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Master Thesis

Target Firms of SPACs – Are They Set up to Fail?

An empirical study of firms' features and their unconventional choice of merging with a SPAC

by

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Abstract

We study the determinants of why target firms choose to merge with SPACs, despite severe underperformance for the common stocks. The SPAC asset class has experienced extraordinary growth in the latest years, suggesting that other determinants influence the choice for a firm to merge with a SPAC. We find that post-merger SPACs report a median initial overpricing, i.e., negative first day returns, of -0.82%, continuing this negative trend throughout the first year a public company with median returns for 1, 3, 6 and 12 months being -9.01%, -15.87%, -29.83% and -58.71%. Despite this, target firms rush to merge with SPACs. We found that these firms are of inferior quality, meaning characterized by smaller size, lower profitability, weaker liquidity, and lower debt.

Keywords: Special Purpose Acquisition Company, SPAC, SPAC-Merger, Post-Merger SPAC, Underperformance, Public Listing Route Choice, Target Firm Characteristics

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1. Introduction

We examine why firms choose to merge with a special purpose acquisition company, i.e., a SPAC, despite it being a perceived unfavorable route to access public markets. The current boom in SPAC-IPOs and SPAC-mergers, categorized as a bubble by Klausner et al. (2022) together with previous evidence of SPACs common stock underperformance (Gahng et al., 2021), was the main motivation for our research topic.

In the first part we examine the performance of the post-merger SPAC and conventional IPO common stocks. We analyzed the initial returns of the first reported trading day, and subsequently, the excess returns after 1, 3, 6 and 12 months through a buy-and-hold strategy. Moreover, we run the three different regressions: CAPM and the three- and five-factor models by Fama & French, to observe how our portfolio of SPACs load on standard asset pricing models. The parameters, known as factor loadings, measure the sensitivity of the portfolio to each of the factors in the regressions.

Next, through the second part we analyze numerous firm characteristics in a univariate setting, to determine the fundamental differences between the firms that choose the two routes. This analysis is the basis for selecting specific variables to include in our probit regressions in part three. We want to assess if any variables can be found to have an explanatory factor on the route choice of a firm. Thus, we developed the optimal model to predict the likelihood of a route choice.

We contribute to the literature by providing a focused report on the determinants that lead firms to choose a SPAC-merger listing. Hence, we focus on the operating firm's perspective in contrast to the majority of the SPAC literature that mainly analyze the investment return aspect for a set of stakeholders of the SPAC. We built upon the work of Datar et al. (2012) by adding firm- and industry-specific variables to our probit regression models. We add to the literature by also taking the viewpoint of an operating firm in addition to the perspective of investors. Kolb & Tykvová (2016) is the paper we identified with the most similar scope to us. Similarly, this paper also analyzed firm specific variables as determinants for choosing listing route. Additionally, our paper uses univariate analyzes to identify both firm specific variables for our regressions while also testing for specific industry characteristics in addition to controlling for industry effects.

Our empirical analysis is presented in three main parts. Since SPACs are primarily a US phenomenon, we chose to analyze SPACs listed on the two largest

US exchanges, NASDAQ and NYSE, and contrasting them to comparable conventional IPOs. We selected the time-period from 2014 – 2019, to give sufficient time for SPACs to complete a business combination. For the analyzes of post-merger SPACs¹, our time-period extends to March 30th, 2022.

We find that post-merger SPACs' common shares underperform with median first day returns of -0.82%. The return for 1, 3, 6 and 12 months is -9.01%, -15.87%, -29.83% and -58.71%, consecutively. The conventional IPOs also have a negative trend, but with a substantially lower magnitude. Furthermore, we find that our post-merger SPACs portfolio load positively on the size factor in the Fama & French model, indicating that our portfolio of post-merger SPACs are of smaller size. These results are in line with the research of Gahng et al. (2021).

In our univariate analysis, we discover that firms choosing to merge with SPACs are considerably smaller than firms choosing conventional IPOs based on all financial statements variables, which was expected based on the previous findings of Kolb & Tykvová, (2016). Moreover, we found the same results when adjusting for industry effects. Post-merger SPACs report losses on earnings-before-tax (EBT) and net income, whereas conventional IPOs report gains. This trend continues within the following year. Measuring the current profitability, we found the returns on assets (ROA) to be substantially more negative for conventional IPOs than for post-merger SPACs. The ROA decreases for both routes one year post listing, but at a greater magnitude for post-merger SPACs. Furthermore, post-merger SPACs, at the time of listing, have weaker liquidity, but a lower debt component of their total funding. These metrics increase substantially in the year following the listing.

Subsequently, we chose to include the variables of ROA, EBT and debt-to-enterprise in our development of the most optimal model in predicting the likelihood of listing route choice. We build upon the probit regression of Datar et al. (2012) being our reference model, by adding firm-specific variables and industry effects. We found that adding these firm-specific variables greatly improved the predictability of the model. Furthermore, adjusting for industry fixed effects slightly improved the fit of the model. To deepen the analysis, we changed the model to only adjust for the manufacturing and technology industries. Our objective was to capture the varying industry characteristics in terms of asset concentration

¹ Throughout this paper we will refer to the firms that have finalized the process of accessing the public markets through a business consummation with a SPAC as post-merger SPACs.

and growth prospects. To summarize, adding variables based on our univariate analysis to the reference model substantially improved its predictability. Next, we found that adjusting for the manufacturing and technology industry slightly improved this model's fit. Finally, adjusting for the fixed effects of all industries, rather than just the two industries, marginally improved the fit, thereby producing the most optimal likelihood model.

Our results indicate, despite the substantial underperformance of common stock for post-merger SPACs, that target firms rush to merge with SPACs. We found these firms to be of inferior quality, meaning characterized by smaller size, lower profitability, weaker liquidity, and lower debt.

1.1. Thesis Structure

The thesis is divided into 8 sections where each section begins with building a rationale, then increasing the sophistication and complexity. The following section consists of an extensive literature review, with the purpose of introducing the topic and create a foundation for further discussions. Thereafter, Section 3 outlines our hypotheses and Section 4 describes how we gathered our data. Section 5 explains the methodological approaches used in this thesis. Section 6 describes the descriptive statistics of our data and Section 7 discusses the results and findings from our analyses. Lastly, we present our concluding remarks and suggestions for further research in Section 8. To supplement, the appendix and citations are listed at the end.

2. Literature Review

In the following section, we will review the existing literature on SPACs and their performance. The existing literature with direct focus on SPACs began to appear after SPAC activities achieved critical mass beginning in 2006 and growing with the recent few years' popularity of SPACs. In the literature review, we start off with the studies on how SPACs evolved from blank-check companies into its own stand-alone asset class. Next, we reviewed the unique characteristics of SPACs in reference to its structure, investor-protection, ownership, and risks. The literature is mainly focused on the US markets, as SPACs is primarily an American phenomenon. In addition, some studies explored the escalating international momentum of SPACs. Furthermore, the literature was ambiguous on the

advantages and disadvantages of SPACs in comparison to conventional IPOs, especially on a performance perspective.

However, few studies specifically address the firm-specific characteristics of the target firm acquired by a SPAC in contrast to those choosing the conventional IPO route, as both are means for private companies to access public stock markets. Subsequently, our study aims to contribute to the literature focusing on the determinants of why target firms might choose to go public through a SPAC-merger instead of a conventional IPO. Furthermore, we add to the literature by also taking the viewpoint of an operating firm looking to access public markets, in addition to the perspective of investors.

2.1. SPACs Reincarnated from Blank-Check Companies

SPACs represent a reincarnation of blank-check companies, which can be tracked all the way back to the eighteenth-century. Revamped blank-check vehicles were developed in the 1980s and 1990s and used in some niches in the US capital markets for “pump-and-dump” schemes. Once the stock price jumped, the management team would dump the shares and hoard profits (Sjostrom, 2007). Regulators acknowledged fraud and abuse in this investment vehicle, deeming it illegal, which led to its abolishment at that time (Shachmurove & Vulcanovic, 2017).

The congress amended the SEC to act, and in 1992 new federal legislations were in place. Among these was Rule 419, which was a registration statement to be filed by any issuer that was a blank-check company. The rule required, among other things, that 90% of the net SPAC-IPO proceeds needed to be held in a trust account until a completed merger. If the merger was deemed unsuccessful within the provided timeframe of twelve to twenty-four months of the closing of the IPO, the blank-check company must return all offering proceeds to its investors. In addition, the rule restricts a merger unless the fair value of the merged business or net assets represent at least 80% of the maximum offering proceeds. It also prohibits trading of the blank-check securities until a business consummation. (Sjostrom, 2007).

A reverse merger, which can be viewed as the predecessor of the SPAC, is a non-conventional method of going to the public market. Instead of hiring an investment bank as an underwriter to market and sell their company’s shares as with a conventional IPO, the private operating company, with the help of advisors, works to locate an already public blank-check company to merge with (Sjostrom, 2007). The reverse merger process let the operating company continue to be controlled by

the same group of shareholders and managed by the same directors and officers, but now as a public, rather than private, company (Feldman & Dresner, 2006). The reverse merger method provided advantages by unraveling financing options from private investment in public equity (PIPE), which was not available to private companies. Another significant improvement was the time advantage compared to the tedious listing process of a conventional IPO. However, this time advantage has greatly diminished with new shell company rules adopted by the SEC in June 2005 (Sjostrom, 2007), and thereby did the attraction for this method of reverse mergers.

Beginning in 2003, the unique shell formation SPAC took an increasingly important role among the non-conventional shell-oriented methods (Datar et al., 2012). SPACs have several similarities to reverse mergers, with some SPACs even being types of reverse mergers, but with more disclosure (Sjostrom, 2007). SPACs also have similar characteristics to a hybrid of private equity (Rodrigues & Stegemoller, 2012) and as a public version of a buyout fund (Riemer, 2007).

Even though a SPAC's business plan is to acquire "an unidentified company/companies", it circumvents Rule 419 by not issuing penny stock (Sjostrom, 2007) as a hybrid security consisting of the two components of common stocks with a redemption value of \$10 per share and warrants with exercise prices usually set at \$11.50 (Rodrigues & Stegemoller, 2021).

Originally SPACs could only be listed on the over-the-counter (OTC) bulletin board (Rodrigues & Stegemoller, 2021). In 2008, SPACs were allowed to list on the two large US exchanges: NASDAQ and NYSE. This was enabled by SEC allowing those exchanges to change their listing requirements to allow for SPACs (Lakicevic & Vulcanovic, 2011). SPACs adoptions were off to a slow start and subsequently died out during the financial crisis in 2008. However, a SPAC wave began in 2010, picking up speed in 2016 and surged by 2020 (Erickson, 2021), (Rodrigues & Stegemoller, 2012).

2.2. Unique Characteristics of SPACs

2.2.1. The Structure of SPACs as an Asset Class

A SPAC is a stand-alone asset class (Lewellen, 2009), characterized as an "empty" shell company taken public through an IPO with the intent of merging with, at the time of the listing, an unidentified operating company within a limited time horizon of eighteen to twenty-four months (Sjostrom, 2007). The funds raised

in the SPAC-IPO is placed in a trust account where it earns interest until a SPAC-merger is approved.

A SPACs lifecycle can be divided into two periods (Gahng et al., 2021). The first period begins with the SPAC-IPO and ends with either a SPAC-merger, i.e., a business combination, or, alternatively, a liquidation. The second period begins at the first trading day as a merged company. This can be viewed as the functional equivalent of a conventional IPO, with the primary difference of being effected through a merger rather than a public offering (Rodrigues & Stegemoller, 2021).

2.2.2. Investors Protection and Ownership

Due to the aforementioned rocky history of blank-check companies, investor protection became vital during the early justification phase of SPACs as an asset class (Rodrigues & Stegemoller, 2021). Followingly, SPACs are essentially designed with a downside protecting nature of the initial SPAC-IPO investment, which, according to Gahng et al. (2021), can be compared to the equivalent of a default-free convertible bond with extra warrants. These investors hold a so-called redemption right, granting them the optionality to hold, redeem or sell their SPAC shares in the market before the merger with a target firm.

A SPAC is organized, taken public, and managed (in effect) by a sponsor, i.e., the sponsor forms the SPAC. With respect to initial ownership, the sponsor typically purchases, at a nominal price, 20% of the SPACs' shares post-IPO, as part of the compensation in the form of a promote. More specifically, the sponsor may be associated with a private equity, venture capital, or a hedge fund, alternatively it can be one or more individuals (Klausner et al., 2022). However, the vast majority of SPAC shares seem to be held by institutional investors, more specifically large hedge funds (Klausner et al., 2020). On the other hand, retail investors that purchases SPAC shares on a public exchange does not reap any of these benefits, but rather get exposed to noteworthy downside risk (Rodrigues & Stegemoller, 2021).

2.2.3. Regulatory Arbitrage

The regulatory environment has developed into a sweet spot for SPAC market participants. Wen & Zhu (2022) argues that going public via a SPAC-merger yields regulatory arbitrage, as the route allows firms merging with SPACs to circumvent the SEC's review process that conventional IPO has to undertake.

The study found that SPACs provide overconfident and less comprehensive disclosures. Moreover, SPACs benefit from a “safe harbor” provision in US laws for mergers, with its projections being largely shielded from lawsuits (Cazier et al., 2019). However, stricter regulatory rules of SPACs have since been proposed, but not yet ruled on, by the SEC to strengthen disclosure and marketing requirements, in addition to increasing the obligations SPAC market participants are subject to (SEC, 2022).

2.2.4. Potential Investor Risks Inherent in the SPAC Structure

There are several potential issues inherent in the structure of SPACs: firstly; different degrees of favorability concerning investment terms for various investor groups, secondly; incentives to push the merger deal forward, thirdly; moral hazardous behavior, and finally; asymmetric informational risk due to SPACs lack of operating history to evaluate and uncertainty of quality of target choice.

The US SEC alerted all investors that SPAC-sponsors generally receive more favorable share-purchase terms compared to SPAC-IPO investors and subsequently the public stock market investors. Additionally, the sponsors are usually the source of funds in case of supplementary financing needs for the SPAC-merger process. This may result in the interests of the sponsors diverging from the other claimants by dilution of the other investors’ claims with the new funding possibly being provided as a loan or security with differencing, and potentially more advantageous, rights (SEC, 2022). Similarly, Klausner et al. (2020) proclaim that SPACs represent a sweet deal for the SPAC-IPO investors but a rather poor deal for the retail investors who later buys the unit on public exchanges from those initial investors. Additionally, Rodrigues & Stegemoller (2021) suggests that retail investors tend to invest in SPACs under conditions that almost perfectly are designed to expose them to significant downside risk.

A drawback of the SPAC structure is the misalignment of incentives between shareholders and other major SPAC players, creating an environment of potential excessive risk taking. This is due to the payoffs for sponsors, investment banks, private investors, and the target, all being incentivized to push the deal forward. Hence, the process is lacking a vetting function, which Klausner et al. (2022) links to worse performance, i.e., the study found evidence of this push resulting in bad deals. The SPAC literature points to sponsor earnouts, a contingent compensation requiring the post-merger SPAC share price to reach a specified threshold before

the sponsor can claim those shares, as an innovation that would align the interests of sponsors and shareholders and reduce the cost of the dilution inherent in SPACs. However, Klausner et al. (2022) disagree with these findings, stating that there is no evidence to suggest that earnouts align interests, or meaningfully reduces costs.

Another worrying tendency, documented by Rodrigues & Stegemoller (2021), is the evidence of moral hazardous behavior by a small group of insiders using SPACs to manipulate the merger process. This is done through empty voting, delinquent public filings, and thin-to-nonexistent trading, which demonstrates an inverse correlation with stock performance.

Asymmetric information risk, meaning one party to the transaction has superior or additional information in comparison to the other(s), is native to SPACs, as there is no operating history to evaluate. Hence, it is important for new potential investors to review the business background of the SPAC management and sponsors (SEC, 2022), in order to make an as informed investment decision as possible. An additional source of information is the SPAC-IPO prospectus and periodic and current reports issued to the public.

2.2.5. SPAC Units

When tradable on an exchange the SPAC is packaged as a unit, a hybrid security, consisting of two components. The unit consists of the first component being a share of common stock, with a redemption value of \$10 per share, and the second component being two warrants with a joint exercise price, usually set at \$11.50 (Rodrigues & Stegemoller, 2021). The warrant is a derivative that give the right, but not the obligation, to buy or sell a security at a certain price, usually a premium compared to the current common stock price, before a set expiration date. However, the terms of the warrants may differ considerably among SPACs (SEC, 2021). Later, the unit may unbundle, allowing the common share and the warrants to trade separately, i.e., with their own ticker symbols, post a SPAC-merger completion (Gahng et al., 2021).

