

Serial Entrepreneurs: Evidence from SPACs

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Abstract

This study examines whether the serial entrepreneurial experience of founders contributes to improved overall performance using a sample of Specified Purpose Acquisition Companies (SPACs) innovative firms that entered the U.S. financial markets since August 2003. Based on subsample analysis, evidence shows that previous experience has significant positive implications for the likelihood of the SPACs merger and consequently for value creation.

Keywords: Blank checks, Initial public offering, M&A, SPACs, Serial entrepreneur, Specified purpose acquisition companies

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1. Introduction

There is an ongoing debate on what contributes to the success of investment choices in startups. Literature (Shepherd and Zacharakis, 2001; Brau et al., 2003; Nahata et al., 2014) state that the crucial feature of the venture capital industry is the harvesting of investments in well-functioning equity markets via initial public offerings (IPO) or acquisitions. A natural question arises: whether CEOs characteristics and primarily their reputational capital accumulated via prior managerial experience (Cope, 2005; Rocha et al., 2015; Lafontaine and Shaw, 2016), determine the success of these harvest avenues. Literature examining whether previous managerial experience accrued via business venture creation is value enhancing compared to novice managers is inconclusive. One set of studies reports that serial entrepreneurs do not exhibit significant abnormal performance over novice ones (Wright et al., 1997), exhibit negative consequences (Presutti et al., 2008), that serial entrepreneur performance does not uniformly improve over venture spells, and positive performance fades away after some time (Parker, 2013), that they are not able to use their acquired knowledge to develop new more viable firm than novice managers (Gottschalk et al., 2016). The other set of studies reports that serial entrepreneurs are learning while doing and improving performance (Eesley and Roberts, 2006), enhances future survival and sale value (Delmar and Shane, 2006), have a tendency to raise more substantial amounts of funds compared to novice entrepreneurs (Zhang, 2011), that improvements in performance are primarily

results of the ability and the level of skills instead of experience (Chen, 2013), and that serial entrepreneurs perform better regardless of whether entrepreneurs had prior success or failure (Paik, 2014). Finally, Zhang (2018) establishes the positive influence of serial entrepreneurs on aligning the incentives of venture capital investors and in lowering the level of asymmetric information.

In addition, Toft-Kehler et al. (2014) reconcile previous evidence and report that only specialized-expert entrepreneurs create value. Cotei and Farhat (2017) document that young corporations owned by serial entrepreneurs are more likely to become M&A targets. In a recent work Gompers et al. (2016) report that in the process of investment selection, venture capitalists see the management team as a more critical determinant of success than business related characteristics.

To add to the discussion, this paper provides novel evidence on how managerial attributes and experience impact the likelihood of successful exit of the companies they form and bring public. Namely, we address the issue of whether the experience of serial entrepreneurs and their reputational capital accumulated, accrued through their prior involvement in creating similar companies, warrants better future overall performance. To achieve that we examine the sample of 259 Specified Purpose Acquisition Companies (SPACs) that entered U.S. financial markets in period 2003-2017 via IPO, and ultimately resolved their corporate status by December 31st, 2018 either by finding proper acquisition target or dissolving the company. In defining serial entrepreneurs, we build on previous research as (Birley and Westhead,1993; Westhead and Wright, 1998; Gompers et al., 2010; Zhang, 2011; Zhang, 2018) and label them as serial if they have

founded at least two other SPACs before starting the most recent one, and as novice if they did not have that level of experience in the SPAC market.

SPACs, corporate entities that raise capital via IPO with the sole purpose to acquire another company in the future are useful for examining this question for at least two reasons. First, they are innovative financial products emerging in the financial markets in 2003, deemed by [Lewellen \(2009\)](#) as a separate asset class whose managers believe that markets would be a successful mechanism of connecting entrepreneurs with a great idea and without money with potent investors ([Kaplan and Stromberg, 2001](#); [Gompers and Lerner 2001](#)). They consequently represent an untested sample for answering a question as this.² In an innovative market, such this the quality of the firm is hardly observed directly, and stakeholders rely on the reputation of firms' management to be the certificate of the quality and willingness to build a reputation for not expropriating minority shareholders. ([Megginson and Weiss, 1991](#); [Gomes, 2000](#); [Hsu, 2004](#)). Firm managers who re-enter the market after the initial success and with prior longer exposure to markets consequently provide higher returns to entrepreneurship ([Amaral et al. 2011](#)). Second, that despite their innovativeness modern SPACs share a resemblance, some essential structural characteristics and some common stakeholders of the shady blank check market companies which operated in the 1980s and 1990s. Both exhibit a high involvement of the managers and underwriters acting also as market makers ([Ellis et al.,2000](#)) which crucially determine their corporate outcomes. Consequently, the paper extends existing venture capital literature in two ways. First, by using the

² The Security and Exchange Commission (SEC) defines SPACs as type of blank check company and 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, other entity, or person. These companies typically involve speculative investments and often fall within the SEC’s definition of “penny stocks” or are considered “microcap stocks.”

new sample, it adds evidence on how serial entrepreneurs contribute to value creation. Second, the paper extends emerging literature on SPACs.

SPACs in financial literature were first examined by [Jog and Sun \(2007\)](#) and following them this paper conforms to the Security and Exchange Commission (SEC) definition according to which “a SPAC is created specifically to pool funds in order to finance a merger or acquisition opportunity within a set timeframe. The opportunity usually has yet to be identified.” This baseline definition may offer an insight that investing in SPAC is not for everyone. Previous experience either in this type of the market or in similar endeavors, like blank check market in 1980s and 1990s may be valuable, most importantly in the eyes of initial investors who contribute 100% of capital for this blind pool at the initial public offering (IPO) date while receiving only 80% of the equity on average. This shareholding structure is consistent with the structuring of shells in the 1980s as shown in the literature ([Morgan, 1988](#); [Floros and Sapp, 2011](#)). Notwithstanding, SPAC promoters clearly outline and emphasize on ownership structure after the IPO in filing forms with the SEC, which is entirely consistent with general economic theory and entrepreneurial objective in founding business that would result in significant financial payoff at the IPO or in acquisition ([Arora et al., 2011](#); [Nahata et al., 2014](#); [Dawson et al., 2018](#)) .³

Consequently, [Boyer and Baigent \(2008\)](#) recognize three crucial features of SPACs that make them unique innovation in capital markets and to a degree a substitute to common private equity investments at the time. First, SPACs represent alternative access to private equity investments to retail investors, which before their emergence was the sole playground of institutional investors. Second, SPACs determination to file timely financial statements and forms

³ Serial entrepreneurship-prior involvements are recorded under separate paragraph named” Prior Involvement of Management in Blank Check Companies” in prospectuses forms

with the SEC enables them to exhibit a higher degree of transparency than private equity investments. Finally, despite all uncertainties, SPACs provide limited downside investment to potential investors due to their innovative corporate structure and an establishment of trust accounts where IPO proceeds stay until the resolution of their corporate status.

After these initial studies, literature on SPACs diverged attempting to distinguish their life-cycle and the performance of their securities around various announcement days, as (Lewellen, 2009; Thompson, 2010; Tran, 2012; Lakicevic and Vulanovic, 2013), governance mechanisms as (Berger, 2008; Kim, 2009; Howe and O'Brien, 2012), overall performance as Jenkinson and Sousa (2011), overall and operating performance as (Kolb and Tykvova, 2016; Dimitrova, 2017), merger likelihood as in (Cumming et al., 2014; Lakicevic et al., 2014) and post-merger success as in Vulanovic (2017).

Consequently, literature agrees that SPAC represents an innovative structure in financial markets, that prior the merger event the returns to its securities are non-negative, while overall post-merger performance across all studies shows consistent underperformance against many relevant benchmarks. Merger likelihood studies show that both financial conditions as their structural characteristics matter. Despite all of these studies, SPAC market is still mostly underexplored in academic literature, and their world-wide establishment as one of the vital funding innovations warrants need for further research attempting to isolate some factors that contribute to their success.⁴ One such question that remains unanswered up to now is: whether

⁴ SPACs are also discussed in legal literature by Hale (2007), Heyman (2007), Davidoff (2008), Sjostrom (2008). Furthermore, Kim (2009) elaborates on corporate governance mechanisms and their impact on performance.

repeat SPAC sponsors in the process develop reputational capital that is so crucial for corporate success and financial harvest of these companies.

Consequently, we document that reputational capital accrued via repeated involvement, similarly to prior findings in the literature (Ucbasaran et al., 2008; El-Khatib et al., 2015), in bringing SPAC public and finding an acquisition is crucial. Results show a clear distinction of the success rate of acquisition between serial entrepreneurs and novice ones. On average, a SPAC founded by managers with multiple prior experiences have about 33.98% percent higher likelihood to merge than the rest of SPACs. That difference is economically significant and may have implications on the behavior of SPAC investors, especially those that are involved in the market with the long term purpose.

