

A Work Project, presented as part of the requirements for the Award of a Master's degree in Finance from the Nova School of Business and Economics.

Contributing Factors to the Performance of Firms Acquired by
Special Purpose Acquisition Companies

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Abstract

SPACs were one of the most discussed topics in media recently. This paper examines which factors contribute to the performance of firms that merged with SPACs. Multi-linear regression analyses are performed with a sample of 77 different firms acquired between 2006 and 2020. Initiators (sponsors) of SPACs are often considered well experienced in their industries. This study confirms that if a sponsor took over the CEO role in the operating company, it positively impacts returns, especially in complex industries. Eventually, it can be concluded that sponsors' involvement in the merged entity's management team positively impacts returns regardless of the industry.

Keywords

Corporate Finance, SPACs

deSPACs

Special Purpose Acquisition Company

SPAC vehicle

Performance

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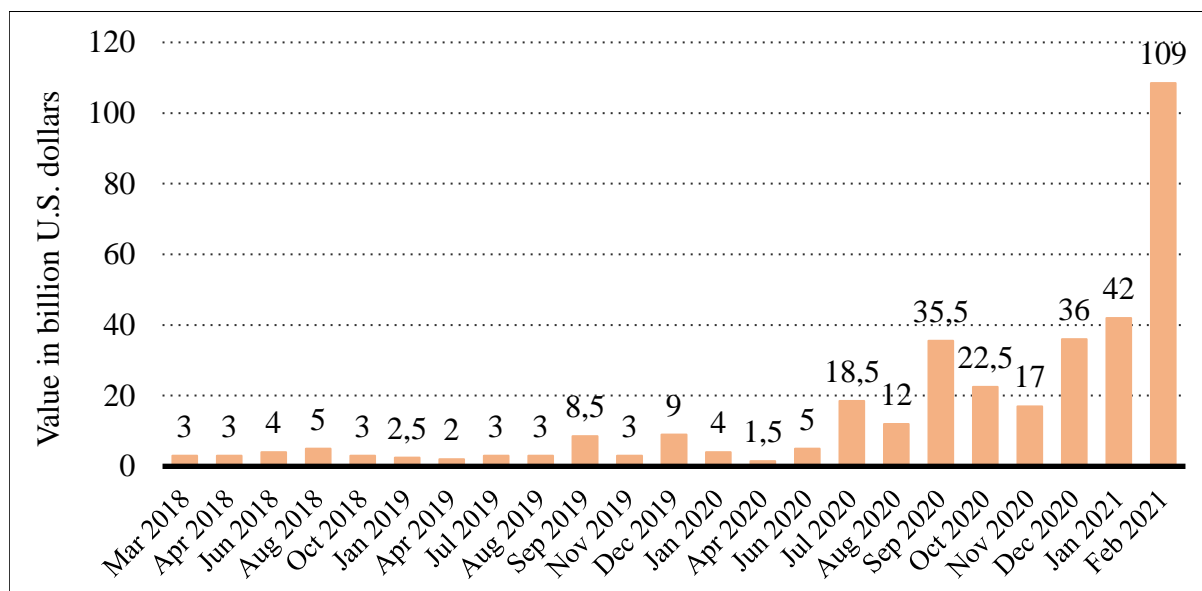
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1 Introduction

After the Special Purpose Acquisition Company (hereafter “SPAC”) market reached records highs in volume in 2020, in the first half of 2021, it has been flourishing even faster. This trend can be observed in new initial public offerings (hereafter “IPO(s)”) of SPAC vehicles and acquisitions conducted by SPACs, which reached a volume of \$166 billion in the first quarter of 2021. This volume accounts for approximately 30 percent of all M&A deals in the US, by value, in this period (Rajvanshy 2021). Firms such as “Lucid Motors”, “DraftKings”, or “Virgin Galactic” choose the route of going public via a SPAC. The SPAC called “Altimeter Growth Corp”, recently conducted the largest SPAC acquisition in history, buying and taking public the ride-hailing firm “Grab” (The Financial Times 2021).

Figure 1

Value of SPAC M&A deals completed worldwide (in billion U.S. dollars)



This figure shows the value of completed mergers done by SPACs, from March 2018 to February 2021 in billion US Dollars (Statista, The Financial Times, Refinitiv 2021, adjusted).

This paper focuses on acquisitions conducted by SPAC vehicles subjected to the regulators' rules in the United States, the Securities and Exchange Commission (hereafter "SEC"). Moreover, this paper excludes deSPAC firms that operate in the financial- or real estate sector. Numerous research shows that SPACs underperform the market and firms that go public via traditional IPOs. This finding is factual under specific circumstances concerning factors such as size or industry (Tykvová and Kolb 2016). While this finding can mostly be confirmed, this paper aims to address the specific factors contributing to deSPAC (under-)performance rather than comparing firms that go public via a traditional IPO and deSPAC firms. The focus is solely on the operating companies (target), not the SPAC vehicle. Previous research suggests that SPAC managers (also often referred to as "sponsors", "managers", or "promoters" (Vulanovic and Lakicevic 2011)) often possess more relevant experience and industry knowledge than other firms such as traditional IPO firms (Kim 2009). This paper investigates which factors (positively or negatively) contribute to the performance of firms that merged with SPACs. In particular, this paper examines which factors attributable to the merged entity's management influence returns. The analyses also consider influences on the origin of the sponsor. Sponsors could be private equity funds, hedge funds, or other investment companies (Vulanovic and Lakicevic 2011). The clear focus on management characteristics can be seen as the main value-added to previous research.

