ERASMUS UNIVERSITY ROTTERDAM
ERASMUS SCHOOL OF ECONOMICS
MSc Economics & Business
Specialization Financial Economics

Who makes a successful Special Purpose Acquisition Company?

Research on the effects of a high-quality SPAC management team on the firm performance and the success factors of a SPAC management team

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Finish date: 25/10/2022

PREFACE AND ACKNOWLEDGEMENTS

I would specially like to thank my thesis supervisor Jan Lemmen for his excellent help, insights, and ideas during my master thesis trajectory. Besides that, I would like to thank my co-reader, Sjoerd van den Hauwe, for his time. The thesis trajectory was a very educational process, and I couldn't have done it without the support of my family and friends.

ABSTRACT

In the last few years, there can be observed a tremendous trend in the number of firms becoming publicly listed via the SPAC vehicle, instead of the traditional IPO route. The thing that is particularly special about this so-called Special Purpose Acquisition Company is that it does not have any ongoing operations before the merger with a target company. At the time of the SPAC IPO, the identity and industry of the private target company is unknown to the public and managers of the SPAC, which makes it very hard for investors to predict future returns. The only information available for the public are the characteristics of the SPAC managers. This study aims to find statistical evidence for the positive influence of a high-quality SPAC management team on the ability to find a high-quality target firm and on the post-merger firm performance on the short- and long-term. The results indicate that SPACs with high-quality management teams generate superior post-merger firm performance both on the short- and long-term. Some key consideration points for investors should be to look at older management teams with prior experience in the SPAC industry, as these characteristics boost the post-merger firm performance.

Keywords: Special Purpose Acquisition Company (SPAC), Initial Public Offering (IPO), Firm Performance, Buy-and-hold Abnormal Returns, Firm Characteristics, Management Team Characteristics, Human Characteristics

JEL Classification: G12, G24, G34

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1 Introduction

Corporations often need to raise external finance to grow their business into new markets or regions, to invest in research and development, or to compete with similar businesses in the market. The most familiar way to raise external capital is via the traditional Initial Public Offering (hereafter, "IPO"). Although, in the past few years, we have seen an enormous trend in a new non-traditional way of firms going public. A reverse merger is seen as the most popular non-traditional route to go public, in which a private firm gets publicly listed not through its own IPO, but instead through being acquired by a publicly listed natural- or cash-shell company (Feldman, 2010). Natural shell companies are publicly traded firms that have gone bankrupt or that have sold off a significant part of their assets. Cash shell companies, on the other hand, raise money through a traditional IPO when they go public. Their main goal is to acquire an operational private firm that becomes publicly listed when the acquisition is accomplished. At the time of the IPO, the identity of the private firm is unknown to the managers and the public, which results in a certain form of information asymmetry. In this paper, the focus will be on the cash shell companies, more commonly known as a Special Purpose Acquisition Company (hereafter, "SPAC").

In 2021, there were 613 U.S. SPACs that went public via an IPO and raised over $162,5 billion in proceeds, which corresponds to 49% of the total amount raised by IPOs in the United States.[1] It appears that Wall Street's trend regarding SPACs continues to grow rapidly, as the number of SPAC IPOs in 2022 is already 81% of the total number of IPOs in the U.S. There are a lot of reasons why firms choose to become a publicly listed company via the SPAC route instead of a traditional IPO. First, firms going public via SPACs will be less sensitive to the current market environment, as the SPAC will already have money at its disposal. Therefore, existing shareholders of the SPAC target firm will be able to cash out their holdings immediately after the SPAC's acquisition. Secondly, the SPAC route can be seen as a less lengthy and less costly process compared to a traditional IPO route, because the SPAC firms do not have to go through the time-consuming registration process of the Securities and Exchange Commission ("SEC"). Since, the SPAC vehicles have already gone through this. Lastly, SPAC firms are exempt from having to organise road shows and are subjected to lower underpricing (Rodrigues & Stegemoller, 2014).

Despite the advantages of going public via a SPAC, researchers and professionals have pointed out risk factors of the SPAC vehicle, caused by its special components. Firstly, a SPAC management team is restricted to a period of two years to complete a deal, creating a pressure on finding a suitable target and accomplishing the acquisition before the expiring date. Secondly, the managements' private investment ("at risk-investment") that is initially placed into the SPAC fund, cannot be taken out of the fund until the SPAC completes a merger. If an acquisition is not accomplished, management (or "sponsors") lose their initial investments, as the fund will be distributed to the public shareholders.

[1] SPAC data obtained from the website: *www.spacanalytics.com.*

Moreover, the SPAC management team is not allowed to draw salaries and to receive management compensation fees for their efforts to find a suitable target company (Berger, 2008). Thirdly, as a SPAC is a blank-check company with no ongoing economic operation it is almost impossible for investors to identify the quality of a SPAC and to estimate future earnings. There exists a problem of information asymmetry, because in the early stage of the SPAC life it is unknown to the public what kind of business and in what industry the SPAC management is planning to take over. This indicates that investors primarily trust on managerial skills and their ability to find a value-enhancing and promising target company, which is consistent with the "betting on the jockey" idea of Cumming et al. (2014). Therefore, from a public shareholder perspective, it is of great importance to look at the characteristics and skills of the SPAC management team to have an indication whether a SPAC will be a success or not. This leads to the following research question:

Does a SPAC's high-quality management team really make a difference in a SPAC being successful or not? And if yes, what are the most important determinants of a SPAC management team in making the SPAC a success?

To answer the research question, this study will focus on the quality of a SPAC's management team and try to investigate the effects on the ability to find a suitable target company and the firm performance after a merger. In order to determine whether a SPAC will be successful, first, the paper will analyse the quality of the management team and investigate the effect on the quality of the target firm they have acquired by using a multivariate ordinary least squares ("OLS") regression analysis. In the regressions, the quality of the SPAC management team is determined based on several management characteristics (i.e. age, education, investment experience, operational experience, professional experience, and SPAC experience). The quality of the selected target depends on the Tobin's Q, which indicates the growth opportunities of the company. Secondly, the paper investigates the effects of a high-quality management team on short- and long-term firm performance by looking at the buy-and-hold abnormal return after the merger date.

The tremendous rise in the number of firms becoming publicly listed via a SPAC instead of a traditional IPO indicates the relevance of this research in several ways. The most important reason is that SPACs have no underlying business before they merge with a target company. Therefore, this research could provide critical consideration points for investors, as they rely rigorously on the abilities and characteristics of the SPAC management team in their search for a good investment opportunity. Secondly, this research could be valuable for companies that consider going public via a reverse merger, as the paper will give insights in the effects of a high-quality SPAC management team and the benefits and drawbacks of the SPAC route. Thirdly, this paper could be relevant for U.S. policy makers by showing them the relevance of shareholder protection, as retail investors only rely on the available information, namely the characteristics of the management team. In 2021, the SEC already published an

investor alert in which they caution investors not to base their SPAC investing decisions exclusively on celebrity engagement.[2] In addition, SEC Acting Director John Coates published a statement that urged that SPAC management teams (founders) have strong incentives to boost valuations to maximize their profits at the expense of the shareholders.[3] The relaxation of SPAC regulations enables the management to make favourable performance forecasts, which can be exploited by the SPAC management team. The paper of Jog & Sun (2007) provides evidence for the favourable management conditions by showing that SPAC managements earn annualized returns of 1900% while SPAC ordinary shareholders earn minus 3% annualized abnormal returns in the period between 2003 to 2006. Therefore, the question arises whether shareholder protection could be maintained.

Historical research mainly focusses on firms becoming publicly listed via traditional public offerings, but there exists little research in the field of the alternative SPAC route. Some research investigates the performance of SPAC firms and finds that these SPACs perform systematically worse compared to the market, the industry and to their IPO peers (Datar et al., 2012; Klausner et al., 2022; Kolb & Tykvová, 2016). Other research focusses on the determinants of target firms that choose to go public via a SPAC instead of an IPO and finds that SPAC's target firms are smaller, riskier and have higher leverage ratios (Bai et al., 2021; Datar et al., 2012; Kolb & Tykvová, 2016). Cumming et al. (2014) identify the factors that determine the shareholder approval and find that SPAC management teams with young managers tend to have a higher deal approval probability. In addition, Klausner et al. (2022) find that SPAC management teams formed by Fortune 500 executives and large private equity funds have lower costs, more net cash and higher returns than other SPACs. However, to my knowledge the relation between the specific characteristics of the SPAC management team (the quality of the management team) and the post-merger firm performance in the short-and long-term has not been studied yet. Although, the management's characteristics is the only information available for retail investors when making their investment decisions. This paper attempts to fill this gap in the historical research and aims to help investors with better decision-making. Moreover, this paper contributes to the existing literature by investigating the new wave of SPAC firms after 2015 which is referred to as the "SPAC 3.5" generation (Gahng et al., 2021). In this new generation of SPACs, the institutional environment is significantly changed to provide investors more protection. Therefore, this paper contributes to the literature by investigating the more recent years (period from 2016 to 2022). Lastly, historical literature that analyses the SPAC management teams only look at the human characteristics of the Chief Executive Officer (Blomkvist et al., 2021), instead of studying the entire board of directors. Though, this paper takes in to account the characteristics of all the directors of the management team.

The paper's main findings indicate that SPAC management teams that are of high-quality generate superior post-merger firm performance on the short- and long-term. Some key consideration

[2] *https://www.sec.gov/oiea/investor-alerts-and-bulletins/celebrity-involvement-spacs-investor-alert*
[3] *https://www.sec.gov/news/public-statement/spacs-ipos-liability-risk-under-securities-laws*

points for investors should be to look at older management teams with prior experience in the SPAC industry, as these characteristics boost the firm performance.

The remainder of this paper is structured as follows. Section 2 gives a comprehensive overview of relevant literature on SPACs and their structure, the parties involved, SPAC performance, and the human characteristics of a management team, after which the hypotheses are proposed. Section 3 describes the data selection and descriptive statistics. Section 4 describes the research methods employed to find statistical evidence for the hypothesises. Section 5 reports the results from the empirical analyses followed by several robustness checks. Section 6 provides the conclusions and discusses the limitations and potential future research implications.

2 Literature review

This chapter will provide theoretical background to better understand the SPAC route and the purpose of this research. First, the definition of a SPAC is discussed in detail, and the different views of the parties involved are highlighted. Second, we will discuss the literature related to the performance of SPACs and discuss the SPAC management team.

2.1 Special Purpose Acquisition Company

A Special Purpose Acquisition Company ("SPAC") is a blank-check company and has no operational activity, though it has become a popular vehicle for the transition of a private company to a publicly traded company. A SPAC generates money through an initial public offering, which they can use to acquire a privately held company and thereby bringing it to the public. A SPAC is usually arranged and controlled by a sponsor, which could be an investment company (private equity, venture capital or hedge fund), a former Fortune 500 executive with no relevant background or a group of individuals with experience in the mergers and acquisitions market (Klausner et al., 2022). In the new SPAC generation, the SPAC is managed by a group of directors who are selected by the sponsors. Usually, these managing directors are the same people who own the SPAC and form the SPAC sponsor. Therefore, the compensation structure of the directors and sponsor is aligned. As a result, the sponsor can be seen as the SPAC management team, which will be the general term used in this paper. The SPAC's sponsors invest an amount of US$25,000 to form the SPAC entity. This private placement is formally known as the so-called sponsors' promote or at-risk investment (Lakicevic et al., 2014). In addition, the management purchases SPAC warrants and shares (or both) at prices the management believes to represent their fair market value. This is also attributable to the sponsors' promote. In the "searching for a target' period, the SPAC utilises the proceeds of the sponsors' investment to meet the costs of the IPO and its operating expenses. If the SPAC succeeds in merging with a potential target, the sponsors' promote is worth approximately 20% of the SPAC's equity, and the remaining 80% is acquired by public investors (Cumming et al., 2014). The equity received by the management for their effort consists of non-tradable shares and a fraction of warrants and rights, commonly known as "founder shares" (Klausner et al., 2022).

Following the management's investment, the SPAC will launch an initial public offering, which will raise most of the capital required for an acquisition that takes place in the future. The SPAC usually issues tradeable units that consist of public shares (common shares that contain voting rights) and warrants. Since 2010, IPO proceeds need to be deposited for 100% into a trust account, which is invested in risk-free assets and can only be taken out if the SPAC finds a target company to acquire or if the SPAC is liquidated. In recent years, several SPACs choose to put more than 100% of their IPO proceeds into the trust account to be more interesting for investors (Gahng et al., 2021).

In general, when a SPAC enters the market via an IPO, it has a predetermined time limit of 24 months for finding a suitable target company and completing a merger (Dimitrova, 2017). In this 'screening for a target' period, the management does not receive salary or any other compensation for their efforts. In general, the focus of the SPAC is on industries or regions in which the management has a high degree of expertise. The SPAC management team consists of high-profile businesspersons with established networks and extensive expertise in several industries (Lewellen, 2009). The management's expertise is the only information available for investors and could therefore be seen as an important SPAC's asset. Therefore, the public investors should rely on the management's expertise, investment focus, reputation, and business experience, which are reported in the SPAC's prospectus (Cumming et al., 2014).

When a SPAC management team identifies a potential target firm, they will announce the firm to the SPAC's shareholders. In addition, the management will do a comprehensive due diligence, negotiate the structure of the transaction, and wait for the SEC to audit the acquisition. After these steps are taken, the management will organize a proxy vote. In the proxy vote, the shareholders are able to vote on the proposed acquisition, which will only persevere if the majority approve the acquisition of the proposed target firm. Since shareholders could reject value-destroying acquisitions, a SPAC that successfully acquires a target firm should generate positive future returns. If the management presents a 'poor' acquisition, shareholders can either 'vote with their feet' by selling their shares, or they can vote against the proposed acquisition. If the majority of shareholders votes against the acquisition, the management has the right to look for another target firm (Kolb & Tykvová, 2016).

The SPAC's shareholders who vote against all proposed acquisitions or who do not want to participate in the SPAC anymore, can choose to redeem their shares instead of participating in the merger, and assure themselves of receiving a pro-rate share of the cash held in the SPAC's trust account. This means that the downside risk for IPO investors is limited. Therefore, the SPAC management is not likely to trade underneath the discounted value of the shares held in the trust account before an acquisition is completed. Moreover, because the amount of money in the trust account is invested entirely in risk-free US government securities, the SPAC's yield should roughly resemble the current market yield on Treasuries (Lewellen, 2009). To conclude, the shareholders will always have two options regardless of whether they voted in favour of or against the proposed acquisition: they can maintain their shares in the new public company or they can redeem them in exchange for the corresponding value deposited in the trust account.

If the management is not able to accomplish an acquisition within the time limit of 24 months, the SPAC's fund is liquidated, and the firm's net assets are returned to the shareholders with interest. Thus, a SPAC IPO investor basically holds a risk-free zero-coupon bond with a future acquisition option. In case of liquidation, all the money held in the trust will be returned to the shareholders. This means that the management loses their investment, which serves as a strong incentive to find a promising target firm and accomplish a merge (Kolb & Tykvová, 2016; Rodrigues & Stegemoller, 2013).

2.1.1 Different SPAC stages

In the literature, SPACs are frequently described as a "poor man's private equity fund", because they allow a wide variety of investors to participate in a fund that acquires a private firm, which was historically exclusively available to accredited (i.e., wealthy) investors (Dimitrova, 2017). Almost every SPAC element is based on a standard private equity firm's playbook, which can be seen as investors entrusting their money to mangers, who use the fund to invest in a diversity of private target firms. However, these investors do not have the same information as the SPAC management team, because they do not know the exact value of the management's skills. In addition, the investors are unsure whether the management has the same incentives as they do (Rodrigues & Stegemoller, 2013).

At the time of the SPAC entering the market via the traditional IPO route, the SPAC has no ongoing operations and assets besides the capital raised in the IPO process. The shares that are offered to the public consist of units that are made of common stocks combined with one or more warrants. The general price for one unit is conventionally set at $10.00. The warrants typically are locked until the acquisition is completed, meaning that they cannot be exercised before the acquisition. In addition, the firm can call the warrants at any time throughout the exercise period. Following roughly one month after the IPO, the units are divided into two parts; the common stocks and warrants, and they start trading separate from each other. The expiry date of the warrants depends on the terms of emission, but it is usually after a period of two to five years (Lewellen, 2009).

Following Cumming et al. (2014) and Lewellen (2009), the lifecycle of a SPAC can be divided into several stages, starting with the first stage: the "no target" stage. The "no target" stage encompasses the time between the date of the IPO and the date when the management announces that they have found a suitable target company, the announcement date. The name of the potential target will be announced to the SPAC's shareholders via an 8-K filling[4], which brings the SPAC in the second stage: the "target found" stage.

At the "target found" stage, the SPAC management team will inform the shareholders via a letter of intent. The proposed target company must account for at least 80% of the SPAC's net asset value, and if this condition is met, the shareholders will schedule a special meeting to vote on whether to accomplish the acquisition or not. Besides the condition above, a successful takeover must satisfy two other criteria. First, the transaction must be approved by the majority of the shareholders, generally more than 50% of the shareholders must vote in favour of the proposed acquisition. Second, the proportion of shareholders who chooses to redeem their shares and who do not want to participate in the merger cannot surpass the threshold. The SPAC's prospectus specifies this criterion, which previously ranged between 20% and 40%. To prevent a single large shareholder to be able to reject the acquisition, several SPACs have regulations that do not make it possible for shareholders who own more than 10%

[4] Companies must submit Form 8-K with the SEC to report noteworthy developments that shareholders should be aware of. The report notifies the public of events, including acquisitions.

of the SPAC to redeem more than 10% of their shares. In the “target found” phase, the market volatility increased significantly, because the identity of the potential target firm is known to investors enabling them to make their own value estimations (Lewellen, 2009).

The last stage can either be “acquisition completed” or “acquisition withdrawn”. If the shareholders vote against the acquisition, the SPAC will liquidate the fund and return the money to the public shareholders, or the management can restart the target search again (return to the “no target” stage). The last option is only applicable if the SPAC has enough time to find a new target company and complete the merge within the two-year deadline. However, if the shareholder meeting has reached a positive decision and a vote has been taken in favour of the acquisition, the SPAC’s target firm will obtain the publicly listed status and receive all the capital held in the trust account. The SPAC now continues to exist as an operating company and the IPO proceeds can be used by the SPAC firm as fresh equity. The initial target’s firm owners can remain large shareholders, become minority shareholders or exit their positions entirely, depending on the financing structure of the deal and the size of the stake acquired by the SPAC. To prevent managers from acting opportunistically, the SPAC's terms and conditions may further demand that the sponsor’s promote stay locked up for a period of time, which ensures that the management does not exit immediately when the acquisition is completed. Another mechanism could be a staggered promote structure, which links the management’s compensation to the company performance (Cumming et al., 2014).

2.1.2 Why the Interest in SPACs?

In the existing literature, there is a significant amount of research that focusses on the advantages and disadvantages of SPAC mergers. In this subsection, literature will be highlighted which explains the different views on SPACs. The main question that arises is: *What is the purpose of a SPAC for all the parties involved?* The SPAC's role in the market will be briefly reviewed from the perspective of the different parties having an interest in SPACs.

2.1.2.1 Underwriter Interest

Every SPAC that plans to enter the public market needs a financial advisor, commonly known as an underwriter company. An underwriter company is a financial expert who teams up with the SPAC to determine the initial offering price of the shares, buy the units from the SPAC, and sell them to investors via the underwriter’s distribution network. The simple reason for investment banks to participate in SPAC mergers as the underwriter company is that they could earn a decent fee. According to Klausner et al. (2022), the underwriters receive a fee which typically equals 5.5% of the IPO proceeds and is not adjusted for the redemption of shares in a later phase. The underwriters have an incentive to participate in the merger process, because the underwriting fee is not completely paid upfront. A proportion is

normally postponed and paid only after the SPAC successfully has completed a merger. This means that the underwriters receive only a proportion of the total underwriting fee if the SPAC is not able to complete a transaction within the time limit. This results in higher initial trust values, as the costs spend on the underwriters before the merger are lower, and it also creates a strong incentive for the underwriters to find a target company and complete a transaction before the 24-months deadline expires (Dimitrova, 2017). Recently, major players in the investment banking industry, such as Citigroup, JP Morgan, and Morgan Stanley, participate in different SPAC companies. In the paper of Heyman (2007), they describe the underwriters' interest in SPACs as a reflection, not of a substantial fee, but of the industry's acceptance of this new promising and growing vehicle to take a firm public compared to the traditional IPO market. Cumming et al. (2014) find that SPACs with an increasing number of underwriting companies send a negative signal to the market, as it could be a sign for the need of risk-sharing and syndicating. Their results show that an increase in the number of underwriters by one decreases the shareholder deal approval probability by 6.54%.