2.2.6. Other Closely Related Investment Vehicles

The literature draws comparisons of the similarities between SPACs and other types of investment vehicles. Rodrigues & Stegemoller (2021) compare SPACs to a hybrid of private equity, whereas (Riemer, 2007) believe SPACs resembles a public version of a buyout fund. Moreover, Sjostrom (2007) describe SPACs as a

reverse merger, but with more disclosure, though arguing that comparing SPACs with conventional IPOs are more meaningful than comparing reverse mergers to IPOs. Lastly, Rodrigues & Stegemoller (2021) argues that SPACs can be viewed as an insiders IPOs due to their small pool of investors.

2.3. SPACs are Increasing in Popularity

The frequency and total proceeds of US SPAC-IPOs has increased in magnitude compared to conventional IPOs, see Appendix 9.3A and 9.3B. The first SPAC-introduction was in 2003, followed by a handful of OTC listings. Subsequent to a dry-out period during the financial crisis, there were an increase in SPAC adoption, enabled by the listing admittance on the major US exchanges in 2010 (Rodrigues & Stegemoller, 2012). The SPAC wave further picked up speed in 2016 and surged by 2020, keeping the momentum through 2021 (Erickson, 2021).

2.3.1. SPACs are Slowly Gaining International Momentum

SPACs are primarily a US phenomenon. However, other countries are starting to get the taste of this alternative investment vehicle, with unrealized potential benefits of their home-courts, friendlier regulatory environment, and potential favorable tax considerations being more advantageous than those of their US comparable.

European SPACs are comparable to those in the US in most respects (Schumacher, 2020). The key differences in European SPACs are primarily their additional ability, if efficiently utilized, to take advantage of tax benefits and friendlier regulatory measures. For instance, European SPAC regulation allows for multiple smaller SPAC-mergers rather than only one, severely capital-intensive merger, as in the US. Additionally, they are also free to search for target companies outside of Europe. The first European SPAC was listed in 2005, but the listings were close to absent, and in 2019 and 2020 only 5 and 4 SPAC-IPO listings were on European exchanges. However, this figure increased to 39 in 2021 (White & Case, 2022).

The first Asian SPAC was listed in 2009. Nonetheless, SPAC listings on Asian market exchanges are yet to really take off, with only Malaysia and South Korea regulating the space at the time of Schumacher's (2020) study. Singapore (SGX Group, 2021) and Hong Kong (HKEX, 2022) recently opened for SPAC listings in late 2021 and early 2022. The Asian SPAC regulation widely mirrors that

of US SPACs, but with one key advantage of added flexibility, allowing thirty-six months to find a target to merge with. The SPAC market in Malaysia is currently focused on the oil and gas industry, whereas the South Korean SPACs have accumulated notable interest from retail investors. Furthermore, there is a surge in investments by US SPAC investors targeting Chinese companies (Schumacher, 2020). It remains to see whether the early 2022 Hong Kong exchange opening of SPACs can capture benefits from this momentum (HKEX, 2022).

2.3.2. Scandinavian SPACs at the Beginning Stages

The Scandinavian countries are in the very beginning phases of SPACs in terms of regulation, listings, and investor attention. On February 1st, 2021, NASDAQ introduced specific admission requirements for SPACs for NASDAQ Stockholm and on April 12th, 2021, for NASDAQ Copenhagen (Rosenberg, 2021). At the end of 2021, there were only a handful of SPACs trading on the NASDAQ Nordic exchanges. In Norway, Viking Venture was the first to establish a SPAC, occurring in mid-2021, and are, as of the beginning of 2022, waiting, and hoping that the Oslo Euronext Growth exchange will allow listings for SPACs in the near future (Viking Venture, 2021).

The current literature is thin concerning research on SPAC prerequisites for entering and succeeding in the Scandinavian market specifically. This makes sense as Sweden and Denmark allowed SPACs as recently as halfway through 2021, whereas Norwegian regulation has still not allowed for SPACs as an asset class.

2.4. Advantages of SPAC-mergers

Conventional IPOs are the most widely adopted method for private companies to access public equity markets. Companies aiming to access extra capital in the public equity markets may desire a SPAC-merger to avoid the lengthy conventional IPO process, lower the costs of the process, tap into manager expertise, and provide liquidity to owners that want to cash out (Dimitrova, 2016).

A study of Datar et al. (2012) points to three essential ways in which SPACs differ from conventional IPOs: First, the amount of liability investment the banks face; second, the ability to make forward projections; and third, the certainty of a deal and its price. Rodrigues & Stegemoller (2021) supports the suggestion that SPAC-mergers offer assurances for execution and price, adding that they essentially

offer their investors a risk-free investment with substantial upside from warrants, a benefit conventional IPOs are unable to match.

According to Gahng et al. (2021), there are especially five advantages of merging with a SPAC, compared to a conventional IPO. First, sponsors can provide advice and certification. Second, the time advantage of SPACs allows them to take advantage of a current public equity market favorable sentiment. Third, SPACs pose a regulatory arbitrage with its projections being largely shielded from lawsuits with a ‘safe harbor’ provision in US laws for mergers (Cazier et al., 2019). Fourth, SPACs may provide relative certainty compared to a conventional IPO. And fifth, having contingent features, as with other merger agreements, provides more contracting flexibility among different stakeholders for SPACs.

2.5. Ambiguous SPAC Performance Results

The published research on SPAC performance suggests that SPACs might outperform, underperform, or a combination of the two. These results are both in comparison to the market and to conventional IPOs. The differing results might be attributed to variations in data samples, research methodology, time-period, and performance measures. Some studies claim that SPACs outperform conventional IPOs, while other studies conclude the opposite. Furthermore, some studies suggest that the warrant part of the unit outperforms, whereas the common share part of the unit underperforms. Additionally, a study concludes that the SPAC-IPO period yield satisfactory performance results whereas period after a SPAC-merger severely underperforms.

2.5.1. Underperformance of SPACs

Most of the literature suggests that SPACs underperform, both in the sense of negative returns and in comparison with conventional IPOs. Kolb & Tykvová, (2016) found that SPACs attracted low-quality firms, which ultimately created a value-destroying asset. The study by Datar et al. (2012) found SPACs to be significantly inferior to their industry peers and to contemporaneous conventional IPO companies, both in terms of operating performance and stock returns. Klausner et al. (2020) and Lakicevic & Vulanovic (2011) both suggest negative performances of SPACs due to share dilution. Supporting this, Gahng et al. (2021) point to the primary two sources of dilution stemming from promote shares held by sponsors and warrants and/or rights held by public SPAC shareholders and sponsors.

However, Lin et al. (2021) point to quality sponsors' ability to constitute the value from the dilution loss. Lastly, (Dimitrova, 2016) found negative performance effects with large institutional-owned block holding of shares.

2.5.2. Outperformance of SPACs

Some studies suggests that SPACs outperform or have comparable results to conventional IPOs. Sjostrom (2007) reported that SPAC-reverse mergers were the only type of reverse merger that has a satisfactory and comparable end-result to a conventional IPO. Rodrigues & Stegemoller (2021) argues that if a merger with a target company is a measure of SPAC success, then approximately 75% of SPACs are successful by this basic and value-neutral measure in the 2014 - 2016 time-period. Bazerman & Patel (2021) reports market outperformance of SPACs after the substantially evolved SPAC-market conditions post 2019. They found that SPACs, as a comparison with conventional IPOs, have higher valuations, lower dilution, higher speed, higher transparency, less fees, and a more beneficial regulatory environment.

2.5.3. Combination of Out- and Underperforming Elements of SPACs

Interestingly, several studies suggests that certain aspects and periods of SPACs outperforms, whereas others underperforms. Lakicevic & Vulcanovic (2011) found that warrant holders gained significant abnormal returns at the time of a merger announcement. Supporting this, Gahng et al. (2021) found that warrants were the main driver of abnormal returns with SPAC-warrant investors persistently outperforming the SPAC-common-share investors.

Furthermore, Gahng et al. (2021) also found that, as for the lifecycle of SPAC data of 210 SPAC-IPOs from January 2010 – December 2019, that investors had on average earned an annualized return of 15.9% during the SPAC period, while the result of the investors for the merged companies were -8.1% in the first year on common shares. The negative return after the SPAC-merger period may be due to high redemptions, underwriting fees, and net promote. On the other hand, the first-year return on warrants was 68.0%. (Rodrigues & Stegemoller, 2021) supports this view by believing that the most likely path of materializing the warrant value is through a completed merger.

3. Hypotheses

In this section, we will present our two main hypotheses supporting our research question: “Why do firms choose to merge with a SPAC, despite it being a perceived unfavorable route to access public markets?” The hypotheses aim to further explore the differences between post-merger SPACs and conventional IPOs, both in terms of performance and firm characteristics.

There is limited research in the literature contrasting the performance aspect of post-merger SPACs in connection to the likelihood of choosing that route based on characteristics of the target firms. Hence, we contribute to the existing research by also taking the viewpoint of the operating firm that are looking for a route to public listing, thus forming our hypotheses thereafter.

Hypothesis 1: Post-merger SPACs underperform compared to conventional IPOs and the stock market

Hypothesis 1.1: Post-merger SPACs experience lower magnitude of initial underpricing than conventional IPOs

Initial IPO underpricing is a broadly documented phenomenon, with Ritter (1991) identifying the first day return of conventional IPOs to be a so-called ‘Window of Opportunity’ for investors i.e., a fleeting time-period where a rare and desired action could be taken. This initial underpricing can be viewed as a “hot issue” market phenomenon, measuring a substantial excess in average initial returns from the offering price to the market price at the end of the first day of trading.

In contrast, the issuing price for the business consummation between the SPAC and their target firms are agreed upon in the merger agreement. This means that the issuing price is locked in, which helps them to initially shield the issuing stock value from market uncertainty. Gleason et al. (2008) note that underpricing is substantially lower for reverse mergers, which SPACs is a subset of, than for conventional IPOs. Furthermore, more recent studies suggest that misalignment of incentives (Klausner et al., 2020) and moral hazardous behavior (Rodrigues & Stegemoller, 2021) to push the deal forward and manipulate the merger process, demonstrates a negative correlation with the stock performance post-listing.

Based on this, we hypothesize that there will be less underpricing, i.e., a lower magnitude of positive first day returns, for post-merger SPACs than conventional IPOs.

Hypothesis 1.2: Post-merger SPACs experience a larger magnitude of negative long-term abnormal return than conventional IPOs

The “Windows of Opportunity” hypothesis (Ritter, 1991), among other conventional IPO literature, states that the long-term underperformance act in accordance with the disappointment of the initial IPO over-optimism. In the SPAC-literature, previous research by Datar et al. (2012) found that the performance of post-merger SPACs in the first year of trading was significantly more negative than that of the conventional IPO firms, with both generating negative excess stock returns for the 2003–2008 period. In addition, Gahng et al. (2021) found that post-merger SPACs yield significantly negative long-term returns on common stocks.

Based on this, we hypothesize that post-merger SPACs will generate a larger magnitude of negative long-term excess returns, i.e., through the first full year of being listed, compared to that of conventional IPOs.

Hypothesis 1.3. Post-merger SPACs performance can be explained by asset pricing factors

The ‘Three Factor Model’ by Fama & French (1998) builds upon the capital asset pricing model (CAPM), by adding two explanatory variables for size and value in addition to market risk. The work of Fama & French was to explain the average stock returns by controlling for these factors that may capture the sensitivity to macroeconomic risks. The model is often used to identify exposure to the different factors. Datar et al. (2012) found that companies that have merged with a SPAC tend to be of smaller size compared to those companies that go through a conventional IPO. Hence, it is reason to believe that size risk can be an explanatory factor to the stock performance of post-merger SPACs. Moreover, Gahng et al. (2021) report findings that post-merger SPAC common shares underperform on a monthly basis after controlling for these factors.

Based on this, we hypothesize that post-merger SPACs will load positive on the size factor, in addition to yielding abnormal negative monthly returns, i.e., reporting negative alphas.

Hypothesis 2: Firm characteristics influences whether a firm chooses the SPAC-merger or conventional IPO route to access public markets

Hypothesis 2.1. Firm-specific characteristics may influence which route, i.e., SPAC-merger or conventional IPO, it chooses to access the public markets with

Datar et al. (2012) found that companies with characteristics of higher leverage, smaller size and lower investment rate tended to choose SPAC-mergers to a higher degree than the conventional IPO route. Kolb & Tykvová (2016) suggest that the quality of a company influences the choice of the route to access the public markets, at which lower quality companies will choose to merge with a SPAC.

Based on this, we hypothesize that certain firm characteristics may influence the likelihood of choosing the SPAC-merger route to go public.

Hypothesis 2.2. The industry a firm operates in may influence the route, i.e., SPAC-merger or conventional IPO, it chooses to access the public markets with

Taking the analysis from the aforementioned hypothesis of individual firm characteristics one step further, we want to research whether there are industry-wide characteristics of firms that may indicate an increased propensity of choosing a particular route. Specifically for our analysis, we want to research whether asset-light industries with lower capital expenditures could have increased likelihood of choosing the SPAC-merger route. Subsequently, we implicitly suggest that industries with the opposite characteristics, i.e., mature, and capital-intensive, would be more likely to choose the conventional IPO route.

Kolb & Tykvová (2016) adjusted for industry fixed effects, by bundling the three most frequent industries of target firms together. This added to their study's firm-specific variable analysis of the relations to route choice likelihood.

Based on this, we hypothesize that firms within asset-light industries have increased likelihood of choosing the SPAC-merger route.

4. Data

In this section, we will introduce how we collected our data and constructed our sample. We used three different databases to form our data sample that was needed to test our hypotheses. The process was time-consuming, but crucial to collect the information we needed.

4.1. Sample Selection

4.1.1. Identification of SPACs and IPOs

We identify US SPACs as companies that register at any US exchange under the SIC code "6770", blank-check companies, while not being subject to the Penny-Stock rule. We compiled the list of US IPOs by screening for "IPO" issue type in

the Refinitiv Eikon database with necessary adjustments elaborated in Section 4.2.2. SPACs and IPOs that traded on OTC markets were excluded from our dataset due to limited reporting.

4.1.2. Time-Period

We chose a six-year time-period from 2014 – 2019 for our SPAC-IPO sample data, to give sufficient time for the SPACs to complete either a business combination, i.e., a merger, or a liquidation. For the analyzes of the post-merger SPACs, our time-period extends to March 30th, 2022. Structurally, when SPACs file an S-1 form to get listed on a US exchange, they specify a deadline ranging from 12-24 months to complete a business combination or else they will dissolve.

We started our time-period in 2014 when NASDAQ and NYSE began to attract the majority of the SPAC listings, as OTCBB was the exchange of choice for the majority of SPAC listings up until 2013 (Rodrigues & Stegemoller, 2021).

Another reason for limiting the time-period of the SPAC-IPOs is excluding the potential current “SPAC-bubble” (Klausner et al., 2022). The number of listings exploded in 2020, with a completion that year alone of three times the frequency of the four prior years combined. Keeping that momentum, the 2021 SPAC-IPO listings increased by approximately 40% from the prior record year of 2020. See Appendix 9.1A for an overview of the development of SPAC-IPO frequency and total proceeds from 2003-2021.

4.2. Data Collection

After an initial screening, our data sample is a set of 194 SPACs and 680 IPOs in the US between 2014 and 2019 listed on NASDAQ and NYSE. To collect our data sample, we used a combination of the databases of SEC EDGAR, Refinitiv Eikon and CRSP.

4.2.1. SPACs – Data Collection

We found there to be no standard method for collecting SPAC data, therefore, we cannot claim to have screened the entire SPAC area in our specified time frame, but we did extensive research to get there. To construct our list of SPACs, we started with an advanced search in the SEC EDGAR database. First, we searched for all companies that filed an S-1 with the SEC between January 1st, 2014, and December 31st, 2019. An S-1 filing is required by the SEC for all public companies in the US,

and a company must have the filing before shares can be listed on any US exchange (CFI, 2019). Further, we narrowed the search to companies with the SIC code “6770”, which is the SIC code for blank-check companies, which SPACs are a subset of. The initial list of firms collected contained 259 companies.

Next, we excluded companies subject to rule 419 that, by definition, are not considered SPACs (Sjostrom, 2007), and any firm with operating cash flows that somehow retained the “6770” SIC code due to past transactions. Most of the excluded companies are subject to the Penny-Stock Rule, which the SPAC-structure circumvents.