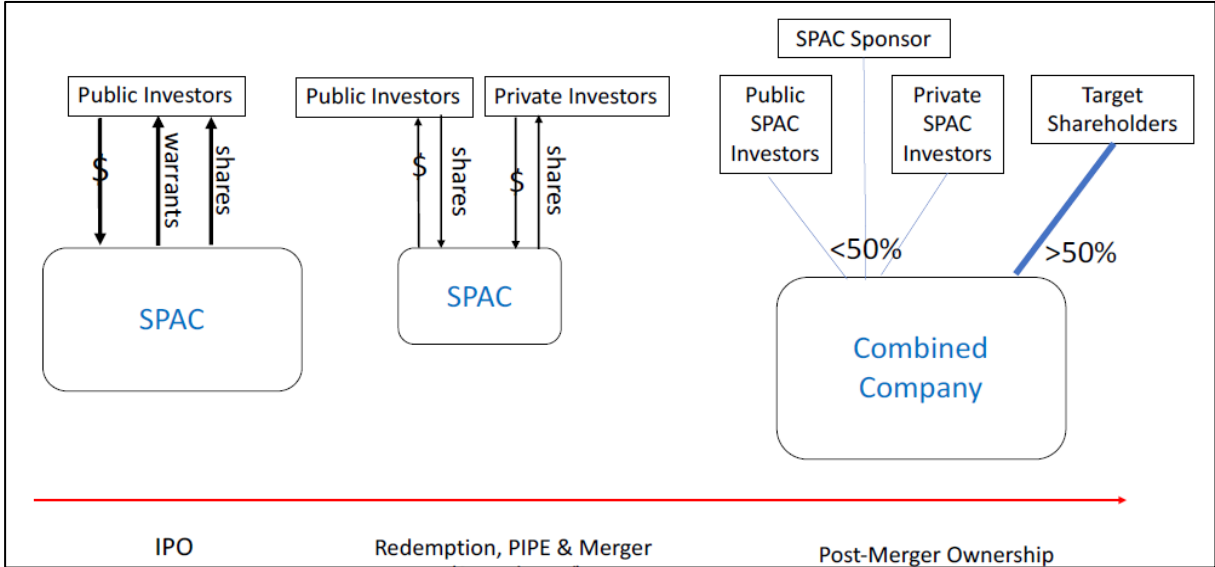
2 General Structure and Key Characteristics of SPACs

In the process of a SPAC deal, several participants are included (Chong et al. 2021). These participants are: the sponsors, the investors, and the owner(s) of the private company (Chong et al. 2021), hereafter referred to as “deSPAC”, “the target”, or “the operating company”.

The process can be broken down into three stages. The first stage is the creation of the SPAC itself, which is done by sponsors. In order to bring the SPAC, public sponsors have to deliver all relevant filings that are necessary when going public (CB Insights 2021). That means the exact legal terms are applied as with all other firms. However, as a SPAC has no operating business because it is only a vehicle to acquire another company, the process is faster and easier (CB Insights 2021).

In the following, the SPAC-merger process is briefly explained by commenting on the various steps shown in figure 2.

Figure 2
SPAC Merger Process



This figure shows the simplified SPAC merger process divided into three steps (Ruan, Klausner, and Ohlrogge 2020, adjusted).

IPO: A SPAC raises cash through an IPO by giving out units (usually \$10 per unit) which consist of warrants (derivates) and shares. Most of the money raised is deposited in escrow accounts. (Gahng, Ritter, and Zhang 2021).

Redemption, PIPE & Merger: Once the SPAC is public, it has two years to identify and acquire a private company. The acquisition has to be approved by the shareholders (Ruan, Klausner, and Ohlrogge 2020). A notable characteristic of SPACs is that shareholders have the right to redeem their shares upon the de-SPAC phase. If they do so, they reclaim their investment, including any interest accrued through escrow accounts. This right creates uncertainty for sponsors because if too many shareholders redeem their shares, the leftover cash could not be sufficient to finance the acquisition. In order to mitigate this risk, sponsors often invite PIPE (Private Investment in Public Equity) investors to invest (Gahng, Ritter, and Zhang 2021). The participation of PIPE investors provides additional cash to finance the acquisition (Gahng, Ritter, and Zhang 2021).

Post-Merger Stage: If the transaction has been approved, the target continues its operations as a public company (Cumming, Haß, and Schweizer 2014). At this point, people often refer to the “de-SPAC”-phase. The sponsors usually do not receive any salary for their efforts. However, they get access to discounted equity and warrants prior to the IPO. These shares can be sold at any time after the lock-up period ends (Cumming, Haß, and Schweizer 2014). Various other agreements are often used. However, an in-depth explanation would go beyond the scope of this paper. In general, sponsors only receive the equity with the stipulation that an acquisition will occur within the defined time period (Cumming, Haß, and Schweizer 2014). After this step, the new ownership structure is set, and the company target is public. The process is completed. Overall, one could argue that this construction leads to a high dependency on a successful acquisition. Therefore, it could be assumed that sponsors, investors, and the target company’s share the same interest. In theory, sponsors should be incentivized to find a well-performing

target (Cumming, Haß, and Schweizer 2014). However, one could also argue that sponsors are only incentivized to find any target at all, no matter if the target is promising or not (Cumming, Haß, and Schweizer 2014).

