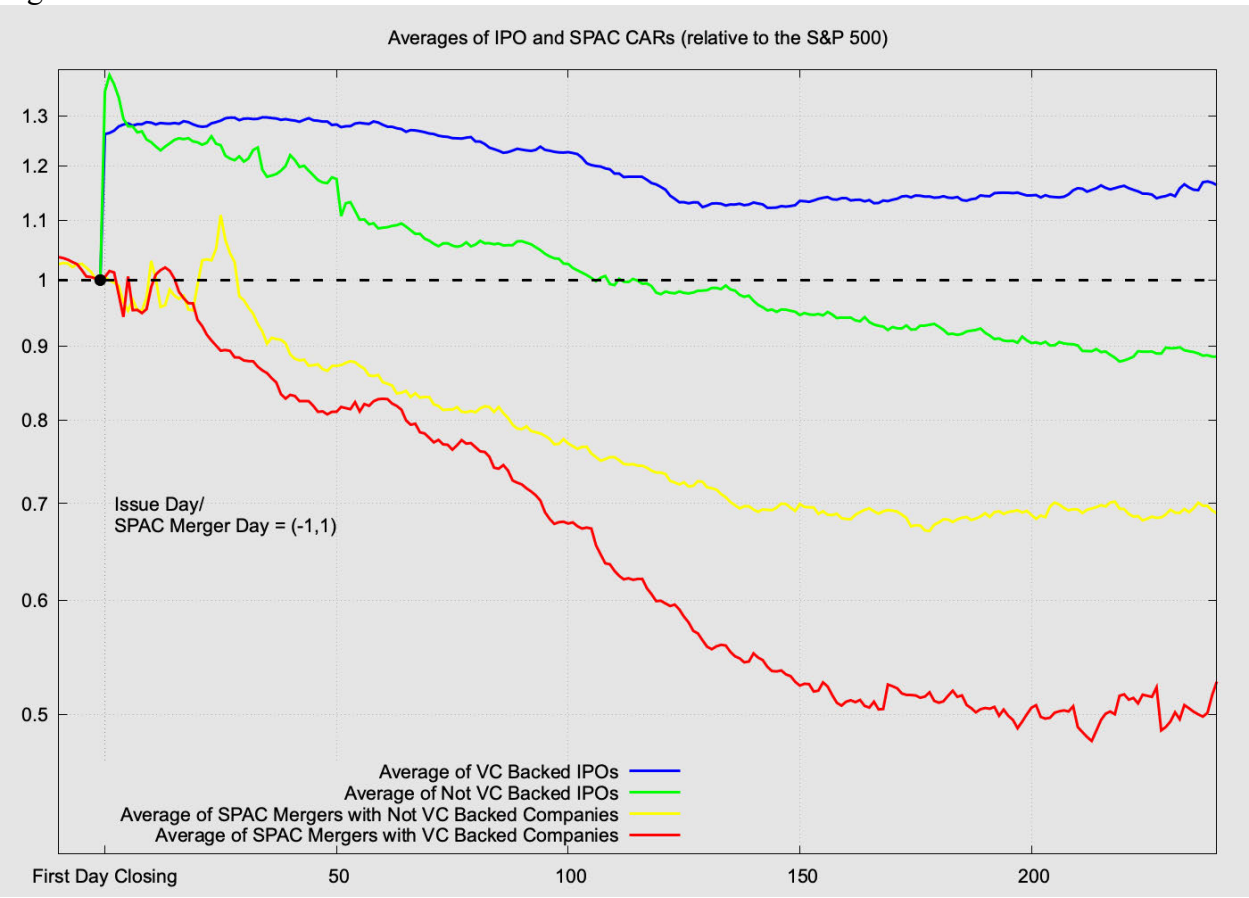

Averages of IPO and SPAC CARs (relative to the S&P 500)
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
Issue Day/
SPAC Merger Day = (-1,1)
Average of VC Backed IPOs
Average of Not VC Backed IPOs
Average of SPAC Mergers with Not VC Backed Companies
Average of SPAC Mergers with VC Backed Companies
First Day Closing
50
100
150
200

Figure 6:

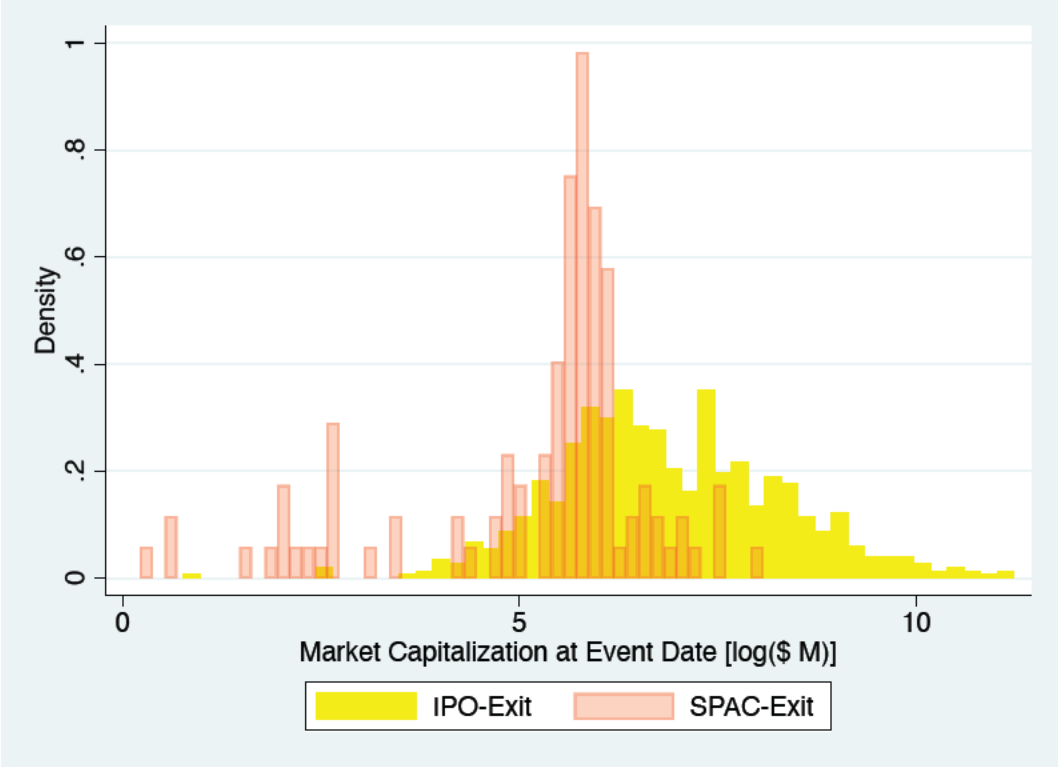


Figure 7:

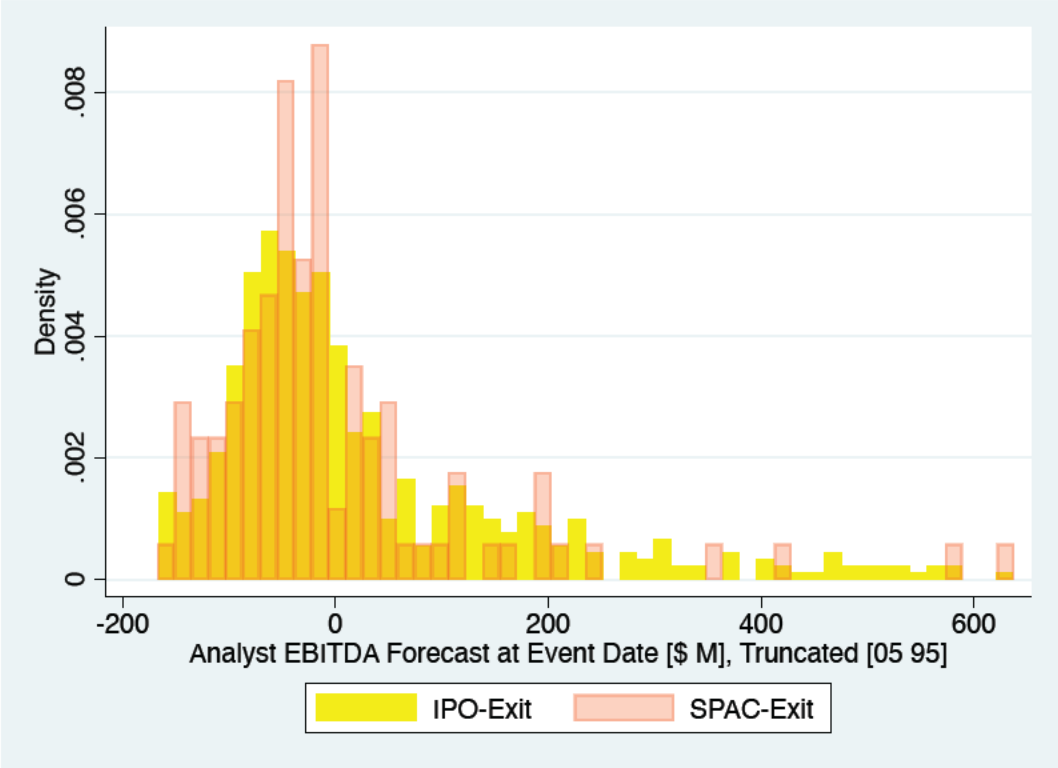


Figure 8:

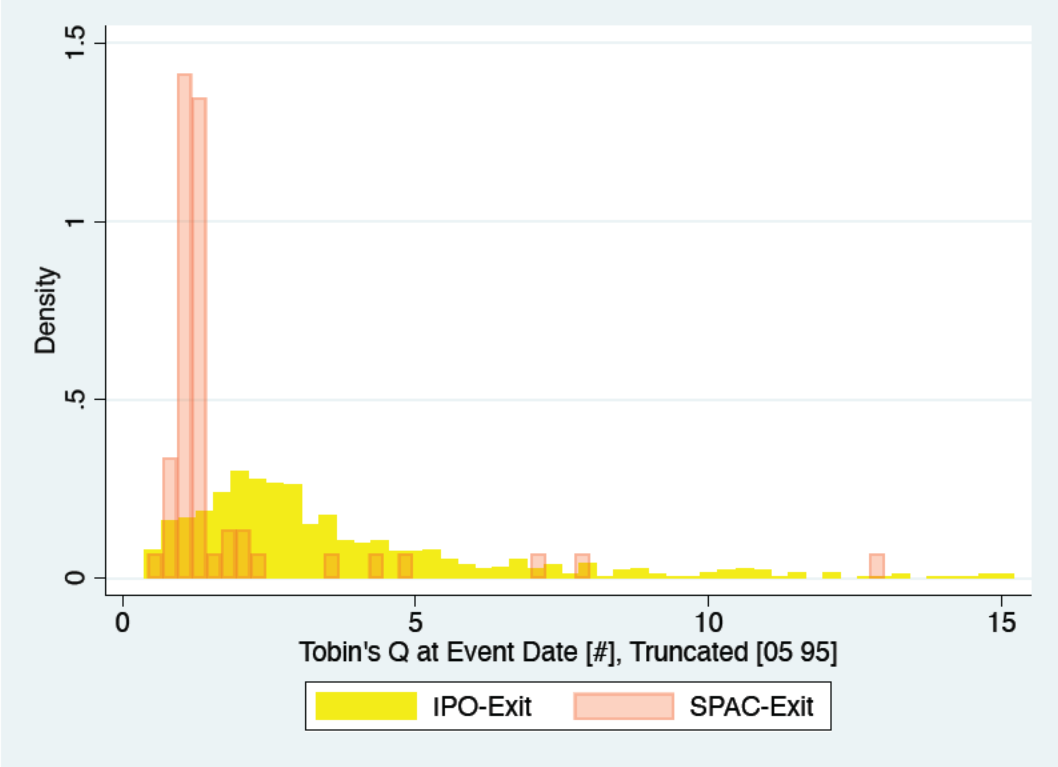


Figure 9:

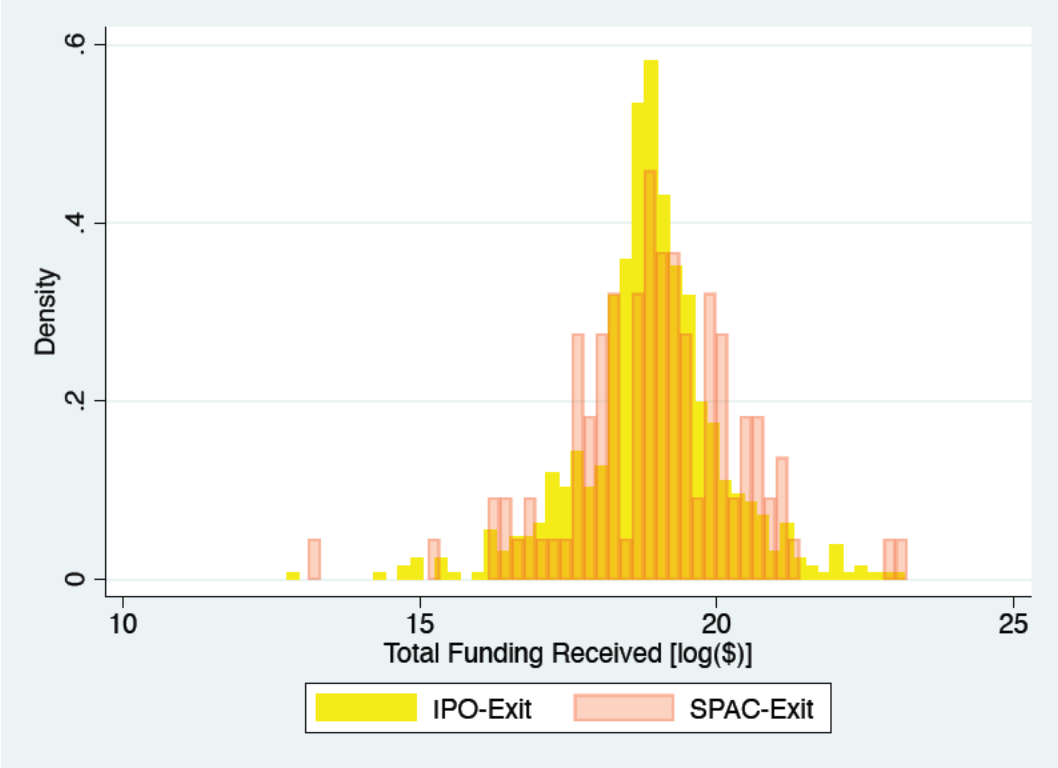
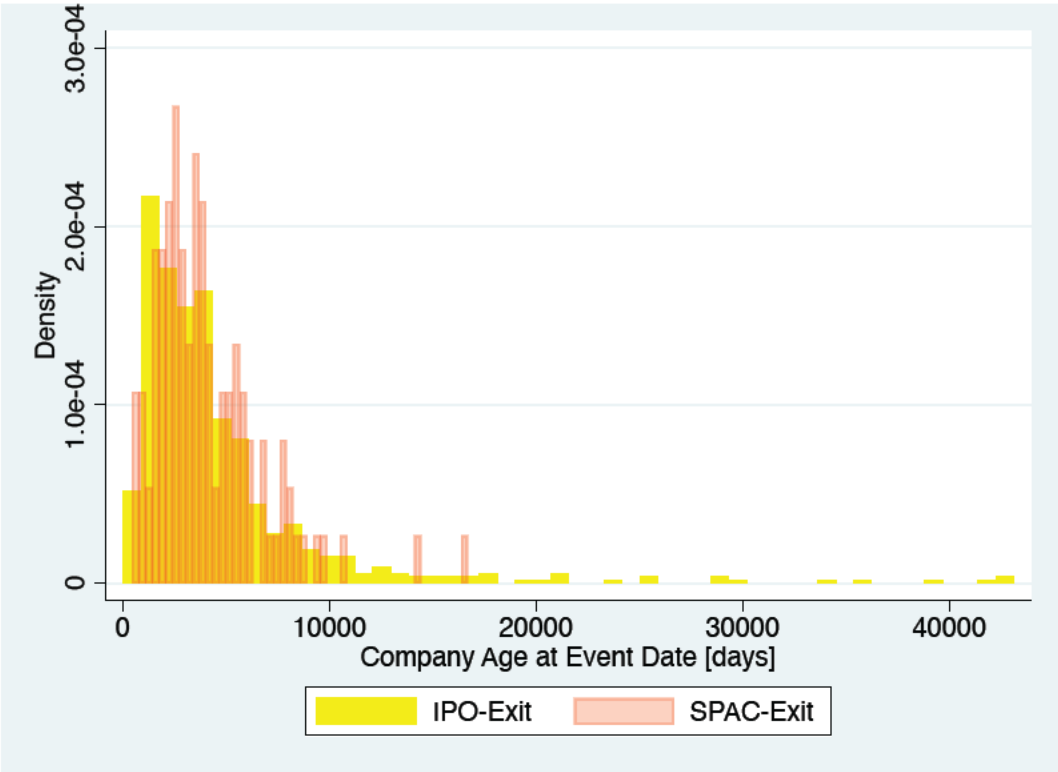


Figure 10:


Density
0
1.0e-04
2.0e-04
3.0e-04
0
10000
20000
30000
40000
Company Age at Event Date [days]
IPO-Exit
SPAC-Exit

Online Appendix

The online appendix to our paper contains all raw data, the algorithm to calculate CARs, the data matching procedure, the final data set, the code for the econometric analyses, and for the tables and figures presented.

Please refer to this link http://gofile.me/55FbB/bgecIwGJJ to download all data and code required to produce this paper. The appendix includes:

- The raw data file for SPACs,
- The raw data file for IPOs,
- The raw data file for VC Exits via IPO or Reverse Merger with blank-check companies,
- Additional raw data files to complement further details and accounting data,

  Note: All raw data files need to be manually cleaned and verified according to instructions in the STATA do files.
- The code to calculate the abnormal returns and their trajectories using PHP on a shared server,
- The Stata do files to match the data and prepare the final data set,
- The final Stata data set, which is manually cleaned and verified by the authors,
- The Stata do files to label the variables, to run the analyses, and to create the output presented in the paper,
- The script to create the graphs on SPAC performance using Gnuplot.