To validate the accuracy of our data, we cross-examined the list of SPACs composed based on the SEC EDGAR search with Refinitiv Eikon’s database screen of “IPO” issue type and “Blank Check (SPAC) Involvement”. We found few instances of irregularities but did further research to make the essential modifications when necessary. Finally, this compiled a list of 194 SPACs.

To identify the timeline of the different milestones for a SPAC, we searched the EDGAR database for “EFFECT” filings, to identify the dates of the listings for the SPAC-IPOs. Next, we searched for “S-4”, “8-K” and “25-NSE” filings to identify the announcement date of successful mergers between SPACs and target companies. In some instances, there were delisting filings in the case of the SPACs failure to complete a business consummation. This was either due to failure to identify a target company within the given time frame, or failure to get an approval vote for a merger. Additionally, we validated the data by cross-examining the results with a web search of reliable news announcements.

4.2.2. Conventional IPOs – Data Collection

In our sample construction of the list of conventional IPOs, we used the Refinitiv Eikon database. We searched for equity deals in the US target market, IPO issue type from 01.01.2014 - 31.12.2019, listed on NYSE and NASDAQ. Furthermore, we excluded units, ADSs, ADRs, beneficial interests, depository shares, limited liability company interests, limited partnership interest, shares of beneficiary interest and stapled security from the list. New-issues offer-price that were below USD 5.00 were also excluded. The initial list of firms collected contained 913 companies. Additionally, we also excluded close-end funds, open-ended funds, ETFs, trusts, REITs, indexes, economic indicators as well as private companies and OTC re-listings due to limited reporting. Moreover, we had to

exclude a handful of companies due to missing observations, i.e., lack of reported financial statements variables. These had the common denominator of industry affiliation to public health. Finally, this compiled a list of 680 conventional IPOs.

4.2.3. Variables – Data Collection

Next, we collected data on firm financials, operating performance and stock returns using the Refinitiv Eikon database and CRSP. The Fama & French factors were downloaded for French's website (French, n.d.). See Appendix 9.4 for the full list of variables and specifications. For the list of post-merger SPACs, we excluded certain firms due to missing observations on the target companies, and companies that have been delisted shortly after a business consummation.

After eliminating firms with missing data, our final sample used in the regression analysis contains 146 post-merger SPACs and 680 conventional IPOs.

5. Methodology

In this section, we describe the methodology we used to assess our hypotheses. We used both univariate analyses, and various multivariate regression models that were appropriate for the topics of examination.

5.1. Data Analyses

5.1.1. Buy-and-Hold Returns

We examined the common stock performance for post-merger SPACs and conventional IPOs. To do this, we used the methodology of a buy-and-hold strategy where shares are held for 1, 3, 6 and 12 months. For the post-merger SPACs, we analyzed the scenario where an investor purchased shares of the merged company on the first day of trading as a new entity, consecutively, conventional IPOs were analyzed at its first trading day. The returns consist of both dividend yields and capital gains. We examined both raw return and excess return, where we used the value weighted CRSP market index to calculate the excess return, matched to each investment period. In addition to the buy-and-hold strategy, we also calculated the initial underpricing of the first day of trading.

We performed both t-tests and Wilcoxon signed rank tests to test the null hypotheses of means and medians equal to zero, respectively.

5.1.2. Asset Pricing Models

To further analyze the common stock performance, we ran the capital asset pricing model (CAPM) and the Fama and French three-factor model on a portfolio of post-merger SPACs to examine how the portfolio load on standard asset pricing models. The Fama & French three-factor model expands on the CAPM by adding size risk and value risk factors to the market risk factor. The main factors driving expected returns are sensitivity to the market, sensitivity to size and sensitivity to value stocks. Hence, any additional average expected return may be attributed to unpriced or unsystematic risk (Fama & French, 2015). Additionally, we ran the five-factor model, which expands by adding the two factors of profitability and investment.

We constructed the portfolio by adding firms in the calendar month following the business combination, then keeping them in the portfolio for the subsequent 12 months. Our portfolio starts when there are at least four observations for a given month. Hence, based on our sample, the portfolio starts in December 2016 and ends in March 2022, yielding 64 monthly observations.

5.1.3. Univariate Analysis of Firm Characteristics

We compared the mean and median values of several financial and operating characteristics of post-merger SPACs and conventional IPOs in a univariate setting. We assessed the first reported variables following the initial listing date to identify the key differentiating factors between the two routes. Additionally, we tracked the changes in the financial and operating factors over the course of the first full year as a public company. More specifically, we compared the variables at the listing date with that following year, in order to examine whether post-merger SPACs outperform conventional IPOs over time. Then, we generated these results on both a stand-alone and an industry-adjusted basis.

We performed both two-sample t-tests and Wilcoxon rank sum tests to test for the null hypotheses of equality of means and medians, respectively, for the post-merger SPAC and conventional IPO results. This allowed us to compare each variable on an individual basis. However, it is important to recognize that using this methodology is different than providing a causal relationship between the two routes and any other variables in a regression setting (Brooks, 2014).

5.1.4. Probit Regression Models

We performed several probit regressions to examine the likelihood of a firm to choose the route of a SPAC-merger or a conventional IPO to access the public markets. In our regression, we have a dichotomous dependent variable, that takes on the value of 1 in the case of a post-merger SPAC, and the value of 0 in the case of a conventional IPO. We examined the difference between the routes based on specific financial, operating and industry characteristics.

The probit model is a non-linear binary response model that restricts the predicted value of the dependent variable between 0 and 1 (Brooks, 2014). We specify the probit regression in various ways to observe how the magnitudes and significance levels of key variables change with variations in the model. A positive coefficient indicates an increasing probability of choosing the SPAC-merger route in that specific characteristic, whereas a negative coefficient indicates the opposite. By looking at the goodness of fit measure, Pseudo R^2 , we are able to find the most optimal model to examine the likelihood of what route a company chooses.

5.1.5. Tests of Robustness

To further evaluate our linear regression models, we ran different diagnostic tests to check for problems of autocorrelation and heteroskedasticity. We use the Breusch-Pagan test to check for heteroskedasticity, and the Breusch-Godfrey to check for autocorrelation. We used robust standard errors to confront the issues of heteroskedasticity and autocorrelation.

To test the robustness of our probit regressions we added fixed effects for industries. We also specified the models in different ways, both with and without industry fixed effects, to observe how the regression changes.

6. Descriptive Statistics

In this section, we provide an overview of our sample and present descriptive statistics for our SPACs and conventional IPOs samples, in addition to contrasting them. We will also explain the differences in the listing processes of a SPAC-merger and a conventional IPO, in addition to the typical lifecycle of a SPAC.

6.1. Sample Description

6.1.1. SPAC Sample Description

The first stage for a SPAC is getting granted listing on a public exchange. From our total sample of 194 SPACs that filed an S-1 with the SEC, 181 succeeded with its IPO, see Panel A in Table 1.

The next milestone for a SPAC is the completion of a business consummation with a target company. Panel B in Table 1 displays a 90% success rate of completion. In comparison with previous studies, the success rate has significantly improved from only 45% in the 2003-2008 period (Datar et al., 2012).

7% of SPACs has liquidated post its IPO i.e., filed a 25-NSE with the SEC, due to the failure of identifying a target or completing a business consummation. Additionally, 3% of the SPACs are currently having a merger in progress. As for the choice of exchanges, NASDAQ is the most popular with 78% of the SPAC listings, whereas NYSE accounts for 22%.

Table 1: Life Stages of SPACs

	Frequency	Percentage
Panel A: Pre SPAC-IPO		
<i>Total Sample</i>	194	100%
Completed SPAC-IPO	181	93%
Failed SPAC-IPO	13	7%
Panel B: Post SPAC-IPO Completion		
<i>Life Stages of SPACs</i>		
Successful SPAC Mergers	162	90%
Merger in Progress	6	3%
Liquidated	13	7%
<i>Exchange</i>		
NASDAQ	142	78%
NYSE	39	22%

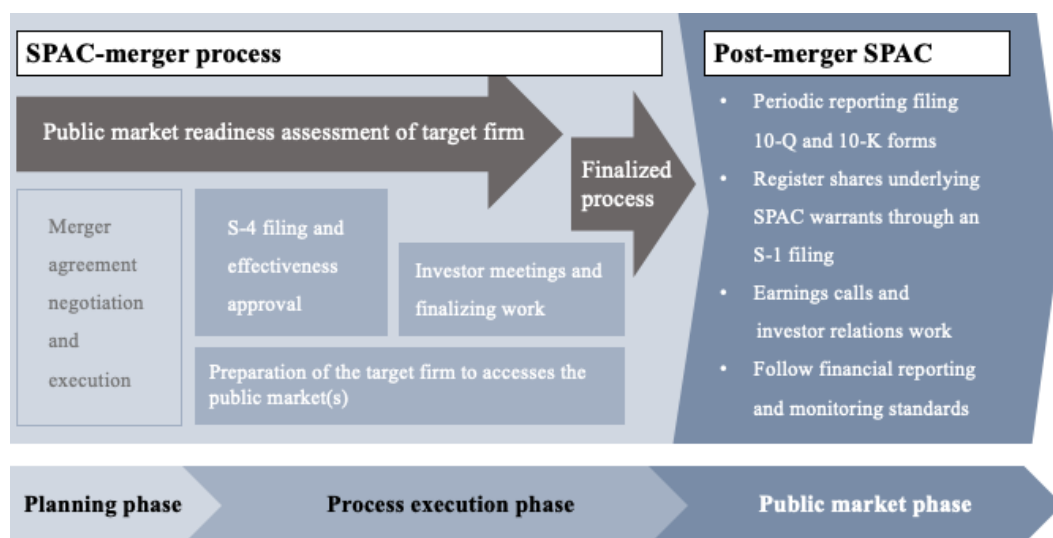
Source: SEC

Note: The table outlines the status and listing exchange of the SPACs with a sample from 2014-2019. Successful SPACs have already completed a business combination, and liquidated SPACs did not succeed in completing a business combination. Merger in progress is SPACs that are still searching for a target company or have yet to complete a merger.

To describe the evolution of the SPAC sample from 2014 – 2019, we found that the number of SPACs listed each year was stable until 2016, then beginning an increasing trend till 2019, shown in Figure 2. Logically, the total proceeds follow the same trend, shown in Figure 3. By assessing the average proceeds, we observe an increasing trend from 2014 until 2017, and a slightly decreasing trend until 2019, shown in Figure 4. See Appendix 9.1 to observe the full evolution of SPACs from the first SPAC-IPO in 2003 and until 2021.

Furthermore, we found it helpful to, as a foundation for further description of the SPAC sample, to provide an overview of the stages in a SPAC-merger process, see Figure 1 below.

Figure 1: SPAC-Merger Process Overview



6.1.2. Conventional IPO Sample Description

Our conventional IPOs sample from 2014-2019 initially consisted of 913 firms. Because of missing data, we used the refined conventional IPO sample of 680 firms to analyze the data, further described in Section 4.2.2. To describe the trend of conventional IPOs over time, we can see that both frequency, average and total proceeds experienced a decreasing trend from 2014 until 2016, then an increasing trend until 2019. For the 2003-2021 period, see Appendix 9.2 for the number of IPOs, total and average proceeds, in addition to country- and economic sector distributions.

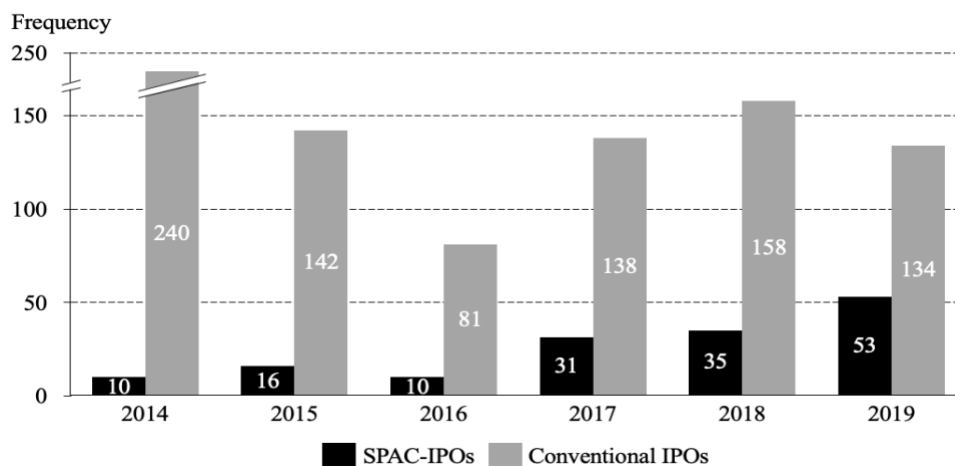
6.1.3. SPAC-IPOs and SPAC-mergers versus Conventional IPOs

We contrast the two public listing routes in terms of frequency, total- and average proceeds in Figures 2 – 4, to compare their adoption. See Appendix 9.3 for the abovementioned comparisons for the full time-period from 2003-2021. Moreover, we compare the SPAC-merger with the conventional IPOs in terms of its typical process in Figure 5.

First, Figure 2 shows that the frequency of SPAC-IPOs is significantly lower than that of conventional IPOs, with SPAC-IPOs being only 4% of the conventional IPO number in 2014. This figure is 40% in 2019, indicating an increasing adoption of the SPAC-merger route at the expense of the conventional

IPO route. Next, we contrasted the total proceeds and the average proceeds of the two routes. First, the total proceeds of SPAC-IPOs are considerably lower than that of conventional IPOs, see Figure 3. However, as the frequency is much lower for SPAC-IPOs, a comparison of average proceeds is more representable, as done in Figure 4. Interestingly, the average proceeds of the SPAC-IPOs are higher than for conventional IPOs for the 2015-2018 period, but lower for 2014 and 2019.

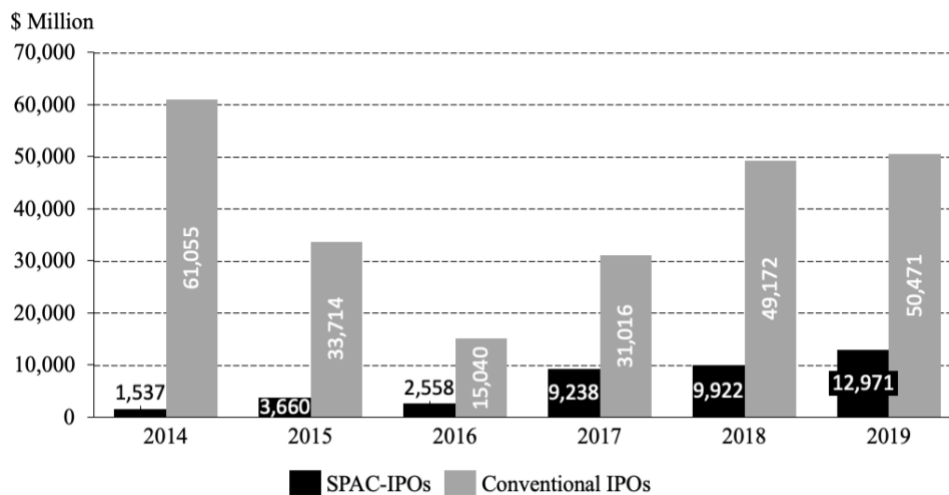
Figure 2: Frequency of SPAC-IPOs versus Conventional IPOs



Source: Refinitiv Eikon

Note: The bar graph displays the frequency of SPAC-IPOs and Conventional IPOs in the 2014-2019 period listed on NASDAQ or NYSE.

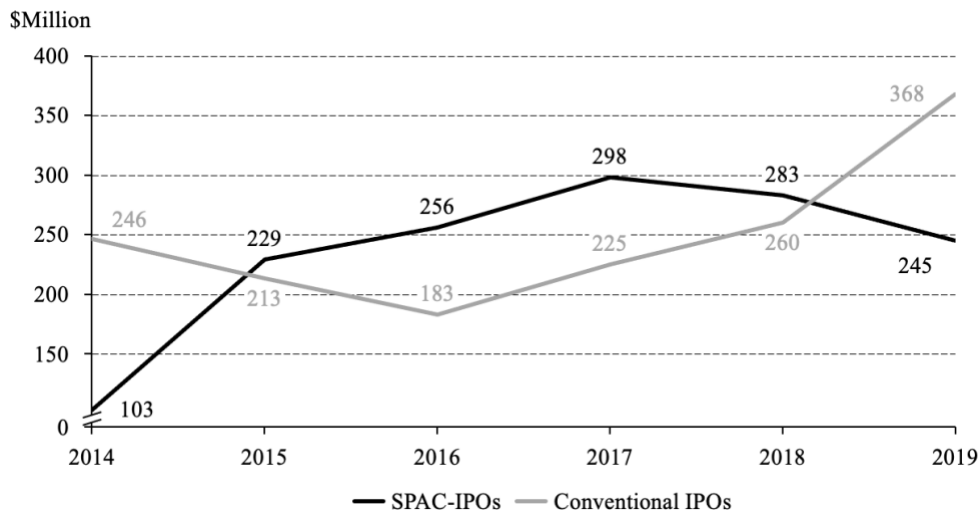
Figure 3: Total Proceeds of SPAC-IPOs versus Conventional IPOs



Source: Refinitiv Eikon

Note: The bar graph displays the total proceeds in USD million raised from the SPAC-IPOs and the conventional IPOs in the 2014-2019 period listed on NASDAQ or NYSE.