Going public through a SPAC may have some advantages for a target company compared to the traditional way of going public. One advantage can be seen in the higher certainty and control regarding the price and the other deal terms (U.S. Securities and Exchange Commission 2021). The target negotiates with the acquirer (the SPAC) and agrees on a fixed price. Previous research in this field also states that taking a firm public via a SPAC is expected to be executed faster as the operating company does not have to go through the entire SEC registration process as they would have to in a traditional IPO (Tykvová and Kolb 2016). Moreover, choosing the SPAC route is often considered as a cheaper way of going public (Tykvová and Kolb 2016). However, this depends on which perspective one assumes a SPAC to be cheap. While researchers agree on SPACs being comparatively cheap from the target's perspective, this might not be true from an investor perspective as going public via SPACs can have dilutive effects (Ruan, Klausner, and Ohlrogge 2020)

Choosing the SPAC route of going public might also have some disadvantages. Although the potential target has certainty regarding the purchase price and deal terms, it still faces uncertainty if the takeover will follow through, as the acquisition needs to be approved by shareholders of the SPAC vehicle (Tykvová and Kolb 2016). If the shareholders ultimately reject the acquisition, the time, and efforts both parties dedicated to the process, were in vain (Tykvová and Kolb 2016).

3 Previous Research

Due to the tremendous rise in popularity, research in this field continues to rise. As a result of the extensive literature review conducted to create this paper, it can be said that, in general, researchers often focus on the entire lifetime of a SPAC vehicle from IPO to merger and beyond. This is a key difference to this paper, focusing only on the deSPAC phase. As shown in section 1, SPAC mergers have mainly surged in the last few years, which might limit certain studies in this field. The paper of Tykvová and Kolb (2016) can be seen as an influential paper in this field. For a horizon from 2003 to 2015, Tykvová and Kolb (2016) studied the performance of SPAC firms compared to the market and comparable IPO firms. They found that SPAC firms severely underperform in comparison. Agrawal, Jaffe, and Mandelker (1992) found significant negative post-merger returns of firms acquired by SPACs. Being aware of drastically changed regulations and the paper being far back in time, some principles and findings might still be applicable. The study of Ruan, Klausner, and Ohlrogge (2020) showed that in most cases, the share prices of SPACs fall after a merger. Furthermore, the study of Ruan, Klausner, and Ohlrogge (2020) elaborates on the costs structure built into SPACs and SPACs are far higher than previously recognized in the context of this study. They also consider dilutive effects investors might face when investing in outstanding shares of a SPAC. Another relevant study in this area that has to be mentioned is the paper of Cumming, Haß, and Schweizer (2014). Amongst others, they found that active investors, defined as financial sponsors and hedge funds, negatively impact the approval probability of shareholders to approve a respective merger of a SPAC. Dimitrova (2017) interestingly found that SPAC performance worsens for acquisitions closer to the predetermined two-year deadline. In the study of Kim (2009), it is shown that SPAC management has more industry experience than management teams from traditional IPO firms. Of course, also some basic principles such as

the theories of (Modigliani and Miller 1963) or Fama and French (1992) remain crucial to draw conclusions, assumptions or hypotheses.

4 Data

The data used for the sake of the regression performed are mainly retrieved from Refinitiv EIKON, The Center for Research in Security Prices (CRSP), SDC Platinum, as well as from the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) operated by the SEC. To identify SPAC relevant managers before the IPO, forms such as Form 424 were used (the idea for this procedure is inspired by the study of (Cumming, Haß, and Schweizer 2014)). The information of relevant SPAC managers before the IPO was necessary to identify the relevant firms and sponsors involved reliably. Some data, such as (monthly) stock prices, were easily accessible through CRSP. However, a substantial amount of data was not presented in a structured form. In particular, the variables that are not easily retrievable such as the average age of the board members of a specific firm required an extraordinary effort. These and other data were hand-collected and calculated individually for every firm (77 different firms). Besides the findings of this paper, this extensive data collection work can be seen as a major contribution to existing research. Relevant SPAC mergers were identified through Refinitiv Eikon and SDC Platinum. In order to guarantee the usage of correct and audited data, most data were cross-checked against each other or to other data providers such as S&P CapitalIQ or Bloomberg. Cross-checking was also mainly done manually as identifiers of different platforms (e.g., Ticker symbols or respective unique numeric identifiers), such as Eikon and Bloomberg, are different and cannot be matched automatically across platforms. The relevant data for the benchmark is retrieved through Compustat. A further value this study creates is the variable selection for the regression model.

The variable selection is the result of extensive literature review and research on SPACs. Furthermore, each variable was tested if it contributes to the explanation power of the overall model. The detailed reasoning for the inclusion of the most relevant variables can be found in section 5. Fundamental variables such as Total Assets (=variable *Size*) were retrieved through Compustat. The variable *Volatility* (described in table 1) was only available annually. However, all other variables were available quarterly. This circumstance was taken into account before running each regression. In addition, to control for cross-sectional industry effects, each firm possesses a particular SDC macro industry classification. These industry groups are defined and retrieved from Eikon/SDC. In total, the sample concludes 77 firms from ten different industry groups. The industries “High Technology”, “Industrials”, and “Energy and Power” occurred the most within the sample. The paper observes deSPAC transactions from 2006 to 2020.