2.1.2.2 In the View of the Target Company

The SPAC literature discusses various reasons why it would be attractive for private companies to enter the market by merging with a SPAC vehicle. In the paper of Heyman (2007), he indicates that a SPAC could be a way for smaller companies to raise capital without having to do an IPO themselves. The author suggests that there is less interest for small companies doing an IPO. Therefore, a SPAC could be a valuable option for small companies to raise cash.

Looking back at conventional IPOs, the number of companies that went public via the traditional route has fluctuated throughout time. In addition, we can experience more intense IPO cycles, which translates to fewer IPOs in certain times with adverse market conditions. However, SPACs are considerably less sensitive to certain market conditions, as the SPAC has already raised capital in its IPO, enabling the SPAC to acquire a target company even in cold market cycles. Kolb & Tykvova (2016) find that SPAC acquisitions enable firms to enter the market in difficult periods when accessing the market via an IPO is challenging.

Another frequently stated advantage of a SPAC compared to a traditional IPO is the difference in time to enter the market. It is commonly believed that it takes an operating firm less time to arrange a take-over by a SPAC firm which is being approved by the shareholders than it would for going through a whole IPO process. From the perspective of the target firm, a SPAC merger timeline is defined as the period from the start of merger negotiations and its completion. Gahng et al. (2021) indicate that it is very challenging and almost not possible to quantify and make a comparison between the time it takes to go public via a SPAC with the time of an IPO process. The length of a conventional IPO relies on the circumstance and the amount of preparation the firm has done prior to the IPO process.

Companies that go public via the conventional route are mandatory to have audited financial statements, however a private company that merges with a SPAC does not have to satisfy the auditing requirements. Companies that intent to enter the market via an IPO are permitted to submit their IPO paperwork to the SEC as a confidential Draft Registration Statement (DRS). In general, the timespan between filling a DRS and the public form S-1[5] is about three months. After this period, it takes at least 21 days before the IPO is completed, and the stocks start trading on the market. In contrast, a private company's merger with a SPAC usually takes at least six months to complete. As a result, going public via the SPAC route does not ensure significant advantage in the time of a process compared to a firm which has a thorough IPO preparation. However, for a firm that not has a proper IPO preparation, the SPAC route will be faster (Gahng et al., 2021).

Firms that are going public in the U.S. rarely make and publish revenue forecasts, but these forecasts are common with merger announcements that require the approval of the shareholders. These forecasts are generally protected from lawsuits with the 'safe harbour' provision in the U.S. merger legislation (Cazier et al., 2020). Following Gahng et al. (2021), certain firms that aspire to make forward-looking statements in order to boost their pre-money valuations can potentially benefit by merging with a SPAC, as SPACs can elude regulations regarding forward-looking statements. In addition, SPAC mergers are not subject to the same amount of lengthy SEC review processes as traditional IPOs and therefore are accompanied by lower direct expenses (i.e., legal costs) (Cumming et al., 2014). In contrast, Klausner et al. (2022) find that the costs related to a SPAC in the modern structure of the 3.5 SPAC generation, are above the costs related to an IPO. However, because the SPAC shareholders bear the costs, a SPAC route can be a less expensive way to go public from the perspective of a target company. To accomplish this, the SPAC firm has to negotiate the merger terms in such a way that the non-redeeming shareholders will carry the expenses of the merger.

2.1.2.3 In the View of the Management

From the perspective of the SPAC management, the SPAC might be a vehicle for businessmen with some experience, but currently without a firm to call home, to get back into the business game by raising funds and acquiring a firm to manage (Schumacher, 2020). In addition, the SPAC management is enabled to acquire 20% of the firm's equity, commonly referred to as the "management promote", in return for managing the SPAC and injecting their private equity prior to the IPO. The managers usually agree to vote these shares in line with the preferences of the majority of public shareholders during all votes concerning acquisition decisions to avoid conflicts of interest (Lewellen, 2009). However, the promote could be seen as a cost of forming the SPAC and therefore dilutes the value of the SPAC shares.

[5] SEC Form S-1 is the SEC's initial registration form for new securities for public companies that are headquartered in the U.S.

IPO shareholders originally purchase SPAC units for $10.00 each, but after adjusting the value for the promote, the share is worth only $8.00 in cash (Klausner et al., 2022).

The management promote also creates two harmful incentives. First, it makes forming a SPAC highly appealing, regardless of whether the management has a decent chance of negotiating a successful transaction. Even if the management accomplishes a value-destroying acquisition, they can earn yields equal to millions of dollars (Rodrigues & Stegemoller, 2013). Second, the management's incentive to acquire a company is overwhelming. In case of a failed transaction, the management must liquidate the fund and will lose their initial private investment. The management will prefer a deal that creates shareholder value. However, they will choose a deal that is unfavourable for the shareholders over no transaction at all. By contrast, the shareholders would prefer a liquidation of the fund over a poor deal, as they would receive $10 per unit plus interest (Klausner et al., 2022).

2.1.2.4 Investor interest

Investors in SPAC vehicles range from large private equity firms, hedge funds and venture capitalists to small retail investors. The main benefit for the investors is that they have the right to have their money refunded if a transaction is not completed within the 24-months' time limit or if they personally do not agree with the proposed acquisition possibility and vote against it (Schumacher, 2020).

Private equity ("PE") firms have interest in SPAC investments, because it is a method to access the public market for additional funds. Given the recent PE trend toward alternative investments that are more transparent and have more flexible structures than before, SPAC investments are a good fit with the PE industry. Despite that the private equity industry has weathered the financial crisis in 2008, it is facing substantial reforms and greater regulations because of public demand, media scrutiny, and government pressure. Limited partners are looking for alternatives for the classic ten-year funds, resulting in alternative structures and assets classes becoming increasingly frequent. Moreover, the SPAC's deal-by-deal structure, whereby investment opportunities are presented to investors so that they can determine whether to participate or not in the transaction, is preferred over a traditional PE investment, in which investors lock-in their money for 10 years (Dimitrova, 2017). In the paper of Cumming et al. (2014), they investigate the shareholder structure of SPAC companies and find that hedge funds and private equity funds account for most of the block holdings, which means that they hold majority interests in the SPACs. The paper also finds evidence for the theory that major shareholders (hedge funds and private equity firms) are likely to vote against proposed deals by the SPAC management, because if the transaction cannot be successfully completed, the shareholders will receive the value that has been held in the trust account. These funds will thereby realize an arbitrage profit. Therefore, the results show that SPACs having larger block holdings by hedge funds and private equities are associated with lower deal approval probability. On the other hand, it is also possible that hedge funds and private equity firms are on the other side of the transaction. As SPACs have large cash

reserves, it could also be attractive for target companies that are owned by institutions that prefer to cash out. The owners of the target firm obtain liquidity by permitting a SPAC to buy the business, and therefore avoid the need to sell their shares in a traditional IPO. Following this reasoning, private equity firms may employ SPACs as an exit strategy for their portfolio companies (Dimitrova, 2017). As private equity firms need to achieve their required internal rate of return, they will require a premium for the acquisition of their portfolio company, which could affect the post-merger SPAC performance. In contrast, it could be a positive signal to the market if a SPAC is intending to acquire a private equity owned target firm. The study of Levis (2011) shows that private equity backed IPOs are larger firms with higher profitability rates. The firms outperform their non-backed private equity peers, based on operation and market performance.

For relatively small investors, referred to as retail investors, the reason of investing in SPAC companies is simple: it is a means of participating in private equity-style transactions without having to put up millions of dollars. In addition, the SPAC's shares are trading at low prices on the market so the potential for large gains exists (Heyman, 2007). The investors may potentially get a sizable return on their investment if the acquired company turns out to be a value-enhancing firm (Schumacher, 2020).

2.2 SPAC performance

In the historical literature, the performance of SPACs has been a widely discussed topic over the last decade, but there exists a difference in the used datasets. Especially SPAC studies that have been done prior to the SPAC bubble, do not have enough available data as it was not obvious that SPACs succeeded in merging with a target company at that time. In the early study of Boyer & Baigent (2008), they do an empirical analysis of the performance of SPAC IPOs between 2003 and 2006, using a dataset of 87 SPAC IPOs. They find that the SPAC's returns are mixed, and correspond to 33.8%, 13.75% and 3.50% for the years 2004, 2005 and 2006. This suggests an overall annual rate of return of 17% compared to the overall return of 7% on NASDAQ for the period 2003-2006. However, we can question the liability of these results, as the sample size corresponds to 1 SPAC in 2004 and 5 SPACs in 2005, making the findings very uncertain. In the study of Lewellen (2009), they analyze almost the same period of time, but add 2007 and 2008 to the sample. The researchers divide the SPACs in different categories based on their phase in the SPAC lifecycle. SPACs that do not have identified a potential target yet, located in the "No Target" category, earn an annualized return of less than 1% over the risk-free rate. In comparison, SPACs that have found a suitable target company, "Target Found" category, yield an annualized excess return of around 11%, demonstrating that the market reacts positively on a proposed target. On the other hand, SPACs in the "Acquisition Completed" category have an average excess return of -36.5% per year. These findings are based on a sample consisting of 158 SPAC IPOs and 78 SPACs located in one of the different categories.

In the paper of Datar et al. (2012), they focus on the long-term financial and operational performance of SPAC firms. In order to analyze the stock returns after the consummation of a SPAC merger and a conventional IPO, they use a buy-and-hold return model over a period of one month, three months, six months and one year after the SPAC merger and traditional IPO. They find that SPAC firms significantly underperform their industry IPO peers in terms of stock returns. Besides, the operational performance of SPAC firms is lower than IPO firms, based on the following performance measures: return on assets, profit margins, cash flow to assets, sales and total asset turnover. In addition, to compare the characteristics of IPO firms with SPAC firms, they employ a six multivariate regression model to identify the link between firm characteristics and the probability of becoming public via the traditional IPO or SPAC route. They find that the firms that use the SPAC vehicle to become publicly listed have higher leverage ratios, are smaller, have less investment activity, and have lower growth opportunities.

In another study by Kolb & Tykvová (2016), they confirm the findings mentioned above and refer to this phenomena by stating that frogs cannot turn into princes. In the paper, they show that the SPAC route can be a feasible alternative to the traditional IPO for firms that intend to enter the market in difficult market conditions. Although, it seems that it does not attract profitable and value-enhancing firms. Instead, the findings support the hypothesis that small firms that have lower growth opportunities and high leverage ratios are more likely to use the SPAC compared to a traditional IPO. In addition, it seems that it is less likely that in these low-quality SPAC firms, venture capitalist and private equity firms are involved. To measure the long-term firm performance of SPAC and IPO firms, the paper uses buy-and-hold abnormal returns and a five-factor regression model. They find that SPAC and IPO firms significantly perform worse than their industry matched portfolios and the market. SPAC firms underperform the benchmark portfolios stronger than IPO firms, and show underperformance of 59%, 96%, and 85% on average for a period of 24 months. However, IPO firms underperform their respective portfolios only by 34%, 43% and 45% in the same period. The calendar-time five-factor model approach shows the same underperformance for SPAC and IPO firms, but again, the underperformance for SPAC firms is stronger than for IPO firms. Over a period of 24 months, the monthly alpha for SPAC firms is -5.2%, whereas the monthly alpha for IPO firms ranges from -1.2 to -1.7%.

Dimitrova (2017) focusses on the announcement returns and the post-merger SPAC performance in the U.S. market between 2004 and 2009. Similar to the studies above, he finds that shareholder announcements are received positively by the market. The cumulative abnormal return (CAR) over a period of three days covering the acquisition announcement is 1.5% on average for the entire sample. However, after the SPAC acquisition is completed, the firm performance of the de-SPAC[6] starts to get very poor. The paper's findings show that the average buy-and-hold return for a two-year period corresponds to -56.3% compared with a 1.4% market return, correspondingly adjusted for size, industry, and IPOs. Furthermore, the research shows that not only the SPAC stocks perform worse on

[6] In this paper, de-SPAC refers to the company created by the merger of the SPAC and the privately held target firm.

the market, but they also have very poor operating performance. The paper suggests that similar to Kolb and Tykvová (2016), the underperformance of SPACs is explained by the fact that already lower quality firms that are less profitable are more likely to enter the public market via SPACs.

In the most recent paper of Gahng et al. (2021), they also find that the market is reacting positively on acquisition announcements. From January 2010 to December 2019, the average annualized return on 210 SPAC IPOs equals 15.9%, where all 210 returns showed being positive. However, the investor returns on the merged companies are ambiguous. On average, common share owners have earned annualized returns of -8.1% in the first year after the merger is completed, whereas warrant holders have generated positive returns of 68.0%. In addition, the paper discovers that from the perspective of the target firm, merging with a SPAC is much more expensive than a conventional IPO. The cost associated with becoming publicly listed via a SPAC route is 14.6% of the post-merger market capitalization, compared to 3.2% for an IPO process. Concluding, historical literature on the performance of SPAC companies finds similar results, indicating that SPACs under-perform their IPO peers and have negative abnormal returns after the merger is completed. Table 1 provides an overview of the results of the performance literature on SPACs.

Table 1 Overview and highlights of historical literature related to SPAC firm performance

Author(s)	Time period	Method	Control variables	Results
Boyer and Baigent (2008)	2003 – 2006	OLS, with share price	Gross Proceeds, Offer Price, Warrants, Days until Announcement	Positive one-year returns for all years
Lewellen (2011)	2003 – 2008	OLS, with monthly and annual BHAR	IPO Proceeds Founders' investments, Trust value, Underwriting Fees	Negative excess annual return after transaction completed
Datar et al. (2012)	2003 – 2008	OLS, with BHAR	ROA, Profit Margins, Cash Flow to Assets, Sales and Total Asset Turnover	SPAC underperformance compared to IPO firms
Kolb and Tykvová (2016)	2003 – 2015	OLS, with one-month BHAR	Time to resolution, Debt ratio, VC / PE involvement, ROA, Market-to-Book ratio	Underperformance SPACs stronger than IPO firms
Dimitrova (2017)	2004 – 2009	OLS, with one year CAR and BHAR	Deal value, SPAC sponsor, Method of Payment, Institutional Investors, Underwriters	Shareholder announcement positive effect on CAR, but negative post-merger performance
Gahng et al. (2021)	2013 – 2021	Fama and French 3-Factor Model	Sales, Age, Profitability, Warrants, Underwriter prestige rank, Dilution	Positive announcement returns, but negative annualized returns after merger

2.3 SPAC management team

Most researchers in the existing literature seem to strongly agree that the quality of the SPAC management team is what the investors are betting on. This is because the SPAC itself is an empty shell

company, making it very hard for investors to predict future returns. The only information available for investors is the characteristics of the SPAC management team. In the paper of Klausner & Ohlrogge (2022), they have a sober look at SPACs and distinguish between high-quality management teams and non-high-quality teams. The high-quality management teams consist of individuals that have participated in private equity funds with assets under management over $1 billion or are managers that are former senior executives of Fortune 500 companies. They find that there are a few reasons why the performance of high-quality management teams may be superior to that of others. First, SPACs with high-quality management teams are less likely to have dilution, as investors have more faith in the management teams. Second, if the management team remains involved in the merged company, its skills and experience could improve the firm performance, perhaps filling the value gap left by the dilution. Third, high-quality management teams can more reliably vouch for the value of the target, which could help to shrink the information gaps between targets and investors, allowing a mutually lucrative transaction to occur that might not have been possible otherwise. In the study of Kim (2009), he investigates how the market is pricing the quality of SPAC management team. The paper finds that SPAC management teams have more experience compared to regular IPO firms, and that the market puts a higher value on SPACs with more experience. These more skilled and experienced SPACs require less time to achieve a successful transaction and have higher long-term stock performance. The paper measures the management experience and quality with the average industry experience of the team, the percentage of MBA holders and the percentage of managers that had a senior function before.

In the literature on mergers and acquisitions (M&A), the key driver of success continues to be frequently debated. Delis et al. (2017) emphasize that most of the variables researchers employ as determinant of acquirers' performance relate to the quality of the acquirer's management team. In their paper, they define the quality of the management team based on three main interrelated dimensions: human resources, technical abilities, and conceptual skills. They find that their measure of the management quality is the most important factor in value creation in M&A transactions. In the paper of Beitel et al. (2004), they investigate the success factors on the mergers and acquisitions of European Banks, and find that the experience of the acquiring firm (measured by M&A frequency) does not have significant effect on the transaction success. Instead, certain M&A related knowledge of the acquiring firm seems way more important in determine if the M&A transaction is going to be a success or not. In addition, the results of Zollo & Leshchinskii (1999) suggest that firms do learn from their past acquisition experience, but not in a linear way. They find that M&A performance is significantly and favorably affected by specific investments in explicit learning procedures designed to articulate and codify lessons learnt from earlier acquisition experiences. Furthermore, the research of Liu et al. (2019) shows that firms with a high-quality management team create greater shareholder value with their mergers and acquisitions and are not likely to overpay for the target firm. Unlike previous studies, they employ firm accounting profitability measures as proxy for the management quality, such as operating and net profits. Another paper shows that firms with high optimistic CEOs and low pessimism CFOs

tend to acquire more businesses. However, these acquisitions are accompanied by lower returns on assets a year after the transaction (Chen & Shi, 2019).

Furthermore, the paper of Chemmanur and Paeglis finds that firms with high-quality management teams have less underpricing, greater institutional interest, higher quality underwriters, and lower underwriting expenses. More important, the paper shows that a high-quality management team is more likely to select better investment projects and is associated with higher long-term stock returns. Therefore, we could argue that a high-quality SPAC management team is more likely to identify a high-quality target company. Given the importance of the characteristics of the management team to the SPAC entity, this thesis attempts to expand on the research of Klausner & Ohlrogge (2022), by linking the quality of the management to the ability that they find a value-enhancing target company and the post-merger firm performance. As a result of these considerations, the following hypotheses are developed:

Hypotheses (1): High-quality SPAC management teams are more likely to acquire high-quality target firms.

Hypotheses (2): A high-quality SPAC management team leads to better post-merger firm performance on the short- and long-term.

In the paper of Cumming et al. (2014), they describe that the most important point in a SPAC's life cycle is the proxy vote, when investors determine if the acquisition can be completed. In their paper, they try to understand which criteria have the most impact on the deal approval probability. They find that it is more likely that investors vote in favor of the acquisition if the SPAC management team is younger. The results are interpreted in terms of that a younger management team have more financial incentives to complete a successful transaction compared to more senior SPAC managers that may pursue a SPAC as a hobby investment. If this reasoning is correct, younger managers would have incentives to propose certain acquisitions regardless of the target quality, because if there is no transaction completed, they will not receive any compensation. Therefore, we could reason that younger managers more often pass on poor target firms than older more experienced managers, leading to worse post-merger firm performance.

Hypotheses (3): Younger SPAC management teams lead to worse post-merger firm performance compared to older SPAC management teams on the short- and long-term.

In an early paper of Golec (1996), he examines the characteristics of fund managers and the effects on their portfolio performance and finds that the performance is significantly impacted by its manager's human characteristics. The paper's findings suggest that managers holding an MBA programme have

better excess returns and lower embedded risk. According to MBA, this higher degree of education provides a thorough grasp of business, finance, and organisational leadership. In addition, Chaudhuri et al. (2012) suggest that the performance of equity investments managed by managers with a Ph.D. is superior to the performance of individuals that do not have a Ph.D. Investment funds managed by high educated managers generate significantly larger cash flows with their investments and provide superior risk-adjusted returns. Furthermore, Jalbert et al. (2010) find a positive relation between the CEO's education level and the firm performance for large U.S. firms. A more recent paper of Blomkvist et al. (2021), finds that a typical SPAC CEO is a well-educated male, have at least a MBA, have the age of 50, and have experience in the financial service sector. Therefore, we could argue that the level of education of the management team is very important for the firm performance, bringing us to the fourth hypothesis:

Hypotheses (4): Higher educated SPAC management teams lead to better post-merger firm performance on the short- and long-term.

In the study of Custódio & Metzger (2014), they analyze CEOs with a background in corporate finance and find that firms led by financial experts have less cash, more debt, and participate in more share repurchases. In general, financial experts are more financially sophisticated, which means that they are less likely to adopt a single companywide discount rate rather than a project-specific one, they actively manage financial policies, and their investments are less sensitive to cash flows. Besides that, they find that CEOs with more financial experience are able to raise external equity even when credit is scarce. From the perspective of SPAC companies, Blomkvist et al. (2021) argue that the signaling theory plays an import role in the SPAC process, as experienced SPAC managers can be a positive sign for investors, as they can use their experience to find a suitable target company and create value in the future. The paper shows that SPACs with more experienced managers are affiliated with bigger SPAC funds. Furthermore, the researchers show that CEOs with more expertise and experience in the investment banking industry create increased demand for the SPAC throughout the IPO process. Therefore, we could say that certain SPACs perform better than others based on the previous experiences of the management team. This brings us to the last two hypothesis:

Hypotheses (5): More experienced SPAC management teams lead to better post-merger firm performance on the short -and long-term.