Figure 4: Average Proceeds of SPAC-IPOs versus Conventional IPOs

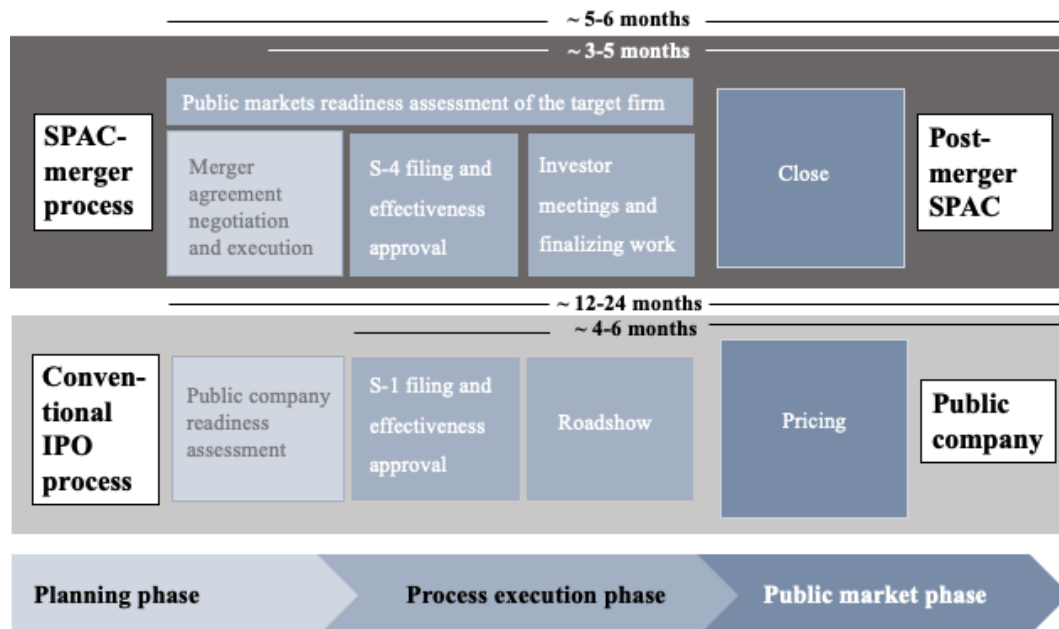


Source: Refinitiv Eikon

Note: The line graph displays the average proceeds in USD million raised from the SPAC-IPOs and the conventional IPOs in the 2014-2019 period on NASDAQ or NYSE.

Post the SPAC-IPO, when a target firm has been identified, the SPAC-merger process starts. This stage is reasonable to compare to the conventional IPO process. Elaborating on Figure 1 that outlined the SPAC-merger process, Figure 5 contrasts the process of the SPAC-mergers with the conventional IPOs, from the planning phase, through the process execution phase until they list on the public markets.

Figure 5: Comparative Overview of SPAC-Merger- and Conventional IPO Processes

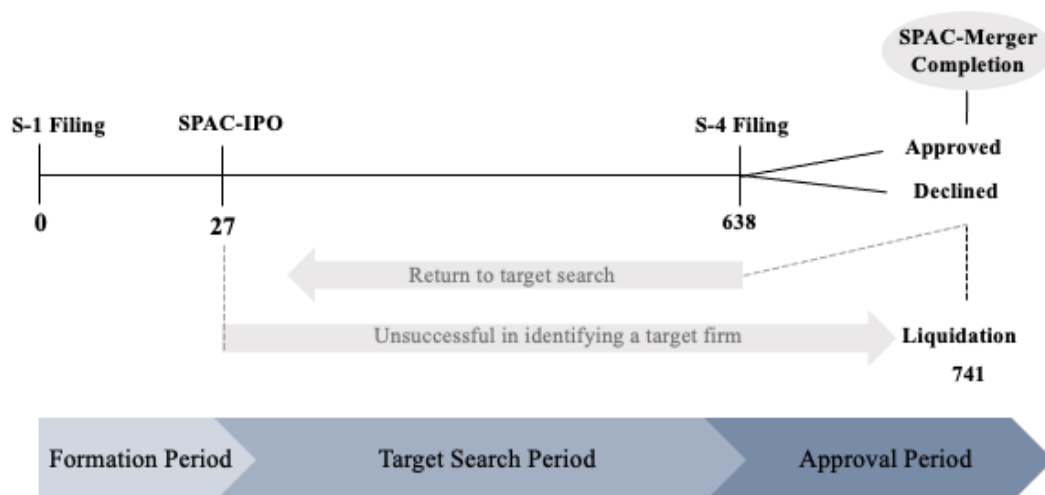


6.2. Timeline of Milestones in a SPACs Lifecycle

The timeline of median days between key events for SPACs in the 2014-2019 timespan ranges from the S-1 filing through each possible event in the life of a SPAC. In Figure 6, we observe that the median number of days from an initial S-1

filing till a successful SPAC-IPO is 27. Furthermore, till the next milestone being the S-4 filing, it is 638 days. This is the SEC application for a business consummation between the SPAC and its operating target firm. This is either approved, leading to a completed SPAC-merger, or declined. If the SPAC is unsuccessful in completing a merger, it either returns to the target search stage or liquidates.

Figure 6: Timeline of SPACs Milestones



Source: Refinitiv Eikon

Note: The timeline displays the median number of days from an S-1 filing to each milestone of a SPACs based on our sample from 2014-2019 listed on NASDAQ or NYSE (or OTC for early SPACs).

The described timeline is in line with the previous research, indicating that the timing of key events has remained somewhat consistent over time. Moreover, Table 2 displays the descriptive statistics of our SPAC sample from 2014-2019.

Table 2: Descriptive Statistics of SPAC Lifecycle Milestones

	SPAC-IPO	Merger Completion	Liquidation
Number	181	162	13
Mean	39	661	809
Median	27	638	741
Minimum	15	231	280
Maximum	419	1,249	1,558
Standard Deviation	44	212	317

Source: Refinitiv Eikon

Note: The table outlines the descriptive statistics of the number of days from an S-1 filing to each milestone of a SPAC, based on our sample from 2014-2019, listed on NASDAQ or NYSE (or OTC for early SPACs).

6.2.1. Refining the Data Sample

For further data analyses, we refined the SPAC sample to only include 146 successful SPACs that both completed a SPAC-IPO and a merger with a target firm up until December 31st, 2020. This is due to missing data on the target firms, and firms that have been delisted shortly after a business consummation.

7. Results

In this section, we present the results addressing our two main hypotheses introduced in section 3². This, in turn, breaks down our research question of: “Why do firms choose to merge with a SPAC, despite it being a perceived unfavorable route to access public markets?”

The first part of our analysis addresses the common stock performance of post-merger SPACs compared to conventional IPOs, analyzing the first day returns and buy-and-hold strategies from one month up to one year, post listing. Additionally, we analyzed whether the post-merger SPACs stock performance can be explained by standard asset pricing models.

The next part of our analysis assesses the target firms’ characteristics in terms of financial and operating variables. These variables are reported both on a nominal and an industry-adjusted basis and are examined both at the first reported trading day, as well as tracked over the first year as a public company.

In the last part, we develop a model to predict the likelihood of a target firm choosing the SPAC-merger or the conventional IPO route for public listing. We base our selection of variables for the regression on our findings from part two. We assess whether specific variables, both firm- and industry specific, can be found to have an explanatory factor on the listing route choice of a firm.

7.1. Common Stock Returns

The first section addresses the second part of our research question, the perceived SPAC-merger unfavourability, and subsequently the first main hypothesis of post-merger SPACs’ underperformance in comparison to conventional IPOs. Hence, the section first assesses the first day returns, then the buy-and-hold strategies from one month up to one year, and finally whether the post-merger SPACs performance can be explained by any asset pricing models.

7.1.1. First Day Common Stock Returns

We observe that conventional IPOs has an initial underpricing whereas post-merger SPACs has an initial overpricing, as reported in Table 3. Underpricing means that the common stocks are offered at a lower price than what the market, on

² Note that all results being discussed in this section has a statistical significance level of 1%, highly significant, or 5%, unless stated otherwise.

the first day of trading, perceives to be the true value. The opposite is the case for overpricing.

Table 3: First-Day Stock Returns

First-Day Stock Returns (%)						
	Mean	Median	Q1	Q3	Positive	Negative
Post-merger SPACs	- 1.69*	- 0.82***	- 4.55	1.39	38	62
Conventional IPOs	1.55**	- 0.21	- 4.35	3.46	48	52

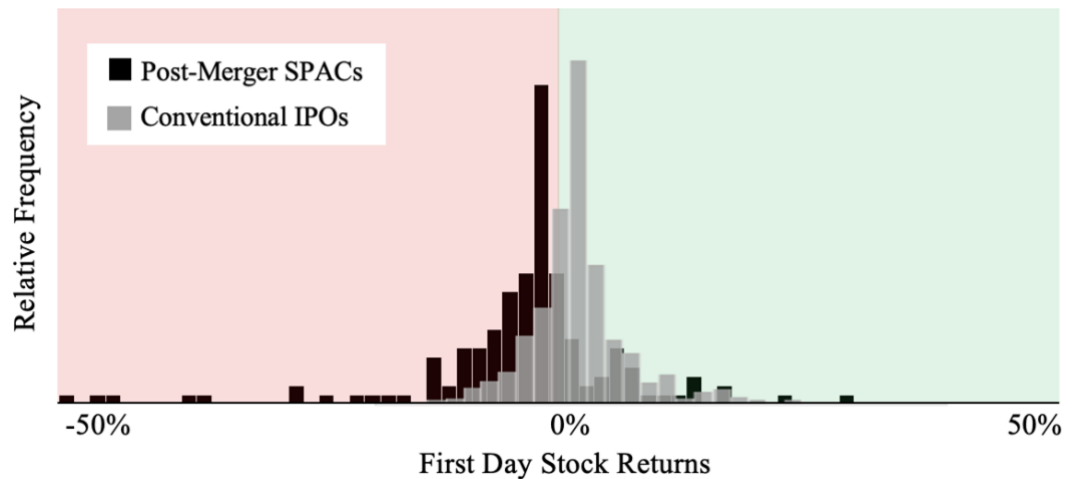
Source: Refinitiv Eikon

Note: The table report first day common stock returns for post-merger SPACs and conventional IPOs, based on our sample from 2014-2019, listed on NASDAQ or NYSE. calculated as the ((closing price – opening price) / opening price), at the first reported trading day. All values are expressed as percentages. The null hypothesis of mean return equal to zero is tested using a t-test. The Wilcoxon signed rank is used to test the hypothesis of median return equal to zero. The significance tests are reported as *, ** and ***, indicating a significance at the 10%, 5% and 1% confidence level, respectively. Q1 and Q3 represent the 25th percentile and 75th percentile of the data set. Positive and negative is the split of the data set reporting results above/equal 0 and below 0.

First, assessing the conventional IPOs’ results, the average first day return is 1.55% and the 75th percentile is 3.46%, which is in line with the “hot issue” market phenomenon (Ritter, 1991). Yet, slightly more than half of the sample has negative first day returns with the 25th percentile being -4.35%. This lower quartile result is the same ballpark as for the post-merger SPACs sample of -4.55%. The two routes differ on a mean and median basis, as well as with the highest quartile reported being 3.46% and 1.39%, respectively.

Next, assessing the post-merger SPACs’ results, only 38% of the post-merger SPACs has a positive first day return, with the mean being -1.69% and a median of -0.82%. This is not surprising, as we expected there to be less underpricing compared to conventional IPOs due to it being an unconventional and less established method of accessing public markets, hence, less of an “hot issue” (Ritter, 1991). Figure 7 displays that most of the relative frequency reports initial overpricing for post-merger SPACs and initial underpricing for conventional IPOs, illustrated by the red and green shaded areas, subsequently.

Figure 7: Distribution of First-Day Stock Returns



Source: Refinitiv Eikon

Note: The histogram displays the relative distribution of the first day common stock returns of our post-merger SPACs and conventional IPO samples, from 2014-2019, listed on NASDAQ or NYSE. The red shaded area indicates an initial overpricing, and the green shaded area represents an initial underpricing.

In contrast to conventional IPOs, target firms of SPAC-mergers can negotiate the issuing stock price directly with the SPAC sponsor as part of their merger deal, i.e., targets can lock in a price which helps them to shield its value from market uncertainty. Rodrigues & Stegemoller (2021) points to SPAC-mergers being able to offer assurances for execution and price, a benefit conventional IPOs are unable to match. However, when the market can finally assess the true value of the stock on the first day of trading, they perceive it as lower than from the merger agreement, i.e., initial overpricing. This may be connected to the misalignment of incentives to push a SPAC-merger deal forward, with contingent compensation, and the lack of a vetting function, as researched by Klausner et al. (2020). In addition, Rodrigues & Stegemoller (2021) suggest moral hazardous behavior by a small group of insiders using SPACs to manipulate the merger process, demonstrating an inverse correlation with stock performance.

7.1.2. Buy-and-Hold Returns

We base the analysis of longer-term returns, i.e., from 1 month to 12 months, on a potential investor strategy of purchasing a common share of stock on the first reported day of trading, then holding it for 1, 3, 6, and 12 months. Table 4 displays the stock returns results for the common shares of post-merger SPACs and conventional IPOs reported as the means, medians, and percent of positive/negative returns.

Table 4: Buy-and-Hold Returns

	Mean	Median	Positive	Negative
1 Month Buy-and-Hold Strategy (%)				
<i>Post-merger SPACs:</i>				
Raw return	9.66	- 9.18***	32	68
Market return	1.20***	2.19***	69	31
Excess return	8.45	- 9.01***	31	69
<i>Conventional IPOs:</i>				
Raw return	3.93***	0.76***	54	46
Market return	0.68***	0.97***	75	25
Excess return	3.25***	0.38	52	48
3 Months Buy-and-Hold Strategy (%)				
<i>Post-merger SPACs:</i>				
Raw return	- 9.94***	- 12.46***	34	66
Market return	4.90***	6.24***	79	21
Excess return	- 14.84***	- 15.87***	27	73
<i>Conventional IPOs:</i>				
Raw return	5.22***	0.26	51	49
Market return	2.74***	2.88***	80	20
Excess return	2.48	- 2.60**	44	56
6 Months Buy-and-Hold Strategy (%)				
<i>Post-merger SPACs:</i>				
Raw return	- 13.14***	- 21.65***	35	65
Market return	10.52***	10.40***	87	13
Excess return	- 23.65***	- 29.83***	25	75
<i>Conventional IPOs:</i>				
Raw return	5.02**	- 2.00	47	53
Market return	6.08***	6.46***	92	8
Excess return	- 1.05	- 8.65***	41	59
12 Months Buy-and-Hold Strategy (%)				
<i>Post-merger SPACs:</i>				
Raw return	- 22.01***	- 39.40***	25	75
Market return	18.11***	15.76***	93	7
Excess return	- 40.12***	- 58.71***	17	83
<i>Conventional IPOs:</i>				
Raw return	13.10***	0.00*	50	50
Market return	12.52***	13.84***	94	6
Excess return	0.58	- 12.77***	41	59

Source: Refinitiv Eikon

Note: The table reports the mean, median and the percent of positive/negative raw returns, market returns and excess returns of common stocks of post-merger SPACs and conventional IPOs for buy-and-hold strategies of 1, 3, 6 and 12 months. The sample is for the time-period 2014-2019, listed on NASDAQ or NYSE. All values are expressed as percentages. The raw return is the common stock return, the market return is the CRSP value weighted index, and the excess return is calculated as (raw return – market return). The null hypothesis of mean return equal to zero is tested using a t-test. The Wilcoxon signed rank is used to test the hypothesis of median return equal to zero. The significance tests are reported as *, ** and ***, indicating a significance at the 10%, 5% and 1% confidence level, respectively.