After this introduction, the paper has the following structure: part two discusses data sources used to derive sample statistics in the paper; part three thoroughly describes the sample, subsamples, and empirical approaches; part four elaborates on results and part five presents the conclusion.

2. Data

Data are compiled from various sources and conform to similar studies examining SPACs. Founders of modern SPAC constructed them to be systematically different from typical blank check companies that were prevalent in the 1980s and 1990s in the U.S. financial markets primarily in respect to compliance with a Rule 419A. SPACs that entered financial markets since 2003 comply with Securities Act of 1933, and they file with the SEC regular financial statements, prospectuses and other forms that report any material corporate change. Consequently, the

Electronic Data Gathering Analysis and Retrieval (EDGAR) database arises as a natural source of information on all institutional details of these companies.

Institutional information around IPO event on all characteristics in respect to SPAC founders, underwriting agreements, securities properties, financial statements is first collected from initial issuance S-1 forms and then updated when any material change happen, concluded with the information that is provided in final prospectuses before the IPO. Overallotment information is extracted from the 8-K forms following the IPO. The institutional information on these fundamental characteristics is partially verified until the year 2013, with publicly provided statistics on SPACs maintained by one of their major promoters and underwriters, an investment bank Morgan Joseph.

Additional data that provides information on the merger are collected using DEFM filing of SPACs deposited by the SEC around merger events. When overlapping, this statistic is cross-checked with data from Factiva search and other various public sources as well as individual corporate websites. All announcement dates are cross-checked between filing forms with the SEC, Factiva search, and public news. Returns for SPAC securities are extracted from Datastream and Wharton Research Data Services (WRDS).

Baseline sample consists of 259 SPACs that entered the U.S. capital markets since its emergence in August 2003 and which successfully resolved their corporate status by the end of the calendar year 2018. The final sample is observed in January 2019 which results that the observed companies conducted their IPO in the period 2003 - 2017.

The observed sample represents the entire set of SPACs that resolved their corporate status by December 31st, 2018. Consequently, it represents about 80% of the population of 327 SPACs which includes SPACs with an unresolved status that emerged in the U.S. financial markets since

2003 and about 60% SPACs in existence worldwide.⁵ The final sample used in this study has all institutional information available for baseline tests. Tables 1 and 2 report descriptive statistics for all variables. Table 3 reports subsample properties.

3. Summary statistics and empirical procedure

The market for SPACs emerged in 2003 with the IPO of Millstream Acquisition Corporation, first modern SPAC. Table 1 presents the temporal characteristics of the market, and few trends are visible. SPACs gained popularity in period 2003-2008 and their absolute number in the peak year of 2007 was 66. Literature reports (Ritter, 2008) that in 2007 SPACs represented more than 20% of the entire IPO market both in the amount of money raised and regarding the number of IPOs. The financial crisis of 2008, as well as prevailing structural characteristics of SPACs namely trading environment where SPAC investors were the subjects to high margin requirements, primarily for technically imposed reasons related to shareholder voting procedures in order to approve acquisition, lead to a full decline in 2009 as explained in Mitchell and Pulvino (2012).

The interest of investors for SPACs recuperated both in the U.S. and globally and filings with the SEC for the year 2017 and 2018 show that their public offerings represent 21.2% and 24.1% of the entire IPO market.⁶ In overall in the period 2003-2018, 327 SPACs went public. Out of these, 259 SPACs resolved their corporate status, where 175 successfully found a target and

⁵ Following entrance to the U.S. capital markets SPACs gained listing in other major financial markets such as: Australia, Austria, Brazil, Canada, France, Germany, Italy, Malaysia, Netherlands, New Zealand, South Africa, South Korea, Sweden and the United Kingdom.

⁶ Statistics is confirmed in IPO reports of Renaissance Capital. <https://www.renaissancecapital.com/IPO-Center/Stats>

executed merger combination while 84 of them were unable to approve the merger and resolved their corporate status via liquidation distributing to investors their initial investments.

Panel B presents the mean values of the main institutional characteristics of the SPAC market in the period under observation. We group these determinants into four types: SPAC structure at the IPO, managerial involvement, underwriting involvement, and macroeconomic factors. Few clear patterns are explaining SPAC institutional changes over time. Threshold, a variable that represents the level of investors in percentage terms enough to disapprove merger is exhibiting an almost monotonic increase. Prior literature, ([Mitchell and Pulvino, 2012](#); [Cumming et al., 2014](#)) find that threshold level is one of the most critical determinants of survival and merger likelihood.

[Lakicevic et al. \(2014\)](#) also report this monotonic increase in threshold level over time and explains it as with increased activism of investors and consequently higher motivation of SPAC founders to create a better set of contracts serving to improve chances to complete the merger and to avoid liquidation. This was an especially important incentive in the post-2006 era when SPAC founders along lowering threshold levels started committing more substantial amounts of money buying pre-IPO warrants and sometimes units. Given SPAC structural characteristics this pre-IPO investment, termed as “skin in the game” by [Rodrigues and Stegemoller \(2012\)](#) aligns better incentives of founders and shareholders and financial benefit for SPAC founders would only be commanded in the case merger is executed. In the case of liquidation, the entire monetary amount committed by founders and already deposited in the SPAC escrow account would be distributed back to initial shareholders, and founders would suffer losses.

While founders increased their monetary commitment over the observation period, the original structure of the unit has evolved. SPACs in the early years usually included two in the

money warrants in the units, while the most recent ones usually construct unit combining one common share and one half of warrant.⁷ Variable “warrants overhang” represents the measure of the evolution of unit. Another variable where changes over time could be observed is underwriter quality. In this study, underwriting quality variable is defined as a dummy variable where pioneers in the underwriting of SPACs, investment banks such as EarlyBirdCapital, Morgan Joseph, Maxim Group are coded as one and major investment banks such as Citigroup, Deutsche Bank, Lazard as zero. Consequently, in the first few years until the market for SPACs as a financial asset has matured more than 50% of the deals were underwritten by these pioneering mezzanine investment banks. Later, higher involvement of major investment banks in the underwriting of SPACs becomes evident indirectly stating to the increased importance of SPACs in financial markets.

Descriptive statistics of the sample

Table 2 reports major statistical properties of institutional characteristics of the SPACs in the sample. Reported variables are like ones documented in various prior studies in SPAC literature and form a baseline for comparison. Describing the average SPAC, we observe its size at IPO to be \$153.02 million almost identical to the average size of general IPOs in period 1996-2012 (Dambra et al.,2018) , be founded by six entrepreneurs at the average age of 51 years at the time of IPO similar to the mean CEO age for 157,996 general firms as reported in Belenzon et al. 2019. The two-thirds of founders were CEOs elsewhere before entering the SPAC market. Previous literature on SPACs (Cumming et al.,2014; Lakicevic et al., 2014) shows that these individual characteristics of founders have implications on overall performance and the merger likelihood of

⁷ SPACs use units as a IPO issuance security. Unit is a composite security consisting of a combination of common shares and warrants. In finance literature, Schultz (1993) and Chemmanur and Fulghieri (1997) provide rationale why risky companies should choose units during the initial public offering. They state that unit IPOs are well positioned to solve information asymmetry problems and to enable companies that are considered risky by outsiders, to signal their true value.

these companies. General finance literature (Yim, 2013) indicates that CEO age crucially determines the likelihood of acquisition announcement. That complements findings in entrepreneurial literature (Wright et al.,1997; Westhead and Wright, 1998; Pollock et al., 2010; Cope, 2011; Carbonara et al.,2019) that personal attributes such as the age, level of knowledge and human capital endowment, and prior track record matters. SPAC founders, on average, contribute about 2.25 million pre-IPO warrants to increase commitment to the merger success. Literature reports that individual SPAC founders come from all sorts of life and most of them are prominent public figures in the U.S., After all, it is their reputation by the investors and their set of skills that may determine the final outcome of the SPAC. For that reason, multiple prior involvements in the blank check market may be positively determining the merger likelihood and consequently contribute to higher payouts to all stakeholders.