Hypotheses (6): SPAC management teams that already have experience in the SPAC sector lead to better post-merger firm performance on the short- and long-term.

Table 2 provides an overview of the results of the historical research on management teams and indicates how certain studies describe high-quality management teams.

Table 2 Overview and highlights of historical literature related to management teams

Author(s)	Time period	Method	Quality management	Results
Golec (1996)	2003 – 2008	3SLS	-	Positive relation between education and investment performance
Zollo and Leshchinski (1999)	1964 – 1996	OLS, with AR	Acquisition experience	Acquisition experience no effect, but learning processes important
Chemmanur and Paeglis (2005)	1993 – 1996	Fama and French 3-Factor Model	Team resources, structure, and reputation.	Positive relation between management quality and stock returns
Kim (2009)	2003 – 2008	OLS, with CAR	Industry experience, MBA holders, Fortune 500 executives	Positive relation long-term performance and team experience
Jalbert et al. (2010)	1997 – 2006	OLS, with returns	-	Positive relation between education CEO and firm performance
Chaudhuri et al. (2012)	1993 – 2007	Difference analyses	-	Positive relation between education and investment performance
Cumming and Schweizer (2014)	2003 – 2008	Logit model, with deal approval	Team age.	Negative relation between team age and deal approval
Custódio and Metzger (2014)	1993 – 2007	OLS	-	Positive relation between financial experience and performance
Beitel et al. (2017)	1985 – 2000	OLS, with CAR	Frequency of M&A transactions	Positive relation M&A knowledge on M&A success (not frequency)
Delis et al. (2017)	1980 – 2016	OLS, with CAR	Human resources, technical abilities, and conceptual skills	Positive relation between management practices and CAR
Liu et al. (2019)	1981 – 2014	OLS, with CAR and BHAR	Operating and net profits	High-quality firms create greater shareholder value with their transactions
Blomkvist et al. (2021)	2003 – 2018	OLS, with fund size	-	Positive relation between experience and size of SPAC fund
Klausneer et al. (2022)	2019 – 2020	-	PE experience and former senior executives at Fortune 500 companies	SPACs underperform the IPO index, but SPACs with high-quality management perform better

3 Data

The following chapter will describe in detail how the data in this study is collected by looking at all the different databases used and how these different data samples are merged into one main unique dataset. Besides, the chapter will describe all the key variables, consisting of dependent variables, independent variables, and control variables, used in the methodology chapter of this study.

3.1 Data collection and construction of unique dataset

In this study, mainly three databases are employed to create a unique dataset that contains all important SPAC data. First, Refinitiv is used to collect the information regarding the SPAC IPOs. The Refinitiv database is also used to obtain information on the merger of the SPAC with the target company. Next to that, this database will provide all the required information on the target companies. The Datastream database is employed to gather daily SPAC's and target's stock prices. Besides, the Electronic Data Gathering, Analysis and Retrieval system ("Edgar" database) is employed to collect additional SPAC information, such as the SPAC's financials, management's private placements and the characteristics of the SPAC management team. There are several criteria that must be met for a SPAC to be included into the dataset of this study. These criteria are discussed below.

First of all, the first trading day of the SPAC vehicle must be after the 1st of January 2016, as the focus of this research is on the new wave of SPAC firms referred to as the "SPAC 3.5" generation by Gahng et al. (2021). They argue that in this new generation of SPACs, the institutional environment is significantly changed, which leads to more shareholder protection. Prior to this changed environment, SPAC shareholders that voted in favour of the announced target firm did not have the option to redeem their shares instead of participating in the merger. This indicates that shareholders were more strongly incentivized to reject a poor merger since they were not able to recover their shares. The new protective environment introduced by the SEC could lead to a higher shareholder acceptance rate of poor SPAC deals since the shareholders can always redeem their shares regardless of the merger is being a success or not. Consequently, this could have implications on the quality of the targets that are being selected by the SPAC vehicles. Secondly, the SPACs have to be located in the United States of America. Most worldwide SPAC listings emerge in the U.S., making this market the most representative market for this research. Besides, U.S. SPACs are subject to strict SEC regulation resulting in the availability of SPAC information that could influence shareholder's decision making. This leads to more transparency and, in general, greater availability of the SPAC data. Third, the SPACs must have completed a deal with a target company, as the focus of this research is on the post-merger firm performance. Therefore, SPACs that have not yet found a target company and completed a merger are not included in the dataset. In addition, SPACs that completed a merger but liquidated thereafter are being excluded, as stock price information is not available.

To create a dataset with all the required information for this study, we have to create two different sub datasets and merge it into one final unique dataset. The first sub dataset consists of SPACs that became publicly listed via an IPO in the U.S. from 2016 until now and have successfully completed a merger. The first SPAC IPO sub dataset consist of 1191 SPACs that entered the market, with *'SK Growth Opportunities Corporation*[7]*'* as the most recent SPAC that became publicly listed and completed a successful merger. Data related to the SPAC IPOs is obtained from Refinitiv's Deal & League Tables by looking under the *'Equity'* category. The two search criteria that are being used are first *'IPO'* and second *'Blank Check'.* The second sub dataset consists of the information on the acquired targets by the SPAC entities and is obtained from the 'M&A' tables in the Refinitiv Workspace by filtering 'Special Purpose Acquisition Companies'. The two different sub datasets are subsequently merged into a new unique dataset and gives a comprehensive outline of all information on the SPAC companies and their targets, including the SPAC's issue date, SPAC's gross proceeds, effective merger date, and the target name and industry. Merging the two subsamples and removing SPACs with missing information leads to a subsample size of 318 completed deals.

To further complete the merged dataset, Datastream is used to collect the financials of the SPAC and target companies. The database is used to obtain daily stock price information of the de-SPAC companies from the first trading day after the merger. In addition, various other important financial information is obtained from the Datastream database, such as market value of equity, book value of equity, total liabilities, total assets, and cash positions. The final merged dataset is compared to and cross-checked with the information provided by the Edgar database, which is publicly available. The Edgar database is an U.S. federal government repository for all forms that companies and others are legally required to file with the SEC. First, the form 425 is retrieved from the Edgar database to check whether the de-SPAC name and ticker code will be different after the merger compared to the target name and ticker. In some cases, the name of the target company changes after the merger is completed. To cross-check, all SPAC companies are searched manually in the Google search engine to check whether the de-SPAC name has been changed or not.[8] Second, the registration statement (form S-1) is retrieved from the Edgar database providing financial information of the SPAC companies for which we had missing financials. Finally, we had to drop all the SPAC deals in the merged dataset with missing financial information in Datastream and Edgar. Next to that, we had to drop a significant number of SPAC deals, as the dataset contained deals that belonged to each other. In other words, some SPAC companies acquired more than one target company to create a de-SPAC, leading to more SPAC deals

[7] On the 23th of March in 2022 *SK Growth Opportunities Corporation* issued their shares to the public and received 200 Million Dollar as gross proceeds.
[8] For example, the SPAC *SVF Investment Corp 3* acquired the target company *Variant Bio Inc* and changed their de-SPAC name to *Symbotic Inc.*

for one particular SPAC company.[9] Making the applications mentioned above ensures that we have to exclude 160 more SPAC deals leading to a dataset of 158 SPAC transactions in total.

Table 3 Total number of SPAC IPO and SPAC mergers in the U.S. market between 2016 – 2022

Year	Number of IPOs	Number of Mergers
2022	67	5
2021	737	123
2020	232	25
2019	56	5
2018	42	0
2017	40	0
2016	17	0
Total	1191	158

Most important form retrieved from the Edgar database is Form 424B, also known as the SPAC's prospectus, providing detailed information on the SPAC management team. This form provides us with detailed information of every SPAC board member, such as age, gender, experience, and education. Besides, Form 424B is employed to obtain the at-risk investments, which could be used to calculate the percentage of invested capital by the management compared to the gross proceeds.

3.2 Defining variables

The following sections will provide a detailed explanation and description of the variables that are employed in the methodology part of this paper. First the dependent variables will be discussed, second the independent variables will be explained and lastly the control variables will be mentioned.

3.2.1 Dependent variables

3.2.1.1 Quality of the selected target

The first dependent variable that will be discussed is used to support the first hypothesis of this paper, that indicates that SPACs with a high-quality management team are more likely to select high-quality target firms. In the literature, one of the most pronounced methods to test the value of a company is the Tobin's Q calculation. The Tobin's Q, which is also known as the 'Q ratio', is determined by the market value of a company divided by the replacement costs of the firm's assets, and is an indication for the firm value and future growth opportunities (Chen & Lee, 1995). In the paper of Kolb & Tykvová (2016), they capture the quality of a SPAC target firm by looking at the profitability and growth opportunities

[9] The SPAC *GTY Technology Holdings Inc* acquired six different target companies: *Bonfire Interactive, Sherpa Govt Solutions, Open Counter Enterprises, eCivis, CityBase* and *Questica.*

of a firm. The paper's authors user return on assets ("ROA") as a proxy for the profitability and Tobin's Q as a proxy for the firm's future growth opportunities. Therefore, Tobin's Q will be employed as a proxy for the quality of the target firms. Following Chung & Pruitt (1994), the Tobin's Q will be computed by the more practical method, which requires only basic accounting information. Hence, we will stick to their method and will approach Tobin's Q with the market-to-book asset ratio. The following measure to approximate the growth opportunities and quality of the target firms will be employed:

$$Tobin's\ Q = \frac{Equity\ Market\ Value\ +\ Total\ Liabailities\ Market\ Value}{Equity\ Book\ Value\ +\ Total\ Liabailities\ Book\ Value}$$

Since the target companies are privately held before they merge with a SPAC company, it is not possible to calculate the market value of these companies before the merger. After the completion of a SPAC merger, the target companies start trading on the public market and the market values can be computed. Therefore, the target's Tobin's Q will be calculated in the year of the merger.

A value of the Tobin's Q ratio above one suggests that the firm's market value exceeds the firm's book value, which indicates that the firm is overvalued and has growth opportunities. If the Tobin's Q ratio is below one, the firm's book value exceeds the firm's market value, suggesting that the firm is undervalued and has low growth opportunities. Following this reasoning, we could suggest that target firms with high Tobin's Q ratios have more growth opportunities than firms with low Tobin's Q ratios and could therefore be labelled as high-quality target firms. As defined in the paper of Lang et al. (1989), Tobin's Q ratios above one will be considered as high, suggesting that these firms are high-quality target firms. However, Tobin's Q ratios below one will be considered as low ratios, corresponding with low-quality target firms. Following the research of Kolb & Tykvová (2016), the Tobin's Q ratio will be applied as the continuous dependent variable to test the first hypothesis of this paper. To investigate in-depth how SPAC specific and management specific variables effect the ability of the SPAC management team to select a high-quality target company, the multivariate regression analysis will be employed.

In addition, to check the robustness of the results, the target's ROA will be used as a measurement of the target's quality. Corresponding to the paper of Liu et al. (2019), corporate accounting profitability measures will be employed as a proxy for the firm's quality. They argue that the Tobin's Q proxy can be affect by market mispricing as the ratio contains a market valuation factor. The ROA will be calculated for the target companies in the year of the merger with the SPAC company and can be computed as follows:

$$Return\ on\ Assets = \frac{Net\ Income}{Total\ Assets}$$

3.2.1.2 Post-merger stock performance

To answer the research question of this study, we have to look at the performance of the de-SPAC companies to determine whether the SPAC is successful or not. Therefore, the hypothesises 2 – 6 examine the effects of certain SPAC specific variables on the short-and long-term performance of de-SPAC companies. In this paper, the short-term performance is examined by looking at a three- and six-months period directly after the merger date. The de-SPAC company starts restructuring and reorganising the firm directly after it receives the publicly listed status. Therefore, the long-term effect will be analysed by looking at a nine-months period. To examine the effect, we will apply an event study approach in which the focus will be on the buy-and-hold abnormal return ("BHAR"), consistent with the same method to measure the short-and long-term performance as Kolb & Tykvová (2016). In the study of Dimitrova (2017), the stock price performance of the SPAC companies is compared with a measure of the overall stock market, using the return on the Russell 2000 index as benchmark. Therefore, the Russell 2000 index will be used as the benchmark for the BHAR calculations. The dependent variable for hypothesises 2 – 6 will be defined as the buy-and-hold abnormal return for periods of 3, 6, and 9 months and will be measured with the following formula:

$$BHAR_i\ (t_0, t_1) = \prod_{t=0}^{t=1} \left[\left(1 + R_{i,t}\right)\right] - \prod_{t=0}^{t=1} \left[\left(1 + R_{Russel\ 2000,t}\right)\right]$$

In the formula, $BHAR_i\ (t_0,\ t_1)$ represents the buy-and-hold abnormal return for portfolio *i* throughout the period t_0 to t_1. More specific, $t_0$is defined as the first trading day after the completion of the merger and t_1 is defined as the end of the measurement period (3, 6, and 9 months), $R_{i,t}$ is the daily return of SPAC *i* at day *t,* and $R_{Russel\ 2000,t}$ represents the daily return of the benchmark that matches the SPAC return on day *t*.

3.2.2 Independent variables

In the regression models of this paper, we distinguish between the different independent variables by looking at management specific variables, which can be seen as the key variables in examining the research question, and control variables. The control variables can be divided in SPAC specific, target firm specific, and deal specific control variables.

3.2.2.1 Management specific variables

High-Quality SPAC Management Team

In the empirical literature, the connection between the quality of a management team and the firm performance is a widely discussed topic. Especially, we can observe the ongoing debate how to identify

and determine whether a management team is of high quality or not. In this paper, we will define what is a high-quality management team in three different ways, and therefore create three high-quality dummy variables.

The first variable ***HQ_1*** will be based on the definition of a high-quality management that is used in the research of Klausner & Ohlrogge (2022). To assess the quality of a SPAC management, we assume two selection criteria, both of which must be met for a management to be characterised as high-quality. The first criterion is that at least one of the managers had a senior position at a Fortune 500 company, and the second criterion is that at least one of the managers has experience in the financial service industry, which means that they have worked in private equity, venture capital or in an investment bank. The dummy variable *HQ_1* can be defined as follows:

$$HQ\_1_{Dummy} \begin{cases} 0 \; if \; not \; all \; criteria \; are \; met \\ 1 \; if \; all \; criteria \; are \; met \end{cases}$$

The second dummy variable that will be used to determine whether a management team is of high quality or not is ***HQ_2*** and is based on the average team age. In the paper of Anderson et al. (2004), they argue that the average team age can be seen as a proxy for the overall team experience of the SPAC management team. Existing research show that management teams with a high average team age are linked to better firm performance compared to younger teams (Goll et al., 2001). We could argue that older management teams have more years of experience, expertise, and social connections that could be a valuable addition to the SPAC management. In this line of reasoning, these teams could have more ability in the decision-making process, suggesting that older teams outperform younger teams. Hence, we define an old management team as high quality. Management teams are considered to be old if the average team age is above the sample average. Thus, the dummy variable *HQ_2* can be defined as follows:

$$HQ\_2_{Dummy} \begin{cases} 0 \; if \; average \; team \; age \; \leq \; 54 \\ 1 \; if \; average \; team \; age \; > \; 54 \end{cases}$$

The third dummy variable that will be created to indicate the quality of a SPAC management team is ***HQ_3***. The variable considers a few selection criteria for a SPAC management team that all must be met for a management to be characterised as high quality. The criteria are as follows:

I. At least one of the managers has investment experience.
II. At least one of the managers has operational experience.
III. At least one manager has experience in the SPAC industry.

If all these criteria are met, we can consider a SPAC management team as high quality. If one of the criteria cannot be satisfied, the SPAC management team will be considered as non-high-quality team. This brings us with the third dummy variable *HQ_3:*

$$HQ\_3_{Dummy} \begin{cases} 0\ if\ not\ all\ criteria\ are\ met \\ 1\ if\ all\ criteria\ are\ met \end{cases}$$

Team Age

The continuous variable ***Team_Age*** is defined as the sum of all the director ages divided by the total number of directors. As mentioned above, the average team age could be an indication whether the management team is experienced or not (Anderson et al., 2004). Therefore, we can assume that SPACs with older management teams, are managed by more experienced managers resulting in high firm performance (Acquaah, 2012). The ages of all the directors are collected from the SPAC prospectus (Form 424B4, Edgar database).

Team Gender Diversity

The continuous variable ***Team_Diversity*** indicates the ratio of men to women in the SPAC management team. The variable is defined as the number of female board members divided by the total amount of board members. Empirical support for the link between management diversity and performance can be seen as positive. In the paper of Dwyer et al. (2003), they show evidence for the positive relation between gender diversity in a management team and the firm's growth and performance. Goll et al. (2001) argue that the heterogeneity is expected to bring different viewpoints to the decision-making process in a management team, as these individual directors have different interpretations and perspectives. This will have a positive influence on the firm's performance. Therefore, we could argue that SPAC teams with ratios approaching 0.5 perform better, as the number of female directors equals the number of male directors. The gender of each director is collected from the SPAC prospectus (Form 424B4, Edgar database).

Team Size

Following the same reasoning as with the variable *Team_Diversity*, we could argue that larger managements have more heterogeneity in their teams, and therefore individuals with different perspectives, which improves the firm performance. The paper of Cumming et al. (2014) emphasis our way of thinking with their findings. They find evidence for a positive relation between the SPAC board size and the firm performance. The continuous variable ***Team_Size*** can be defined as the sum of the total directors. The number of directors is derived from the Form 424B4 prospectus (Edgar database).

Team Education

The continuous variable ***Team_Education*** is defined as the number of SPAC directors holding an MBA degree divided by the total number of directors. In the paper of Golec (1996), the effect of certain human characteristics on the performance of fund portfolio managers has been examined and the conclusion is

that there is a significant positive effect. Directors holding an MBA programme have better excess return and therefore better performance. In the paper of Chemmanur & Paeglis (2005), the quality of the management is measured by the team resources. The management team resources depend on the knowledge and education of the members and is defined as the percentage of managers with an MBA degree. The argument is that management teams with a higher percentage of managers holding an MBA are of better quality and lead to better firm performance. Goll et al. (2001) show that the education level and proportion of management teams with higher education will have a positive impact on the firm's performance. Following this reasoning, we could say that the education of a SPAC management team is of particular importance for the SPAC to be successful, making the variable *Team_Education* a key variable in examining the research question. Information on directors holding an MBA can be derived from the prospectus (Form 424B4, Edgar database).

Ivy League

The continuous variable ***Ivy_League*** is defined as the average number of directors that graduated from an Ivy League University, which could be a Bachelor or a higher degree. The variable can be calculated by the sum of the directors graduated from an Ivy League University divided by the total number of directors. Ivy League schools represent the top universities of the U.S., with most of them having a long history of outstanding reputation. In the Appendix, table A.2 displays the Ivy League Universities. In the paper of Miller et al. (2015), it is stated that graduation from an Ivy League school can be considered as a type of human capital, as this type of education is of the highest level. Besides this, the selection by a top university may indicate the individuals' talents demonstrated by the fact that Ivy League graduated CEO's demonstrate higher firm performance compared to non-Ivy League CEO's. On top of this, directors graduated from an Ivy League University may have an advantage in terms of social network. Cohen et al. (2008) find evidence for the social network hypothesis in the fact that directors can gain an informational advantage through their social networks which they have retained from university. Following the above, we can conclude that managers graduated from an Ivy League University can add significant value to a SPAC management team. The information regarding the director's university is derived from the SPAC prospectus (Form 424B4, Edgar database).

Investment Experience

The continuous variable ***Inv_Experience*** depends on whether managers have experience in investment banking, private equity, or venture capital. The variable is defined as the sum of directors with investment experience divided by the total number of directors of the SPAC team. Considering that a SPAC is an empty shell company with the purpose of acquiring a target company, it is highly relevant for the SPAC management team to have extensive experience in the corporate finance industry, as identifying a value-enhancing target company and completing a successful merger is the manager's key task. Information on the investment experience is obtained from the 'Management Section' in the SPAC prospectus by looking at the resume for each director (Form 424B4, Edgar database). Work experience is carefully reviewed for every director to see if the experience fits within the financial service industry.

Operational Experience

In the paper of Chauviere et al. (2020), a potential recipe for a SPAC to be successful has been identified in that adding an operational edge to a SPAC management team makes a difference in post-merger performance. The continuous variable ***Op_Experience*** is defined as the sum of managers having relevant experience in the same industry as the target company divided by the total number of managers. In general, the focus of the SPAC is on industries in which the management has a high degree of expertise. Therefore, the variable *Op_Experience* can also be a proxy to determine whether a SPAC transaction is in a familiar industry (focusing merger) or in an unknown industry (diversifying merger). SPAC firms with a high operational experience rate have more managers that are or have been active in that particular industry. When the SPAC entity is created there is no target industry in which the SPAC is planning to take over. Hence, the management sector expertise is the only information available for investors and could be seen as an important SPAC asset. Information on the work experience can be obtained from the 'Management Section' in the SPAC prospectus (Form 424B4, Edgar database). The directors' work experiences are compared with the industry of the target company to determine whether the experience is relevant or not.