Based on the stock returns of the buy-and-hold strategy, we observe that post-merger SPACs underperform compared to conventional IPOs across all time periods analyzed. We find the median excess return numbers to be the most representative for comparison reasons, as it adjusts both for outliers and market return. The excess return for 1, 3, 6, and 12 months consecutively is -9.01%, -15.87%, -29.83%, -58.71% for post-merger SPACs. There are negative returns for all periods, with the magnitude increasing with time after the business consummation. The conventional IPO firms also have a negative trend, but at a

lower magnitude, with excess returns of 0.38%, -2.60%, -8.65%, -12.77% for the 1, 3, 6, and 12 months, respectively. This is in line with our expectation based on the “Windows of Opportunity” hypothesis (Ritter, 1991) of long-term underperformance consistent with the initial IPO over-optimism, i.e., positive first reported trading day returns, as discussed in Section 7.1.1.

Moreover, our results are also consistent with the findings of Datar et al. (2012) from 2003-2008 of excess stock returns for both conventional IPO firms and post-merger SPACs being negative, but at a substantially greater magnitude for the post-merger SPACs. The longer-term returns of the respective routes seem to follow the same trend relative to one another, on a market-adjusted basis, as prior periods. In more recent time periods, several studies also concluded that post-merger SPAC common shares underperform in comparison to comparable firms choosing the conventional IPO route, among these are (Klausner et al., 2020), (Lakicevic & Vulcanovic, 2011), (Gahng et al., 2021), (Vulanovic, 2016), (Lin et al., 2021), (Dimitrova, 2016).

7.1.3. Asset Pricing Factors

We use three different asset pricing models to determine how our portfolio of post-merger SPACs load on each of the factors. First, we applied the capital asset pricing model (CAPM), shown in equation (1). Secondly, we ran the Fama & French three-factor model which expands on the CAPM by adding the size and value risk factors, shown in equation (2). Finally, we extended the model even further by running the Fama & French five-factor model, which adds the two additional factors for investment and profitability, shown in equation (3). The results are reported in Table 5 below.

$$R_{it} - R_{ft} = \alpha_{it} + \beta_1(R_{mt} - R_{ft}) + e_{p,t} \quad (1)$$

$$R_{it} - R_{ft} = \alpha_{it} + \beta_1(R_{mt} - R_{ft}) + \beta_2SMB_t + \beta_3HML_t + e_{p,t} \quad (2)$$

$$R_{it} - R_{ft} = \alpha_{it} + \beta_1(R_{mt} - R_{ft}) + \beta_2SMB_t + \beta_3HML_t + \beta_3RMW_t + \beta_3CMA_t + e_{p,t} \quad (3)$$

Table 5: Asset Pricing Models

	CAPM		Three-Factor Model		Five-Factor Model	
Alpha	- 1.8614	(1.2835)	- 1.5484	(1.2592)	- 1.5884	(1.3788)
Rm-Rf	1.4826***	(0.4791)	1.2368***	(0.4031)	1.5347***	(0.4588)
SMB			1.2219**	(0.4591)	0.7578	(0.3863)
HML			- 0.5708	(0.2250)	- 0.6041	(0.2258)
RMW					- 1.2137	(0.6131)
CMA					0.7599	(0.5423)
Adj. R ²	0.2040		0.2320		0.2360	

Source: Refinitiv Eikon, Kenneth French's Data Library

*Note: The table displays three asset pricing models namely CAPM, Fama & French three-factor model and Fama & French five-factor model. *, ** and *** indicate a significance at the 10%, 5% and 1% confidence level, respectively. Robust standard errors are reported in parenthesis. The parameter estimates are expressed as percentages. Based on our sample from 1st December 2016 – 30th March 2022, listed on NASDAQ or NYSE.*

$(R_{mt} - R_{ft})$, SMB_t , HML_t , RMW_t , CMA_t are the factors for market excess returns, firm size, value, profitability, and investment respectively³ (Fama & French, 2015). The parameter estimates from these regressions are known as factor loadings that measure the sensitivity of a portfolio to each of the factors.

The three-factor model explains the stock performance of the post-merger SPACs better than the CAPM, generating a higher adjusted R^2 . Our portfolio loads positively on the size risk in addition to the market risk, which is in line with previous research (Gahng et al., 2021). This is consistent with our expectation considering the smaller size of firms choosing the post-merger SPACs, see analysis of target firm variables in Section 7.2.

In addition to the three-factor model and the CAPM, we also ran the five-factor model, which includes two additional factors for profitability and investment. Previous studies by Datar et al. (2012) found that post-merger SPACs tend to have lower profit margins, so we wanted to examine how they load on the two additional factors. Interestingly, neither of the parameters except from market risk is statistically significant, and the adjusted R^2 is only slightly higher, indicating that the two additional factors do not really help to explain the return of our post-merger SPACs portfolio.

Consistent with the raw returns reported in Table 4, post-merger SPACs underperform by 1.5% to 1.8% per month, although the alphas are not statistically significant in either of the models. This can be explained by the low frequency of firms in the portfolio early in our sample period, resulting in high standard errors.

7.2. Target Firms Characteristics and Performance

In the previous section, we found that SPAC-mergers were an unfavorable route to access public markets. Followingly, we move to the second part of our research question: Why do firms choose to merge with SPACs despite this? To answer the question, we start by identifying the fundamental differences between companies that choose to merge with SPACs and those that goes through a conventional IPO

³ R_{it} is the monthly return on the equally-weighted portfolio of post-merger SPAC common shares; R_{mt} is the monthly return on the value-weighted CRSP index; R_{ft} is the risk-free rate; SMB_t is the return on small stock portfolios minus the return on big stock portfolios; HML_t is the return on value portfolios minus the return on growth portfolios; RMW_t is the return on robust operating profitability portfolios minus the return on weak operating profitability portfolios; CMA_t is the return on conservative investment portfolios minus the return on aggressive investment portfolios.

process. We contrasted a variety of financial and operating variables and ratios at the first trading day after a public listing, both on a nominal and industry-adjusted basis. In addition, we tracked the changes in the variables to assess the changes after the first year as a public company.

7.2.1. Target Firm Variables Analysis

First, we contrasted the target firms of post-merger SPACs with those choosing conventional IPOs based on 16 financial variables, both on an average and median basis. See Appendix 9.4 for definitions of all the variables. We bundled the categories based on variables inherit in the three main financial statements being the income statement, the balance sheet, and the statement of cash flows. Table 6 displays all results presented on both an average and median basis, tested for their degree of significance using two-sample t-tests and Wilcoxon rank sum tests. See the methodology in section 5.1.3 for further specifications of these tests.

Table 6: Univariate Analysis of Financial Statement Variables

	Post-merger SPACs		Conventional IPOs		T-test	Wilcoxon
	Average	Median	Average	Median		
Income Statement Variables						
Sales	511.77	154.33	2 757.49	114.32	- 2 245.73 ***	40.01
COGS	304.35	103.21	1 885.64	64.76	- 1 581.30 ***	38.45
OPEX	421.29	117.91	1 868.83	59.89	- 1 447.54 ***	58.02
EBT	- 27.54	- 12.12	238.98	- 6.77	- 266.52 ***	- 5.35 ***
EBIT	0.70	- 1.57	324.92	- 2.87	- 324.22 ***	1.30
EBITDA	31.10	0.98	422.95	- 1.14	- 391.85 ***	2.12
Net Income	- 31.76	- 14.90	195.71	- 6.41	- 227.47 ***	- 8.49 ***
Balance Sheet Variables						
Total Assets	582.71	226.01	16 566.46	117.32	- 15 983.75	108.69
Total Debt	410.74	13.91	5 700.17	34.36	- 5 289.43 ***	- 20.45 ***
Total Equity	191.75	112.89	2 304.32	- 3.22	- 2 112.57 ***	116.12 ***
Market Capitalization	1 269.87	470.07	6 589.80	541.03	- 5 319.93 **	70.95
Enterprise Value	1 638.85	555.68	9 852.67	646.52	- 8 213.82 ***	- 90.84
Cash Flows Variables						
Operating Cash Flows	- 19.23	- 0.84	229.38	- 1.31	- 248.60	0.48
Financing Cash Flows	129.61	30.89	- 95.31	12.50	224.92	18.39 **
Investing Cash Flows	- 67.38	- 7.44	- 414.05	- 6.59	228.49	- 0.85
Capital Expenditures	28.96	4.23	129.97	3.34	- 101.01 ***	0.98 *

Source: Refinitiv Eikon

Note: The table contrasts 16 characteristics of post-merger SPACs and conventional IPOs, reporting mean and median values. The data is from the first reported trading day, for firms listed in our sample period from 2014-2019, listed on NASDAQ or NYSE. Values are reported in USD millions. The null hypothesis of equality of means for the post-merger SPACs and conventional IPOs are tested using a two-sample t-test. The difference in means is reported as $(Mean_{SPAC} - Mean_{IPO})$. The Wilcoxon rank sum is used to test the null hypothesis of equality of medians. The difference in medians is reported as $(Median_{SPAC} - Median_{IPO})$. The significance tests are reported as *, ** and ***, indicating a significance at the 10%, 5% and 1% confidence level, respectively. See Appendix 4 for definitions of the variables.

Income statement variables. On average, the sales of conventional IPOs are over five times larger than that of post-merger SPACs at the first reported trading day. We find that proportion to be somewhat similar for net income, but with post-merger SPACs yielding a loss, i.e., negative net income. We observe that all average income statement variables for conventional IPOs are positive, while they are positive yet smaller, for post-merger SPACs, except for losses on EBT and net income. These results are in line with the findings of Bai et al. (2021) stating that target firms of SPACs are notably smaller, with substantially less revenue than those going with the conventional IPO route.

Comparing the two routes on a median basis allow us to adjust for outliers. The only median variables of statistical significance, the EBT and net income, are negative for both routes, but the magnitude is larger for post-merger SPACs. The spread between the routes is narrower on a median than on an average basis, indicating that the distributions for both routes are skewed to the right with several sizable amounts contributing to the higher average values compared to the median.

Balance sheet variables. On average, firms choosing conventional IPOs are considerably larger than the target firms of a SPAC in terms of total debt, total equity, market capitalization, and, naturally, enterprise value. We observe a common tendency of target firms of both routes having more debt on their balance sheet than equity, on average. However, the opposite is the case on a median basis for post-merger SPACs. Contrastingly, conventional IPOs has taken up a larger amount of debt, but the book equity value is slightly negative.

The difference in total assets does not provide any statistically significant results on a nominal basis. We find this result to be quite surprising, but attribute this to how and the timing of when assets are reported by the firms. Besides, the SPAC-merger process allows assets to be reevaluated on the balance sheet, if the SPAC is determined to be the accounting acquirer, whereas this is not the case in a conventional IPO process (Murphy & Weisberg, 2021). Therefore, to interpret the size factor at this stage in the analysis, we looked to the right-hand side of the balance sheet rather than the left-hand side.

Cash flow variables. We find that post-merger SPACs, on an average basis, has about four and a half times lower capital expenditures compared to conventional IPOs. The median values are notably more conservative, at the 10% significance level, with the routes being in closer proximity to one another. This can indicate that the data, especially for conventional IPOs, are skewed to the right due to high

outlier values. Furthermore, on a median basis, the financing cash flows, i.e., the sum of all inflows and outflows from financing activities, is negative for post-merger SPACs, but positive and substantially larger for the conventional IPO firms.

Takeaways. Datar et al. (2012) found, in the early adoption stages of SPAC-mergers from 2003-2008, a tendency of smaller firms going with the SPAC route, which we found to continue in our sample period from 2014-2019. Their study attributed this to the fundamental differences in the way SPACs and conventional IPO firms initially tap public markets, where the size of a SPAC is limited by the funds it raises in its initial SPAC-IPO. Hence, the target firm size of a SPAC will be limited to this amount. In contrast, for the conventional IPO process, all sizes of firms are theoretically able to get publicly listed through this route. Fang (2005) infer that smaller firms may find it challenging to find a high-quality underwriter to increase the chance of a successful outcome of a conventional IPO. In addition, the reduced benefits for smaller firms, combined with less interest attracted from potential investors, prompt some small companies to rather choose alternative routes to access public markets (Adjei et al., 2008). Hence, a SPAC-merger, where the issuing price is predetermined in the merger agreement, might be these small firms' only sensible choice.

7.2.2. Industry Distribution

We add another layer to our analysis by introducing the industry segment. (Gahng et al., 2021), (Datar et al., 2012), (Kolb & Tykvová, 2016), among other SPAC literature, research the industry component in connection with performance and choices of route. First, in Table 7, we compare the industry distribution of the two routes, providing an overview before analyzing the target firm variables from Section 7.2.1. on an industry-adjusted basis in Section 7.2.3, allowing us to adjust the results for industry effects.

Table 7: Industry Distribution

	Post-merger SPACs		Conventional IPOs	
	Frequency	Percentage	Frequency	Percentage
Consumer Services	9	7%	23	4%
Finance and Insurance	17	13%	102	17%
Industrial	15	12%	26	4%
Manufacturing	39	31%	193	32%
PST Services	21	17%	178	29%
Technology	25	20%	83	14%
Others	20	16%	75	12%
Sum	126	100%	605	100%

Source: Refinitiv Eikon

Note: The table outlines the frequency, displayed both as a number and in percentage of total, of both post-merger SPACs and conventional IPOs sorted by industry. The data is from the first reported trading day, for firms listed in our sample period from 2014 – 2019, listed on NASDAQ or NYSE. The industry classification is a bundle based on SIC code and registered industry search (Eikon code). “PST services” is an abbreviation for professional, scientific, and technological services. The “Others” category is a bundle of less frequent industries in the data set.

The industries with the highest frequency of post-merger SPACs are manufacturing, technology, “PST” services and finance. The conventional IPOs follows a similar trend in the industry distribution. It is worth noting that only 17% of the total listings in our sample period are post-merger SPACs.

We observe that these industries have varying characteristics in terms of the typical concentration of assets and growth prospects. For example, the manufacturing industry tend to be tangible asset heavy with significant capital investments consisting of more mature companies. Whereas the technology industry has firms with a larger fraction of intangible assets and in more of a growth phase.

7.2.3. Target Firm Variables Analysis - Industry-Adjusted

Additionally, we adjusted the results from Table 6 for industry effects by subtracting the median of each industry from each observation. Due to the right-skewing tendency on an average basis, we believed using the median, thereby adjusting for some sizable outliers inherit in the mean, provided the most representative results.

Table 8: Univariate Analysis of Industry-adjusted Financial Statement Variables

	Post-merger SPACs		Conventional IPOs		T-test	Wilcoxon
	Average	Median	Average	Median		
Income Statement Variables – Industry Adjusted						
Adj. Sales	340.19	12.17	2 633.33	8.55	- 2 293.14 ***	3.63
Adj. COGS	195.65	14.47	1 800.10	3.33	- 1 604.46 ***	11.14 *
Adj. OPEX	272.48	- 0.14	1 762.76	0.85	- 1 490.29 ***	- 0.99 ***
Adj. EBT	- 22.83	- 8.96	246.15	1.41	- 268.98 ***	- 10.37 ***
Adj. EBIT	- 3.16	- 4.61	323.78	0.60	- 326.94 ***	- 5.20 **
Adj. EBITDA	17.32	- 3.60	417.70	0.64	- 400.38 ***	- 4.24 **
Adj. Net Income	- 26.23	- 9.04	202.16	1.41	- 228.39 ***	- 10.46 ***
Balance Sheet Variables – Industry Adjusted						
Adj. Total Assets	251.09	3.91	16 342.58	- 3.26	- 16 091.50 ***	7.17
Adj. Total Debt	216.95	- 16.96	5 654.48	7.04	- 5 437.53 ***	- 24.00 ***
Adj. Total Equity	148.38	84.85	2 278.88	- 5.91	- 2 130.51 ***	90.77 ***
Adj. Market Cap.	556.52	- 141.75	5 965.12	9.21	- 5 408.60 **	- 150.97 ***
Adj. Enterprise value	679.00	- 220.28	9 081.05	13.65	- 8 402.05 ***	- 233.93 ***
Statement of Cash Flows Variables – Industry Adjusted						
Adj. Op. Cash Flows	- 28.48	- 5.56	222.99	0.73	- 251.47	- 6.29 ***
Adj. Fin. Cash Flows	119.99	22.11	- 108.51	- 0.32	228.49	18.39 ***
Adj. Inv. Cash Flows	- 46.75	0.45	- 398.58	- 0.42	351.83	0.86 ***
Adj. Capital exp.	20.57	0.73	123.91	0.08	- 103.33 ***	0.64

Source: Refinitiv Eikon

Note: The table contrasts characteristics of post-merger SPACs and conventional IPOs on an industry-adjusted basis, reporting average and median values. The data is from the first reported trading day, for firms listed in

our sample period from 2014 – 2019, listed on NASDAQ or NYSE. Values are reported in USD millions. The null hypothesis of equality of means for the post-merger SPACs and conventional IPOs are tested using a two-sample *t*-test. The difference in means is reported as ($Mean_{SPAC} - Mean_{IPO}$). The Wilcoxon rank sum is used to test for the null hypothesis of equality of medians. The difference in medians is reported as ($Median_{SPAC} - Median_{IPO}$). The significance tests are reported as *, ** and ***, indicating a significance at the 10%, 5% and 1% confidence level, respectively. “Adj.” is an abbreviation for industry adjusted variables, calculated by subtracting the median of each industry from each observation. See Appendix 4 for definitions of the variables.