Descriptive statistics of subsamples

Table 3 reports descriptive statistics for subsamples. Dividing variable for subsamples is a dummy that defines whether SPAC founders had multiple involvements in the blank check market or modern SPAC market prior to the recent SPAC they are bringing to the IPO.⁸ If at least one of

⁸ This is an excerpt from form filled by a SPAC explaining the multiple involvement before. “Kerry S. Propper has been our chief executive officer and a member of our board of directors since inception. From March 2005 through September 2007, Mr. Propper served as the chief financial officer, secretary and a member of the board of directors of Chardan North China Acquisition Corp. which acquired HLS Systems International Ltd. in September 2007. Since September 2007, Mr. Propper has served as a director of HLS Systems International Ltd. (OTCBB Symbol: HLSYF). From March 2005 through January 2008, Mr. Propper served as the chief executive officer and a member of the board of directors of Chardan South China Acquisition Corp. (which through a merger became A-Power Energy Generation Systems —Nasdaq Symbol: APWR). Mr. Propper has been the owner and chief executive officer of Chardan Capital Markets LLC (formerly known as Gramercy Group), a New York based broker-dealer and FINRA member firm, since July 2003. He has also been a managing member of SUJG, Inc., an investment company, since April 2005. From its inception in December 2003 until November 2005, Mr. Propper served as the executive vice president and a member of the board of directors of Chardan China Acquisition Corp., an OTC Bulletin Board listed blank check company that was seeking to acquire an operating business in the People’s Republic of China. In November 2005, Chardan China Acquisition Corp. completed its business combination with State Harvest Holdings Ltd. and changed its name to Origin Agritech Limited (Nasdaq Symbol: SEED). Mr. Propper has continued to serve as a member of the board of directors of Origin Agritech since its merger. Since November 2006, Mr. Propper has served as the executive vice president of mergers and acquisitions of Shine Media Acquisition Corp., a blank-check company listed on the OTC Bulletin Board. On May 8, 2008, Shine Media entered into a stock purchase agreement pursuant to which it will

the founders had been involved in at least two SPACs in the past variable that shows prior multiple involvement Serial entrepreneur is coded as one. The first subsample consists of 40 SPACs whose CEOs were at least three times involved in the market and whose companies resolved their corporate status by December 31st, 2018. They would be referred to as Serial Entrepreneur SPACs in the further development of the paper. The second subsample has 219 SPACs that resolved their corporate status by the same time, but none of their directors before December 31st, 2018 was previously involved in multiple blank check offerings or modern SPACs. These remaining 219 SPACs may serve as a proper benchmark to Serial Entrepreneur SPACs to evaluate whether their previous involvement positively impacts corporate performance and primarily the likelihood of the merger.

Observing Table 3 most of the defining characteristics do now show the statistically significant difference between subsamples. Below we elaborate on variables that describe the structure of the SPAC at the IPO and on human capital characteristics that demonstrate the statistically significant difference between subsamples. Two structural variables exhibit difference among subsamples, namely the dilution to incoming shareholders and the frequency to use the rights in structuring the IPO. Literature ([Jog and Sun, 2007](#); [Lakicevic and Vulcanovic, 2013](#)) shows that SPAC founders purchase entire equity of the company before the IPO at the approximate price of five cents per share, which is consistent with shell behavior in the 1980s ([Morgan, 1988](#)). At the IPO they typically sell 80% of the equity, while retaining 20% of the ownership. That structure creates dilution for incoming investors. Table 3 reports that Serial Entrepreneurs were able to dilute

acquire all of the ordinary shares of China Greenscape Co., Ltd., a British Virgin Islands company, which owns 100% of Jiangsu Sunshine Zoology and Forestry Development Co., Ltd., a PRC company. Jiangsu Sunshine is an urban green resources company that develops, cultivates, and distributes trees, plants and flowers to expanding PRC municipalities. Since December, 2005, Mr. Propper has served as a special advisor to Jaguar Acquisition Corp., a blank-check company listed on the OTC Bulletin Board”.

their IPO offerings to a higher degree than the novice managers, 56.69% vs. 48.00%. Similarly, in structuring the IPO, Serial Entrepreneurs were more frequently using rights than the novice ones.

A set of managerial characteristics show a statistically significant difference between the subsamples. On average CEOs in Serial Entrepreneur SPACs subsample were more frequently in the past executives of other companies and more regularly executives of public companies. Similarly, Serial Entrepreneurs are more frequently forming a team of at least three executives previously involved to structure the next SPAC they are bringing to the IPO. Summary statistics show that about 58.00% of Serial Entrepreneur SPACs have founders with previous private equity or venture capital experience. It can seem plausible that if SPAC founders are at the same time involved in private equity firm or the founder has previous experience in private equity that should benefit SPAC in overall. ⁹Saying that it seems that novice management teams rely more on previous private equity experience with 73.00% of them having a member with prior involvement in that market.

Subsamples differ on the level of macroeconomic variables at the time of IPO. The primary variable of interest there is the level of T-bill, which is structurally vital for SPACs as after the IPO all the funds after essential expenses are deposited in the escrow accounts with the reputable financial institution where they earn T-bill rate until their usage in financing acquisition. Implicitly T-bill rate represents a capital gain for investors in SPACs. On average, the T-bill level at the IPO is lower in the Serial Entrepreneurs subsample.

⁹ As stated in their filing forms by the SEC managers of number of SPACs, state that as most private equity funds must distribute the fund assets following a fixed term of years, they would typically seek transactions for their portfolio companies that result in the receipt of cash or marketable securities.

Furthermore, Serial Entrepreneur SPACs conducted the IPO when the level of Russell 2000 Index was higher than the novice ones, 2280.51 vs. 2117.18 and at the time of the higher political uncertainty.

To sum, although most of the institutional characteristics of subsamples are not statistically significant some determinants that have shown importance in previous literature show as statistically different.

4. Empirical procedure

To set up baseline for the further tests on whether multiple prior involvements in blank check markets by founders contribute to better market and operational performance of the SPACs pre and post IPO, paper extends on tests conducted in [Cumming et al. \(2014\)](#) and [Lakicevic et al.\(2014\)](#) in attempt to isolate drivers of merger likelihood. Consequently, paper uses similar empirical procedure as these two studies while extending the period of observation for six years and increasing the sample size for about 131.25 % (112 vs 259) in respect to [Cumming et al.\(2014\)](#) and 59.00 % (163 vs 259) in regard to [Lakicevic et al. \(2014\)](#).

The merger is the goal of SPAC management from the point of the formation of the SPAC. They put on the line their personal and professional reputation and post-2006 significant investment before IPO to successfully execute business combination instead of resolving SPAC while returning funds to original investors in liquidation procedures.¹⁰Given these incentives of SPACs founders, we hypothesize that managerial characteristics and an increase in the involvement should increase the likelihood of the merger. Consequently, we state:

¹⁰ Graph 1 presents the payoffs for founders.

H1: Merger likelihood and therefore total returns would be higher for SPACs whose managers have extensive experience in SPAC industry and were involved in a multiple number of SPAC deals

Table 4 has three specifications that show baseline results. In the first specification, we test the likelihood of the merger where our main independent variable Serial Entrepreneur is joined to the set of independent variables that were shown to be statistically significant in previous studies (Cumming et al.,2014; Lakicevic et al., 2014). Reported results in the specification (A) document a positive and statistically significant impact of Serial Entrepreneur on the merger likelihood. This is the first evidence that reputational capital acquired via serial entrepreneurship matters.

Furthermore, the result presented in the specification (A) shows that the choice of underwriting representative is determining acquisition outcomes. Reported results show that if the SPAC is underwritten by EarlyBirdCapital, an inventor of a modern SPAC, it would have higher merger likelihood.

Also, the deals that have a higher threshold level have a higher likelihood to merge. SPAC literature (Cumming et al.,2014; Lakicevic et al., 2014) and studies on merger approval likelihood find that one of the most important institutional features of SPACs is a qualified level of shareholders need to approve the merger. Alternatively, interpretation of threshold is the minimum number of shareholders that could put a hold on merger approvals. The variable is in prospectuses named threshold and literature takes the label from there. Table 1 of this paper shows the temporal level of the variable and reports almost five-fold increase from the early period 2003-2006, where 20% of shareholders would be enough to disprove merger compared to more than 95% in the most recent SPACs.

Cumming et al. (2014) document that the redemption threshold represents a significant obstacle to secure a decisive vote on the acquisition. The hypothesis here is following prior findings and states that the higher level of threshold the easier approval process and therefore the higher likelihood of approval. Indeed, reported results in the specification (A) show that an increase in the level of redemption threshold and lowering the number of investors that could disapprove merger leads to an increase in the likelihood of the merger. The finding confirms Cumming et al. (2014) result.

Finally the timing of the merger announcement that according to Cumming et al. (2014) could serve as a proxy of managerial skills matters and confirms prior findings like in Lakicevic et al. (2014) that the total time between the IPO date and intention to merge announcement is an essential determinant of the likelihood of the merger. This may sound logical as SPACs by construction are allowed limited time after the IPO in which they could execute the merger. The earlier announcement of the merger gives more time to conduct all negotiations and administrative procedures and usually may be considered as a positive sign. On average Serial Entrepreneur SPACs announce merger seventeen days earlier than the remaining SPACs.