Table 1

Variables, Units, Descriptions & Sources

Variable Name	Unit	Description	Source
Size	The natural logarithm of Total Assets	Total Assets (in \$m) are used as a measurement of size.	Compustat
Days to merger	Number	The number of days it takes the SPAC from the IPO to the acquisition (announcement) of the target.	Eikon
Number of Sponsors on board	Number	The total amount of people which have been on the board and who have been associated with the sponsor.	Eikon, EDGAR, CapitalIQ
Average age board	Number	The average age of all board members the company had over its entire life upon the time t.	Eikon, CapitalIQ
Sponsor CEO	Dummy	1 if the company ever had a CEO who was associated with the sponsor, 0 otherwise.	Eikon, EDGAR, CapitalIQ
Financial Sponsor	Dummy	1 if a financial sponsor was involved, 0 otherwise.	Eikon, SDC Platinum
Debt/Equity	Ratio	The ratio between the total debt and the total equity of the company at time t.	Compustat
Sales Growth	Percentage	The change in total sales between time t and time t -1	Compustat
Current Ratio	Ratio	The ratio between the total annual current assets and the total annual liabilities of a company at time t.	Compustat
Volatility	Percentage	Volatility, fair value calculation for stock options.	Compustat

5 Contribution Factors: A broad view

As mentioned, SPACs themselves have unique characteristics such as the sponsors' experience (Kim 2009). Therefore, it seems reasonable that these unique characteristics transfer to the firms acquired by a SPAC. The following sections discuss possible determinants (shown in *Italic*) that might influence deSPAC performance (measured by excess returns). The determinants discussed are not the only variables included in the regression analyses but the most relevant ones. Please refer to table 1 for all main variables included in regression analyses.

Furthermore, for the most relevant variables, hypotheses are defined. A regression with three different specifications is performed. Finally, the results of the analyses are discussed and interpreted.

5.1 Size

Fama and French showed that the size factor of a firm influences its risk, which is reflected in returns (Fama and French 1993). This finding also makes sense when considering deSPAC firms not only from the perspective of the theory of Fama and French (1993) but also from a cost perspective. An IPO is more costly than a SPAC IPO for the target firm (Tykvová and Kolb 2016). Furthermore, smaller companies could lack in capabilities (e.g., personnel or necessary specialists) to go through the entire IPO process without losing focus for their operating business (Tykvová and Kolb 2016,). From this perspective, it seems intuitive that deSPAC firms are relatively small companies, measured by total assets. As smaller firms are generally expected to generate higher returns (Fama and French 1993), it is hypothesized that *Size* will negatively impact returns as it goes up, reflecting the lower risk of larger firms.

5.2 Days to Merger

As previously discussed, most SPACs only have up to 24 months to complete an acquisition, which must be shareholder approved. The form of the compensation, briefly described in section 2, suggests that sponsors are incentivized to find a target as soon as possible. However, as research by Cumming, Haß, and Schweizer (2014) logically suggests, shareholders would question the proper quality of the screening process of the target and would therefore be less likely to approve the transaction. By implication, this would mean that a longer screening process results in a better target selection, but the longer sponsors need, the less time they have to turn around and look for another target (Cumming, Haß, and Schweizer 2014). Nevertheless, it seems to make more sense that returns are impacted rather positively as time increases due to a more thorough screening process. This is subjected to the assumption that the time taken for the selection process correlates with a more in-depth analysis of a potential target. This assumption could be questioned. Furthermore, research suggests that the performance is worse for acquisitions announced closer to the acquisition deadline (Dimitrova 2017). Because of the vulnerable assumptions underlying and because of the findings of Dimitrova, it is hypothesized that this determinant will only have a small statistical relevance on impacting returns either positive or negative.

5.3 Average Age Board

For the variable *Average Age Board*, one has to differentiate between the SPAC itself and the operating company acquired by the SPAC. In general, previous research suggests that experience correlates positively with age (Hogan and McPheters 1980). It seems to be valid to assume, that experience has a positive correlation with returns (Cumming, Haß, and Schweizer 2014).

However, Cumming, Haß, and Schweizer (2014), found that younger management could, in a certain way, be beneficial for the performance of the SPAC as a vehicle. As this paper focuses exclusively on the performance of the operating company, the traditional view is assumed. Therefore, it is hypothesized that a higher average age of sponsors on board will positively impact returns.

5.4 Debt-To-Equity Ratio

The debt-to-equity ratio (D/E) has been part of numerous academic studies such as Modigliani and Miller (1963) and is a crucial figure. In a non-theoretical environment, taxes occur, and this is when the debt-to-equity ratio influences firm returns. A reason for this is the tax shield (Modigliani and Miller 1963). As a firm makes an active decision on its financing structure, it is hypothesized that it will first have a significant impact on deSPAC returns. Secondly, it should positively impact returns, as in some cases, a higher D/E ratio leads to higher returns (Berk and DeMarzo 2020). This is due to tax shield, a detailed explanation would go beyond the scope of this thesis. However, this remains only true up to a certain level from where more debt would no longer make sense because it would have to bear more and more of the entire firm risk, which would lead to the same or even a higher risk level as equity would have (Berk and DeMarzo 2020). The risk can even be higher due to debt service (principal + interests) that has to be paid. This obligation doesn't exist when financing the firm with equity (Berk and DeMarzo 2020).