Professional Experience

The continuous variable ***Prof_Experience*** is defined as managers who have been former executives of high-profile firms or are currently holding a board position at a Fortune 500 company. SPAC management teams with managers having experience in high-profile firms can be a positive sign to the market and could attract attention, following the signalling theory. In the paper of Kromidha & Li (2019), it is observed that performance has significant positive influence on followers, suggesting that investors are more attractive to SPAC management teams consisting of managers that held a high positions at a well performing Fortune 500 company. The variable can be calculated by the sum of managers that have experience at a Fortune 500 company divided by the total number of managers. Information on the work experience is derived from the 'Management Section' in the SPAC prospectus (Form 424B4, Edgar database).

SPAC Experience

For the variable ***SPAC_Experience*** the same reasoning can be applied as we have seen with the variables *Investment, Operational* and *Professional Experience*. If one or more members of the management team have experience in bringing a SPAC to the market, finding a suitable target company, and completing the merger this could be seen as a valuable addition to the management team, resulting in better post-merger performance. The variable *SPAC Experience* that is created can only take the value 0 or 1 to indicate the absence or presence of a manager with experience in the SPAC industry. The dummy variable can be defined as follows:

$$SPAC\_Experience \begin{cases} 1 \; if \; one \; or \; more \; managers \; have \; experience \; with \; SPACs \\ 0 \; if \; no \; manager \; has \; experience \; with \; SPACs \end{cases}$$

3.2.2.2 SPAC Specific Control Variables

In this study, specific variables that control for the effect of different SPAC companies are included to account for all the SPAC characteristics. The SPAC specific control variables employed in this paper are as follows:

I. *SPAC Size:* The control variable ***SPAC_Size*** will be defined as the natural logarithm of the amount of gross proceeds obtained from the SPAC prospectus ('Use of Proceeds' section in form 424B4, Edgar database). The literature demonstrates that the SPAC size has significant influence on the deal approval and post-merger performance (Cumming et al., 2014; Dimitrova, 2017; Kolb & Tykvová, 2016). Besides, the variable *SPAC_Size* can also be an indication for the perception of the market (Dimitrova, 2017).

II. *Days until Announcement:* The variable ***Days*** captures the increasing pressure on the SPAC management to find a suitable target company as the deadline approaches. Similar to Dimitrova (2017), the number of days between the first trading day of the SPAC and the day of the merger announcement is included to account for the pressure put on its management.

III. *At Risk Investments:* The at-risk investment or private placement is defined as the amount of capital that the management invests into the SPAC proceeds. The private placement could be an incentive for the SPAC management team to acquire a target firm, independent of the target's quality, because if they fail in merging with a company, they will lose their private placement (Cumming et al., 2014). The variable ***At_Risk*** can be defined as the total amount of private placements, divided by the total amount of gross proceeds. The amount of private placement and gross proceeds is obtained from the 'Use of Proceeds' section in the prospectus (form 424B4, Edgar database).

IV. *Intermediaries:* The control variable ***Intermediaries*** is defined as the total number of underwriters that are involved in the SPAC transaction. This can be seen as a proxy for the number of intermediaries. A various number of SPAC processes, such as the IPO, negotiations with potential target firms, preparation and filings of financial statements involve the use of intermediaries. These intermediaries could have significant influence on the performance of the SPAC companies (Gosen, 2021). A high number of underwriters can be a negative signal to the market, as it could be a sign for risk-sharing and syndicating (Cumming et al., 2014). Therefore, the variable *Intermediaries* is included in the regression to control for potential effects on the post-merger firm performance. The number of underwriters is obtained from Datastream.

V. *PE Backed SPAC:* the variable ***PE_Backed_SPAC*** indicates whether the SPAC is backed by a private equity or hedge fund company. The variable will have the value 1 if the SPAC is backed by private equity or hedge fund companies, otherwise the value is 0. The variable *PE_Backed_SPAC* is included as the owner structure of the SPAC

can have strong influence on the deal approval probability, and therefore the post-merger performance (Cumming et al., 2014). The ownership structure of the SPAC can be obtained from the SPAC prospectus (form 424B4, Edgar database).

3.2.2.3 Target Firm Specific Control Variables

The dependent variables of this research, Tobin's Q, ROA, and the stock price performance, of the de-SPAC companies can be influenced by many factors in addition to the independent variables. Therefore, we should look carefully at control variables that could influence the target firms and their performance. The target firms specific control variables that will be employed in this study are the following:

I. *Firm size*: the variable ***Firm_Size*** will be defined as the natural logarithm of the target's total assets. In general, larger corporations have easier access to external funds, providing them with the opportunity to expand their operations and stimulate growth. This could eventually generate more profits (Ang, 1992). Therefore, we could assume that larger targets firms are more likely to have superior post-merger performance compared to smaller firms. The total assets are obtained from Datastream.

II. *Return on Assets (ROA)*: the variable ***ROA*** is computed by the net income before extraordinary items divided by the target firm's total assets, commonly known as the return on assets (ROA). Target firms with high profitability rates have more excess to internal funds to expand their operations and invest in profitable projects (Morgan et al., 2009). Therefore, we could argue that target firms with a high profitability are more likely to have superior post-merger performance. Next to this, in terms of performance measurement, the ROA can be used as a control tool to measure projections made by the SPAC management team. Blankespoor et al. (2022) in their paper argue that SPAC mergers typically include highly optimistic forecasts, whereas in reality only 35% of the de-SPACs meets or beats their projections. The target's income before extraordinary items and total assets are derived from the Datastream.

III. *Debt Ratio*: the variable ***Debt_Ratio*** will be defined as the total amount of long-term debt outstanding divided by the firm's total assets. The *Debt_Ratio* will be included in the regressions to account for the target firm-specific risk. Following the reasoning of Kolb & Tykvová (2016), firms that are highly levered are unattractive for the sponsors of SPACs who wish to employ debt financing for the acquisition, as the debt ratio will increase even more after the merger. Additional debt could significantly increase the risk and likelihood of default and the cost of capital. The target's total amount of long-term debt is derived from Datastream.

IV. *Liquidity:* the liquidity of the firm will be computed by the firm's total cash and cash equivalents divided by total assets. The variable ***Liquidity*** will be included in the

regressions to control for the effect of short-term liquidity on the stock price performance. The study of Fang et al., (2009) shows that firms with higher liquidity have better performance. Therefore, we have to include liquidity as a control variable in the regression function. The target's cash positions and total assets are derived from Datastream.

V. *PE Backed Target:* The target specific control variable ***PE_Backed_Target*** indicates whether the target firm is backed by a private equity company or not. The variable will take on the value 1 if the target company is PE backed, otherwise the value is 0. SPACs can be used by private equity firms as an exit strategy of their portfolio companies (Dimitrova, 2017). These private equity companies require an acquisition premium for their portfolio firms, which could influence the post-merger firm performance. On the other hand, target firms backed by private equity can be a positive signal to the market. Levis (2011) argues that private equity backed IPOs tend to be larger firms and are more profitable. The firms display better performance compared to other IPOs. Therefore, the variable *PE_Backed_Target* is included to account for the effect on the post-merger firm performance. The target's ownership structure is retrieved from Refinitiv.

3.2.2.4 Deal Specific Control Variables

In addition to the SPAC and Target Firm Specific Control Variables, other deal specific factors could possibly influence the dependent variables Tobin's Q and the buy-and-hold abnormal return of this study. Therefore, the following deal specific variables are taken into account:

I. *Deal Size*: The control variable ***Deal_Size*** can be defined as the natural logarithm of the total deal value of the merger between the SPAC and the target firm. The control variable is important as larger transactions often take longer and result in indigestion (King et al., 2021). Therefore, the deal size can have effect on the dependent variable post-merger stock performance. The deal size is obtained from Refinitiv.

II. *Cross-border Deal:* the control variable ***Cross-Border*** *is* defined as a dummy variable, which takes on the value 1 if the target company is located in another country outside the U.S. If the target company is located in the U.S. the variable will take on the value 0. Cross-border transactions can be accompanied with overpayment, as there could be an information asymmetry. Hence, the acquirer could have limited knowledge of the target's market and pricing (Inkpen et al., 2000). Following this reasoning, the countries of registration of the SPAC and target firm are being compared and flagged in cross-border deals to control for the possible effect on Tobin's Q and the post-merger stock performance. The target's nation is obtained from Datastream.

III. *Method of Payment:* The control variable *Payment* is defined as a variable that can take on different values. The variable ***Payment2*** will take on the value 1 if the method of payment is with cash only, compared with the payment method stock only. The variable ***Payment1*** will take on the value 1 if the payment is a combined cash and stock, compared with the stock only payment. In the literature, stock payments are considered to be a negative signal, whereas cash payments demonstrate confidence in the transaction. Cash payments could result in more investor trust and subsequently better performance (King et al., 2021). The method of payment for each deal is obtained from Refinitiv.

IV. *Industry fixed effects:* the target's 4-digit SIC code is used to distinguish between the different industries of the target companies in the sample. The industry fixed effects are included to eliminate time-invariant industry characteristics that can influence the financial structure and performance of companies within that industry. Some researchers are convinced that industry factors affect the individual firm but also the joint distribution of financial characteristics within industries. The individual firm's financial structure and real financial decisions depend on the changes made by industry peers (MacKay & Phillips, 2005). Moreover, in the paper of Wernerfelt & Montgomery (1988) it is stated that the industry effects are the major determinants of a firm's success in a particular industry. In their research, the firm performance is measured with the Tobin's Q. The importance of industry effects is emphasised by McGahan & Porter (1997) who claim that 19 percent of the aggregate firm profitability, measured with accounting returns on assets, is due to the industry effect. This outlines the importance of industry factors on the financial structure and performance of individual firms. In the paper's context, the industry fixed effects are included to account for the disparities between different industries that could affect the performance of individual companies and thus the dependent variables Tobin's Q and BHAR.

V. *Year fixed effects:* the year fixed effects will be included in the regressions to account for economic factors that are constant for all the SPACs and target firms, but which vary over time. The year fixed effects capture systematic differences between the years and eliminate the effect of annual trends that could influence the Tobin's Q and BHAR. They account for all the factors that cannot be captured by the control variables, and therefore tackle the problems of omitted variables.

In the Appendix, Table A.1 provides a detailed overview of the dependent variables, independent variables, and the control variables.

3.3 Descriptive statistics

In Table 4, the descriptive statistics are provided for the five different groups of variables. Table 4 will give an overview of the number of observations, mean, median, standard deviation, minimum, 25 percentile, 75 percentile and the maximum. When analysing the data, it became apparent that some of the variables were not distributed normally. The variables *Debt_Ratio* and *At_Risk* had a rightward skew, and therefore had to be transformed with a cube root transformation to make the variables suitable for further analysis (Manikandan, 2010). Furthermore, to reduce the impact of extreme values a winsorizing approach is employed. The winsorizing approach replaces the values above the given percentile with the values that are equal to that specific percentile (Statology, 2021). Values that were outside of the 5th or 95th percentile were designated as outliers. Comparing the distributions following winsorizing, the range was adequate to incorporate all the relevant outliers.

Analysing the data, the mean of the buy-and-hold abnormal return for every period displays a negative value, with the lowest return for 9 months. Considering the management specific variables, we notice that the average age of a director is 54 and that a SPAC management team consists of 7 directors on average. Besides, the variable *Investment Experience* has a relatively high average value of 0.673, suggesting that 67.3% of the directors in a SPAC management team has experience in the financial service industry. The average number for operational and professional experience equals 0.405 and 0.138 respectively, meaning that on average 40.5% of the directors has experience in the same industry as the target company, and 13.8% has worked in a Fortune 500 company. Interestingly, the average number of days between the SPAC IPO and the merger announcement is 263. However, the maximum number of days between the IPO and announcement equals 638, which indicates that a SPAC spends over 1.5 year looking for a suitable target company.

Table 4 Descriptive Statistics

Variables	N	Mean	Median	St. Dev.	Min	Pctl (25)	Pctl (75)	Max
Dependent variables								
Tobin's Q	158	0.560	0.413	0.436	0.120	0.228	0.763	1.613
BHAR_3	158	-0.008	-0.004	0.013	-0.038	-0.015	0.0004	0.013
BHAR_6	148	-0.017	-0.013	0.020	-0.058	-0.030	-0.002	0.011
BHAR_9	118	-0.024	-0.021	0.025	-0.072	-0.044	-0.007	0.018
Management specific variables								
Team_Age	158	53.917	54.365	5.402	43.642	50.233	58.161	62.714
Team_Diversity	158	0.119	0.125	0.119	0.000	0.000	0.200	0.000
Team Size	158	6.975	7.000	1.432	5.000	6.000	8.000	10.000
Team_Education	158	0.380	0.388	0.224	0.000	0.200	0.571	0.750
Ivy_League	158	0.315	0.333	0.209	0.000	0.143	0.444	0.714
Inv_Experience	158	0.673	0.667	0.222	0.243	0.514	0.857	1.000
Op_Experience	158	0.405	0.375	0.325	0.000	0.143	0.667	1.000
Prof_Experience	158	0.138	0.125	0.159	0.000	0.000	0.200	0.000
SPAC specific variables								
SPAC_Size	158	2.396	2.398	0.225	1.985	2.267	2.544	2.806
Days	158	263.006	184.500	181.075	74.000	124.200	409.00	638.000
At_Risk	158	0.310	0.304	0.022	0.281	0.295	0.318	0.370
Intermediaries	158	1.677	2.000	0.707	1.000	1.000	2.000	3.000

Target firm specific variables							
Firm_Size	158	5.743	5.700	0.496	4.897	5.417	6.020	6.831
ROA	158	-0.010	0.000	0.035	-0.170	-0.155	0.045	0.060
Debt_Ratio	158	2.367	1.737	2.368	0.000	0.000	3.800	7.000
Liquidity	158	0.495	0.552	0.339	0.011	0.108	0.812	0.961
Deal specific variables							
Deal_Size	158	3.100	3.113	0.373	2.396	2.886	3.337	3.806

4 Methodology

The following chapter presents the methodology of this study is presented. The methods of this study are used to provide an answer to the research question and will be described in detail. First, the method will be described to test the first hypothesis, related to the quality of the selected targets. Second, we will provide the outline of the methodology designed to test which factors influence the post-merger SPAC performance. Lastly, the robustness checks employed will be outlined. Table 5 will provide a legend of all variables used in the regressions.

4.1 Quality of the selected target

To examine the effect of a high-quality SPAC management team on their ability to find a value-enhancing target company and complete a successful deal, we will design **Model 1**, **2** and **3**. The main objective of this model is to find statistical evidence to either reject or accept the following hypothesis:

Hypotheses (1): High-quality SPAC management teams are more likely to acquire a high-quality target firm.

Model 1

The first model to be used will be based on the variables presented in Section 3.2, and will employ Tobin's Q as the continuous dependent variable. Tobin's Q will be computed by the sum of the market value of the target firm's equity and total liabilities divided by the sum of the book value of equity and total liabilities. The ratio will be calculated for the year after the merger is completed, as before the merger the firms were privately held, and therefore have no market value. In this study, Tobin's Q will be a proxy for the quality of the selected target firms by the SPAC management. To test how the quality of the SPAC management team and other independent variables are related to the quality of the selected target firms, we will apply a multivariate regression analysis. The regression model is as follows:

$$\begin{aligned} Tobin's\ Q = {} & \alpha_i + \beta_1 HQ\_1_i + \beta_2 Team\_Age_i + \beta_3 Team\_Diversity_i + \beta_4 Team\_Size_i + \beta_5 Team\_Education_i \\ & + \beta_6 Ivy\_League_i + \beta_7 Op\_Experience_i + \beta_8 SPAC\_Experience_i + \beta_9 SPAC\_Size + \beta_{10} Days \\ & + \beta_{11} At\_Risk + \beta_{12} Intermediaries + \beta_{13} PE\_Backed\_SPAC + \beta_{14} Firm\_Size + \beta_{15} Debt\_Ratio \\ & + \beta_{16} Liquidity + \beta_{17} PE\_Backed\_Target + \beta_{18} Deal\_Size + \beta_{19} Cross\_Border + \beta_{20} Payment \\ & + \beta_{21} Industry_{FE} + \beta_{22} Year_{FE} + \varepsilon_i \end{aligned}$$

The key variable of interest in the equitation above is the quality of the SPAC management team, indicated with the dummy variable HQ_1_i. The variable will be 1 if one of the managers in the SPAC team had a senior position at a Fortune 500 company (professional experience) and if one of the

managers has experience in the financial service industry (investment experience). If not all criteria are met, the dummy variable will have the value 0.

Model 2

The second model to test the first hypothesis will almost be identical to Model 1. The difference is that the variable *HQ_1* will be replaced with the variable *HQ_2*. This means that the effect of professional and investment experience in not captured anymore. Therefore, the variables *Prof_Experience* and *Inv_Experience* will be included in model 2. The dummy variable *HQ_2* is based on the average team age and takes on the value 1 if the average team age is above the sample average of 54, which indicates that the team is old and experienced. The variable will take on the value 0 if the average team age is below the sample average. As *HQ_2* will capture the effect of the team age, the variable *Team_Age* is not included in model 2. The effect of a high-quality management team on the target's Tobin's Q will be analysed with the following regression function:

$$\begin{aligned} Tobin's\ Q = {} & \alpha_i + \beta_1 HQ\_2_i + \beta_2 Team\_Diversity_i + \beta_3 Team\_Size_i + \beta_4 Team\_Education_i + \beta_5 Ivy\_League_i \\ & + \beta_6 Inv\_Experience_i + \beta_7 Op\_Experience_i + \beta_8 Prof\_Experience_i + \beta_9 SPAC\_Experience_i \\ & + \beta_{10} SPAC\_Size + \beta_{11} Days + \beta_{12} At\_Risk + \beta_{13} Intermediaries + \beta_{14} PE\_Backed\_SPAC \\ & + \beta_{15} Firm\_Size + \beta_{16} Debt\_Ratio + \beta_{17} Liquidity + \beta_{18} PE\_Backed\_Target + \beta_{19} Deal\_Size \\ & + \beta_{20} Cross\_Border + \beta_{21} Payment + \beta_{22} Industry_{FE} + \beta_{23} Year_{FE} + \varepsilon_i \end{aligned}$$

Model 3

The third model takes into account the third variable that considers the quality of the SPAC management team. The variable *HQ_3* is based on the following criteria that all must be met to classify the SPAC management team as high quality; at least on director with investment experience, one with operational experience and one with SPAC experience. The variable *Team_Age* is included in model 3, as it is not captured in *HQ_*3 anymore. Compared to Model 2, the variables *Inv_Experience, Op_Experience,* and *SPAC_Experience* are excluded from Model 3, as the variable *HQ_3* captures the effect. The regression model is as follows:

$$\begin{aligned} Tobin's\ Q = {} & \alpha_i + \beta_1 HQ\_3_i + \beta_2 Team\_Age_i + \beta_3 Team\_Diversity_i + \beta_4 Team\_Size_i + \beta_5 Team\_Education_i \\ & + \beta_6 Ivy\_League_i + \beta_9 Prof\_Experience_i + \beta_{11} SPAC\_Size + \beta_{12} Days + \beta_{13} At\_Risk \\ & + \beta_{14} Intermediaries + \beta_{15} PE\_Backed\_SPAC + \beta_{16} Firm\_Size + \beta_{17} Debt\_Ratio + \beta_{18} Liquidity \\ & + \beta_{19} PE\_Backed\_Target + \beta_{20} Deal\_Size + \beta_{21} Cross\_Border + \beta_{23} Payment + \beta_{24} Industry_{FE} \\ & + \beta_{25} Year_{FE} + \varepsilon_i \end{aligned}$$

4.2 Post-merger stock performance

To examine the relationship between the characteristics of the SPAC management team and the post-merger stock performance, we apply an event study approach focusing on the buy-and-hold abnormal return ("BHAR"). Similar to the method used in Jenkinson & Sousa (2015), this study will use the returns of the target firm's stock prices after the business combination has been finalized (and the ticker symbol has changed) to analyse the performance and comprehend the fundamentals of the SPAC business. To be able to give a proper answer to the research question, both short- and long-term stock performance will be examined. At the time of incorporation of the target company, when the firm starts trading on the public market, the de-SPAC can either overperform or underperform the market. In order to analyse how the de-SPAC company performs compared to the market, we compare the returns of the SPAC post-business combination with the returns of the markets (Jenkinson & Sousa, 2015). The SPACs abnormal returns can be calculated as follows:

$$AR_{i,t} = R_{i,t} - R_{b,t}$$

Where $AR_{i,t}$ is the abnormal return of stock i at time t, $R_{i,t}$ is the actual return of stock i at time t, and $R_{b,t}$ is the return of the benchmark Russell 2000 at time t. The daily return on the share price and the market index can be computed via the following formula:

$$R_{i,t} = \frac{P_{t+1}}{P_t} - 1$$

Where P_t is the price of a share at time t and P_{t+1} is the price of a share at time t + 1.