The second specification in Table 3 replaces the variable Threshold with a new variable T-bill level at the IPO date. The reasoning here is that two variables have been shown to have an almost perfect negative correlation as reported in Appendix 2 and Appendix 3. The reported regression results are very similar and show that Serial Entrepreneurship matters and positively impact the likelihood of the merger. As expected, the variable T-bill level at IPO is negatively related to the merger likelihood.

Specification (C) in Table 3 presents results of logit regression where, besides of independent variables included in the first two regressions, we include set of independent variables

that detail SPAC structure at the IPO, managerial characteristics, underwriting characteristics, and macroeconomic environment. Most of these variables are used in prior literature on SPACs, but not the most important for our study, namely Serial Entrepreneurship. A closer look in the evidence confirms our main result that Serial Entrepreneurship matters and that it positively impacts the likelihood of the merger. The last three columns present the averaged marginal effects and document that the presence of Serial Entrepreneur in the management team of SPAC increases the likelihood of the merger by 33.98%.

In addition to Serial Entrepreneurship, other variables impact the likelihood of the merger. Two that we classified as explaining the structure at the IPO, namely variable PIPE and Escrow_Dummy are very much dependent on managerial behavior during the IPO. If SPAC was funded via PIPE before the IPO that would negatively impact the likelihood of the merger. While there will be a positive impact if more than 100% of the IPO proceeds are deposited in the escrow account. Positive effect on the merger likelihood is seen if the IPO is oversubscribed and with the size.

The reported results document that the level of commitment to merger approval indeed improves outcomes. First, the number of founders has a statistically significant influence on the merger outcomes. It seems that an increase in the size of the SPAC management team has additive effects and positively increases merger likelihood. Similarly, a positive influence on merger likelihood is shown by an increase in founders human capital measure by the level of education.

A variable that captures managerial skills in negotiation and finding a proper target for acquisition is the time until the announcement of the merger. As by its construction SPACs have a limited timeframe to find merger target and to conduct business combination or otherwise they have to liquidate, in overall it is expected that earlier announcement would mean higher chances

that merger happens. Previous literature, specifically [Lakicevic et al. \(2014\)](#) find that the earlier the announcement is, the higher is the merger likelihood. This study with 59.00 % larger sample has the same finding, and SPACs able to announce merger intent sooner tend to be more successful in the closing acquisition.

Finally, the quality of underwriters matter. The presence and the preparation of offering by the lesser-known investment banks that were pioneers of SPAC structuring in the deal increase the likelihood of the merger.

Additional tests

To address the possible noise as we have a relatively high degree of freedom, a relatively low number of observations and possibly high correlation among independent variables we conduct additional tests. The first test involves the choice of independent variables from the set we used in our prior regression using lasso selection procedure ([Tibshirani,1996](#); [Belloni et al., 2012](#); [Belloni and Chernozhukov, 2013](#); [Ahrens et al., 2018](#)). Table 5 in the first three columns presents the set of variables chosen as relevant by lasso procedure. Namely four of them are selected: Serial entrepreneurship, Time until the merger announcement, a dummy variable that represents whether SPAC has company in healthcare as a target and the level of T-bill at the IPO. Our intuition that serial entrepreneurship is important for the success of acquisition gets validation.

Consequently, as the next test, we regress the merger outcome variable on these four independent variables. Results presented in Table 5, specification (B) show that all four of these show statistical significance and expected signs.

Results presented in Table 5, specification (C) add to regression used in specification (B) instrumentalized threshold following [Cumming et al. \(2014\)](#), as they interpret threshold as an indirect measure of the team quality.

Finally, the last three columns of Table 5 present results where we include annual dummies to control for a year. Although this decreases the degree of freedom, it may offer additional insights into what characteristics are recognized as determining the success of the SPAC merger.

All previously reported results from baseline logit regression stand. Also, results confirm previous literature as in [Lakicevic et al. \(2014\)](#) that SPACs with merger focus on Chinese private companies do exhibit a higher likelihood for a successful acquisition. Also, the deals that were better organized and took less time between the filling of a registration statement with the SEC and IPO have a higher likelihood of a merger.

Finally, when the entire team that was previously involved gets involved again, it improves merger chances. In overall, most of the determinants isolated as relevant in prior studies, still show economically significant importance in merger likelihood tests, but most importantly previous managerial experience in the form of Serial Entrepreneurship shows as one of the most fundamental determinants of the merger outcomes. We

Furthermore

5. Conclusions

This paper examines whether the previous entrepreneurial experience of founders in the blank check market or modern SPACs contributes to improved overall performance in that market in the period 2003-2018. Based on the sample of 259 SPACs that resolved their corporate status by the end of December 2018, either by merging with some new private company or liquidating and based on subsample analysis, evidence shows that multiple previous experiences has important implications

Serial Entrepreneur SPACs tend to be formed by executives with higher experience as CEOs in any industry compared to the benchmark, are more frequently having as founders executives who were CEOs of publicly listed companies before and were less frequently having venture capital and private equity industry experience.

Most importantly, we document that Serial Entrepreneurship has statistically significant positive influence on the merger likelihood of SPACs. This has the following implications on literature...

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Table 1: Baseline SPACs' institutional characteristics

This table describes study sample which consists of 259 Specified Purpose Acquisition Companies (SPACs) that conducted an IPO in period 2003-2017 and resolved their corporate status by December 31st, 2018. Panel A presents temporal distribution of SPACs in period 2003-2017 that we use as a baseline for analysis. To enlighten the importance of this unique market we also add to resolved SPACs the other SPACs that conducted IPO but are still in the search stage and create column 2018. In Panel B major SPAC IPO and merger characteristics on: structure at IPO, managerial involvement, underwriting involvement, and macroeconomic variables are reported as annual averages.

Panel A : Temporal distribution in period 2003-2017																	
Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Resolved SPAC count	1	12	28	37	66	17	1	7	15	9	10	11	20	10	15		259
Percent	0.00	0.05	0.11	0.14	0.25	0.07	0.00	0.03	0.06	0.03	0.04	0.04	0.08	0.04	0.06		0.94
SPAC merged count	1	10	24	19	32	11	1	3	12	6	8	8	17	8	15		175
Percent	100.00	83.33	85.71	51.35	48.48	64.71	100.00	42.86	80.00	66.67	80.00	72.73	85.00	80.00	100.00		67.57
SPAC liquidated count	0	2	4	18	34	6	0	4	3	3	2	3	3	2	0		84
Percent	0	90.00	76.00	81.00	68.00	89.00	99.00	97.00	88.00	94.00	92.00	92.00	83.00	92.00	85.00		32.43
Total U.S. IPOs	71	226	206	199	213	31	63	153	125	128	222	275	170	105	160	191	2538
Total SPAC IPOs	1	12	28	37	66	17	1	7	15	9	10	11	20	13	34	46	327
SPAC IPOs as % of total	0.01	0.05	0.14	0.19	0.31	0.55	0.02	0.05	0.12	0.07	0.05	0.04	0.12	0.12	0.21	0.24	0.13
Panel B : SPACs' IPO and merger deal characteristics																	
<i>SPAC structure at IPO</i>																	
IPO size	24.15	40.35	81.41	96.43	191.94	245.24	41.40	80.66	78.55	61.65	146.23	155.65	192.55	255.79	301.16		
Threshold	20.00	20.00	20.00	21.01	28.30	32.35	81.00	79.79	86.55	82.31	88.27	93.45	94.77	95.25	83.40		
Warrant overhang	1.67	1.57	1.33	1.12	0.80	0.74	1.15	1.09	1.00	1.05	0.58	0.79	0.90	0.56	0.77		
<i>Managerial Involvement</i>																	
SPAC team size	4.00	4.50	5.46	5.78	6.52	5.82	3.00	6.57	5.73	5.89	6.80	6.36	6.40	6.20	6.87		
Founders age at IPO	59.25	47.91	49.73	51.25	52.30	49.27	37.00	52.30	50.41	49.83	52.82	51.02	52.16	55.20	53.45		
Serial entrepreneurship	1.00	0.17	0.18	0.14	0.06	0.18	0.00	0.14	0.20	0.11	0.10	0.18	0.25	0.10	0.40		
CEO Else before SPAC	1.00	1.00	0.86	0.57	0.64	0.41	1.00	0.71	0.73	0.78	0.80	0.73	0.40	0.50	0.73		
<i>Underwriting Involvement</i>																	
Und_Quality	1.00	1.00	0.93	0.86	0.44	0.41	1.00	0.71	0.53	0.56	0.60	0.45	0.45	0.60	0.53		
EarlyBird	1.00	0.58	0.32	0.14	0.08	0.12	0.00	0.00	0.27	0.22	0.40	0.36	0.20	0.10	0.20		
MultipleLead	0.00	0.00	0.07	0.14	0.06	0.06	0.00	0.00	0.00	0.11	0.10	0.09	0.20	0.30	0.47		
Defereed fee until merger %	0.00	0.00	0.57	2.20	3.14	3.83	4.00	2.34	2.15	2.02	2.42	2.25	2.87	3.05	3.53		
Total underwriting fee	10.00	9.17	7.43	6.80	6.97	6.84	7.00	4.48	4.73	4.54	4.98	4.84	5.30	5.05	5.67		
<i>Macroeconomic variables</i>																	
TBill_IPO	1.00	1.48	3.30	4.68	4.27	2.14	0.02	0.14	0.05	0.09	0.05	0.03	0.03	0.30	0.84		
Political uncertainty Index	95.67	90.52	71.15	71.85	81.73	120.55	116.16	168.68	163.24	164.39	122.16	87.11	110.64	99.52	113.31		
GDPgrowth	7.00	3.38	3.05	2.83	2.01	-1.75	4.50	2.24	1.58	1.40	2.70	2.77	1.83	1.85	2.52		