On an industry-adjusted basis, displayed in Table 8, there are similarities in terms of the proportionality pattern to the nominal basis, reported in Table 6, with post-merger SPACs still having substantially lower capital expenditures.

However, we observe that post-merger SPACs report a higher frequency of negative numbers than conventional IPOs. The reason may be that post-merger SPACs tend to be substantially smaller than their industry median, but firms choosing the conventional IPO route are usually only slightly smaller or larger than the median of their industry.

Hence, we observe that post-merger SPACs are still smaller than the firms choosing the conventional IPO route, after adjusting for industry, both on an average and median basis.

7.2.4. Target Firm Ratio and Margins Analysis

To further interpret the data, we found it interesting to analyze the metrics in relation to one another as ratios and margins. These are presented in Table 9 on both a nominal and industry-adjusted basis, with mean and median values. Next, we will particularly focus on the three following variables; return on assets (ROA), current ratio and debt-to-enterprise.

Table 9: Univariate Analysis of Financial Ratios and Margins

	Post-merger SPACs		Conventional IPOs		T-test	Wilcoxon
	Average	Median	Average	Median		
Nominal Ratios						
Operating margin (%)	- 3.03	0.01	- 3.97	0.03	0.94	- 0.02
ROA (%)	- 6.92	- 0.69	- 60.95	- 7.37	54.04 ***	6.69 **
ROE (%)	- 13.08	- 0.67	- 98.43	- 12.35	85.35	11.68
Op. CFs to total assets	- 0.08	0.00	- 0.39	0.03	0.31	0.03 *
Total asset turnover	0.77	0.54	0.87	0.62	- 0.10	- 0.08
Current ratio	1.94	0.89	4.31	1.77	- 2.37 ***	- 0.88 ***
Debt-equity ratio	- 1.38	0.02	- 0.37	0.00	- 1.01	0.02
Debt-to-enterprise	9.08	1.12	18.61	9.02	- 9.53 ***	- 7.89 ***
Price to book	0.23	1.41	- 23.62	- 1.24	23.85	2.65 ***
EPS	- 0.79	- 0.38	- 1.87	- 0.38	1.08	0.00
Price to sales	26.38	2.04	83.98	6.26	- 57.60	- 4.23 ***
Industry-Adjusted Ratios						
Adj. Op. margin (%)	- 2.91	- 0.02	- 3.86	0.00	0.95	- 0.02
Adj. ROA (%)	4.70	1.20	- 43.12	- 0.20	47.81 ***	1.40 **
Adj. ROE (%)	0.06	- 0.23	- 78.47	0.16	78.53	- 0.39
Adj. Op.CFs - tot. assets	- 0.03	0.01	- 0.28	0.00	0.26	0.01
Adj. Tot. asset turnover	0.22	0.06	0.34	0.08	- 0.12 **	- 0.02 **
Adj. Current ratio	0.13	- 0.77	2.11	0.09	- 1.98 ***	- 0.86 ***

Adj. Debt-equity ratio	- 1.53	0.02	- 0.52	-0.03	- 1.00	0.05
Adj. Debt-to-enterprise	- 1.68	- 2.87	12.22	3.86	- 10.53 ***	- 6.74 ***
Adj. Price to book	1.01	2.56	- 22.10	- 0.22	23.11	2.78 ***
Adj. EPS	- 0.55	- 0.30	- 1.58	0.04	1.03	- 0.34 ***
Adj. Price to sales	19.06	- 2.03	75.91	0.20	- 56.86	- 2.23 **

Source: Refinitiv Eikon

*Note: The table contrasts characteristics of post-merger SPACs and conventional IPOs both a nominal and an industry-adjusted basis, reporting mean and median values. The data is from the first reported trading day, for firms listed in our sample period from 2014-2019, listed on NASDAQ or NYSE. The null hypothesis of equality of means for the post-SPACs mergers and conventional IPOs are tested using a two-sample t-test. The difference in means is reported as $(Mean_{SPAC} - Mean_{IPO})$. The Wilcoxon rank sum is used as a test for the null hypothesis of equality of medians. The difference in medians is reported as $(Median_{SPAC} - Median_{IPO})$. The significance tests are reported as *, ** and ***, indicating a significance at the 10%, 5% and 1% confidence level, respectively. "Adj." is an abbreviation for industry adjusted variables, calculated by subtracting the median of each industry from each observation before re-computing the averages and medians of the variables. See Appendix 4 for definitions of the variables.*

First, the ROA is a profitability ratio that displays how profitable the assets are in revenue generating terms. Nominally, our results yield negative values for both post-merger SPACs and conventional IPOs on an average and median basis, with ROA being substantially more negative for conventional IPOs than for post-merger SPACs. This figure is more conservative for both routes on a median level. More interestingly is the industry-adjusted ROA, where post-merger SPACs now report positive values. Though, keep in mind that the industry-adjusted outputs reinforce the size patterns observed from the nominal output.

Secondly, the current ratio is a liquidity measure that remarks the short-term liabilities divided by the most liquid assets. An interesting threshold is above or below 1.00, indicating whether the current assets or the current liabilities has the highest value on the balance sheet. We observe this ratio to be lowest for target firms of post-merger SPACs on all outputs. However, nominally, they are all above this threshold, except for median post-merger SPACs of 0.89. In reference to this, Kolb & Tykvová (2016) suggests that certain levered firms, which are small and with low growth opportunities, tend to go with the SPAC-merger route.

At last, the debt-to-enterprise ratio stipulate the amount of the total financing that comes from debt. We observe this to be lower for target firms of post-merger SPACs for all outputs, hence, their debt component in terms of their total funding is lower compared to the conventional IPOs. This finding is contrary to that of Datar et al. (2012) who found SPACs to carry more debt. This gives reason to believe that target firms of SPACs compared to conventional IPO firms could have evolved in terms of capital structure from their early adoption phase in 2003-2008, till our sample period from 2014-2019. This is further supported by the trend in 2020-2021 that most SPAC deals in the market have moved to either refinance or pay down debt, with advantages such as better credit ratings after a post-merger SPAC debt reduction (Morrison et al., 2021).

7.2.5. Changes in Target Firm Parameters One Year Post Listing

After examining the target firm characteristics at the first reported trading day in the previous sections, we assess the changes after the first year as a publicly traded company. For this section, we chose to focus on 12 variables and ratios that are recurring in our analyses and discussions of our results, to further observe how these changed from the first reported trading day till one year later.

Table 10: Change in Key Financial and Operating Variables One Year Post Listing

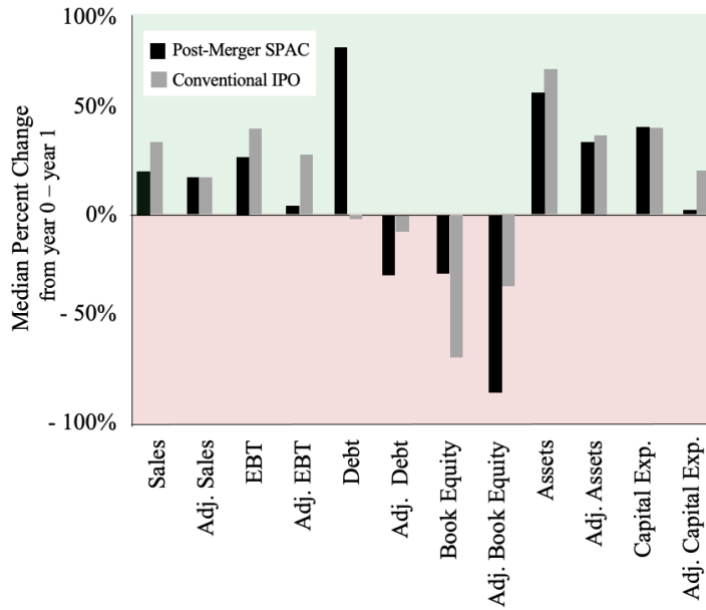
	Post-Merger SPACs		Conventional IPOs	
	Median Change		Median Change	
Financial Statements Variables				
Sales	12%	***	26%	***
Adj. Sales	10%	***	10%	***
EBT	19%		39%	***
Adj. EBT	2%		21%	***
Total Debt	83%	***	- 1%	
Adj. Total Debt	- 30%	***	- 4%	***
Total Equity	- 27%		- 73%	***
Adj. Total Equity	- 88%	***	- 42%	***
Total Assets	53%	***	69%	***
Adj. Total Assets	26%		31%	***
Capital Expenditures	42%	***	41%	***
Adj. Capital expenditures	1%		15%	***
Financial Ratios				
ROA	- 75%		- 24%	***
Adj. ROA	- 22%	*	- 32%	***
Current ratio	124%	***	51%	***
Adj. Current ratio	- 25%		- 5%	
Debt to enterprise	785%	***	7%	***
Adj. Debt to enterprise	- 47%	**	- 14%	
Operating cash flow to assets	- 39%	**	- 38%	***
Adj. Operating cash flow to assets	- 47%	***	- 48%	***
Debt-equity ratio	- 34%	***	- 63%	***
Adj. Debt-equity ratio	- 27%	***	- 75%	***
Price to book	- 25%		- 89%	***
Adj. Price to book	- 100%	***	- 101%	***

Source: Refinitiv Eikon

Note: The table reports the median percent change in financial statement variables and ratios over the first year as a public company for the post-merger SPACs and conventional IPOs, from our 2014-2019 sample, with observations through 2020, listed on NASDAQ or NYSE. The null hypothesis of mean value equal to zero is tested using a t-test. The Wilcoxon signed rank is used to test the hypothesis of median value equal to zero. The significance tests are reported as *, ** and ***, indicating a significance at the 10%, 5% and 1% confidence level, respectively.

Table 10 reports the change in percentage from the first reported trading day till one year after, for the key financial and operating variables. To expand on the discussion from the previous section, it is interesting to analyze the development of these parameters. One-year changes for the full list of variables are reported in Appendix 9.4.

Figure 8: Change in Key Financial Statement Variables One Year Post Listing



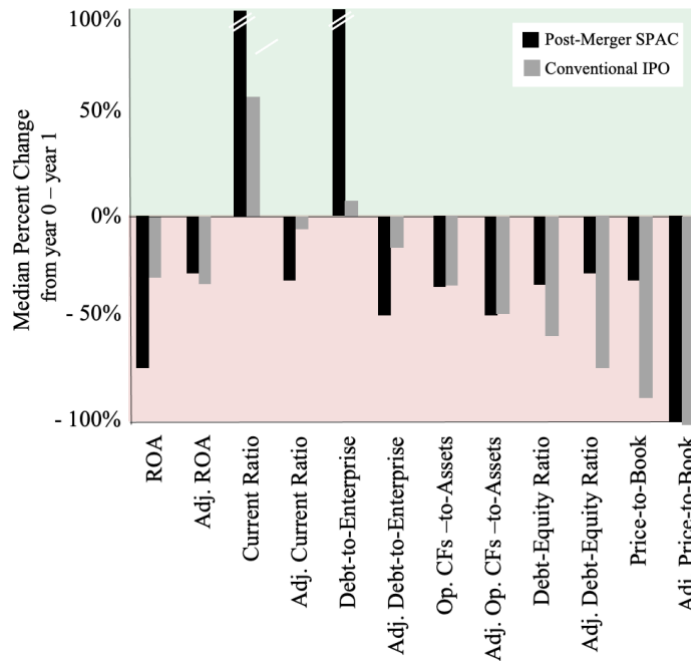
Source: Refinitiv Eikon

Note: The chart displays the percentage change from year 0 to year 1 of selected financial statement variables for post-merger SPACs and conventional IPOs, from our 2014-2019 sample, with observations through 2020, listed on NASDAQ or NYSE. The green shaded area indicates a positive percentage change, and the red shaded area represents negative percentage change.

Figure 8 portrays that both post-merger SPACs and conventional IPOs increase in the first-year post listing regarding sales, EBT, assets and capital expenditures, both on a nominal and industry-adjusted basis. Interestingly, our results indicate a substantial increase in debt for the post-merger SPACs on a nominal basis. This deviate when adjusting for industry effects, reporting a decrease. On the other hand, the debt level only slightly changes for conventional IPOs, and with a deviation from nominal to industry adjusted figures.

We observe a large increase in the current ratio and the debt-to-enterprise ratio on a nominal basis, seen in Figure 9. On an industry-adjusted basis, these are negative. We observe the same directional pattern for both post-merger SPACs and conventional IPOs, but with a larger magnitude for the post-merger SPAC group. This is due to the substantial increase in debt, displayed in Figure 8. The remainder of the ratios displays a decreasing trend through the first year as a publicly listed company.

Figure 9: Change in Key Financial and Operating Ratios One Year Post Listing



Source: Refinitiv Eikon

Note: The chart displays the percentage change from year 0 to year 1 of selected financial ratios for post-merger SPACs and conventional IPOs, from our 2014-2019 sample, with observations through 2020, listed on NASDAQ or NYSE. The green shaded area indicates a positive percentage change, and the red shaded area represents negative percentage change.

7.2.6. Takeaways from the Univariate Analyses

To sum up our preliminary results from the univariate analyses of the fundamental differences between the two routes, we found that post-merger SPACs tend to underperform compared to conventional IPOs.

The literature supports our findings. One explanation for the results can be the finding from Kolb & Tykvová (2016) that lower quality firms tend to enter a SPAC-merger, which they found to be connected to future underperformance. Moreover, target companies of SPACs can, while being largely shielded from lawsuits, state their projected future earnings when marketing their acquisition, as they merge with an already public company (Cazier et al., 2019). Firms that go through a conventional IPO do not benefit from this “safe harbor” provision. This can lead to problems, as the target firms of SPACs might exploit this and inflate the future earnings to attract more investors. This is in line with previous studies by Wen & Zhu (2022) which found that SPACs provide overconfident and less comprehensive disclosures. Hence, they can underperform their initial projections.

Next, we will implement these findings when selecting specific variables to include in our main analysis of the likelihood of choosing the SPAC-merger or conventional IPO route in the following section.

7.3. Likelihood of Choosing the SPAC-merger Route

We employed multivariate probit regression models to assess the effect of distinct financial statement variables and ratios based on our univariate analyses in Section 7.2, on the likelihood of choosing either the SPAC-merger or the conventional IPO route to access the public markets. Furthermore, to find the optimal model, we added specific firm characteristics and adjusted for industry effects based on economic rationale from prior SPAC literature.

7.3.1. Likelihood Models of Route Choice

Probit models run regressions for binary outcome variables, where the dependent variable takes on the value of 1 in case of a SPAC-merger, and the value of 0 in the case of a conventional IPO. We can interpret the model output of a positive sign coefficient to imply that the likelihood of choosing the SPAC-merger route is increasing in that particular variable, whereas a negative sign coefficient indicates the opposite. See Appendix 5, Table 19, for the correlation matrix.

Table 11: Probit Regressions of the Likelihood of Route Choice

Nominal Models	Model 1	Model 2
Constant	- 0.3475 **	0.1999
Total Assets	- 1.17E ⁻¹⁰ **	- 1.76E ⁻¹⁰ **
Oper. CF to Total Assets	0.0572	- 0.0428 *
Total Asset Turnover	- 0.3161 ***	
Current Ratio	- 0.1437 ***	- 0.1234 ***
Debt-Equity Ratio	- 0.0111 *	
Price-to-Book	0.0003 *	3.02E ⁻⁶
EBT		- 2.36E ⁻⁰⁹ ***
ROA (%)		0.0121 ***
Debt-to-Enterprise		- 0.0244 ***
Pseudo R²	0.0958	0.2237

Source: Refinitiv Eikon

Note: The table displays two probit regression estimations of the likelihood of firms choosing the SPAC-merger or the conventional IPO route, for our 2014-2019 sample, listed on NASDAQ or NYSE. The dependent variable takes on the value of 1 in case of a SPAC-merger. The regressions include nominal variables only. *, ** and *** indicate a significance at the 10%, 5% and 1% confidence level, respectively. See Appendix 4 for definitions of the variables.