5.5 Regression Model and Methodology

Regression is performed to evaluate the potential influence on BHAR (buy and hold abnormal return, defined in this section) of a deSPAC firm. The observation period is January 2006 to December 2020. Since different rules in different countries apply to the origination and mergers of SPACs, only SPACs regulated by the SEC are observed. However, this does not necessarily exclude foreign firms as long as they are subjected to the rules of the SEC. In line with previous research (Tykvová and Kolb 2016) the index Russel 2000 is used as a benchmark. The Russel 2000 is a subset of small-cap stocks of the Russel 3000, an index representing the largest 3000 US companies (FTSE Russel). The sample only concludes firms that a SPAC acquired during the observed period. The total number of observed firms can vary from year to year. This is due to delisting's and new deSPACs that occurred.

The regression model can be written as follows:

$$\begin{aligned} BHAR_t = & \alpha + \beta_1 Size_i + \beta_2 Days\ to\ merger_i \\ & + \beta_3 Number\ of\ Sponsors\ on\ board_i \\ & + \beta_4 Average\ age\ board_i + \beta_5 Sponsor\ CEO_i \\ & + \beta_6 Financial\ Sponsor_i + \beta_7 Debt/Equity_i \\ & + \beta_8 Sales\ growth_i + \beta_9 Current\ Ratio_i + \beta_{10} Volatility_i \\ & + \varepsilon_{it} \end{aligned} \quad (1)$$

All variables used in the regression model are defined as stated in Table 1.

The return is defined as an excess return over the benchmark. Therefore, the dependent variable *BHAR* (buy and hold abnormal return) can be defined as follows:

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

where *R* describes the return of the respective deSPAC *i* at time *t* and *R_{mt}* describes the return of the benchmark *m* at time *t*. For all returns, Log returns are used.

Specification 1 controls for cross-sectional year fixed effects. Specification 2 controls for industry fixed effects. In the context of the regression, various statistical tests have been performed. In the variable selection process, tests for multicollinearity were performed by examining each variable's variance inflation factor. A threshold of < 5 was set to eliminate variables in order to reduce the risk of including multicollinear variables. In addition, the Durbin-Watson test was performed to test for autocorrelation problems. In order to be able to detect heteroskedasticity, the Breusch-Pagan test was used. Furthermore, groupwise heteroskedasticity was checked by using the modified Wald test. After the null hypothesis could be rejected, it was corrected for heteroskedasticity using robust standard errors.

5.6 Main Results

Table 2

Coefficients of the main regression with BHAR returns as dependent variable

Variable	Specification (1)	Specification (2)	Marginal effect (2-1)	Specification (3)
Size	-0.21032** (0.10455)	-0.32522*** (0.00766)	-0.1149	0.17331*** (0.06377)
Days to merger	0.00004 (0.00009)	-0.00266*** (0.00010)	-0.0027	0.00000 (0.00011)
Number of Sponsors on board	0.01725 (0.01125)	0.25148*** (0.01128)	0.23423	0.03349** (0.01523)
Average age board	0.01614** (0.00641)	-0.00047 (0.0099)	-0.01661	0.01205 (0.00763)
Sponsor CEO	0.19164** (0.07563)	0.18773 (0.13437)	-0.00391	-0.03600 (0.10925)
Financial Sponsor	0.00043 (0.07363)	-0.03772 (0.11042)	-0.03815	-0.13832** (0.05925)
Debt/Equity	0.03606*** (0.00138)	0.26439*** (0.02553)	0.22833	-0.00119 (0.00073)
Sales growth	0.00333 (0.00296)	0.00219 (0.00294)	-0.00114	0.13764 (0.09455)
Current Ratio	0.03886*** (0.01160)	0.03812** (0.01442)	-0.00074	-0.00863 (0.01217)
Volatility	-0.00210** (0.00077)	-0.00255* (0.00132)	-0.00045	0.00027 (0.00135)
Year fixed effects	Yes	Yes		No
Quarter fixed effects	No	No		Yes
Industry fixed effects	No	Yes		No
Number of Observations	81	50		188
R ²	0.5202	0.4357		0.1215
Adjusted R ²	0.4517	0.2910		0.0718

This table shows the output of the regression defined in equation 1 and described in section 5.5. Specification 1 controlled year-fixed effects. In addition, it is controlled for industry-fixed effects (specification 2). The marginal effect compares both specifications by showing the marginal difference between them. In addition, specification 3 controls for quarter fixed effects. The dependent variable (BHAR) is described in equation 2. Relevant statistical tests have been done as described in section 5.8. All variables are defined as described in Table 1. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All robust standard errors are shown in parentheses.

In the following, the results of the regression performed (table 2) are discussed.