Table 2: Descriptive statistics

This table describes the mean, median, standard deviation, minimum value, and maximum values for all variables used in the study. The sample covers 259 SPACs that conducted an IPO in period 2003-2017 and resolved their corporate status before December 31th, 2018. The description statistics is collected from individual company reportings with the Security and Exchange Commission.

	Mean	Median	Std	Min	Max
<i>SPAC structure at IPO</i>					
Foreign Issuer	0.07	0.00	0.25	0.00	1.00
Filing_IPO_Days	139.74	105.00	124.28	8.00	821.00
China focused acquisition	0.18	0.00	0.39	0.00	1.00
Double Unit	0.06	0.00	0.24	0.00	1.00
Threshold	49.05	30.00	32.31	20.00	100.00
PIPE	0.24	0.00	0.43	0.00	1.00
Dilution	49.34	31.60	26.75	19.00	98.30
IPO Oversubscription	0.88	1.00	0.29	0.00	1.23
SPAC Size	153.02	86.25	165.90	8.42	1035.00
Size Dummy	0.06	0.00	0.24	0.00	1.00
Escrow_Dummy	0.57	1.00	0.50	0.00	1.00
Warrant Overhang	0.95	0.75	0.43	0.00	1.67
Rights	0.02	0.00	0.12	0.00	1.00
IPO_Hot	0.77	1.00	0.42	0.00	1.00
Time until announcement of merger	477.56	504.00	197.93	37.00	1061.00
Listing exchange	0.66	1.00	0.48	0.00	1.00
<i>Managerial Involvement</i>					
SPAC team size	6.07	6.00	1.76	2.00	13.00
Founders age at IPO	51.38	51.50	5.70	31.33	64.40
CEO Military	0.03	0.00	0.18	0.00	1.00
CEO Else before SPAC	0.66	1.00	0.47	0.00	1.00
CEO Foreign	0.33	0.00	0.47	0.00	1.00
CEO Public	0.11	0.00	0.31	0.00	1.00
Ceo PhD	0.03	0.00	0.17	0.00	1.00
CEO Law Degre	0.12	0.00	0.32	0.00	1.00
CEO MBA	0.34	0.00	0.48	0.00	1.00
Carlyle previous experience	0.04	0.00	0.20	0.00	1.00
Healthcare target	0.07	0.00	0.25	0.00	1.00
Founder Private Equity Experience	0.70	1.00	0.46	0.00	1.00
Special Advisors	0.25	0.00	0.43	0.00	1.00
Entire team previously involved	0.12	0.00	0.33	0.00	1.00
Focus of merger at IPO date	0.72	1.00	0.45	0.00	1.00
PriorInv~913	0.34	0.00	0.48	0.00	1.00
Serial entrepreneurship	0.15	0.00	0.36	0.00	1.00
<i>Underwriting Involvement</i>					
Underwriter Quality	0.62	1.00	0.49	0.00	1.00
Syndicate size	3.23	3.00	1.65	1.00	10.00
EarlyBirdCapital	0.20	0.00	0.40	0.00	1.00
Multiple Lead	0.11	0.00	0.32	0.00	1.00
Defereed fee until merger	2.44	3.00	1.44	0.00	5.40
Total underwriting fee	6.37	7.00	1.56	2.25	10.00
Underwriters Units	0.06	0.00	0.23	0.00	1.14
<i>Macroeconomic factors</i>					
TBill_IPO	2.40	2.79	1.96	0.00	5.03
Vix_IPO	15.88	14.54	4.91	9.44	34.99
Russell2000_IPO	2142.40	1973.41	551.69	1202.56	3583.16
PI3_Index	98.80	91.41	33.61	57.20	245.13
Pinews_Index	101.45	90.64	40.88	44.78	283.67
ANN_PI	99.45	81.15	70.28	3.09	364.84
ANN_EqInd	51.06	25.13	80.43	4.91	591.21
GDPgrowth	2.11	1.74	2.30	-2.30	7.00

Table 3: SPAC subsamples based on the Multiple Prior Involvement of Founders

This table describes the mean, median, standard deviation, minimum value, and maximum values for all variables used in the study for SPAC subsamples in period 2003-2017. The first subsample consists of 40 SPACs whose founders have multiple prior involvement in blank check market. The second subsample consists of 219 SPACs whose founders invest in SPAC for the first time. The description statistics is collected from individual company reportings with the Security and Exchange Commission. The last three columns test statistical difference of the means of variables in subsamples, and symbols *, **, and *** represent statistical significance at the 10%, 5% and 1% level.