We based the variables of Model 1 on the parameters included in the regressions by (Datar et al., 2012) to test for the propensity to choose the SPAC-

merger or the conventional IPO route. According to this model, we can observe that higher values of total assets, total asset turnover, current ratio, and debt ratio, increases the probability of the firms to choose the conventional IPO route rather than the SPAC-merger route. This model has a low Pseudo R², which is an indication of a poorer model fit.

To find a model of better fit, we added three variables of interest based on our univariate analyses and discussions in Section 7.2. These are EBT, ROA and debt-to-enterprise. The EBT measures a firm's profitability before income taxes are factored in. The ROA is a profitability ratio that calculate how much profit a firm can generate from its assets. The debt-to-enterprise ratio convey the part of the total financing that comes from debt. Thus, we replaced the variables of debt-equity ratio and total asset turnover as these are based on the same fundamentals as debt-to-enterprise and ROA. With these modifications, Model 2 get a substantially higher Pseudo R² compared to Model 1. We observe that EBT and debt-to-enterprise is negative, hence indicating a higher likelihood of the conventional IPO route choice. On the other hand, the ROA parameter has a positive coefficient, predicting that a higher ROA value increases the propensity of choosing the SPAC-route.

7.3.2. Industry-Adjusted Likelihood Models of Route Choice

We find that adding fixed effects for industries improves the predictability of our probit regression models, reported in Table 12.

Table 12: Industry-adjusted Probit Regressions of the Likelihood of Route Choice

Industry-Adjusted Models	Model 1A	Model 2A	Model 2B
Constant	0.0100	0.3732 **	0.4780
Total Assets	- 1.32E ⁻¹⁰ **	- 1.78E ⁻¹⁰ **	- 1.77E ⁻¹⁰ **
Oper. CF to Total Assets	0.0516	- 0.0478 **	- 0.0489 **
Total Asset Turnover	- 0.3237 ***		
Current Ratio	- 0.1334 ***	- 0.1301 ***	- 0.1267 ***
Debt-Equity Ratio	- 0.0107 *		
Price to Book	0.0002 *	0.0001	5.38E ⁻⁰⁶
EBT		- 2.44E ⁻⁰⁹ ***	- 2.35E ⁻⁰⁹ ***
ROA (%)		0.0121 ***	0.0109 ***
Debt-to-Enterprise		- 0.0262 ***	- 0.0285 ***
Manufacturing Industry Dummy		- 0.2802 *	
Technology Industry Dummy		- 0.4006 **	
Industry Fixed Effects	Yes		Yes
Pseudo R²	0.1102	0.2342	0.2445

Source: Refinitiv Eikon

Note: The table displays three probit regression estimations of the likelihood of firms choosing the SPAC-merger or the conventional IPO route, for our 2014-2019 sample, listed on NASDAQ or NYSE. The dependent variable takes on the value of 1 in case of a SPAC-merger. The regressions include nominal variables, in

*addition to industry effects. *, ** and *** indicate a significance at the 10%, 5% and 1% confidence level, respectively. See Appendix 4 for definitions of the variables.*

Model 1A is the same as Model 1 with added industry fixed effects, which controls for systematic differences in risk and performance across industry types. The adjusted model has a better fit, with every variable still predicting the same route choice as the nominal model.

For Model 2 we constructed two versions adjusting for industry in different ways. In Model 2A we chose to adjust for two specific industries, being manufacturing and technology. In addition to those industries having among the highest frequencies of listings for both routes, see Section 7.2.2, they also, on a general basis, contains opposite characteristics to one another. Manufacturing is an asset-heavy industry, requiring large capital expenditures. In contrast, the technology industry is usually characterized as asset-light, i.e., firms within this industry generally owns fewer capital assets compared to their operational assets. Firms in the manufacturing industry have, on a 10% significance level, a higher likelihood of choosing the conventional IPO route.

An unexpected result is that companies within the technology industry is inclined to list through the conventional IPO route rather than a SPAC-merger. Gahng et al., (2021) provide a possible explanation within the biotech sub-industry of the technology industry. Biotech firms account for over a third of the conventional IPOs, while they only account for 8% of SPAC-mergers, even though these biotech firms have the typical SPAC-merger target firm patterns, as discussed throughout this thesis, of being smaller, younger, and not profitable.

An alternative explanation for this result could be that certain technology-driven companies are not, in fact, registered under the technology industry, but rather classified within other industries. An example can be a technology firm registered within the asset-heavy semiconductor industry that have outsourced their production, with their main assets therefore being more intangible and intellectual property centered. Hence, these types of firms would be less capital intensive and simulate the asset-light industry characteristics, but not being captured within our analysis.

In Model 2B, we added industry fixed effects. Moreover, we observe that controlling for all industry types slightly improves the fit of the model. Model 2A and 2B both have higher predictability, measured by a higher pseudo R^2 , than the nominal Model 2. We find the industry-adjusted Model 2B, reported in Table 12, to be the most predictive probit model for the route choice to access the public

market. This is evident with the Model 2B having the highest pseudo R^2 value of 24.45%. We take note of the fact that all the models' pseudo- R^2 values are quite small. However, this is often the case for limited dependent variable models (Brooks, 2014).

To summarize, we find that introducing additional variables, that are justified in our univariate analysis, while also adjusting for industry fixed effects, grant us the best model for predicting the likelihood route choice among the two options of a SPAC-merger and conventional IPO. Moreover, based on the most optimal model, we found that firms that tend to choose the SPAC-merger route are of inferior quality, meaning characterized by smaller size, lower earnings, weaker liquidity, and lower debt.

7.4. Results in Connection to the Hypotheses

This section provides an overview and summary of our results in connection to our research question: Why do firms choose to merge with a SPAC, despite it being a perceived unfavorable route to access public markets? In turn, this is broken down into the two main hypotheses of I) Post-merger SPACs underperform compared to conventional IPOs and the stock market, and II) Firm characteristics influences whether a firm chooses the SPAC-merger or conventional IPO route to access public markets. Followingly, we display our findings in connection with several sub-hypotheses, with our results mainly supporting these, which in turn provide several possible explanations addressing our research question.

Post-merger SPACs experience lower magnitude of initial underpricing than conventional IPOs. Our results support this hypothesis. Conventional IPOs has positive returns for the first reported trading day, whereas post-merger SPACs, in fact, has negative first day returns. Results are reported in Table 3: First-Day Stock Returns.

Post-merger SPACs experience a larger magnitude of negative long-term abnormal return than conventional IPOs. Our results support this hypothesis. Post-merger SPACs have severely larger magnitudes of negative excess returns after 1, 3, 6 and 12 months than conventional IPO firms, analyzed through a buy-and-hold strategy. Results are reported in Table 4: Buy-and-Hold Returns.

Post-merger SPACs underperformance can be explained by asset pricing factors. Our results partly support this hypothesis. Supporting our hypothesis, we found that our portfolio of post-merger SPACs loaded positively on the size factor

in the Fama & French three-factor model, suggesting that target firms of SPAC-mergers are of smaller size. Not supporting our hypothesis, we found that none of the parameters were significant in the five-factor model, however. The portfolio also generated negative alphas, suggesting that post-merger SPACs underperform by 1.5% to 1.8% per month, but the alphas are not statistically significant in either of the models. An explanation for these results can be the low frequency of firms in the portfolio early in our sample period, resulting in high standard errors. Results are reported in Table 5: Asset Pricing Models.

Firm-specific characteristics may influence which route, i.e., SPAC-merger or conventional IPO, it chooses to access the public markets with. Our results support this hypothesis. We found that firms who choose the SPAC-merger route are of inferior quality, meaning characterized by smaller size, lower earnings, weaker liquidity, and lower debt. Hence, firm-specific characteristics have a significant influence on the route choice of a firm. Results are reported in Table 11: Probit Regressions of the Likelihood of Route Choice. Table 11

The industry a firm operates in may influence the route, i.e., SPAC-merger or conventional IPO, it chooses to access the public markets with. Our results do not support this hypothesis. We were not able to find supporting evidence for our hypothesis that firms within asset-light industries, like the technology industry, could have increased likelihood of choosing the SPAC-merger route. An explanation could be that our analysis is unable to capture certain firms with characteristics placing them in the intersection between the technology and the industry they are registered within. Results are reported in Table 12: Industry-adjusted Probit Regressions of the Likelihood of Route Choice.

8. Concluding Remarks

8.1. Conclusion

Throughout this thesis, we have shed light on several aspects and perspectives of why firms choose to merge with a SPAC, despite it being an unfavorable route to access public markets. Based on our sample of SPAC-mergers and conventional IPOs from the major US exchanges NASDAQ and NYSE, in the time period from 2014-2019, extending to March 30th, 2022, for post-merger SPACs, we find that post-merger SPACs' common shares underperform with median first day returns of

-0.82%, and -9.01%, -15.87%, -29.83%, and -58.71%, for 1-, 3-, 6- and 12-months holding period, consecutively. By this, we confirm the Gahng et al. (2021) findings.

Based on all financial statement variables in our univariate analysis, we find that firms choosing to merge with SPACs are considerably smaller and less profitable than firms choosing conventional IPOs. This trend continues within the following year and when adjusting for industry effects. Next, we find that our post-merger SPACs portfolio load positively on the size factor in the Fama & French model, further indicating that these firms are of smaller size.

We provide a focused report on the determinants that lead firms to choose a SPAC-merger listing, adding to the research field by taking the viewpoint of an operating firm in addition to the perspective of investors. Kolb & Tykvová, (2016) is the paper we identified with the most similar scope to us, but our research is distinguished by additionally using univariate analyzes to identify both firm specific variables for our regressions while also testing for specific industry characteristics in addition to controlling for industry effects.

Despite our finding of severe underperformance on a common stock return basis, the SPAC asset class has experienced extraordinary growth in the latest years (Klausner et al., 2022). This suggest that other determinants influence the choice for a firm to merge with a SPAC. We found that the firms that choose this route are of inferior quality, meaning characterized by smaller size, lower profitability, weaker liquidity, and lower debt.

8.2. Topics for Future Research

There are especially three areas linked to SPACs that the literature has yet to really address, which we believe would be interesting topics for further research. Namely, developments in the regulatory environment, reuse of SPAC brand names for following generations, and SPAC reforms outside of the US.

New stricter regulatory rules of SPACs were proposed by the SEC on March 30th, 2022 (SEC, 2022), as they worry about the adverse developments of SPACs. These constitute increased reporting and transparency requirements, cost and fee limitations, and expanded compliance monitoring. This can potentially impact the strategy, performance, founders- and investors attraction towards SPACs.

A development in the recent years is the reuse of SPAC brand names for following generations of the investment vehicle, e.g., “SPAC Fund I”, “SPAC Fund II” etc. This brand recognition strategy is used by serial founders of private equity

funds, which, like SPACs, has a limited life span. It would be interesting to research whether these have any correlation for performance metrics.

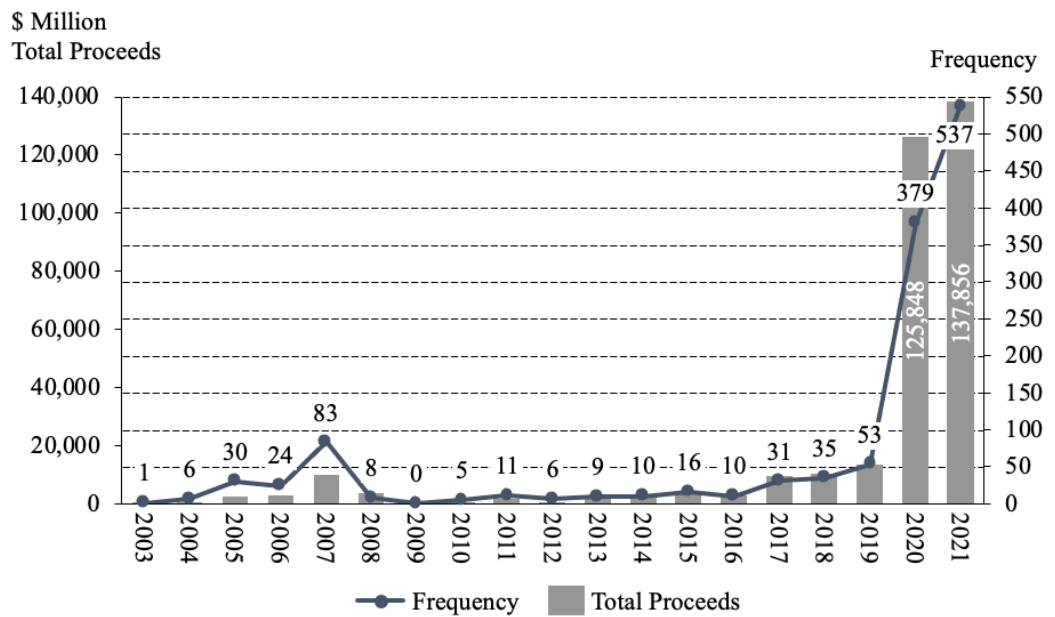
SPAC reforms outside of the US is another topic of limited coverage in the literature. This is likely because many of these markets are awaiting regulatory approval of SPACs or has yet to reach a critical mass. This is a compelling topic to assess on whether there is any connection of SPAC performance based on country factors, and if there are distinctions across markets and industries.

Additionally, warrants, being bundled with the common stock in a SPAC, could also be of researching interest. At the time of this thesis, there was no database in our access to retrieve such warrant data. This, in combination with data related to investor redemptions, are topics for additional research that could further expand the analysis of this paper.

9. Appendix

9.1. SPAC-IPOs Statistics from 2003-2021

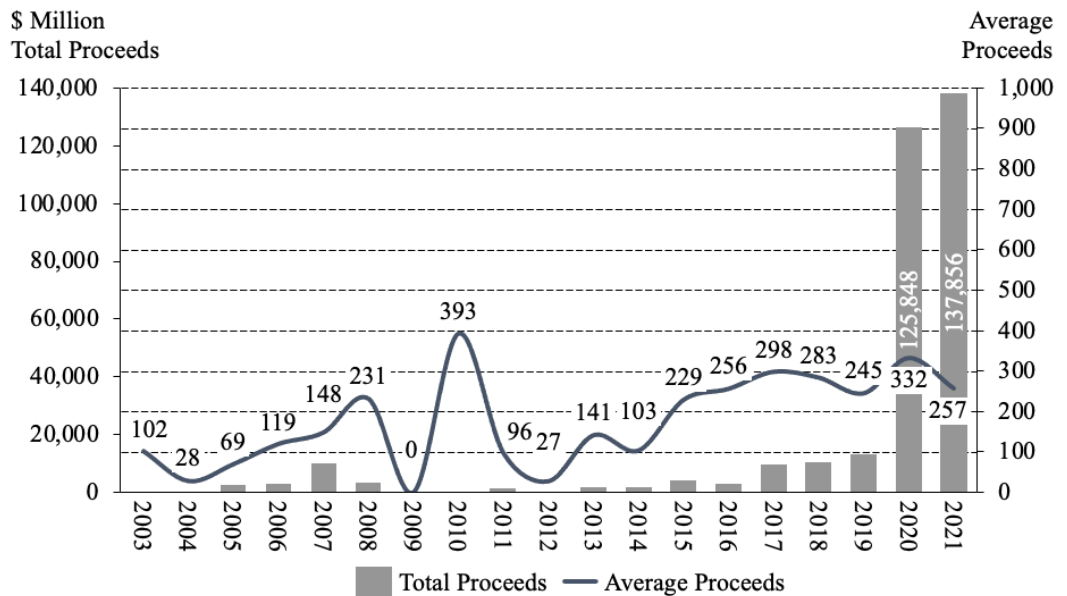
Figure 10: SPAC-IPOs, Total Proceeds versus Frequency



Source: Refinitiv Eikon

Note: The graph displays the per year frequency and the total proceeds of listings on NASDAQ or NYSE (or OTC for early SPACs) for SPAC-IPOs in the 2003-2021 period.