Considering *Size* the regression shows significance across all specifications. In general, rather relatively small firms tend to go public via deSPACs (Tykvová and Kolb 2016). The regression suggests that deSPAC firms in the sample suffer a decrease in returns when getting larger, measured by total assets. This result is not surprising as it shows that considering the size factor, returns of deSPAC firms behave the same way traditional businesses behave shown by (Fama and French 1993). Furthermore, the regression shows that the coefficient of *Days to merger* is only significant when considering industry-fixed effects. Interestingly, the coefficient is no longer negative when controlling for industry-fixed effects. However, the coefficient is very small. The reasoning for this could be that too many factors may impact the eventual date of the announcement, and it is hard to explain the impact on returns in this relation. The coefficient of the *Average age board* indicates a positive influence on returns which is statistically significant. This result is congruent with the findings of Hogan and McPheters (1980), that experience correlates with age. This finding is interesting because Cumming, Haß, and Schweizer (2014) found a negative correlation between the increase in age and returns in their study. However, the critical difference here is that they considered the SPAC vehicle itself and not the operating entity after the SPAC merger. This contrariety between existing research and the presented finding shows a notable difference between pre and post-merger performance determinants.

As expected, *Debt/Equity* has a significant impact on returns. Investors acknowledge this actively made decision. The regression shows that a higher debt-to-equity ratio leads to a positive impact on returns for deSPACs. The significant impact is not surprising since the financing structure is one of the most important decisions a firm has to make (Hussan 2016). The regression analysis also shows a substantially higher impact on returns when controlling for industry-fixed effects. In general, it can be assumed that the capital structure varies a lot between industries.

6 Contribution Factors: Industry-specific analysis

Companies that go public via a SPAC often operate in industries that one could call “alternative”. For instance, the electric truck producer Nikola Motor (acquired by the SPAC “VectoIQ” in 2020 (Nikola Motor Corp 2020)) might not attract an investor who prefers traditional businesses. Also, the spaceflight company Virgin Galactic (acquired by the SPAC Social Capital Hedosophia” (Virgin Galactic Inc 2021)) can be seen as a company that operates in an industry that could be called “alternative”. However, one could argue that this, in particular, makes deSPAC firms attractive (The Economist 2021). By no means, businesses that are rather seen as “traditional” or relatively “stable” do not go public via a SPAC merger. On the contrary, the industry classification “Industrials” is the second most presented in the sample covered in this paper. The industry “High Technology” is the one that occurs the most in the sample. Either way, it is intuitive that industries matter. In addition to the regression analysis presented in section 5, this section analyzes which impacts those variables have that are rather related to the management (such as the total *Number of Sponsors on Board*). As in section 5, not every variable is discussed, but rather the most relevant ones. The focus is to compare companies operating in industries that could be alleged as “more complex” with those working in sectors that might be alleged as “less complex” industries.

Of course, this is highly subjective but still intuitive. For instance, a company such as “DermTech Inc” (covered in the sample) develops machines and products supposed to detect early skin diseases such as skin cancer (DermTech Inc 2019). Such a company seems to be more complex than enterprises from other sectors, e.g., the “Consumer Products and Services” sector.

6.1 Number of Sponsors on Board

In contrast to a traditional company, one can say that the management of a SPAC vehicle requires more experience and reputation (CB Insights 2021). The SPAC only has a single opportunity to find and merge with a promising target. Therefore, one could argue that the selection process should be thorough and done by experts of the specific industry. When comparing deSPACs to traditional IPOs, it can be assumed that SPAC vehicles possess management with more industry experience (Kim 2009). This edge in experience can significantly affect returns (Kim 2009). If the SPAC managers (or some of them) also transfer to the target company's management, this experience could be used in the operating company. It is hypothesized that more complex industries require even higher management quality and that the *Number of Sponsors on board* will positively impact the returns of deSPACs.

6.2 Sponsor CEO

Through the extensive data collecting process for this paper, it could be observed that the CEOs of deSPAC firms are not always the former CEOs of the operating firm but also individuals associated with the sponsor. This could especially be found for the transition period right after the merger. Therefore, variable *Sponsor CEO* is expected to impact deSPAC firms regardless of the industry group. However, because of the signaling theory (Blomkvist, Nocera, and Vulcanovic 2021), it is expected that the effect will be more substantial for firms operating in more complex industries.

6.3 Financial Sponsor

SPACs are often called “poor man’s private equity funds” (Dimitrova 2017). One can recognize parallels to the practice of private equity funds. Professionals are searching for a private company to acquire. Through SPACs, one could say that retail investors also have access to these investments (Dimitrova 2017). Some researchers also contradict this opinion and argue that the effects of a private equity fund are overstated (Ruan, Klausner, and Ohlrogge 2020). However, many researchers found a positive impact on returns if financial sponsors were involved. While being critical about the generalized terminus of “poor man’s private equity”, Ruan, Klausner and Ohlrogge (2020) also determined a positive effect. Considering the capabilities, network, and experts large private equity funds tend to possess (Dimitrova 2017), it is hypothesized that the involvement of financial sponsors will have a positive effect on deSPAC returns.

6.4 Regression Model and Methodology

The original sample is divided into two samples to conduct the regression in this section. One sample includes firms that might be alleged to operate in comparatively less complex industries (group 1). The other sample includes firms that might be alleged to operate in comparatively more complex industries (group 2). As in section 5, the “SDC macro industry classification” is used as an industry identifier.

Firms of group 1 operate in the following industry groups: “Consumer Products and Services”, “Media and Entertainment”, “Materials”, “Retail”, and “Consumer Staples”. An exemplary company which is within this group would be the Mexican-American restaurant chain “Del Taco”, merged in 2015 with the SPAC vehicle “Levy Acquisition Corp.” (Del Taco Holdings Inc 2015).