	Multiple prior Involvement				No prior involvement					
	Mean	Std	Min	Max	Mean	Std	Min	Max	T stat	Sig. P-value
Merged (Y/N)	0.90	0.30	0.00	1.00	0.63	0.48	0.00	1.00	-3.35 ***	0.00
SPAC structure at IPO										
Foreign Issuer	0.13	0.33	0.00	1.00	0.05	0.23	0.00	1.00	-1.65	0.10
Filing_IPO_Days	132.55	122.42	13.00	506.00	141.05	124.85	8.00	821.00	0.40	0.69
China focused acquisition	0.23	0.42	0.00	1.00	0.17	0.38	0.00	1.00	-0.77	0.44
Double Unit	0.05	0.22	0.00	1.00	0.06	0.25	0.00	1.00	0.34	0.74
Threshold	56.15	34.88	20.00	98.80	47.75	31.74	20.00	100.00	-1.52	0.13
PIPE	0.28	0.45	0.00	1.00	0.24	0.43	0.00	1.00	-0.51	0.61
Dilution	56.69	28.50	26.00	98.30	48.00	26.27	19.00	96.70	-1.90 *	0.06
IPO Oversubscription	0.83	0.33	0.00	1.00	0.88	0.29	0.00	1.23	1.00	0.32
SPAC Size	141.65	193.21	8.42	1035.00	155.10	160.83	17.42	1035.00	0.47	0.64
Size Dummy	0.08	0.27	0.00	1.00	0.06	0.24	0.00	1.00	-0.38	0.71
Escrow_Dummy	0.65	0.48	0.00	1.00	0.56	0.50	0.00	1.00	-1.09	0.28
Warrant Overhang	0.92	0.47	0.00	1.67	0.96	0.43	0.00	1.67	0.60	0.55
Rights	0.06	0.22	0.00	1.00	0.01	0.10	0.00	1.00	-2.10 **	0.04
IPO_Hot	0.75	0.44	0.00	1.00	0.77	0.42	0.00	1.00	0.30	0.77
Time until announcement of merger	463.58	215.16	146.00	1061.00	480.12	195.04	37.00	955.00	0.49	0.63
Listing exchange	0.63	0.49	0.00	1.00	0.66	0.47	0.00	1.00	0.45	0.65
Managerial Involvement										
SPAC team size	5.85	1.53	4.00	11.00	6.11	1.80	2.00	13.00	0.87	0.38
Founders age at IPO	50.72	5.51	40.00	60.50	51.50	5.73	31.33	64.40	0.79	0.43
CEO Military	0.03	0.16	0.00	1.00	0.04	0.19	0.00	1.00	0.36	0.72
CEO Else before SPAC	0.80	0.41	0.00	1.00	0.63	0.48	0.00	1.00	-2.04 **	0.04
CEO Foreign	0.30	0.46	0.00	1.00	0.34	0.47	0.00	1.00	0.47	0.64
CEO_Public	0.20	0.41	0.00	1.00	0.09	0.29	0.00	1.00	-2.04 **	0.04
Ceo PhD	0.00	0.00	0.00	0.00	0.04	0.19	0.00	1.00	1.23	0.22
CEO Law Degre	0.10	0.30	0.00	1.00	0.12	0.32	0.00	1.00	0.34	0.73
CEO MBA	0.40	0.50	0.00	1.00	0.33	0.47	0.00	1.00	-0.81	0.42
Carlyle previous experience	0.08	0.27	0.00	1.00	0.04	0.19	0.00	1.00	-1.11	0.27
Healthcare target	0.13	0.33	0.00	1.00	0.06	0.24	0.00	1.00	-1.50	0.13
Founder Private Equity Experience	0.58	0.50	0.00	1.00	0.73	0.45	0.00	1.00	1.93 *	0.06
Special Advisors	0.25	0.44	0.00	1.00	0.25	0.43	0.00	1.00	-0.05	0.96
Entire team previously involved	0.38	0.49	0.00	1.00	0.08	0.27	0.00	1.00	-5.54 ***	0.00
Focus of merger at IPO date	0.65	0.48	0.00	1.00	0.73	0.44	0.00	1.00	1.04	0.30
Underwriting Involvement										
Underwriter Quality	0.70	0.46	0.00	1.00	0.60	0.49	0.00	1.00	-1.16	0.25
Syndicate size	3.13	1.38	1.00	7.00	3.25	1.70	1.00	10.00	0.44	0.66
EarlyBirdCapital	0.28	0.45	0.00	1.00	0.18	0.39	0.00	1.00	-1.35	0.18
Multiple Lead	0.15	0.36	0.00	1.00	0.11	0.31	0.00	1.00	-0.83	0.41
Defereed fee until merger	2.35	1.56	0.00	5.00	2.45	1.42	0.00	5.40	0.41	0.68
Total underwriting fee	6.32	1.75	3.00	10.00	6.38	1.52	2.25	10.00	0.26	0.80
Underwriters Units	0.07	0.24	0.00	1.00	0.06	0.23	0.00	1.14	0.10	0.92
Macroeconomic factors										
TBill_IPO	1.85	1.88	0.00	5.00	2.50	1.96	0.01	5.03	1.94 *	0.05
Vix_IPO	15.98	5.91	10.14	34.99	15.87	4.72	9.44	31.43	-0.13	0.90
Russell2000_IPO	2280.51	700.86	1202.56	3516.08	2117.18	517.88	1364.42	3583.16	-1.73 *	0.09
PI3_Index	104.93	36.70	63.37	245.13	97.68	32.98	57.20	197.92	-1.26	0.21
Pinews_Index	112.28	51.07	51.04	283.67	99.47	38.54	44.78	225.37	-1.83 *	0.07
ANN_PI	90.38	54.12	14.97	261.42	101.11	72.82	3.09	364.84	0.89	0.38
ANN_EqInd	48.45	94.47	5.70	591.21	51.54	77.83	4.91	591.21	0.22	0.82
GDPgrowth	2.23	1.96	-2.30	7.00	2.09	1.70	-2.30	5.40	-0.46	0.64

Table 4: Logit regression analysis of SPACs' corporate status

This table reports results from logit regression analysis based on three specification. The sample consists of 259 SPACs that conducted their IPO in period 2003-2017 and resolved their corporate status by December 31th, 2018. The dependent variable for regression equals 1 if the SPAC merged, and 0 if the SPAC liquidated. The symbols *, **, and *** represent statistical significance of coefficients at the 10%, 5% and 1% level. The logit regression specification (A) present results of regression where explanatory variables aside of serial entrepreneurship are the ones that were significant in prior studies on SPACs. The logit regression specification (B) present results where a variable Threshold is replaced by T-bill rate at the IPO date as their correlation coefficient is close to negative one. The logit regression specification (C) present results where all relevant variables that could determine likelihood of the merger are included. Final three columns present postestimation averaged marginal effects.

Variables	Logit regression analysis results (A)			Logit regression analysis results (B)			Logit regression analysis results(C)			Averaged marginal effects		
	Coef.	Std.	z	Coef.	Std.	z	Coef.	Std.	z	Coef.	Std.	z
Serial entrepreneurship	1.6431	0.5788	2.84 ***	1.5891	0.5884	2.70 ***	2.9400	0.8976	3.28 **	0.3398	0.0959	3.54 **
China focused acquisition	0.5350	0.4139	1.29	0.4999	0.4261	1.17	0.8748	0.6166	1.42	0.1011	0.0702	1.44
Time until announcement of merger	-0.0040	0.0009	-4.70 ***	-0.0043	0.0009	-4.88 ***	-0.0056	0.0013	-4.24 ***	-0.0007	0.0001	-4.93 ***
EarlyBirdCapital	0.8541	0.4159	2.05 **	0.6658	0.4330	1.54	1.3867	0.7353	1.89 *	0.1603	0.0827	1.94 *
Focus of merger at IPO date	0.2640	0.3490	0.76	0.3329	0.3604	0.92	0.6005	0.5146	1.17	0.0694	0.0587	1.18
Threshold	0.0194	0.0053	3.69 ***				-0.0012	0.0278	-0.04	-0.0001	0.0032	-0.04
T-bill rate at IPO				-0.4263	0.0871	-4.90 ***	-0.6291	0.3396	-1.85 *	-0.0727	0.0383	-1.90 *
SPAC structure at IPO												
Foreign Issuer							-0.2563	0.8995	-0.28	-0.0296	0.1039	-0.29
Filing_IPO_Days							-0.0023	0.0019	-1.25	-0.0003	0.0002	-1.26
Double Unit							-0.0484	1.2810	-0.04	-0.0056	0.1480	-0.04
PIPE							-1.7169	0.6101	-2.81 ***	-0.1984	0.0659	-3.01 ***
Dilution							0.0097	0.0255	0.38	0.0011	0.0029	0.38
IPO Oversubscription							3.0540	1.2972	2.35 ***	0.3529	0.1452	2.43 ***
SPAC Size							0.0075	0.0025	2.94 ***	0.0009	0.0003	3.17 ***
Size Dummy							-1.9939	1.3745	-1.45	-0.2304	0.1564	-1.47
Escrow_Dummy							2.0127	0.7012	2.87 ***	0.2326	0.0757	3.07 ***
Warrant Overhang							-0.1128	0.5976	-0.19	-0.0130	0.0690	-0.19
Rights							-0.9468	4.0511	-0.23	-0.1094	0.4680	-0.23
IPO_Hot							0.6803	0.9188	0.74	0.0786	0.1058	0.74
Listing exchange							-0.4470	0.5831	-0.77	-0.0517	0.0671	-0.77
Managerial Involvement												
SPAC team size							0.2410	0.1326	1.82 *	0.0279	0.0149	1.87 *
Founders age at IPO							-0.0602	0.0400	-1.51	-0.0070	0.0045	-1.53
CEO Military							-1.0935	1.3676	-0.80	-0.1264	0.1574	-0.80
CEO Else before SPAC							0.6161	0.4990	1.23	0.0712	0.0572	1.25
CEO Foreign							-0.5716	0.5002	-1.14	-0.0661	0.0572	-1.15
CEO Public							0.3300	0.8797	0.38	0.0381	0.1016	0.38
Ceo PhD							2.3234	1.2944	1.79 *	0.2685	0.1456	1.84 *
CEO Law Degre							-0.3602	0.7321	-0.49	-0.0416	0.0845	-0.49
CEO MBA							0.7263	0.4960	1.46	0.0839	0.0563	1.49
Carlyle previous experience							0.7954	1.2321	0.65	0.0919	0.1421	0.65
Healthcare target							-3.1604	0.9457	-3.34 ***	-0.3652	0.1005	-3.63 ***
Founder Private Equity Experience							-0.2253	0.4983	-0.45	-0.0260	0.0574	-0.45
Special Advisors							0.3929	0.5572	0.71	0.0454	0.0642	0.71
Entire team previously involved							-0.6746	0.8570	-0.79	-0.0780	0.0987	-0.79
Prior Involvement							-0.7170	0.6627	-1.08	-0.0829	0.0760	-1.09
Underwriting Involvement												
Underwriter Quality							1.8155	0.6961	2.61 ***	0.2098	0.0764	2.75 ***
Multiple Lead							0.7122	0.9777	0.73	0.0823	0.1126	0.73
Defereed fee until merger							0.0141	0.2497	0.06	0.0016	0.0289	0.06
Total underwriting fee							0.0023	0.1404	0.02	0.0419	0.0258	1.62
Underwriters Units							-0.0259	0.1406	-0.18	-0.2244	1.2170	-0.18
Macroeconomic factors												
Macroeconomic												
Vix_IPO							0.0287	0.0694	0.41	0.0033	0.0080	0.41
Russell2000_IPO							0.0017	0.0016	1.10	0.0002	0.0002	1.11
PI3_Index							-0.0275	0.0304	-0.90	-0.0032	0.0035	-0.91
Pinews_Index							0.0140	0.0212	0.66	0.0016	0.0025	0.66
ANN_PI							-0.0010	0.0034	-0.31	-0.0001	0.0004	-0.31
ANN_EqInd							-0.0013	0.0027	-0.46	-0.0001	0.0003	-0.46
GDPgrowth							0.1507	0.1528	0.99	0.0174	0.0176	0.99
Constant	1.2438	0.5805	2.14	3.3969	0.6403	5.31	-4.9139	4.9636	-0.99			
Mc Fadden R square	16.57%			20.34%			42.74%					
LR Ratio	54.09			66.39			139.49					
Number of observations	259			259			259					