Different sub-samples will be created with SPACs having stock price data available for 3, 6, and 9 months. Therefore, abnormal returns can be calculated for the short- and long-term, providing us with statistical evidence to answer the research question. The dependent variable in the following models, supporting either rejection or acceptance of the hypothesises 2 – 6, will be the buy-and-hold abnormal return. As presented in Section 3.2, the buy-and-hold abnormal return can be computed as follows:

$$BHAR_i\ (t_0, t_1) = \prod_{t=0}^{t=1} \left[\left(1 + R_{i,t}\right)\right] - \prod_{t=0}^{t=1} \left[\left(1 + R_{Russel\ 2000,t}\right)\right]$$

where $BHAR_i\ (t_0,\ t_1)$ represents the buy-and-hold abnormal return for portfolio *i* throughout the period t_0 to t_1. t_0 is defined as the first trading day of the post-business combination of the SPAC and t_1 is defined as the end of the measurement period (3, 6, and 9 months), $R_{i,t}$ is the daily return of SPAC *i* at

day *t.* Following the method of Dimitrova (2017), we compare the SPAC's daily returns with the Russel 2000 Index, as this can be seen as an proxy for the overall stock market.

The following models have been formulated to provide statistical evidence for hypotheses 2 – 6. These final hypotheses can be seen as the crux of this study and provide us with comprehensive understanding of the effects of different management characteristics on the post-merger stock performance. To give the best possible answer to the research question, we first examine the second hypothesis, which can be formulated as follows:

Hypotheses (2): High-quality SPAC management teams lead to better post-merger firm performance on the short- and long-term.

The dependent variable in Model 4 – 6 below is the buy-and-hold abnormal return (BHAR), as this measure can be seen as the post-merger stock performance of the de-SPACs. For the models below, three different BHAR will be employed, namely the BHAR for **3**, **6**, and **9** months. Therefore, the effects will be analyzed on different time horizons, to check whether the effects hold for the short- and long-term.

Model 4

To test how the management characteristics influence the short- and long-term stock performance, we will use the multivariate ordinary least squares (OLS) regression analysis, which can be computed as follows:

$$\begin{aligned} BHAR_i = \ & \alpha_i + \beta_1 HQ\_1_i + \beta_2 Team\_Age_i + \beta_3 Team\_Diversity_i + \beta_4 Team\_Size_i + \beta_5 Team\_Education_i \\ & + \beta_6 Ivy\_League_i + \beta_7 Op\_Experience_i + \beta_8 SPAC\_Experience_i + \beta_9 SPAC\_Size + \beta_{10} Days \\ & + \beta_{11} At\_Risk + \beta_{12} Intermediaries + \beta_{13} PE\_Backed\_SPAC + \beta_{14} Firm\_Size + \beta_{15} ROA \\ & + \beta_{16} Debt\_Ratio + \beta_{17} Liquidity + \beta_{18} PE\_Backed\_Target + \beta_{19} Deal\_Size + \beta_{20} Cross\_Border \\ & + \beta_{21} Payment + \beta_{22} Industry_{FE} + \beta_{23} Year_{FE} + \varepsilon_i \end{aligned}$$

The multivariate regression analysis allows us to research the effect of the independent variables, the characteristics of the SPAC management team and the firm specific variables, on the performance of the post-merger business combination on the short- and long-term.

Model 5

Model 5 is almost identical to Model 4, except that the variable *HQ_1* is replaced with variable *HQ_2*, and that the variables *Prof_Experience* and *Inv_Experience* are included. The variable *Team_Age* is excluded in Model 5 as *HQ_2* captures the age effect. The regression function can be defined as follows:

$$BHAR_i = \alpha_i + \beta_1 HQ\_2_i + \beta_2 Team\_Diversity_i + \beta_3 Team\_Size_i + \beta_4 Team\_Education_i + \beta_5 Ivy\_League_i + \beta_6 Inv\_Experience_i + \beta_7 Op\_Experience_i + \beta_8 Prof\_Experience_i + \beta_9 SPAC\_Experience_i + \beta_{10} SPAC\_Size + \beta_{11} Days + \beta_{12} At\_Risk + \beta_{13} Intermediaries + \beta_{14} PE\_Backed\_SPAC + \beta_{15} Firm\_Size + \beta_{16} ROA + \beta_{17} Debt\_Ratio + \beta_{18} Liquidity + \beta_{19} PE\_Backed\_Target + \beta_{20} Deal\_Size + \beta_{21} Cross\_Border + \beta_{22} Payment + \beta_{23} Industry_{FE} + \beta_{24} Year_{FE} + \varepsilon_i$$

Model 6

In Model 6, the variable *HQ_2* is replaced with *HQ_3*. Therefore, the variable *Team_Age* is included again and the variables *Inv_Experience, Op_Experience,* and *SPAC_Experience* are excluded from Model 6. The regression model follows:

$$BHAR_i = \alpha_i + \beta_1 HQ\_3_i + \beta_2 Team\_Age_i + \beta_3 Team\_Diversity_i + \beta_4 Team\_Size_i + \beta_5 Team\_Education_i + \beta_6 Ivy\_League_i + \beta_9 Prof\_Experience_i + \beta_{11} SPAC\_Size + \beta_{12} Days + \beta_{13} At\_Risk + \beta_{14} Intermediaries + \beta_{15} PE\_Backed\_SPAC + \beta_{16} Firm\_Size + \beta_{17} ROA + \beta_{18} Debt\_Ratio + \beta_{19} Liquidity + \beta_{20} PE\_Backed\_Target + \beta_{21} Deal\_Size + \beta_{22} Cross\_Border + \beta_{23} Payment + \beta_{24} Industry_{FE} + \beta_{25} Year_{FE} + \varepsilon_i$$

In order to test the remaining hypothesises that focus on the different characteristics of the SPAC management team and the performance of the post-merger business combination Model 7 will be created. The model is designed to find statistical evidence to either reject or accept the following hypothesises:

Hypotheses (3): Younger SPAC management teams lead to worse post-merger firm performance compared to older SPAC management teams on the short- and long-term.

Hypotheses (4): Higher educated SPAC management teams lead to better post-merger firm performance on the short- and long-term.

Hypotheses (5): More experienced SPAC management teams lead to better post-merger firm performance on the short -and long-term.

Hypotheses (6): SPAC management teams that already have experience in the SPAC sector lead to better post-merger firm performance on the short- and long-term.

Model 7

The last model is created to test the effect of all the independent variables on the post-merger performance. The dependent variable BHAR will be analysed for all the three periods of time, namely 3, 6, and 9 months. The regression can be defined as follows:

$$\begin{aligned} BHAR_i = \ & \alpha_i + \beta_1 Team\_Age_i + \beta_2 Team\_Diversity_i + \beta_3 Team\_Size_i + \beta_4 Team\_Education_i + \beta_5 Ivy\_League_i \\ & + \beta_6 Inv\_Experience_i + \beta_7 Op\_Experience_i + \beta_8 Pro\_Experience_i + \beta_9 SPAC\_Experience_i \\ & + \beta_{10} SPAC\_Size + \beta_{11} Days + \beta_{12} At\_Risk + \beta_{13} Intermediaries + \beta_{14} PE\_Backed\_SPAC \\ & + \beta_{15} Firm\_Size + \beta_{16} ROA + \beta_{17} Debt\_Ratio + \beta_{18} Liquidity + \beta_{19} PE\_Backed\_Target \\ & + \beta_{20} Deal\_Size + \beta_{21} Cross\_Border + \beta_{22} Payment + \beta_{23} Industry_{FE} + \beta_{24} Year_{FE} + \varepsilon_i \end{aligned}$$

In statistics, heteroskedasticity occurs when a variable's standard errors are not constant throughout a certain period. Similar as in the research of Dimitrova (2017), we will run the Breusch-Pagan test for all models, which tests the null hypothesis that the error variances are constant against the alternative hypothesis that the error variances can take multiple values. The test indicates that the null hypothesis should be rejected, which ensures that robust standard errors will be employed in Models 1 – 7.

In addition, the Hausman Test is used for Models 1 – 7 to check whether the appropriate model should be a fixed or random effects model. The null hypothesis indicates that the correct model should be a random effect model against the alternative hypothesis that the appropriate model is fixed effects. The Hausman Test indicates that the null hypothesis can be rejected for every test, this implies that the appropriate model for all the models it the fixed effects.

Table 5 Legend of regressions

Variables	Definition
Tobin's Q	Tobin's Q can be defined as the market value of equity and total liabilities divided by the book value of equity and total liabilities.
BHAR_i	Buy-and-hold abnormal return for the time periods of 3, 6, and 9 months.
HQ_1	At least one of the managers had a senior position at a Fortune 500 company, and at least one manager has experience in the financial service industry. If all criteria are met the variable will denote 1, otherwise 0.
HQ_2	Average team age is a proxy for the experience and quality of the team. High-quality teams have average age above 54, non-high-quality teams below 54.
HQ_3	High-quality team must meet several criteria; At least one director with investment experience, one with operational experience and one with SPAC experience.
Team_Age	Average age; sum of all director ages divided by total number of directors.
Team_Diversity	Ratio of men to women; number of female directors divided by the total number of directors.
Team_Size	Sum of total directors.
Team_Education	Number of directors holding an MBA divided by total number of directors.
Ivy_League	Number of directors graduated from an Ivy League University divided by total number of directors.
Inv_Experience	Number of directors that have experience in investment banking, private equity or venture capital, divided by total number of directors.
Op_Experience	Number of directors that have experience in target's industry divided by total number of directors.
Prof_Experience	Number of directors that have experience in Fortune 500 companies divided by total number of directors.

SPAC_Experience	At least one of the managers has already experience in the SPAC industry.
SPAC_Size	Natural logarithm of total amount of gross proceeds.
Days	The number of days between the first SPAC trading day and the day of the merger announcement.
At_Risk	Amount of private placements (by the management) divided by the total amount of gross proceeds.
Intermediaries	Total number of underwriters that are involved in the SPAC transaction.
PE_Backed_SPAC	Dummy variable equals 1 if the SPAC firm is backed by a private equity or hedge fund company, otherwise 0.
Firm_Size	Natural logarithm of target's total assets.
ROA	Net income before extraordinary items divided by the target firm's total assets.
Debt_Ratio	Total amount of long-term debt divided by target firm's total assets.
Liquidity	Total cash and cash equivalents divided by target firm's total assets.
PE_Backed_Target	Dummy variable equals 1 if the target firm is backed by a private equity or hedge fund company, otherwise 0.
Deal_Size	Natural logarithm of total deal value.
Cross_Border	Dummy variable equals 1 if the target firm is located outside U.S., otherwise 0.
Payment1	Variable equals 1 if the payment method is 'Cash and Stocks Combined' and is compared with the payment method 'Stock Only'.
Payment2	Variable equals 1 if the payment method is 'Cash Only' and is compared with the payment method 'Stock Only'.

5 Results

The following chapter will give a comprehensive overview of the study's results and is based on the hand collected SPAC data. The methods introduced in the previous chapter will be used to find statistical evidence for the hypotheses in order to answer the research question properly.

5.1 Pearson's Correlation Matrix

The Pearson correlation matrix is generated and displayed in Table 6 and measures the strength and direction of linear relationships between the variables. Similar as in Kolb & Tykvová (2016), the Pearson Correlation matrix is employed to test for multicollinearity. The problem of multicollinearity arises when independent variables are highly correlated, making the results of the regression insignificant. The correlation matrix in Table 6 shows that a strong and significant correlation exists between the three buy-and-hold abnormal returns (BHAR). Considering that these variables measure the same value over various time periods, this is in line with the predictions. Furthermore, the table indicates that a significant correlation exists between the variable *HQ_1* and the variables *Inv_Experience* and *Prof_Experience.* However, this is not surprising as the variable *HQ_1* is defined based on the management characteristics professional and investment experience. Nevertheless, this does not ensure the multicollinearity problem as these variables are not employed in the same model. The same can be observed for the correlation between the variables *HQ_2* and *Team_Age*, as *HQ_2* depends on the average team age. However, these variables are not tested in the same model. In addition, a strong and significant correlation exists between the variables *HQ_3* and *SPAC_Experience*, as *HQ_3* is based on the managers having experience in the SPAC industry.

Furthermore, a significant negative correlation with a coefficient of -0.69 at 1% confident level can be observed between the variable *SPAC_Size* and *At_Risk*. This strong correlation can be explained by the fact that the variable *At_Risk* is defined as the total amount of private placements (by the management) divided by the total amount of gross proceeds. The ratio will decrease if the SPAC size increases and vice versa. However, the strong correlation coefficient does not exceed the threshold that indicates that we should be concerned about multicollinearity. Following the general rule of thumb, multicollinearity is a serious problem if the correlation coefficient between two independent variables is greater than 0.8 or 0.9 (Senaviratna & Cooray, 2019). In addition, Table 6 displays a positive significant correlation between the variables *SPAC_Size* and *Firm_Size*. The variable *SPAC_Size* is defined as the total amount of gross proceeds, which can be used to acquire a target company. A larger SPAC size suggests that the SPAC has more money to acquire a target company. The same reasoning can be applied to the correlation between the variables *Firm_Size* and *Deal_Size*. However, all the coefficients are not exceeding the threshold of 0.8, that ensures that there is no multicollinearity problem. Nevertheless, all the variables will be controlled based on the variance inflation factor (VIF) (Table A.3, Appendix).

Table 6 Pearson Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)
(1) Tobin's Q	1.00																												
(2) BHAR_3	0.00	1.00																											
(3) BHAR_6	0.09	0.71***	1.00																										
(4) BHAR_9	0.07	0.59***	0.82***	1.00																									
(5) HQ_1	-0.03	0.01	-0.04	-0.11	1.00																								
(6) HQ_2	0.16	0.00	-0.09	0.00	-0.01	1.00																							
(7) HQ_3	0.14	0.09	0.08	0.07	0.03	-0.03	1.00																						
(8) Team_Age	0.23	0.04	-0.11	0.03	0.01	0.83***	-0.01	1.00																					
(9) Team_Diversity	-0.02	0.03	-0.13	-0.13	0.07	-0.05	0.09	0.01	1.00																				
(10) Team_Size	0.10	0.16**	0.08	0.05	0.12	-0.27***	0.14*	-0.18**	0.10	1.00																			
(11) Team_Education	-0.02	0.02	-0.08	0.02	0.01	-0.01	-0.08	0.03	0.10	0.13*	1.00																		
(12) Ivy_League	0.04	-0.04	-0.09	0.08	-0.02	-0.05	0.00	-0.09	0.14*	0.03	0.47***	1.00																	
(13) Inv_Experience	-0.08	-0.18**	-0.15**	-0.15	-0.16**	-0.19**	0.05	-0.21***	0.11	0.18*	0.09	0.18**	1.00																
(14) Op_Experience	-0.09	0.06	-0.06	-0.01	0.11	-0.09	0.20**	0.01	-0.05	0.00	0.00	0.03	-0.41***	1.00															

Table 6 Pearson Correlation Matrix *(continued)*

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)
(15) Prof_Experience	0.01	0.04	0.01	-0.12	0.78***	-0.01	0.16**	-0.03	0.03	-0.02	0.02	-0.05	-0.20**	0.11	1.00														
(16) SPAC_Experience	0.13	0.03	0.05	0.06	-0.05	0.04	0.83***	0.03	0.08	0.08	-0.05	-0.02	0.16*	-0.02	0.10	1.00													
(17) SPAC_Size	0.08	0.19**	0.22***	0.21**	0.10	0.06	0.15*	-0.02	0.08	0.04	-0.08	0.00	0.13	-0.26***	0.21***	0.19**	1.00												
(18) Days	-0.11	0.03	0.08	0.13	0.02	0.15*	-0.28***	0.14*	-0.18**	0.00	0.12	-0.02	-0.02	-0.19**	-0.01	-0.22	-0.10	1.00											
(19) At_Risk	-0.11	-0.16*	-0.16*	-0.20**	-0.10	-0.05	-0.21***	-0.04	0.00	-0.01	0.08	-0.04	-0.20**	0.14*	-0.17**	-0.27***	-0.69***	0.10	1.00										
(20) Intermediaries	0.09	0.02	0.02	0.06	0.03	-0.06	0.01	0.02	0.06	0.11	0.07	0.21***	0.20**	-0.05	-0.03	0.00	0.27***	-0.03	-0.16	1.00									
(21) PE_Backed_SPAC	0.02	-0.08	0.03	-0.04	0.09	-0.04	-0.12	-0.08	-0.04	-0.01	-0.11	-0.15*	0.10	-0.10	0.07	-0.22***	0.08	-0.12	-0.05	0.15	1.00								
(22) Firm_Size	0.02	0.20**	0.21***	0.24***	-0.01	0.03	0.13	0.03	0.03	0.04	-0.10	-0.01	-0.01	-0.12	0.11	0.17**	0.56***	-0.13	-0.34***	0.26***	0.00	1.00							
(23) ROA	-0.28***	0.26***	0.16*	0.28***	-0.01	0.02	-0.02	0.03	-0.08	0.02	0.01	-0.07	-0.13	0.04	0.03	0.00	0.10	0.14*	-0.09	0.13	-0.05	0.28***	1.00						
(24) Debt_Ratio	0.05	0.08	0.12	0.15	-0.07	0.14*	-0.05	0.13*	-0.03	-0.02	-0.01	0.00	-0.14*	-0.10	-0.02	0.02	0.19**	0.06	-0.05	0.04	-0.08	0.49***	0.30***	1.00					
(25) Liquidity	0.19**	-0.09	-0.19**	-0.19**	0.01	-0.09	0.03	-0.11	0.05	-0.03	0.04	0.01	0.20**	-0.02	-0.02	0.00	-0.17**	-0.14*	0.10	-0.09	0.14*	-0.45***	-0.38***	-0.60	1.00				
(26) PE_Backed_Target	0.00	-0.05	0.04	0.05	0.06	-0.07	-0.09	-0.08	0.08	0.12	-0.02	0.04	0.12	-0.06	0.00	-0.19**	0.07	-0.05	-0.06	0.04	0.22***	-0.11	-0.13	-0.10	0.05	1.00			
(27) Deal_Size	0.34***	0.08	0.06	0.00	0.02	-0.02	0.19**	-0.03	0.11	-0.02	-0.08	0.01	0.15*	-0.22***	0.13	0.19**	-0.60***	-0.35***	-0.45***	0.22***	0.07	0.62***	-0.11	0.12	-0.04	0.02	1.00		
(28) Cross_Border	0.10	-0.08	-0.03	0.02	-0.12	0.18**	-0.04	015*	0.02	-0.18**	-0.04	-0.02	-0.02	-0.08	-0.14*	-0.08	0.00	0.00	0.00	0.06	0.16*	0.13	-0.14*	0.20	-0.12	-0.06	0.09	1.00	
(29) Payment	-0.09	0.21***	0.06	0.07	0.08	-0.04	0.02	-0.04	0.28***	0.06	0.07	0.08	0.03	-0.04	0.08	0.01	0.08	-0.05	-0.11	-0.02	-0.06	-0.06	0.09	-0.14	0.03	-0.04	0.00	-0.04	1.00

Table 6 provides an overview of the Pearson Correlation Matrix. The matrix measures the strength and direction of the linear relationship between the variables of this study. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

5.2 SPAC management team and quality target firm

In Table 7, the results of Models 1, 2, and 3 are presented and indicate the relationship between the different independent variables and the quality of the target firm, which is measured with the Tobin's Q. These models can be used to find statistical evidence to either reject or accept hypothesis 1, which indicates that a high-quality SPAC management team is more likely to acquire a high-quality target firm. Table 7 provides an overview of the results of the three models that test the different variables that characterize a SPAC management team as high-quality or not. For each model, the industry and year fixed effects are included to capture any systematic variance. In Models 1, 2, and 3, the robust standard errors are employed to account for heteroskedasticity. Furthermore, the variance inflation factor (VIF) is checked for all the models to see if the data suffers from multicollinearity. In the Appendix, Table A.3 provides an overview of the model's VIF values. It is generally assumed that VIF values above 10 are considered to cause multicollinearity (Salmerón et al., 2018). For all the models, no evidence for multicollinearity has been found. The explanatory power, measured with R squared, is relatively high for each model, especially for the models with industry and year fixed effects.