On the contrary, firms in group two belong to the industry groups “Healthcare”, “Industrials”, “Energy and Power”, “High Technology”, and “Telecommunications”. Apart from “DermTech Inc” mentioned before, an exemplary company of this group would be “Grid Dynamics International Inc”, an IT service company that offers services such as cloud migration to corporate clients. “Grid Dynamics International Inc” was acquired by the SPAC “ChaSerg Technology Acquisition Corp” (Grid Dynamics International Inc 2019). For this regression, the same data described in section 4 were used. The regression model can be described as shown in section 5.5 (equations 1 and 2). Also, the same statistical tests as described in section 5.5 were performed. The only change made to the first regression shown in this paper, is the underlying sample, separated by industry groups as described.

6.5 Main Results

Table 3

Coefficients of the industry group regressions with BHAR returns as dependent variable

Variable	Industry group 1	Industry group 2	Marginal effect (2-1)
Size	0.16904*** (0.05563)	0.20784 (0.14234)	0.0388
Days to merger	-0.00017 (0.00013)	0.00027 (0.00031)	0.00044
Number of Sponsors on board	0.02678** (0.13039)	0.01774 (0.04016)	-0.00904
Average age board	0.01492 (0.00821)	0.00534 (0.01401)	-0.00958
Sponsor CEO	0.00210 (0.07981)	0.17813** (0.08801)	0.17603
Financial Sponsor	-0.16100 (0.07981)	-0.22899** (0.10492)	-0.06799
Debt/Equity	-0.00120 (0.00083)	0.02644 (0.02849)	0.02764
Sales growth	0.01883 (0.04529)	0.25751* (0.14968)	0.23868
Current Ratio	-0.02644 (0.04725)	0.00277 (0.01632)	0.02921
Volatility	0.00021*** (0.00070)	0.00099 (0.00370)	0.00078
Year fixed effects	No	No	
Quarter fixed effects	Yes	Yes	
Industry fixed effects	No	No	
Number of Observations	125	81	
R ²	0.2129	0.2093	
Adjusted R ²	0.1439	0.1091	

This table shows the output of the regression defined in equation 1 and described in section 6.4. The marginal effect compares both industry groups by showing the marginal difference between them. The dependent variable (BHAR) is described in equation 2. Relevant statistical tests have been done as described in section 5.8. All variables are defined as described in Table 1. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All robust standard errors are shown in parentheses.

Surprisingly, the effect of *Number of Sponsors on Board* is not stronger for firms operating in more complex industries. While positive for both sectors, the coefficient even shows a more substantial effect for firms operating in less complex industries. A possible reasoning for this result could maybe be due to the fact that SPAC sponsors typically act as “consultants” or are seen as those by investors (Cumming, Haß, and Schweizer 2014). A higher number of “consultants” could signal less ability of the current CEO in charge (Cumming, Haß, and Schweizer 2014). Therefore, investors’ fear of having the “wrong person” as a CEO could be greater in more complex industries. This speculation can be seen as confirmed by the significant coefficient of the dummy variable *Sponsor CEO*. So it could be concluded that in more complex industries, it significantly affects returns if the CEO is a sponsor or not. Apart from that, the overall finding of the positive contribution to deSPAC returns, when considering sponsors' involvement in the merged firms, is in line with the previous research of Dimitrova (2017). The impact of the involvement of financial sponsors (*Financial Sponsor*) seems to be negative and even significantly negative when considering industry group 2. A similar result was already detected in the first regression (table 2). As both coefficients are negative, it can be concluded that it does not make a difference whether the firm operates in a more complex or less complex industry. This finding is surprising as it contradicts previous research such as Dimitrova (2017). Concluding, the financial sponsor’s influence might be overstated as Ruan, Klausner, and Ohlrogge (2020) already found. Furthermore, venture capital and private equity firms seem to prefer traditional IPOs over SPACs (Tykvová and Kolb 2016). Therefore, one could speculate that a SPAC might be seen as the “last resort” for financial sponsors, and they only do SPACs with firms they are less confident about successfully taking it public via a SPAC.

7 Conclusion

After running the regression model (equation 1) with multiple specifications and two different data samples, the initial research question of the contributing factors to deSPAC returns could be addressed. The positive contribution to deSPAC returns could be proven when sponsors were involved (*Number of Sponsors on Board*) on the board of the operating firm. While the small overall sample size might limit the comparison between more complex and less complex industries, a clear distinctive difference between these two groups could not be found. However, a fascinating result was the clear impact of a sponsor being a CEO (*Sponsor CEO*) at a company that operates in a more complex industry. Contradicting some previous studies, the positive impact of financial sponsor firms (*Financial Sponsor*) could not be confirmed.

The exclusion of financial and real estate firms can be a further limitation. However, this approach was chosen because these firms might often be subjected to stronger regulations than other firms in the sample, which might result in losing comparability.