Table 5: Post lasso selection logit regression analysis of SPACs' corporate status

This table reports results from post lasso logit regression analysis and with fixed effects. The sample consists of 259 SPACs that conducted their IPO in period 2003-2017 and resolved their corporate status by December 31th, 2018. The dependent variable for regression equals 1 if the SPAC merged, and 0 if the SPAC liquidated. The symbols *, **, and *** represent statistical significance of coefficients at the 10%, 5% and 1% level. The specification (A) present results the post-lasso selected variables and coefficients. The logit regression specification (B) present results with standard dependent variable and independent variables selected by lasso procedure. The logit regression specification (C) present results where instrumentalised threshold is added to lasso selected variables. Specification (D) in the last three columns present results were fixed year effects are applied

Variables	Lasso selection of variables (A)		Logit regression analysis results (B)			Logit instrumentalized threshold (C)			Logit regression analysis results-fixed year effects (D)		
	Lasso Coef.	Post-est	Coef.	Std.	z	Coef.	Std.	z	Coef.	Std.	z
Serial entrepreneurship	0.0898	0.2273	1.8612	0.6025	3.09 ***	0.2247	0.0717	3.13 ***	2.9310	0.9884	2.97 ***
Time until announcement of merger	-0.0004	-0.0007	-0.0043	0.0009	-4.89 ***	-0.0007	0.0001	-5.31 ***	-0.0059	0.0014	-4.07 ***
HC target	-0.0974	-0.3109	-1.8331	0.6316	-2.90 ***	-0.3358	0.1046	-3.21 ***	-3.4762	1.1380	-3.05 ***
T-bill rate at IPO	-0.0420	-0.0718	-0.4215	0.0854	-4.94 ***	-0.1597	0.0955	-1.67 *	-0.4511	0.7192	-0.63
Instrumentalized Threshold						-0.0063	0.0067	-0.93			
SPAC structure at IPO											
Foreign Issuer									-0.6954	1.0445	-0.67
Filing_IPO_Days									-0.0044	0.0023	-1.97 **
China focused acquisition									1.4868	0.7055	2.11 **
Double Unit									0.2460	1.7222	0.14
Threshold									-0.0021	0.0409	-0.05
PIPE									-1.8703	0.7024	-2.66 ***
Dilution									-0.0258	0.0351	-0.74
IPO Oversubscription									4.2062	1.4752	2.85 ***
SPAC Size									0.0071	0.0028	2.59 ***
Size Dummy									-1.5081	1.4931	-1.01
Escrow_Dummy									2.3731	0.8268	2.87 ***
Warrant Overhang									-0.1047	0.6495	-0.16
Rights									-22.9106	15.4991	-1.48
IPO_Hot									0.8044	2.0065	0.40
Listing exchange									-0.6274	0.6994	-0.90
Managerial Involvement											
SPAC team size									0.3740	0.1535	2.44 ***
Founders age at IPO									-0.0573	0.0452	-1.27
CEO Military									-1.3025	1.6457	-0.79
CEO Else before SPAC									0.3568	0.5418	0.66
CEO Foreign									-0.8222	0.5742	-1.43
CEO Public									-0.2404	1.0235	-0.23
Ceo PhD									2.1924	1.4272	1.54
CEOLawDegre									-0.3547	0.8819	-0.40
CEOMBA									0.8888	0.5531	1.61
Carlyle previous experience									1.0325	1.3174	0.78
Healthcare target									-0.2846	0.5648	-0.50
Founder Private Equity Experience									-0.2271	0.5586	-0.41
Special Advisors									0.4422	0.6112	0.72
Entire team previously involved									-0.6892	0.9694	-0.71
Focus of merger at IPO date									1.1143	0.5869	1.90 *
Prior Involvement									-0.3445	0.7126	-0.48
Underwriting Involvement											
Underwriter Quality									1.8975	0.7973	2.38 ***
EarlyBirdCapital									1.4966	0.8623	1.74 *
Multiple Lead									0.5338	1.0356	0.52
Defereed fee until merger									0.2600	0.3098	0.84
Total underwriting fee									0.4047	0.3099	1.31
Underwriters Units									-0.9551	1.3019	-0.73
Syndicate size									0.0551	0.1596	0.34
Macroeconomic factors											
Vix_IPO									0.0512	0.1010	0.51
Russell2000_IPO									-0.0021	0.0039	-0.54
PI3_Index									-0.0441	0.0746	-0.59
Pinews_Index									0.0206	0.0427	0.48
ANN_PI									0.0012	0.0039	0.32
ANN_EqInd									-0.0016	0.0030	-0.52
GDPgrowth									0.1570	0.2066	0.76
Constant	0.9635	1.1747	1.6888	0.5587	3.02	3.9315	0.5979	6.58	8.8703	12.2721	0.72
Lambda	27.57										
Mc Fadden R square			21.35%			22.89%			47.69%		
LR Ratio			69.67			78.27			155.64		
Number of observations	259		259			259			259		

Appendix 1. Variable Definitions

Variable names	Variable definitions
Merger outcome	
Merged (Y/N)	Dummy variable coded as 1 if SPAC successfully conducted acquisition and 0 otherwise
SPAC structure at IPO	
Foreign Issuer	Dummy variable coded as 1 if SPAC filed registration statement with SEC as a foreign issuer and 0 otherwise
Filing_IPO_Days	Number of days between first filing of registration statement with the SEC and an IPO date
China focused acquisition	Dummy variable coded as 1 if SPAC in proposed business paragraph mentions China as a target and 0 otherwise
Double Unit	Dummy variable coded as 1 if SPAC is structured by issuing two types of units and 0 otherwise
Threshold	Percentage of shareholders that can stop acquisition despite of the votes of the remaining ones
PIPE	Dummy variable coded as 1 if SPAC managers purchase units at the IPO date and 0 otherwise
Dilution	The level of dilution to new investors in SPACs
IPO Oversubscription	IPO oversubscription variable in the range of 0 to 1.
SPAC Size	Size of SPAC at IPO
Size Dummy	Dummy variable coded as 1 if SPAC is four times larger than the average SPAC and 0 otherwise
Escrow_Dummy	Dummy variable coded as 1 if SPAC management deposited higher amount of funds in escrow account than raised in IPO and zero otherwise
Warrant Overhang	Variable that calculates whether warrants purchased by investors are "in the money". Calculated as: (Warrant strike price* number of warrants in the unit)/Unit price at IPO
Rights	Dummy variable coded as 1 if SPAC uses rights in the IPO and 0 otherwise
IPO_Hot	Dummy variable coded as 1 if SPAC IPO happened during the year with higher than average IPO activity and 0 otherwise
Time until announcement of merger	Number of days between IPO and an announcement of merger date
Listing exchange	Dummy variable coded as 1 if SPAC is listed on major exchange at the IPO and 0 otherwise
Managerial Involvement	
SPAC team size	Number of founders in SPAC team
Founders age at IPO	Average age of founders at the time of IPO
CEO Military	Dummy variable coded as 1 if SPAC manager served in military and 0 otherwise
CEO Else before SPAC	Dummy variable coded as 1 if SPAC manager was CEO in the past and 0 otherwise
CEO Foreign	Dummy variable coded as 1 if SPAC manager was born outside U.S. and 0 otherwise
CEO Public	Dummy variable coded as 1 if SPAC manager was CEO of the publicly listed company in the past and 0 otherwise
Ceo Phd	Dummy variable coded as 1 if SPAC manager earned Phd degree and 0 otherwise
CEO Law Degree	Dummy variable coded as 1 if SPAC manager earned Law degree and 0 otherwise
CEO MBA	Dummy variable coded as 1 if SPAC manager earned MBA degree and 0 otherwise
Carlyle previous experience	Dummy variable coded as 1 if SPAC manager worked for Carlyle at one point of time and 0 otherwise
Healthcare target	Dummy variable coded as 1 if SPAC in proposed business paragraph mentions healthcare industry as a target and 0 otherwise
Founder Private Equity Experience	Dummy variable coded as 1 if SPAC manager worked in private equity of venture capital company at one point of time and 0 otherwise
Special Advisors	Dummy variable coded as 1 if SPAC managers include special advisors in their team and 0 otherwise
Entire team previously involved	Dummy variable coded as 1 if SPAC team includes at least three executives from prior SPAC and 0 otherwise
Focus of merger at IPO date	Dummy variable coded as 1 if SPAC in proposed business paragraph mentions clear focus of target and 0 otherwise
Prior Involvement	Dummy variable coded as 1 if SPAC managers were involved in the SPACs in the past at once and 0 otherwise
Serial entrepreneurship	Dummy variable coded as 1 if SPAC managers were involved in forming at least three SPACs and 0 otherwise
Underwriting Involvement	
Underwriter Quality	Dummy variable coded as 1 if SPAC is underwritten by mezzanine investments banks and 0 otherwise
EarlyBirdCapital	Dummy variable coded as 1 if one of SPAC underwriters is EarlyBirdCapital and 0 otherwise
Multiple Lead	Dummy variable coded as 1 if SPAC is underwritten by joint effort and 0 otherwise
Deferred fee until merger	Percentage amount of deferred fee conditional on the success of SPAC acquisition
Total underwriting fee	Total amount of underwriting fees
Underwriters Units	Dummy variable coded as 1 if SPAC underwriters purchase units at the IPO date and 0 otherwise
Macroeconomic factors	
TBill_IPO	Level of T-bill rate at the IPO date
Vix_IPO	Level of The CBOE Volatility Index (VIX) at the IPO date
Russell2000_IPO	Level of Russel 2000 Index at IPO date. Russel 2000 is a common performance benchmark in SPAC literature.
PI3_Index	Level of Political Uncertainty Index at IPO date
PInews_Index	Level of Political Uncertainty Index News Index at IPO date
ANN_PI	Level of Political Uncertainty Index at the announcement of merger date
ANN_EqInd	Level of Equity Uncertainty Index at the announcement of merger date
GDPgrowth	Level of the real gross domestic product growth rate at IPO date