Considering **Model 1**, the effect of a high-quality management team based on the professional and investment experience of the management on SPAC's ability to find a valuable target company is positive for the models with and without fixed effects, Columns (1) and (2) respectively. However, as the effect is not significant the positive relationship moves with the expectations set out in this paper. The variables *Prof_Experience* and *Inv_Experience* are not included in Model 1, as the effect is already captured in *HQ_1*. In Column (2), the variable *Team_Age* displays a positive significant effect with a coefficient of 0.016 at 1% confident level. The positive effect is in line with the idea of Anderson et al. (2004), which suggests that the team age is an indication for the experience of the management team, suggesting that they are better at selecting a high-quality target. The coefficient becomes insignificant if fixed effects are included in the model (Column 1). This can be explained by the fact that variation in the team age exists between different industries. Controlling for these industry differences makes the variables not statistically significant anymore. Interestingly, the coefficient of the variable *Team_Education* has a negative sign and is significant at the 10% confident level (Column 1). This contradicts this paper's expectations and findings of Chaudhuri et al. (2012) suggesting that the performance of equity investments by high educated managers are superior compared to managers with lower education levels.

In **Model 2**, the quality of the SPAC management team is indicated with the variable *HQ_2*, which characterizes teams as high-quality if the average team age is above the sample average. The variable *HQ_2* has a positive but insignificant value for the regressions with and without fixed effects (Columns 3 and 4). This indicates a positive relation between the quality of the management team and the quality of the target firm, although the results are not significant. The variable *Team_Age* is not included in Model 2, as the variable *HQ_2* captures the age effect on the dependent variable. The relation

between the investment experience and Tobin's Q is negative and significant at the 1% confident level without fixed effects (Column 4). If fixed effects are included, the coefficient becomes less significant, suggesting that differences in the industries exist. The negative relation contradicts the study's expectations and findings of Custódio & Metzger (2014), that indicate that a manager with background in corporate finance and with financial expertise are more financially sophisticated. This would suggest that management teams with investment experience are more skilled in finding value-enhancing target companies. Moreover, in Column 4, the variable *SPAC_Experience* displays a positive significant effect at the 5% confident level, indicating that prior SPAC experience of the management has positive influence on the ability to find a value-enhancing target company. This supports the findings of Blomkvist et al. (2021) suggesting that CEOs with SPAC experience are linked to bigger SPAC funds with superior performance. The relation between the number of intermediaries and the target's Tobin's Q is also positive and significant, suggesting that these intermediaries successfully help the SPAC firm to find a high-quality target firm. This is not in line with the findings of Cumming et al. (2014), as they argue that the number of intermediaries can be a sign of risk-sharing, which would suggest that the more intermediaries the riskier the transaction and therefore the lower the quality of the target firm.

In **Model 3**, the variable *HQ_3* displays a positive effect on the target's quality if fixed effects are not included (Column 6), but a negative effect if the fixed effects are included (Column 5). Although, the effects are not significant, the negative value contradicts hypothesis 1. The variables *Inv_Experience*, *Op_Experience*, and *SPAC_Experience* are not included in Model 3, as the effect is captured by *HQ_3*. Similar as in Model 1, the average team age seems to have a positive and significant effect on the target's Tobin's Q if the fixed effects are not included (Column 6), and the team education has a negative effect if the fixed effects are included (Column 5).

For the **Models 1 – 3**, the variable *Firm_Size* has a negative and significant effect on the dependent variable Tobin's Q. This does not support the findings of Kolb & Tykvová (2016) which show that small firms have lower growth opportunities and therefore choose to become publicly listed via the SPAC route. The positive significant relation between the debt ratio and the target firm's Tobin's Q can be explained by the positive relation between debt ratio and investments (Cuthbertson & Gasparro, 1995). However, we would suggest that there is a turning point related to debt ratio, as high debt ratios make firms riskier with higher probability of default. The *Liquidity* displays a positive and significant value for the regressions without fixed effects (Columns 2, 4, and 6), which can be explained by the expectation that firms with a lot of cash reserve can use their excess capital to invest in future earnings, resulting in a higher Tobin's Q value. The variable *Deal_Size* is positive and significant for all the models, which implies that the higher the deal value the higher the Tobin's Q of the acquired target firm. The variables *Payment1* and *Payment2* are negative and significant for the models with fixed effects. This suggest that if the payment method is in 'Cash and Stock Combined' or 'Cash Only' the Tobin's Q will be lower. This contradicts the findings of King et al. (2021), because they imply that cash

payments are a positive signal, as the SPAC management team will pay in cash if they are confident about the deal and target's quality.

The remaining variables are not statistically significant and therefore cannot be used to support the relation between the independent and dependent variable. In short, the variables *HQ_1* and *HQ_2* seem to have a positive effect on the target's quality, although they are not statistically significant. The variable *HQ_3* moves in the opposite direction, when controlling for fixed effects, but is insignificant as well. Overall, the results in Table 7 are not in line with the findings of Chemmanur & Paeglis (2005), that indicate that high-quality management teams are more likely to select better investment projects. To conclude, the results cannot provide statistical evidence to accept the first hypothesis, as Table 7 does not find prove for a positive relation between the quality of the SPAC's management team and their ability to find and merge with a high-quality target firm. Therefore, hypothesis 1 is rejected.

Table 7 Multinomial Regression Results Model 1, 2 and 3

	Dependent variable:					
	Tobin's Q					
	Model 1	Model 1	Model 2	Model 2	Model 3	Model 3
	(1)	(2)	(3)	(4)	(5)	(6)
HQ_1	0.034	0.0001				
	(0.084)	(0.062)				
HQ_2			0.153	0.090		
			(0.093)	(0.059)		
HQ_3					-0.053	0.105
					(0.102)	(0.068)
Team_Age	0.012	0.016***			0.013	0.016***
	(0.010)	(0.006)			(0.010)	(0.006)
Team_Diversity	-0.031	-0.246	-0.005	-0.156	0.123	-0.242
	(0.381)	(0.277)	(0.377)	(0.282)	(0.370)	(0.279)
Team_Size	-0.003	-0.006	0.009	0.004	0.006	-0.009
	(0.024)	(0.023)	(0.025)	(0.022)	(0.024)	(0.023)
Team_Education	-0.353*	-0.095	-0.334	-0.063	-0.346*	-0.085
	(0.203)	(0.153)	(0.200)	(0.148)	(0.192)	(0.154)
Ivy_League	0.097	0.158	0.102	0.186	0.036	0.146
	(0.254)	(0.169)	(0.246)	(0.169)	(0.257)	(0.169)
Inv_Experience			-0.340*	-0.513***		
			(0.197)	(0.154)		
Op_Experience	-0.074	-0.002	-0.148	-0.128		
	(0.132)	(0.101)	(0.137)	(0.104)		
Prof_Experience			0.134	-0.048	0.143	0.039
			(0.245)	(0.187)	(0.261)	(0.188)
SPAC_Experience	0.097	0.094	0.123	0.130**		
	(0.087)	(0.064)	(0.086)	(0.062)		
SPAC_Size	0.234	-0.224	0.140	-0.340*	0.294	-0.233
	(0.246)	(0.206)	(0.264)	(0.201)	(0.262)	(0.202)
Days	-0.0001	0.0001	-0.00005	0.0001	-0.0002	0.0001
	(0.0003)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0002)
At_Risk	1.652	-0.081	1.088	-1.477	1.524	-0.234

	(1.615)	(1.526)	(1.632)	(1.436)	(1.609)	(1.486)
Intermediaries	0.042	0.048	0.067	0.085**	0.046	0.050
	(0.063)	(0.044)	(0.061)	(0.043)	(0.060)	(0.043)
PE_Backed_SPAC	-0.013	0.001	-0.010	0.004	-0.044	-0.004
	(0.083)	(0.065)	(0.079)	(0.063)	(0.085)	(0.065)
Firm_Size	-0.557***	-0.271**	-0.530***	-0.307***	-0.572***	-0.272**
	(0.179)	(0.109)	(0.165)	(0.098)	(0.187)	(0.109)
Debt_Ratio	0.040*	0.045***	0.041*	0.045***	0.036	0.047***
	(0.024)	(0.017)	(0.023)	(0.016)	(0.025)	(0.017)
Liquidity	0.184	0.316***	0.253	0.346***	0.178	0.320***
	(0.161)	(0.105)	(0.162)	(0.105)	(0.165)	(0.108)
PE_Backed_Target	0.044	0.007	0.062	0.014	0.022	0.002
	(0.074)	(0.063)	(0.077)	(0.063)	(0.076)	(0.062)
Deal_Size	0.695***	0.648***	0.688***	0.678***	0.725***	0.648***
	(0.160)	(0.115)	(0.145)	(0.116)	(0.150)	(0.112)
Cross_border	0.110	0.034	0.146	0.060	0.096	0.028
	(0.122)	(0.089)	(0.114)	(0.088)	(0.128)	(0.087)
Payment1	-0.251**	0.015	-0.258***	0.022	-0.240**	0.012
	(0.096)	(0.076)	(0.095)	(0.074)	(0.099)	(0.074)
Payment2	-0.179**	-0.060	-0.166*	-0.077	-0.191**	-0.061
	(0.088)	(0.072)	(0.086)	(0.072)	(0.089)	(0.073)
Constant	-1.072	-0.573	-0.359	1.285	-1.115	-0.491
	(2.101)	(1.181)	(1.899)	(1.096)	(2.032)	(1.150)
Year fixed effects	*Included*	*Excluded*	*Included*	*Excluded*	*Included*	*Excluded*
Industry fixed effects	*Included*	*Excluded*	*Included*	*Excluded*	*Included*	*Excluded*
Observations	158	158	158	158	158	158
R^2	0.677	0.314	0.688	0.339	0.673	0.317

The dependent variable in the regression is the target's firm Tobin's Q and is measured in the first year after the merger. In Model 1, 2, and 3 the variable for the quality of the SPAC management team is *HQ_1, HQ_2, and HQ_3* respectively. Every model is displayed with industry and year fixed effects included and excluded. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

5.3 SPAC management team and post-merger firm performance

This section will provide statistic evidence to either reject or accept the second hypothesis, which states that the quality of the SPAC management team has a positive influence on the post-merger firm performance on the short- and long-term. The post-merger firm performance will be measured by the buy-and-hold abnormal returns using the Russel 2000 as a benchmark. Table 8 will provide an overview of the results of Model 4, 5, and 6, which use the *BHAR_3* as the dependent variable. The buy-and-hold abnormal returns for 3 months are employed to examine the effect on the short term. In the regressions the robust standard errors are employed to account for heterogeneity issues. Besides this, the variance inflation factors (VIF) are checked and do not indicate multicollinearity (Table A.3, Appendix). The R squared is relatively high indicating that these models have enough explanatory power.

In **Model 4**, the variable *HQ_1* gives a negative but insignificant value for the regression with and without industry and time fixed effects, suggesting that the relation between the post-merger firm performance for a 3-months period and the quality of the SPAC management team is negative. This

relation contradicts the expectation that high-quality management teams ensure higher post-merger firm performance. However, the effect is not statistically significant. In **Model 4**, the variables *Prof_Experience* and *Inv_Experience* are not included, since *HQ_1* captures these effects. The SPAC's team size seems to have a positive effect on the performance if fixed effects are not taken into account (Column 2), which is in line with the findings of Cumming et al. (2014), indicating that team sizes have a positive influence on firm performances. The effect becomes insignificant if the fixed effects are added to the regression, which indicates that the team size is specific to certain industries. In addition, in Column (2), the variable *Op_Experience* confirms the expectations that operational experience has a positive influence on the firm performance after the merger. Hence, the result is in line with the findings of Chauviere et al. (2020) which indicates that management teams with managers having operational experience can be seen as a recipe for a SPAC being successful and show superior post-merger firm performance. Besides this, there is a positive relation between the target's firm size and the dependent variable, which is in line with the finding of Ang (1992) that large corporations have more opportunities to expand and stimulate growth boosting the firm's performance.

Model 5 displays the results using *HQ_2* as the key independent variable. A negative relation exists between the variables *HQ_2* and *BHAR_3* (Column 4), which contradicts the paper's beliefs. If the fixed effects are included in the model, the relation turns positive. However, the relation is not significant. The variable *Team_Age* is not included in Model 5, because the effect is captured in *HQ_2*. Similar as in Column 2, the team size displays a positive significant effect on the firm performance. Surprisingly, the effect of investment experience is negative and significant, which is not in line with the predictions and the findings of Custódio & Metzger (2014), that stipulates that financial experienced managers actively manage financial policies and make investments that are not sensitive to cash flows, which boosts the firm's performance. However, the paper's findings do not suggest that investment and financial experience can be a valuable addition to the management team in identifying and merging with a target company. In Column (3), the variables *Ivy_League* and *Prof_Experience* display a slightly negative and significant effect. This contradicts the expectations as we would argue that Ivy League graduated managers are educated at the highest level, contributing to better firm performance (Miller et al., 2015). Besides this, negative coefficient of *Ivy_League* does not support the social network hypothesis of Cohen et al. (2008), which indicates that managers graduated from Ivy League Universities have strong social networks helping them to find high-quality target firms and have superior firm performance. The negative relation between professional experience and firm performance does not support the idea of Liu et al. (2019), which suggests that professional experience can be a positive sign to the market and that experience in Fortune 500 companies positively affect firm performance.

In **Model 6,** the variable *HQ_3* has a positive effect on the firm performance in both Columns (5) and (6), in line with the second hypothesis. However, the results are not significant. Similar to Model 4 and 5 when the fixed effects are excluded, team size has a positive effect on the short-term

performance. Again, the variables *Ivy_League* and *Prof_Experience* display a negative and significant effect on the *BHAR_3* (Column 5).

For **Models 4 – 6**, the target firm's ROA positively influences the post-merger firm performance if the industry and year fixed effects are not included. This demonstrates that the ROA for specific industries is in general higher than for other industries, resulting in superior firm performance. Additionally, cash as a method of payment represented by the variable *Payment2*, is positive and strongly significant for every model, which is in line with the expectations following the reasoning of King et al. (2021) that cash payments demonstrate confidence in a transaction, resulting in more trust and better performance. To conclude, the results in Table 8 do not give statistical evidence to indicate a positive relationship between the quality of the SPAC management team and the firm's performance on the short time (3 months). In addition to the 3-months BHAR, Table A.4 in the Appendix, provides an overview of the regression results with the 6-months BHAR as a robustness check to research short-term performance. The independent variable *HQ_2* in Model 5, shows a positive and highly significant relation between the SPAC management quality and the firm's stock performance for a 6-months period. Therefore, Table A.4 displays statically significant evidence for the idea that high-quality SPAC's management teams have superior firm performance on the short term. Similar to Table 8, the variables *Inv_Experience* and *Prof_Experience* display a negative effect as well.

To approach the second hypothesis properly, Table 9 is constructed and gives a comprehensive overview of the effects on the long term. The robust standard errors are employed to account for heteroskedasticity, and the variance inflation factors (VIF) are researched and do not show multicollinearity issues. The R squared is relatively high indicating the explanatory power of the models to draw conclusions about the relations. The dependent variable for the Models 4, 5, and 6 in Table 9 is the buy-and-hold abnormal returns for a period of 9 months.

In **Model 4**, the variable *HQ_1* shows a positive relation in Column (7) and (8), which is in line with hypothesis 2. The effect is significant for Column (8), but by including the industry and year fixed effects the coefficient turns insignificant, which indicates that the effect is industry specific. In Column (7), *Team_Age* shows a positive effect on the firm performance, which is in line with Anderson et al. (2004) suggesting that the average team age is a proxy for the management's experience and boosts the performance. Next to this, the variable *Team_Diversity* in Column (8) is slightly positive and significant, which would suggest that more gender diversity leads to better firm performance. This is in line with the historical literature that stands for better firm performance by diverse teams (Dwyer et al., 2003; Goll et al., 2001). In Column (8), the variable *Ivy_League* shows a positive value, supporting the expectations that Ivy League educated managers add value in terms of education and social connections.

The variable *HQ_2* in **Model 5** supports the second hypothesis with a positive and highly significant value. This relation indicates that high-quality SPAC management teams have better post-merger stock performance on the long term (9 months). These findings are in line with the findings of Chemmanur & Paeglis (2005) that display a positive relation between the quality of the SPAC

management team and the long-term stock performance. Again, Column (10) displays a positive significant effect of the number of Ivy League graduated managers on the firm performance. However, the investment experience is negatively related to the *BHAR_9*. The same negative effect of investment experience can be observed for the buy-and-hold abnormal returns for 3 months. Similar to Model 5 for the 3-months buy-and-hold abnormal returns, the negative effect of the variable *Inv_Experience* contradicts the findings of Custódio & Metzger (2014), that suggest that investment experience contributes to superior firm performance. Nevertheless, SPAC experience is positively related to firm performance (Column 9), which is in line with Blomkvist et al. (2021) reasoning that SPAC experience boosts the firm's performance.

In **Model 6**, the variable *HQ_3* is positive but insignificant. Similar as in Column 7, the variable *Team_Age* displays a positive and significant effect, supporting the idea that older management teams have more experience which they can turn into better performance (Anderson et al., 2004). In line with the expectations, *Team_Diversity* shows a positive effect again. For Model 5 and 6, the professional experience is negative and significant, which is also observed for the 3 months period. The relation between the variable *Firm_Size* and performance is positive and significant for the models excluding fixed effects. This suggest that target firms with more assets experience superior post-merger firm performance. Interestingly, payment method 'cash and stock combined' displays a positive relation on the long-term firm performance if the fixed effects are not taken into account.

Regarding the second hypothesis, that high-quality SPAC management teams are able to create better post-merger stock performance on the short- and long-term, Table 8 does not provide enough statistical evidence for the effects over a 3-months period. However, Table A.4 shows statistical evidence for a strong positive relation between *HQ_2* and the BHAR for 6-months period. This suggests that high-quality SPAC management teams are more likely to have better firm performance over a 6-months period. In addition, Table 9 shows evidence for a positive relation between the *HQ_2* and the stock performance on the long term. Therefore, we can accept hypothesis 2 that indicates that high-quality SPAC management teams have better post-merger stock performance on the short-and long-run.

Table 8 Multinomial Regression Results (Model 4 – 6) for 3-months period

	Dependent variable:					
	BHAR_3					
	Model 4	Model 4	Model 5	Model 5	Model 6	Model 6
	(1)	(2)	(3)	(4)	(5)	(6)
HQ_1	-0.003	-0.001				
	(0.002)	(0.002)				
HQ_2			0.001	-0.0002		
			(0.003)	(0.002)		
HQ_3					0.0002	0.001
					(0.003)	(0.002)
Team_Age	0.0004	0.0002			0.0003	0.0002

	(0.0003)	(0.0002)			(0.0003)	(0.0002)
Team_Diversity	0.005	-0.001	0.008	0.001	0.006	-0.002
	(0.010)	(0.008)	(0.010)	(0.008)	(0.009)	(0.008)
Team_Size	0.001	0.001**	0.001	0.002**	0.001	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Team_Education	-0.001	0.002	0.001	0.002	0.001	0.002
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Ivy_League	-0.009	-0.004	-0.012*	-0.003	-0.011*	-0.003
	(0.007)	(0.005)	(0.006)	(0.005)	(0.007)	(0.006)
Inv_Experience			-0.0001	-0.013***		
			(0.007)	(0.005)		
Op_Experience	0.001	0.006*	0.001	0.002		
	(0.005)	(0.003)	(0.004)	(0.003)		
Prof_Experience			-0.016*	-0.007	-0.014*	-0.002
			(0.008)	(0.006)	(0.008)	(0.006)
SPAC_Experience	0.001	-0.001	0.001	-0.0002		
	(0.003)	(0.002)	(0.003)	(0.002)		
SPAC_Size	-0.005	0.008	-0.004	0.006	-0.004	0.006
	(0.008)	(0.007)	(0.008)	(0.007)	(0.008)	(0.007)
Days	-0.00001	0.00000	-0.00001	0.00000	-0.00001	0.00000
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
At_Risk	-0.055	-0.025	-0.067	-0.053	-0.068	-0.014
	(0.058)	(0.063)	(0.055)	(0.058)	(0.056)	(0.062)
Intermediaries	0.0003	-0.001	0.0004	-0.001	0.0003	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
PE_Backed_SPAC	-0.003	-0.001	-0.003	-0.001	-0.003	-0.001
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Firm_Size	0.003	0.005*	0.001	0.005	0.002	0.005*
	(0.005)	(0.003)	(0.005)	(0.003)	(0.005)	(0.003)
ROA	0.00003	0.0001**	0.00004	0.0001*	0.00003	0.0001**
	(0.00004)	(0.00003)	(0.00004)	(0.00003)	(0.00003)	(0.00003)
Debt_Ratio	0.001	0.00004	0.001*	-0.00002	0.001*	-0.0001
	(0.001)	(0.0005)	(0.001)	(0.0005)	(0.001)	(0.0005)
Liquidity	-0.004	0.004	-0.003	0.005	-0.003	0.003
	(0.005)	(0.004)	(0.005)	(0.004)	(0.005)	(0.004)
PE_Backed_Target	0.0004	-0.0004	0.001	-0.0001	0.0005	-0.00004
	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Deal_Size	0.0003	-0.001	0.003	-0.001	0.001	-0.002
	(0.006)	(0.004)	(0.006)	(0.004)	(0.006)	(0.004)
Cross_border	-0.005	-0.002	-0.005	-0.001	-0.006	-0.001
	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)
Payment1	0.002	0.003	0.002	0.003	0.002	0.003
	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
Payment2	0.009***	0.006***	0.009***	0.006**	0.009***	0.006***
	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
Constant	-0.005	-0.065*	0.027	-0.036	0.014	-0.060
	(0.065)	(0.038)	(0.059)	(0.036)	(0.062)	(0.038)
Year fixed effects	*Included*	*Excluded*	*Included*	*Excluded*	*Included*	*Excluded*
Industry fixed effects	*Included*	*Excluded*	*Included*	*Excluded*	*Included*	*Excluded*
Observations	158	158	158	158	158	158
R^2	0.662	0.192	0.667	0.219	0.669	0.177