The usage of the methodology (e.g., using *BHAR* as a dependent variable) was in line with previous research and can be seen as effective. A managerial implication of this study could be that sponsors should consider participating in the target company's board with a reasonable amount of people considering the respective industry. At least for a short period after the merger. To better understand the implications of delistings future studies could focus on delistings of deSPAC firms. This was not considered in this paper (limitation). However, the impact at the current point in time might not be substantial as not enough delistings occurred to conduct a sufficient analysis. Still, as time goes by more and more delistings will occur. As SPAC mergers continue to rise and regularly reach new record highs in terms of deal value (The Financial Times 2021), literature also continues to rise in this field. This paper contributes value to existing research in the area of deSPACs which has not been studied frequently in other research. In addition, a substantial amount of data that can't be found to be analyzed easily have

been hand-collected. The analyses conducted and the data collection work contribute significant value to existing research.

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Appendix

Table A1

Summary statistics

Variable Name	N	Mean	Std. Dev.	Min	Max
Size	561	6.01	1.20	2.60	9.02
Days	2,483	488.67	186.43	36	996
Number of Sponsors on board	2,483	1.85	1.74	0	6
Average age board	2,483	56.12	3.72	43.90	63.20
Sponsor CEO	2,483	0.07	0.26	0	1
Financial Sponsor	2,483	0.22	0.42	0	1
Debt/Equity	533	1.54	10.76	-109.82	98.27
Sales Growth	467	0.90	16.51	-4.82	355.45
Current Ratio	561	3.05	8.03	0.00	130.63
Volatility	245	54.92	18.64	24.3	106

This table shows the summary statistics for the entire dataset. All variables are defined as described in Table 1 (section 4).

Table A2

Pairwise correlation matrix regression; sample section 5

Variable	Size	Days to merger	Number of Sponsors on board	Average age Board	Sponsor CEO	Financial Sponsor	Debt/Equity	Sales Growth	Current Ratio
Size	1.0000								
Days to merger	-0.2140	1.0000							
Number of Sponsors on board	-0.0085	0.1905	1.0000						
Average age board	0.2784	0.0501	-0.1238	1.0000					
Sponsor CEO	0.0221	-0.1008	0.2570	-0.1616	1.0000				
Financial Sponsor	0.2023	-0.2368	0.2662	-0.1872	0.3374	1.0000			
Debt/Equity	-0.0887	-0.0273	-0.0487	-0.0037	-0.0421	-0.0253	1.0000		
Sales Growth	0.0046	0.0524	0.0017	-0.0488	-0.0146	-0.0242	0.0022	1.0000	
Current Ratio	0.0402	-0.0356	-0.0817	-0.0790	-0.0526	-0.0409	-0.0181	0.0394	1.0000
Volatility	-0.3250	0.0498	-0.1406	-0.1053	0.0155	-0.1381	0.0341	-0.1186	0.2208

This table shows the pairwise correlation matrix ("pwcrr") of the variables described in Table 1 (section 4). Respective values are from the data set described in section 5.5 (no industry split).

Table A3

Pairwise correlation matrix regression; sample section 6 (industry group 1)

Variable	Size	Days to merger	Number of Sponsors on board	Average age Board	Sponsor CEO	Financial Sponsor	Debt/Equity	Sales Growth	Current Ratio
Size	1.0000								
Days to merger	0.0108	1.0000							
Number of Sponsors on board	0.1130	-0.1345	1.0000						
Average age board	0.0173	0.1455	-0.1512	1.0000					
Sponsor CEO	0.0186	-0.1842	0.3569	-0.1765	1.0000				
Financial Sponsor	0.3108	-0.4956	0.2624	-0.2311	0.4983	1.0000			
Debt/Equity	-0.1365	-0.1392	0.0174	-0.0410	-0.1082	-0.1034	1.0000		
Sales Growth	0.0344	0.0747	-0.0052	-0.0609	-0.0214	-0.0309	-0.0064	1.0000	
Current Ratio	0.1624	0.1782	-0.0544	-0.1038	-0.0541	0.0031	-0.0559	0.0858	1.0000
Volatility	-0.2210	0.2645	-0.0811	-0.2429	0.0434	-0.1889	0.0261	-0.1179	0.3123

This table shows the pairwise correlation matrix ("pwcrr") of the variables described in Table 1 (section 4). Respective values are from the data set described in section 6.4 (industry group 1).

Table A4

Pairwise correlation matrix regression; sample section 6 (industry group 2)

Variable	Size	Days to merger	Number of Sponsors on board	Average age Board	Sponsor CEO	Financial Sponsor	Debt/Equity	Sales Growth	Current Ratio
Size	1.0000								
Days to merger	-0.2914	1.0000							
Number of Sponsors on board	-0.0374	0.4188	1.0000						
Average age board	0.3340	-0.0313	-0.1041	1.0000					
Sponsor CEO	0.1236	0.0423	-0.0117	-0.1084	1.0000				
Financial Sponsor	0.0836	-0.1908	0.1206	-0.1248	0.1931	1.0000			
Debt/Equity	-0.0344	0.0336	-0.0836	0.0266	-0.1262	-0.0044	1.0000		
Sales Growth	-0.1336	0.0051	-0.0470	-0.1108	-0.0107	-0.0133	0.0011	1.0000	
Current Ratio	-0.0021	-0.0581	-0.0885	-0.0920	-0.0539	-0.0675	0.0029	-0.0611	1.0000
Volatility	-0.3686	0.0178	-0.1219	-0.0329	-0.0870	-0.1803	-0.0166	-0.1362	0.2699

This table shows the pairwise correlation matrix ("pwcrr") of the variables described in Table 1 (section 4). Respective values are from the data set described in section 6.4 (industry group 2).