Appendix 2: Correlation coefficients of main independent variables used in logit regression.

Corelation table A

	Serial entrepreneurship	China fosused acquisition	Time until announcement of merger	EarlyBirdCapital	Focus of merger at IPO date	Threshold
Serial entrepreneurship	1.00					
China fosused acquisition	0.05	1.00				
Time until announcement of merger	-0.03	0.09	1.00			
EarlyBirdCapital	0.08	0.20	0.03	1.00		
Focus of merger at IPO date	-0.06	0.16	-0.17	-0.04	1.00	
Threshold	0.09	-0.10	0.13	0.02	-0.28	1.00

Corelation table B

	Threshold	T-bill rate at IPO
Threshold	1.00	
T-bill rate at IPO	-0.85	1.00

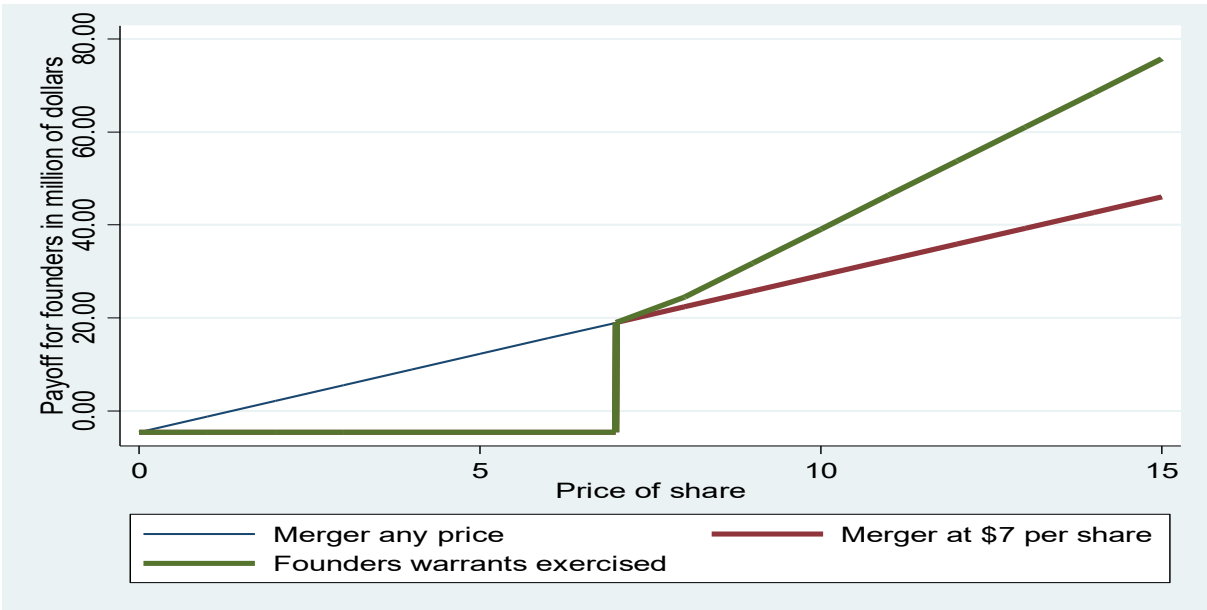
Appendix 3: Threshold regression analysis

This table reports results from logit regression analysis based on three specification. The sample consists of 259 SPACs that conducted their IPO in period 2003-2017 and resolved their corporate status by December 31th, 2018. The dependent variable for regression equals 1 if the SPAC merged, and 0 if the SPAC liquidated. The symbols *, **, and *** represent statistical significance of coefficients at the 10%, 5% and 1% level.

Variables	Linear regression analysis results			
Serial entrepreneurship	-0.8165	2.7774	-0.29	0.77
EarlyBirdCapital	2.1373	2.5015	0.85	0.39
T-bill rate at IPO	-11.4005	0.5218	-21.85	0.00 ***
<i>Managerial Involvement</i>				
SPAC team size	0.6996	0.5218	1.34	0.18
Founders age at IPO	0.4077	0.1547	2.64	0.01 ***
CEO Military	6.2415	4.6315	1.35	0.18
CEO Ivy	-3.1384	2.1035	-1.49	0.14
CEO Gender	-9.2882	4.2291	-2.20	0.03 **
CEO Else before SPAC	-1.3514	1.8621	-0.73	0.47
CEO Foreign	0.9878	2.0360	0.49	0.63
CEO Public	-1.3747	2.7979	-0.49	0.62
Ceo PhD	0.3789	4.8286	0.08	0.94
CEO Law Degre	1.1564	2.8861	0.40	0.69
CEO MBA	1.5513	2.0815	0.75	0.46
Founder Private Equity Experience	-3.6534	1.8870	-1.94	0.05 *
Special Advisors	-2.0098	2.0491	-0.98	0.33
Prior Involvement	4.4527	2.2113	2.01	0.05 *
<i>Underwriting Involvement</i>				
Underwriter Quality	-2.0730	2.1649	-0.96	0.34
Multiple Lead	4.8362	2.7625	1.75	0.08
Defereed fee until merger	3.5768	0.7319	4.89	0.00 ***
Total underwriting fee	-5.8020	0.6539	-8.87	0.00 ***
Constant	89.5809	10.7086	8.37	0.00
R square	85.26%			
Number of observations	259			

Graph 1 : Founders payoffs

Payoffs for SPAC managers are presented using institutional characteristics of the average SPAC in the sample to calculate it. SPAC founders receive 20.00% of shares after the IPO. On average their capital at risk is \$4.65 million that can only be recuperated if the SPAC completes the merger. Three possible payoffs are presented. In the first a merger happened and share has any price. In the second the merger price is \$7 per share. In the third a potential payoff for SPAC founders includes possibility to exercise warrants.



Graph 2 : Founders total returns

Total potential returns for SPAC managers are presented using institutional characteristics of the average SPAC in the sample to calculate it. SPAC founders receive 20.00% of shares after the IPO. On average their capital at risk is \$4.65 million that can only be recuperated if the SPAC completes the merger. Two possible returns are presented. In the first a merger happened and managers accrue gains only from share holding. In the second the gain is also accrued from exercise of warrants.