The dependent variable in the regression is the buy-and-hold abnormal return for the 3-months period (*BHAR*_3) as a measurement of the post-merger stock performance. In Model 4, 5, and 6 the variable for the quality of the SPAC management team is *HQ_1, HQ_2, and HQ_3* respectively. Every model is displayed with industry and year fixed effects included and excluded. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 9 Multinomial Regression Results (Model 4 – 6) for 9-months period

	Dependent variable:					
	BHAR_9					
	Model 4	Model 4	Model 5	Model 5	Model 6	Model 6
	(7)	(8)	(9)	(10)	(11)	(12)
HQ_1	0.010	0.006*				
	(0.006)	(0.004)				
HQ_2			0.024***	0.009**		
			(0.006)	(0.004)		
HQ_3					0.013	0.005
					(0.008)	(0.004)
Team_Age	0.001*	0.003			0.001*	0.004
	(0.001)	(0.004)			(0.001)	(0.004)
Team_Diversity	0.004	0.032*	0.013	0.025	0.002	0.034**
	(0.034)	(0.017)	(0.029)	(0.016)	(0.029)	(0.017)
Team_Size	-0.0004	0.002	-0.002	0.001	-0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Team_Education	-0.020	-0.004	-0.025	-0.001	-0.015	-0.002
	(0.018)	(0.011)	(0.015)	(0.010)	(0.017)	(0.011)
Ivy_League	0.014	0.021*	0.021	0.026**	0.009	0.018
	(0.018)	(0.011)	(0.017)	(0.012)	(0.017)	(0.012)
Inv_Experience			-0.026	-0.034***		
			(0.017)	(0.010)		
Op_Experience	0.005	0.004	-0.0004	-0.003		
	(0.013)	(0.007)	(0.011)	(0.007)		
Prof_Experience			-0.050***	-0.031**	-0.040**	-0.020*
			(0.014)	(0.012)	(0.016)	(0.012)
SPAC_Experience	0.011	0.004	0.017**	0.007		
	(0.008)	(0.005)	(0.007)	(0.004)		
SPAC_Size	0.026	0.017	0.035	0.019	0.027	0.017
	(0.024)	(0.014)	(0.022)	(0.013)	(0.025)	(0.013)
Days	0.00002	0.00001	0.00003	0.00002	0.00001	0.00001
	(0.00002)	(0.00001)	(0.00003)	(0.00001)	(0.00002)	(0.00001)
At_Risk	-0.038	-0.033	-0.121	-0.058	-0.096	-0.036
	(0.146)	(0.133)	(0.136)	(0.127)	(0.151)	(0.127)
Intermediaries	0.002	-0.002	-0.003	-0.002	0.0003	-0.002
	(0.006)	(0.003)	(0.005)	(0.003)	(0.006)	(0.003)
PE_Backed_SPAC	0.004	0.002	0.008	0.003	0.003	0.001
	(0.007)	(0.004)	(0.007)	(0.004)	(0.006)	(0.004)
Firm_Size	-0.011	0.016**	-0.012	0.016**	-0.010	0.017**
	(0.016)	(0.007)	(0.012)	(0.007)	(0.016)	(0.007)
ROA	0.00001	0.0001	0.00004	0.0001	0.00002	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Debt_Ratio	0.0004	-0.001	-0.0001	-0.001	0.001	-0.001
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)

Liquidity	-0.020	-0.002	-0.023	0.0004	-0.020	-0.001
	(0.016)	(0.009)	(0.015)	(0.009)	(0.016)	(0.009)
PE_Backed_Target	0.002	0.004	0.002	0.004	0.002	0.004
	(0.007)	(0.005)	(0.006)	(0.004)	(0.006)	(0.004)
Deal_Size	0.0001	-0.016*	0.005	-0.013	-0.001	-0.017*
	(0.017)	(0.009)	(0.015)	(0.009)	(0.017)	(0.009)
Cross_border	0.001	-0.004	0.00000	-0.003	0.002	-0.004
	(0.013)	(0.006)	(0.009)	(0.005)	(0.013)	(0.006)
Payment1	0.001	0.016***	0.0001	0.015***	-0.003	0.014***
	(0.009)	(0.005)	(0.007)	(0.004)	(0.010)	(0.005)
Payment2	-0.003	0.001	0.0004	0.002	-0.002	0.001
	(0.011)	(0.007)	(0.009)	(0.006)	(0.010)	(0.007)
Constant	0.032	-0.109	0.042	-0.093	0.073	-0.105
	(0.179)	(0.079)	(0.158)	(0.072)	(0.176)	(0.076)
Year fixed effects	*Included*	*Excluded*	*Included*	*Excluded*	*Included*	*Excluded*
Industry fixed effects	*Included*	*Excluded*	*Included*	*Excluded*	*Included*	*Excluded*
Observations	118	118	118	118	118	118
R^2	0.604	0.291	0.662	0.351	0.612	0.292

The dependent variable in the regression is the buy-and-hold abnormal return for the 9-months period (*BHAR_9*) as a measurement of the post-merger stock performance. In Model 4, 5, and 6 the variable for the quality of the SPAC management team is *HQ_1, HQ_2, and HQ_3* respectively. Every model is displayed with industry and year fixed effects included and excluded. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

5.4 Different management characteristics and firm performance

Turning into the last four hypotheses, that are related to the effect of management specific characteristics on firm performance, Table 10 is constructed. The table presents the buy-and-hold abnormal returns for three different periods of time (3, 6, and 9 months) to test the effect of the management characteristics on the stock price performance after the merger. In the regressions, the robust standard errors are employed to account for the heteroskedasticity issue. In addition, the VIF is analyzed for all the variables to see if there is multicollinearity, but this problem does not persist (Table A.3, Appendix). The models' R squared indicates values that are relatively high, suggesting that these models have enough explanatory power.

Turning into the third hypothesis, that indicates that younger SPAC management teams lead to worse post-merger firm performance compared to older SPAC management teams on the short- and long-term. Analyzing the results presented in Table 10, we observe a positive relation between the variable *Team_Age* and the three different dependent variables. However, the effect is only significant for the *BHAR_6* and *BHAR_9* (Columns 15, 16, and 17). The results are consistent with the findings of Anderson et al. (2004), that imply that the average team age is an indication of the team's experience, which is related to the firm's performance (Acquaah, 2012). However, the results are not in line with the paper of Cumming et al. (2014), in which they argue that younger SPAC management teams have more financial incentives to complete a successful transaction. In this paper, we assume that the 3- and 6-months BHAR measure the effect on the short term, and the 9-months BHAR the effect on the long

term. Therefore, Table 10 provides statistical evidence to conclude that the average age of the management team has a positive effect on the short- and long-term firm performance. Thus, we accept hypothesis 3.

The fourth hypothesis suggests that higher educated SPAC management teams lead to better post-merger firm performance on the short- and long-term. To approach this hypothesis, we should analyze two key variables, namely *Team_Education* and *Ivy_Leauge*. First, the variable *Team_Education* displays a positive effect for the *BHAR_3*, but a negative effect for the dependent variables *BHAR_6* and *BHAR_9*. The negative effect contradicts historical research (Chaudhuri et al., 2012; Chemmanur & Paeglis, 2005; Golec, 1996; Goll et al., 2001; Jalbert et al., 2010) suggesting that education has a positive effect on firm performance. However, the results are not significant. Second, the variable *Ivy_League* shows a negative effect for the *BHAR_3* and *BHAR_6*, which is not in line with the expectations and the findings of Miller et al. (2015) that show that high-educated managers lead to superior performance. However, Column (18) displays a positive significant relation between *Ivy_League* and the long-term firm performance. Unfortunately, Table 10 does not provide enough statistical evidence to accept hypothesis 4. Therefore, we reject hypothesis 4.

The fifth hypothesis indicates that more experience leads to better post-merger firm performance on the short- and long-term. To either reject or accept hypothesis 5, we have to consider the three main experience related variables; *Inv_Experience, Op_Experience*, and *Prof_Experience*. First, the variable *Inv_Experience* shows a negative and highly significant effect on the firm performance on the short- and long-term in the regressions without fixed effects. This contradicts the expectation that investment experience could be a value addition to the management team and helps in increasing firm performance, as shown in the research of Custódio & Metzger (2014). The negative relation can be explained with the idea that these managers focus too much on the SPAC vehicle as an investment, rather than looking at the long-term perspective for the target company. However, a positive relation exists between the operational experience and the short-term firm performance (Columns 13 and14). The effect is not significant and disappears when the time period increases. Therefore, we cannot say that a positive relation exists between the short- and long-term. Second, the average number of managers having professional experience seems to negatively affect the post-merger firm performance on both short- and long-term. The effect is slightly significant for the regressions with year and industry effects on the short-term (Columns 13 and 15). On the long-term, the effect is negative and significant at the 5% confident level (Columns 17 and 18). The negative effect contradicts the findings of Liu et al. (2019) that prior work experience in large corporations has a positive influence on a firm's performance. To conclude, the investment and professional experience are not in line with the hypothesis by showing negative results. Operational experience shows a positive but insignificant effect on the short-term. Taking the experience related variables together, we cannot find statistical evidence for hypothesis 5, and therefore we reject hypothesis 5.

The variable of interest for the sixth hypothesis is the variable *SPAC_Experience*, which means at least one manager has relevant experience in the SPAC industry. Hypothesis 6 states that experience in the SPAC industry leads to better firm performance on the short- and long-term. Table 10 shows a positive and significant relation between the SPAC experience and the BHAR for the periods of 6 and 9 months (Column 15 and 17). As the dependent variable *BHAR_6* is considered as the short-term firm performance and *BHAR_9* as the long-term firm performance, we can argue that SPAC experience does positively affect the firm's performance on the short- and long-term. Therefore, we accept hypothesis 6. These findings support the findings of Blomkvist et al. (2021) that prior SPAC experience has a positive impact.

Some other variables that influence the firm's performance should be mentioned as well, as they can guide investors to all the different SPAC companies and help them identify promising SPACs. First of all, the team size positively influences the performance for 3 months (Column 14). Beside this, the target's firm size is positively related to the BHAR (Columns 14, 15 and 18) and the target's ROA shows a positive effect on the short-term as well (Column 13). The payment method 'Cash and Stock Combined' ensures superior firm performance on the short- and long-term (Columns 16 and 18). However, the payment method 'Cash Only' displays a positive and significant effect only for 3-months BHAR. Contrary to the research's expectations, the variables *Days*, *At_Risk*, *Intermediaries*, *PE_Backed_SPAC*, and *PE_Backed_Target* do not display a significant effect on the post-merger firm performance.

Table 10 Multinomial Regression Results SPAC management characteristics

	Dependent variable:					
	BHAR_3		BHAR_6		BHAR_9	
	(13)	(14)	(15)	(16)	(17)	(18)
Team_Age	0.0003	0.002	0.001***	0.001**	0.001**	0.0001
	(0.003)	(0.002)	(0.004)	(0.003)	(0.001)	(0.004)
Team_Diversity	0.006	0.003	0.003	0.022	0.004	0.025
	(0.010)	(0.008)	(0.019)	(0.014)	(0.031)	(0.017)
Team_Size	0.001	0.002**	-0.001	0.001	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Team_Education	0.001	0.002	-0.001	-0.001	-0.018	-0.002
	(0.005)	(0.005)	(0.010)	(0.009)	(0.017)	(0.011)
Ivy_League	-0.011	-0.004	-0.017	-0.004	0.011	0.024*
	(0.007)	(0.005)	(0.011)	(0.009)	(0.017)	(0.012)
Inv_Experience	0.0002	-0.013**	-0.012	-0.025***	-0.022	-0.030***
	(0.007)	(0.005)	(0.013)	(0.009)	(0.020)	(0.011)
Op_Experience	0.002	0.002	-0.008	-0.004	-0.001	-0.001
	(0.004)	(0.003)	(0.007)	(0.005)	(0.013)	(0.007)
Prof_Experience	-0.014*	-0.007	-0.026*	-0.011	-0.041**	-0.029**
	(0.008)	(0.006)	(0.012)	(0.010)	(0.016)	(0.012)
SPAC_Experience	0.001	0.003	0.009**	0.005	0.016*	0.006
	(0.003)	(0.002)	(0.005)	(0.004)	(0.008)	(0.004)

SPAC_Size	-0.004	0.006	0.013	0.017	0.022	0.016
	(0.008)	(0.007)	(0.016)	(0.013)	(0.024)	(0.014)
Days	-0.001	0.000	0.002	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
At_Risk	-0.063	-0.050	-0.027	-0.038	-0.131	-0.073
	(0.056)	(0.063)	(0.102)	(0.102)	(0.142)	(0.131)
Intermediaries	0.002	-0.001	0.003	0.001	0.001	-0.002
	(0.002)	(0.002)	(0.003)	(0.002)	(0.006)	(0.003)
PE_Backed_SPAC	-0.003	-0.001	0.003	0.002	0.005	0.002
	(0.002)	(0.002)	(0.004)	(0.003)	(0.006)	(0.004)
Firm_Size	0.002	0.005*	0.014*	0.005	-0.012	0.015**
	(0.005)	(0.003)	(0.008)	(0.006)	(0.016)	(0.007)
ROA	0.003	0.001**	0.001	0.001	0.004	0.001
	(0.004)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)
Debt_Ratio	0.001*	-0.004	0.001	-0.005	0.001	-0.001
	(0.001)	(0.005)	(0.001)	(0.001)	(0.002)	(0.001)
Liquidity	-0.004	0.005	-0.014	-0.006	-0.019	0.002
	(0.005)	(0.004)	(0.008)	(0.007)	(0.016)	(0.009)
PE_Backed_Target	0.005	-0.01	0.004	0.003	0.002	0.004
	(0.003)	(0.002)	(0.005)	(0.004)	(0.007)	(0.005)
Deal_Size	0.002	-0.001	0.011	-0.004	0.006	-0.012
	(0.006)	(0.004)	(0.009)	(0.006)	(0.018)	(0.009)
Cross_border	-0.006	-0.001	0.004	0.003	0.002	0.004
	(0.004)	(0.003)	(0.005)	(0.004)	(0.012)	(0.006)
Payment1	0.002	0.003	0.004	0.007**	-0.002	0.015***
	(0.003)	(0.002)	(0.005)	(0.004)	(0.009)	(0.005)
Payment2	0.009***	0.006***	0.004	0.002	0.002	0.001
	(0.003)	(0.002)	(0.005)	(0.004)	(0.010)	(0.007)
Constant	0.007	-0.043	0.070	-0.015	0.092	-0.069
	(0.064)	(0.039)	(0.107)	(0.063)	(0.180)	(0.079)
Year fixed effects	*Included*	*Excluded*	*Included*	*Excluded*	*Included*	*Excluded*
Industry fixed effects	*Included*	*Excluded*	*Included*	*Excluded*	*Included*	*Excluded*
Observations	158	158	148	148	118	118
R^2	0.670	0.219	0.626	0.212	0.622	0.333

In Table 10 the buy-and-hold abnormal returns will be employed for three periods of time. Column (13) and (14) display the *BHAR_3* with and without de year and industry fixed effects. Column (15) and (16) display the *BHAR_6*. Column (17) and (18) display the *BHAR_9*. The buy-and-hold abnormal returns are used as a measurement of the post-merger stock performance. Every model is displayed with industry and year fixed effects included and excluded. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

5.5 Robustness checks

One of the challenges in this study is to determine a correct definition of a high-quality management team. In literature, different criteria for a superior management team are highlighted. To account for objectivity of this definition, this study uses three different methods to qualify a management team as high-quality or not, indicated with the variables *HQ_1*, *HQ_2*, and *HQ_3.* The three different definitions are presented in Section 3.2.

In addition, another challenge is to measure the quality of the selected target companies. The Tobin's Q is used as measurement of the target quality. As a robustness check, this study will employ another measurement for the target's quality, namely the return on assets. The ROA can be seen as a

proxy for profitability. Contrary to the Tobin's Q ratio, the ROA is not affected by the perception of the market and cannot be influenced by market mispricing (Liu et al., 2019). In the Appendix, Table A.5 provides an overview of the effects between the quality of the SPAC management team and the dependent variable *ROA*. Similar to Table 7, a positive relation exists between the variables *HQ_1*, *HQ_2*, and *HQ_3* and the quality of the target firm, measured with ROA. However, the results are not significant. The experience related variables *Inv_Experience*, *Op_Experience*, *Prof_Experience*, and *SPAC_Experience* display a similar relation as shown in Table 5.2. Other control variables display similar effects as in the regression with the Tobin's Q. Therefore, the results shown in Table 7 can be seen as robust and valuable findings.

The most challenging of this study is to deal with endogeneity problems, which can be defined as a correlation between the explanatory variables and the error term in the regression. Endogeneity causes parameter estimations that are distorted and inconsistent, making it relatively hard to draw valid conclusions. The endogeneity problem occurs when relevant variables are not included in the regression (omitted variables), when a certain variable is not measured properly (measurement error), and when the dependent and independent variable interact at the same time (simultaneity) (Roberts & Whited, 2013). To test whether the problem of omitted variable bias occurs in the different models, we will run the Ramsey Regression Equation Specification Error Test (RESET). The test is designed to find specification errors in the regression models (Thursby, 1985). The RESET tests the null hypothesis that there is not a misspecification in the model. In the Appendix, Table A.6 displays the RESET test for all the models with and without industry and year fixed effects. The p-values indicate that the null hypothesis cannot be rejected for all the models, which suggests that omitted variables do not cause model misspecifications in this study.

6 Conclusion

Over the last few years, there is a tremendous trend in the number of firms becoming publicly listed via the SPAC vehicle instead of the traditional IPO route. What makes this Special Purpose Acquisition Company particularly special, is that it does not have any ongoing operations before the merger with a target company. At the time of the SPAC IPO, the identity and industry of the private target company is unknown to the public and managers of the SPAC, which makes it very hard for investors to predict future returns. The only information available for the public are the characteristics of the SPAC's managers. This study aims to find statistical evidence for the positive influence of a high-quality SPAC management team on the ability to find a high-quality target firm and on the post-merger firm performance on the short- and long-term. The paper's research question can be defined as follows:

Does a SPAC's high-quality management team really make a difference in a SPAC being successful or not? And if yes, what are the most important determinants of a SPAC management team in making the SPAC a success?

To determine whether the SPAC management team makes a difference in the SPAC being a success or not, first, the study investigates the effect of a SPAC's management quality on the ability to find a value-enhancing target firm. The first hypothesis indicates that high-quality SPAC management teams are more likely to acquire high-quality target firms. The quality of the target firm is measured by the Tobin's Q and returns on assets. The quality of the SPAC management team is measured by three different methods. The first definition of a high-quality SPAC management team follows Klausner et al., (2022) and characterize the management as high-quality if at least one manager has experience in a Fortune 500 company and at least one manager has experience in the financial service industry. The second definition of a high-quality management is based on the idea of Anderson et al. (2004) that the average team age is a proxy for the management's experience. Using this method, a management team is defined as high-quality if the average team age is above the sample average. The third method is introduced in this study and considers a SPAC management to be of high-quality if it meets the following criteria: at least one director with investment experience, one with operational experience and one with SPAC experience. The paper's results do not provide statistical evidence for a positive relation between the quality of the management team, measured by the three methods, and the quality of the target firm. Therefore, we will reject hypothesis 1. Nevertheless, it seems that the average team age does matter for finding a high-quality target company. Although, the average investment experience of the SPAC management team is negatively related to the target's quality.

Turning to hypothesis 2 which indicates that high-quality SPAC management teams ensure superior post-merger firm performance on the short- and long-term. The firm's performance is analysed using the buy-and-hold abnormal return for periods of 3, 6, and 9 months. The 3- and 6-months buy-and-hold abnormal return measures the short-term performance. However, the long-term firm performance is analysed over a period of 9 months. After a SPAC merger is completed, the de-SPAC immediately starts restructuring and reorganising making it possible to observe long-term effects in 9 months. The results do not show a significant relation between the quality of the SPAC management and the firm performance for a 3-months period. However, if we investigate the relation on a 6-months period, there is a strong and significant effect, which suggests that the quality of the management does matter for the short-term firm performance. In addition, the effect is strong and highly significant on the long-term, looking at a 9-months period. The results only sustain for the variable that characterizes the SPAC management team as high quality if the average team age is above the sample average (*HQ_2*). Concluding, the results show statistical evidence for the relationship between the quality of the management and the post-merger firm performance on the short-and long-term.

The hypotheses 3 – 6 hypothesise the effect of the different management characteristics on the firm's performance. These management characteristics have been researched to provide investors with insights which SPACs to select. Hypothesis 3 indicates that SPACs with younger management teams have worse post-merger firm performance compared to older SPAC management teams. The paper's findings indicate that the average team age is an important determinant in forecasting the post-merger stock performance. The average team age demonstrates a significant positive influence on the firm's performance on the short- and long-term. This is in line with the literature that argues that age can be a proxy for experience contributing to better firm performance (Acquaah, 2012; Anderson et al., 2004). Therefore, hypothesis 3 is accepted. Hypothesis 4 states that higher educated management teams lead to better post-merger firm performance. However, the results reveal that the level of education does not seem to be important in determining whether a SPAC will be a success or not, as the effect is not significant. Therefore, hypothesis 4 is rejected. Considering hypothesis 5 which indicates that more experienced management teams ensure superior firm performance, the findings related to the determinants of experience vary strongly and do not correspond to the paper's expectations. First, investment experience shows a negative effect on firm performance. This could be explained with the idea that these managers focus too much on the SPAC vehicle as an investment, rather than looking at the long-term perspective for the target company. Second, the operational experience does not seem to matter, as the results are not significant. Thirdly, there is a negative and significant effect of managers with professional experience on the firm performance. Therefore, the hypothesis 5 is rejected. Last, the hypothesis 6 indicates that management teams with prior SPAC experience show superior performance. The results show a positive relationship between SPAC experience and the performance on the short- and long-term. Therefore, hypothesis 6 is accepted.

The models constructed specifically for this study help address the research question of this paper and indicate that the proper answer to the research question is that the quality of the SPAC management team really makes a difference in making the SPAC a success. The overall findings could provide major consideration points for investors by indicating that the quality of the management team has a strong and significant influence on firm performance both on the short- and long-term. The key determinant of a SPAC management team in making the SPAC a success is the average team age, which could be a proxy for the experience of managers. In addition, investors should pay attention to the prior SPAC experience of the managers, as this ensures superior firm performance as well. Other characteristics like diversity, SPAC size, at-risk investments, the number of days between the IPO and merger announcement, the number of intermediaries involved, and whether the SPAC or target firm is PE backed have no effect on the performance.

This study contributes to the limited but emerging SPAC literature in several ways. First of all, this research focuses on the entire management team instead of only looking at the CEO and CFO characteristics and skills as shown in the papers of Blomkvist et al. (2021), Chen and Shi (2019), and Jalbert et al. (2010). Second, this study employs a new and unique method to characterise a SPAC management team as high-quality, by flagging a management team as superior if at least one manager has investment experience, one operational experience and one SPAC experience. Thirdly, in addition to the education variable that is defined as the percentage of managers with an MBA, this study takes into account the number of Ivy League graduates in the management as an indication for the level of education, but more importantly, which can be a proxy for social connections. This has not been done in prior SPAC research yet. Fourth, in addition to the papers of Cumming et al. (2014), Dimitrova (2017), and Kolb & Tykvová (2016) in which they take into account the ownership structure of the SPAC entity in terms of private equity involvement, this paper also considers the ownership structure of the target firm (private equity backed or not). Fifth, the gender diversity of the SPAC management team is included in this research which is generally addressed in literature related to firm performance (Dwyer et al., 2003; Goll et al., 2001), but to our knowledge not in the field of SPACs yet. Sixth, similar to the study of Dimitrova (2017), certain deal characteristics are taken into account such as the payment method. However, prior SPAC literature does not consider cross-border transactions. This study contributes to literature by investigating the effect of cross-border transactions on firm performance, as done in the M&A research of Inkpen et al. (2000). Lastly, the paper's unique and hand collected dataset covers the more recent SPAC entities in which shareholders obtain more protection, marked as the "SPAC 3.5" generation.

Although, the SPAC industry is growing rapidly, there is still a limited number of SPAC companies that merge with a target company after 2016. Additionally, one of the study's selection criteria is that the de-SPAC have at least stock price information for 3 months. Given that the majority of SPAC's IPOs took place in 2020 and 2021, and the fact that these SPACs have a deadline of two years to find and merge with a target company (i.e. till 2022 and 2023 respectively), we can only research a

limited number of SPAC mergers, which can be seen as one of the study's limitations. Besides, one of the criteria that must be met for a SPAC to be included in the dataset is that the transactions must be completed and that that the firm cannot be liquidated after the merger. This potentially could create survivorship bias, as only the promising SPACs that survived the race to find a valuable target company and merged with it are investigated. Therefore, the paper's findings could be more robust if the entire SPAC population is taken into account, including the SPACs that failed to merge with a target and the SPACs that liquidated after the transaction. Although, the effect of survival bias can be toned down as the management will make every effort to complete a successful transaction, as otherwise they will lose their at-risk investments. This suggests that in practice almost every SPAC merges with a target company. Finally, it could be possible that the problem of a human error has occurred, as the information on SPAC managers is manually extracted from the SPAC's prospectus.

Future research on the SPAC industry could focus more on the financial incentives of the SPAC managers. In this study, the at-risk investment is employed to account for the management's financial incentives. A potential extension could be to look at the equity value the management receives in return for their efforts. In addition, it could be interesting to look at the time the SPAC managers exit their shares in the de-SPAC and compare their exit yield to the returns of general public investors. The SPAC manager's exit behaviour can also be examined by looking at the de-SPAC's stock performance at the expiration date of the lock-up period. Furthermore, the management characteristics can be researched even in greater depth by looking at the manager's connection. In this study, the level of connections can be linked to the manager's graduation at an Ivy League University. In addition, social connections between SPAC managers and target firm managers can be studied more in-depth by reviewing whether they were at the same university, whether they lived in the same area, or whether they worked at the same company. Nevertheless, the difficulty thing about studying these social connections is that there is limited information available about the management of the target firm, as the firm is privately held before the merger. Another valuable addition could be to consider alternative measurements for the target's quality and growth opportunities besides the Tobin's Q and ROA. Finally, it could be interesting to include the SPAC industry in different markets, like the European and the Asian market. A detailed comparison could provide insights into the effects of shareholder protection on the performance of the SPAC firms.

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Appendix

Table A.1 Variables Definition

Variables	Definition	Source
Dependent Variables		
Tobin's Q	Tobin's Q can be defined as the market value of equity and total liabilities divided by the book value of equity and total liabilities.	Datastream
Buy-and-hold Abnormal Return	The buy-and-hold abnormal return can be defined as the portfolio return minus the return of the benchmark.	Datastream
Independent Variables		
HQ_1	At least one of the managers had a senior position at a Fortune 500 company, and at least one manager has experience in the financial service industry. If all criteria are met the variable will denote 1, otherwise 0.	Form 424B4 (EDGAR)
HQ_2	Average team age is a proxy for the experience and quality of the team. High-quality teams have average age above 54, non-high-quality teams below 54.	Form 424B4 (EDGAR)
HQ_3	High-quality team must meet several criteria; At least one director with investment experience, one with operational experience and one with SPAC experience.	Form 424B4 (EDGAR)
Team_Age	Average age; sum of all director ages divided by total number of directors.	Form 424B4 (EDGAR)
Team_Diversity	Ratio of men to women; number of female directors divided by the total amount of directors.	Form 424B4 (EDGAR)
Team_Size	Sum of total directors.	Form 424B4 (EDGAR)
Team_Education	Number of directors holding an MBA divided by total amount of directors.	Form 424B4 (EDGAR)
Ivy_League	Number of directors graduated from an Ivy League University divided by total amount of directors.	Form 424B4 (EDGAR)
Inv_Experience	Number of directors that have experience in investment banking, private equity or venture capital, divided by total amount of directors.	Form 424B4 (EDGAR)
Op_Experience	Number of directors that have experience in target industry divided by total amount of directors.	Form 424B4 (EDGAR), Google, LinkedIn
Prof_Experience	Number of directors that have experience in Fortune 500 company divided by total amount of directors.	Form 424B4 (EDGAR), Google, LinkedIn
SPAC_Experience	At least one of the managers has already experience in the SPAC industry.	Form 424B4 (EDGAR), Google, LinkedIn
SPAC specific control variables		
SPAC_Size	Natural logarithm of total amount of gross proceeds.	Datastream, Form 424B4 (EDGAR)
Days	The number of days between the first SPAC trading day and the day of the merger announcement.	Datastream
At_Risk	Amount of private placements (by the management) divided by the total amount of gross proceeds.	Datastream, Form 424B4 (EDGAR)
Intermediaries	Total number of underwriters that are involved in the SPAC transaction.	Datastream

PE_backed_SPAC	Dummy variable equals 1 if the SPAC firm is backed by a private equity or hedge fund company, otherwise 0.	Refinitiv
Target firm specific control variables		
Firm_Size	Natural logarithm of target's total assets.	Datastream
ROA	Net income before extraordinary items divided by the firm's total assets (ROA).	Datastream
Debt_Ratio	Total amount of long-term debt divided by firm's total assets.	Datastream
Liquidity	Total cash and cash equivalents divided by total assets.	Datastream
PE_Backed_Target	Dummy variable equals 1 if the target firm is backed by a private equity or hedge fund company, otherwise 0.	Refinitiv
Deal specific control variables		
Deal_Size	Natural logarithm of total deal value.	Refinitiv
Cross_Border	Dummy variable equals 1 if the target firm is located outside U.S., otherwise 0.	Datastream
Payment1	Variable equals 1 if the payment method is 'Cash and Stock Combined' and is compared with the payment method 'Stock Only'.	Refinitiv
Payment2	Variable equals 1 if the payment method is 'Cash Only' and is compared with the payment method 'Stock Only'.	Refinitiv

Table A.2 Ivy League

Institution
Harvard University
Yale University
Princeton University
Columbia University
University of Pennsylvania
Brown University
Dartmouth College
Cornell University

Table A.3 Variance Inflation Factors (VIF)

	VIF Range	
Model	Low	High
1	1.1108	2.9654
2	1.1953	2.9574
3	1.1797	2.9423
4	1.1147	3.1893
5	1.1976	3.1408
6	1.1798	3.1742
7	1.1973	3.1946

Table A.4 Multinomial Regression Results (Model 4 – 6) for 6-months period

	Dependent variable:					
	BHAR_6					
	Model 4 (19)	Model 4 (20)	Model 5 (21)	Model 5 (22)	Model 6 (23)	Model 6 (24)
HQ_1	0.006	0.003				
	(0.004)	(0.003)				
HQ_2			0.015***	0.008**		
			(0.004)	(0.003)		
HQ_3					0.005	0.005
					(0.005)	(0.003)
Team_Age	0.001***	0.0005			0.001***	-0.0005

	(0.0004)	(0.0003)			(0.0004)	(0.0003)
Team_Diversity	0.005	0.026*	0.006	0.025*	0.004	0.028*
	(0.020)	(0.014)	(0.018)	(0.014)	(0.019)	(0.014)
Team_Size	-0.001	0.001	-0.001	0.001	-0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Team_Education	-0.002	-0.001	-0.004	-0.001	0.001	0.0001
	(0.010)	(0.009)	(0.009)	(0.008)	(0.010)	(0.009)
Ivy_League	-0.015	-0.003	-0.006	0.003	-0.018	-0.004
	(0.011)	(0.009)	(0.011)	(0.008)	(0.011)	(0.009)
Inv_Experience			-0.013	-0.026***		
			(0.012)	(0.009)		
Op_Experience	-0.005	0.003	-0.009	-0.005		
	(0.007)	(0.005)	(0.007)	(0.005)		
Prof_Experience			-0.026**	-0.011	-0.026**	-0.006
			(0.012)	(0.010)	(0.012)	(0.010)
SPAC_Experience	0.008*	0.003	0.009*	0.005		
	(0.005)	(0.004)	(0.005)	(0.004)		
SPAC_Size	0.013	0.020	0.016	0.019	0.016	0.020
	(0.016)	(0.013)	(0.016)	(0.012)	(0.016)	(0.013)
Days	0.00002	0.00001	0.00002	0.00001	0.00001	0.00001
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
At_Risk	-0.001	0.011	-0.019	-0.028	-0.027	0.013
	(0.102)	(0.102)	(0.104)	(0.093)	(0.102)	(0.102)
Intermediaries	0.003	-0.001	0.002	-0.001	0.003	-0.001
	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
PE_Backed_SPAC	0.003	0.002	0.005	0.003	0.002	0.002
	(0.005)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)
Firm_Size	-0.012	0.005	-0.010	0.006	-0.013	0.005
	(0.008)	(0.006)	(0.007)	(0.005)	(0.009)	(0.006)
Profitability	0.00000	0.00001	-0.00001	0.00001	-0.00001	0.00002
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Debt_Ratio	0.001	-0.0002	0.0002	-0.001	0.001	-0.0002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Liquidity	-0.015*	-0.008	-0.016*	-0.006	-0.016*	-0.008
	(0.008)	(0.007)	(0.008)	(0.006)	(0.008)	(0.006)
PE_Backed_Target	0.004	0.002	0.003	0.003	0.002	0.002
	(0.005)	(0.004)	(0.005)	(0.003)	(0.005)	(0.003)
Deal_Size	0.008	-0.006	0.007	-0.006	0.011	-0.006
	(0.009)	(0.006)	(0.009)	(0.006)	(0.009)	(0.006)
Cross_border	0.003	-0.003	0.001	-0.001	0.001	-0.003
	(0.006)	(0.004)	(0.005)	(0.004)	(0.005)	(0.005)
Payment1	0.004	0.008*	0.005	0.007*	0.003	0.007*
	(0.006)	(0.004)	(0.006)	(0.004)	(0.006)	(0.004)
Payment2	0.003	0.003	0.005	0.002	0.004	0.003
	(0.007)	(0.005)	(0.007)	(0.005)	(0.007)	(0.005)
Constant	0.048	-0.059	-0.001	-0.057	0.057	-0.055
	(0.107)	(0.063)	(0.098)	(0.059)	(0.104)	(0.061)
Year fixed effects	*Included*	*Excluded*	*Included*	*Excluded*	*Included*	*Excluded*
Industry fixed effects	*Included*	*Excluded*	*Included*	*Excluded*	*Included*	*Excluded*
Observations	148	148	148	148	148	148
R^2	0.615	0.174	0.630	0.216	0.608	0.178

The dependent variable in the regression is the buy-and-hold abnormal return for the 6-months period (*BHAR_6*) as a measurement of the post-merger stock performance. In Model 4, 5, and 6 the variable for the quality of the SPAC management team is *HQ_1, HQ_2, and HQ_3* respectively. Every model is displayed with industry and year fixed effects included and excluded. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A.5 Multinomial Regression Results Model 1, 2, and 3 with ROA

	Dependent variable:					
	ROA					
	Model 1 (25)	Model 1 (26)	Model 2 (27)	Model 2 (28)	Model 3 (29)	Model 3 (30)
HQ_1	0.032	0.082				
	(0.054)	(0.024)				
HQ_2			0.042	0.056		
			(0.040)	(0.036)		
HQ_3					0.143	0.830
					(0.146)	(0.092)
Team_Age	0.011	0.014			0.012	0.018
	(0.091)	(0.065)			(0.746)	(0.471)
Team_Diversity	0.032	-0.456	0.076	-0.157	-0.141	-0.022
	(0.702)	(0.283)	(0.342)	(0.305)	(0.452)	(0.309)
Team_Size	0.002	-0.007	-0.006	-0.001	-0.002	-0.005
	(0.038)	(0.018)	(0.053)	(0.046)	(0.043)	(0.039)
Team_Education	-0.410*	-0.099	-0.508	0.052	-0.247	0.064
	(0.237)	(0.163)	(0.211)	(0.142)	(0.192)	(0.164)
Ivy_League	-0.020	-0.063	-0.004	-0.098	-0.086	-0.097
	(0.240)	(0.184)	(0.242)	(0.186)	(0.253)	(0.183)
Inv_Experience			-0.326**	-0.509*		
			(0.223)	(0.179)		
Op_Experience	-0.072*	0.034	-0.068*	0.134		
	(0.129)	(0.107)	(0.114)	(0.102)		
Prof_Experience			0.103	-0.041	0.164	0.032
			(0.232)	(0.191)	(0.239)	(0.194)
SPAC_Experience	0.093	0.090	0.110	0.117*		
	(0.084)	(0.047)	(0.082)	(0.045)		
SPAC_Size	0.262	-0.100	0.211	-0.221	0.186	-0.169
	(0.249)	(0.212)	(0.282)	(0.209)	(0.280)	(0.201)
Days	0.013	0.009	0.004	0.009	0.004	0.005
	(0.023)	(0.016)	(0.024)	(0.016)	(0.025)	(0.016)
At_Risk	0.816	-0.027	1.674	-0.026	-0.664	-0.293
	(1.163)	(1.033)	(1.183)	(1.848)	(1.101)	(1.074)
Intermediaries	0.094*	0.086*	0.012	0.046*	0.029*	0.021*
	(0.075)	(0.076)	(0.077)	(0.072)	(0.069)	(0.073)
PE_Backed_SPAC	0.098	0.051	0.083	0.048	0.060	0.087
	(0.130)	(0.116)	(0.143)	(0.196)	(0.179)	(0.185)
Firm_Size	-0.421***	-0.056*	-0.670**	-0.430***	-0.493***	-0.759*
	(0.244)	(0.204)	(0.235)	(0.058)	(0.251)	(0.202)
Debt_Ratio	0.045	0.047	0.043	0.021	0.036	0.039
	(0.036)	(0.022)	(0.034)	(0.020)	(0.023)	(0.030)
Liquidity	0.148	0.205*	0.245	0.248*	0.128	0.247*

	(0.151)	(0.112)	(0.109)	(0.104)	(0.163)	(0.112)
PE_Backed_Target	0.036**	0.059	0.037**	0.089	0.026*	-0.050
	(0.047)	(0.033)	(0.048)	(0.034)	(0.044)	(0.058)
Deal_Size	0.591***	0.429***	0.445***	0.497***	0.399***	0.589***
	(0.153)	(0.124)	(0.149)	(0.127)	(0.152)	(0.129)
Cross_border	-0.086**	-0.079*	-0.084**	-0.076*	-0.081**	-0.071*
	(0.071)	(0.069)	(0.070)	(0.066)	(0.071)	(0.071)
Payment1	0.196**	0.189*	0.190**	0.071	0.189**	0.053
	(0.082)	(0.079)	(0.080)	(0.058)	(0.079)	(0.52)
Payment2	0.001	0.014*	0.039	0.019*	0.094	0.012*
	(0.094)	(0.071)	(0.097)	(0.070)	(0.086)	(0.075)
Constant	-1.035	-0.783	-0.294	0.204	-0.510	-0.637
	(1.724)	(1.632)	(1.256)	(1.875)	(1.267)	(1.629)
Year fixed effects	*Included*	*Excluded*	*Included*	*Excluded*	*Included*	*Excluded*
Industry fixed effects	*Included*	*Excluded*	*Included*	*Excluded*	*Included*	*Excluded*
Observations	158	158	158	158	158	158
R^2	0.624	0.347	0.635	0.347	0.610	0.341

The dependent variable in the regression is the target's firm ROA and is measured in the first year after the merger. In Model 1, 2, and 3 the variable for the quality of the SPAC management team is *HQ_1, HQ_2, and HQ_3* respectively. Every model is displayed with industry and year fixed effects included and excluded. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A.6 Ramsey Regression Equation Specification Test (RESET)

	RESET		p-value	
Model	Fixed effects	No fixed effects	Fixed effects	No fixed effects
1	0.79893	0.82528	0.7243	0.7144
2	0.71944	0.92322	0.8112	0.5852
3	0.57793	0.93017	0.9278	0.5712
4 (3 months)	0.61975	0.70283	0.8994	0.8654
4 (6 months)	0.53261	0.57771	0.9499	0.9556
4 (9 months)	1.17421	0.71952	0.5233	0.8383
5 (3 months)	0.86764	0.81438	0.6152	0.7423
5 (6 months)	0.65145	0.57141	0.8683	0.9626
5 (9 months)	0.72821	0.69946	0.8871	0.9643
6 (3 months)	0.52285	0.81188	0.9587	0.7392
6 (6 months)	0.60852	0.58713	0.9048	0.9510
6 (9 months)	0.54651	0.89546	0.8509	0.6221
7 (3 months)	0.77648	0.75911	0.7536	0.8182
7 (6 months)	0.51664	0.57438	0.9563	0.9649
7 (9 months)	0.66728	0.59011	0.8592	0.9469

Table A.6 gives a comprehensive overview of the Ramsey Regression Equation Specification Test (RESET). The RESET values are provided for every model with fixed effects and without fixed effects. The p-values indicate whether the null hypothesis can be rejected or accepted. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.