Figure 11: SPAC-IPOs, Total- versus Average Proceeds



Source: Refinitiv Eikon

Note: The graph displays the average proceeds and the total proceeds of listings on NASDAQ or NYSE (or OTC for early SPACs) for SPAC-IPOs in the 2003-2021 period.

Table 13: SPAC-IPOs: Frequency, Exchange, Total- and Average Proceeds

Year	NASDAQ	NYSE	American	Sum Major Exchanges	Avg. Proceeds	Total Proceeds	OTC	Avg. Proceeds	Total Proceeds	Total N	Avg. Proceeds	Total Proceeds
2003		1		1	102	102				1	102	102
2004				0			6	28	165	6	28	165
2005			14	14	79	1 112	16	59	950	30	69	2 061
2006			10	10	175	1 749	14	64	896	24	119	2 645
2007		3	69	72	221	8 858	11	75	820	83	148	9 677
2008		1	6	7	434	3 036	1	29	29	8	231	3 064
2009				0						0	0	0
2010				0			5	393	149	5	393	149
2011	3			3	114	342	8	78	863	11	96	1 205
2012	5			5	53	266	1	1	1	6	27	267
2013	9			9	141	1 269				9	141	1 269
2014	9			9	166	1 497	1	40	40	10	103	1 537
2015	16			16	229	3 660				16	229	3 660
2016	10			10	256	2 558				10	256	2 558
2017	23	8		31	298	9 238				31	298	9 238
2018	25	10		35	283	9 922				35	283	9 922
2019	38	15		53	245	12 971				53	245	12 971
2020	270	109		379	332	125 848				379	332	125 848
2021	351	185	1	537	257	137 856				537	257	137 856

Source: Refinitiv Eikon

Note: The table outlines the frequency of SPAC listings on the US major stock exchanges NASDAQ, NYSE and American in addition to Over-The-Counter (OTC) exchanges, in addition to with average-e and total proceeds from 2003 to 2021. Proceeds are reported in millions of dollars and include underwriter over-allotment options.

9.2. Conventional IPOs Statistics from 2003-2021

Table 14: Conventional IPOs: Frequency, Total- and Average Proceeds

Year	Frequency	Total Proceeds	Average Proceeds
2003	95	31,561	274
2004	212	44,875	205
2005	191	40,202	209
2006	160	36,005	222
2007	192	50,134	251
2008	27	26,038	930
2009	65	26,440	270
2010	131	36,411	229
2011	112	64,000	259
2012	133	315,505	266
2013	201	65,397	324
2014	240	61,055	246
2015	142	33,714	213
2016	81	15,040	183
2017	138	31,016	225
2018	158	49,172	260
2019	134	50,471	368
2020	187	152,675	416
2021	353	151,400	421
Sum	2,952	1,281,111	304

Source: Refinitiv Eikon

Note: The table displays the per year frequency, total- and average proceeds of listings on the US stock exchanges NASDAQ and NYSE of conventional IPOs in the 2003-2021 period.

Table 15: Conventional IPOs: Headquarters Country

United States	2,685	1,417	799	474
	91%	93%	90%	87%
Other	271	107	96	68
	9%	7%	11%	13%
Sum	2,956	1,524	895	542

Source: Refinitiv Eikon

Note: The table displays the country in which the company is registered and headquartered in with the main listing on the US stock exchanges NASDAQ and NYSE from 2003-2021.

Table 16: Conventional IPOs: Economic Sector

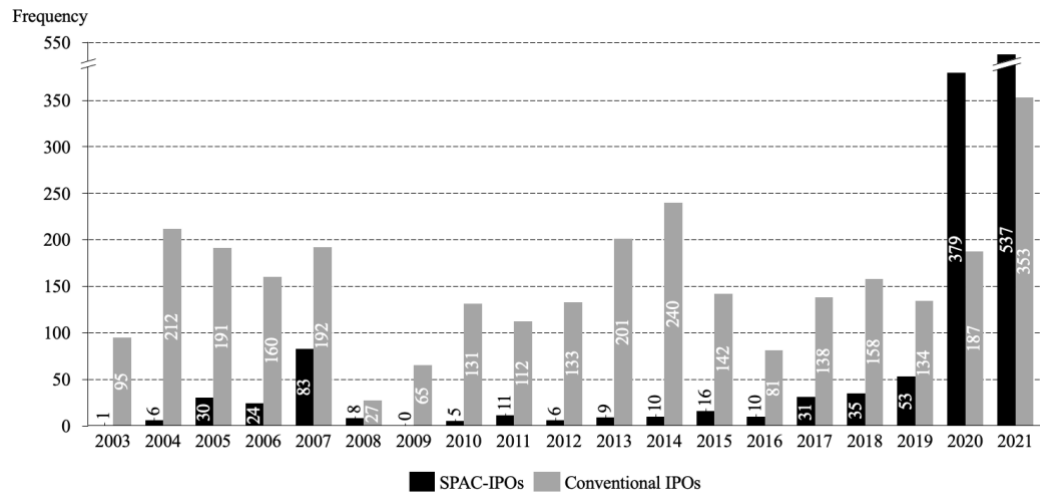
	2003-2021	2003-2013	2014-2019	2020-2021
Academic & Educational Services	18	8	5	5
Basic Materials	75	42	22	11
Consumer Cyclicals	279	151	76	52
Consumer Non-Cyclicals	68	29	22	17
Energy	106	78	24	4
Financials	651	428	140	86
Government Activity	1	0	1	0
Sum	2,956	1,524	895	542

Source: Refinitiv Eikon

Note: This table displays the economic sector frequency of conventional IPOs from the 2003-2021 period from the US stock exchanges NASDAQ and NYSE.

9.3. SPAC-IPOs and Conventional IPOs Statistics, 2003-2021

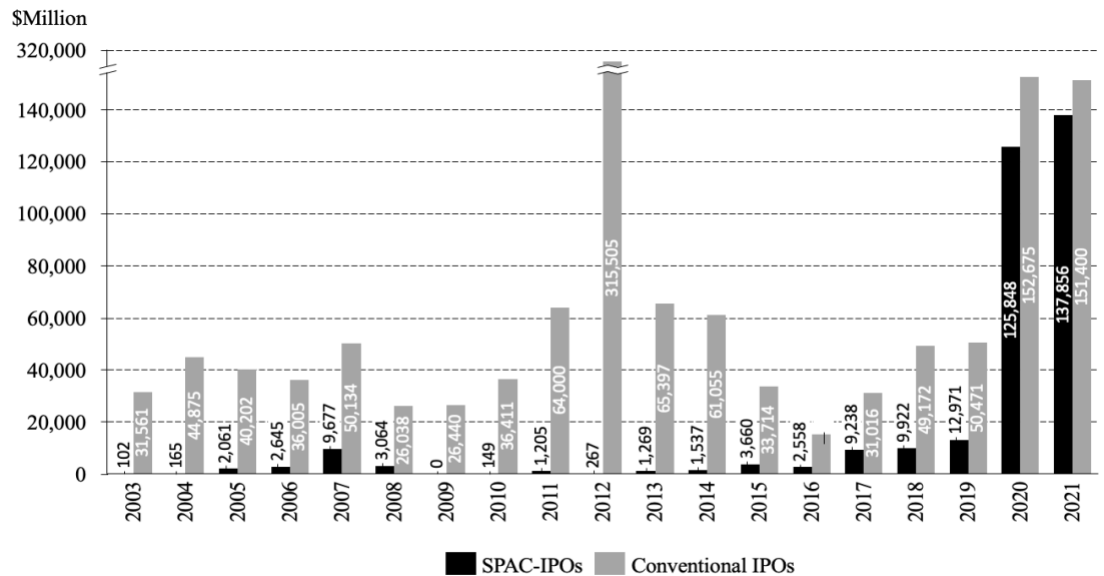
Figure 12: SPAC-IPOs vs Conventional IPOs: Frequency



Source: Refinitiv Eikon

Note: The bar chart displays the frequency every year of SPAC-IPOs and Conventional IPOs from 2003-2019. The number on the bars is the number of listings on an US exchange, NASDAQ or NYSE, of each route.

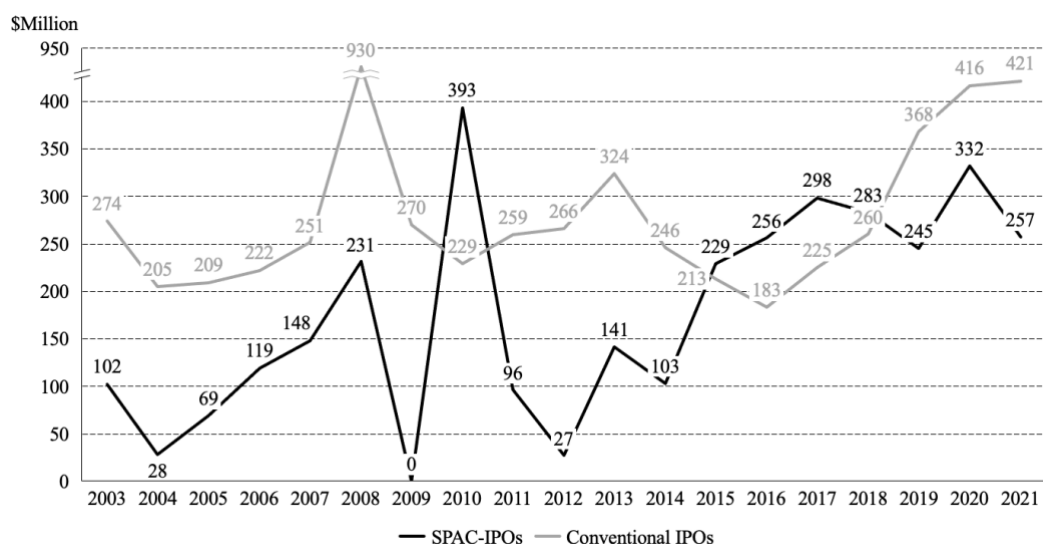
Figure 13: SPAC-IPOs vs Conventional IPOs: Total Proceeds



Source: Refinitiv Eikon

Note: The bar chart displays the per year proceeds of SPAC-IPOs and Conventional IPOs from 2003-2019. The number on the bars is the total proceeds raised on an US exchange, NASDAQ or NYSE, of each route.

Figure 14: SPAC-IPOs vs Conventional IPOs: Average Proceeds



Source: Refinitiv Eikon

Note: The line chart displays the average proceeds every year of SPAC-IPOs and Conventional IPOs from 2003-2019. The number above the lines is the average proceeds raised on an US exchange, NASDAQ or NYSE, of each route.

9.4. Definitions and Classifications

A. Industry Classifications

New Bundled Industry	Sector/Industry based on SIC code
	Arts, Entertainment, and Recreation
	Educational Services
	Accommodation and Food Services
	Administrative and Support and Waste Management and Remediation Services
Consumer Services	
Finance and Insurance	Finance and Insurance
	Construction
	Transportation and Warehousing
Industrial	Mining, Quarrying, and Oil and Gas Extraction
Manufacturing	Manufacturing
PST Services	Professional, Scientific, and Technological Services
Information	Information
	Agriculture, Forestry and Fishing
	Healthcare and Social Assistance
	Real Estate and Rental and Leasing
	Retail Trade
	Utilities
Others	Wholesale Trade

Note: The table outlines our new bundling categorization and the classifications of sectors/industries of the data set based on SIC code and registered industry search (Eikon code) the categories include. "PST services" is an abbreviation of professional, scientific, and technological services.

B. Variable Definitions

Variables	Definitions [Eikon code]
Income Statement Variables	
Sales	The revenue from all business activities. [TR.F.TotRevenue]
COGS	The total cost of goods av services sold by a company. [TR.F.CostOfOpRev]
OPEX	Total operating expense reported by a company. [TR.F.OpexPnTot]

EBT	The reported income/loss after all operating and non-operating income and expense, before the deduction of income tax. [TR.F.IncBefTax]
EBIT	Represents the difference between a company's reported total revenues and total operating expense. [TR.F.EBIT]
EBITDA	A company's reported EBIT plus the total depreciation and amortization value for the period. [[TR.F.EBITDA]
Net Income	The income/expense after all operating and non-operating income and expense, reserves, income taxes.[TR.F.NetIncAfterTax]

Balance Sheet Variables

Total Assets	Total assets reported by a company. [TR.F.TotAssets]
Total Debt	Total value of all borrowings reported by a company. Including both long- and short-term debt. [TR.F.DebtTot]
Total Equity	The sum of all capital surpluses on common stock and share option reserves reported by a company. [TR.F.ShHoldEqCom]
Market Capitalization	The company market capitalization represents the sum of market value for all relevant issue level share types. Calculated by multiplying the requested shares by latest close price. [TR.CompanyMarketCap]
Enterprise Value	EV represents the sum of market capitalization, total debt, preferred stock and minority interest minus cash and short-term investment for the most recent fiscal period. [TR.EV]

Cash Flow Statement Variables

Operating Cash Flows	The total of all operating cash flows after tax and finance service outflows. [TR.F.NetCashFlowOp]
Financing Cash Flows	The sum of all inflows and outflows from financing activities of a company. [TR.F.NetCashFlowFin]
Investing Cash Flows	Sum of inflows and outflows for investing transactions. [TR.F.NetCashFlowInvst]
Capital Expenditures	Encompass all expenditures for factories, equipment, software development costs and intangible assts that have a useful life of more than one year. Also include maintenance of existing property, plant and equipment. [TR.F.CAPEXTot]

Financial Ratios

Operating margin	EBIT (previously defined) divided by Sales (previously defined)
ROA	Return on average total assets. Shows how efficient a company is at using its assets to generate earnings. Calculated for annual periodicity only. [TR.F.ReturnAvgTotAssetsPct]
ROE	Return on average total equity. Measures the ability of a company to generate earnings from its stockholders investments in the company. Calculated for annual periodicity only. [TR.F.ReturnAvgTotEqPct]
Operating cash flow to total assets	Operating cash flows (previously defined) divided by total assets (previously defined)
Total asset turnover	Measured a company's ability to use its assets to generate revenue and is a calculation of the amount of revenue generated per unit of assets. Calculated for annual periodicity only. [TR.F.AssetTurnover]
Current ratio	A ratio of total current assets divided by the value of total current liabilities. [TR.F.CurrRatio]
Debt-equity ratio	Total Debt (previously defined) divided by Total Equity (previously defined)
Debt-to-enterprise	Total debt (previously defined) divided by enterprise value (previously defined) [TR.TotalDebtToEV]
Price to book	Dividing a company's latest closing price with its book value per share [TR.PriceToBVPerShare]
EPS	The diluted net income available to common shareholders excluding extraordinary items on a per share basis. [TR.F.EPSDilExclExOrditemsComTot]
Price to sales	Market capitalization (previously defined) divided by Sales (previously defined)

Source: Refinitiv Eikon

Note: All variables' values are retrieved using Refinitiv Eikon specific codes to build formulas to import data to Excel. The right column of the table defines the variables and provide the code used to retrieve the data.

9.5. Additional Calculations

Table 17: Nominal Change One Year Post-Listing

	Post-merger SPACs		Conventional IPOs	
	Median change		Median change	
Income statement variables				
Sales	12%	***	26%	***
COGS	19%	***	27%	***
OPEX	33%	***	36%	***
EBT	19%		39%	***
EBIT	10%		40%	***
EBITDA	22%		35%	***
Net Income	19%		37%	***
Balance sheet variables				
Total Assets	53%	***	69%	***
Total Debt	83%	***	- 1%	
Total Equity	- 27%		- 73%	***
Market Capitalization	- 18%		2%	***
Enterprise Value	24%	***	- 8%	**
Statement of cash flow variables				
Operating Cash Flows	- 6%		25%	***
Financing Cash Flows	- 68%		83%	***
Investing Cash Flows	17%		45%	***
Capital Expenditures	42%	***	41%	***
Ratios				
Operating margin	- 22%	*	1%	
ROA	- 75%		- 24%	***
ROE	- 71%		- 31%	***
Operating cash flow to total assets	- 39%	**	- 38%	***
Total asset turnover	- 43%		- 7%	***
Current ratio	124%	***	51%	***
Debt-equity ratio	- 34%	***	- 63%	***
Debt-to-enterprise	785%	***	7%	***
Price to book	- 25%		- 89%	***
EPS	- 8%		41%	***
Price to sales	- 7%		- 17%	***

Note: The table reports the median change in the characteristics of post-merger SPACs and conventional IPOs of the first year as a public company, listed on an US exchange, NASDAQ or NYSE, of each route, from the 2014-2020 period. The null hypothesis of medians equal to zero is tested using the Wilcoxon signed rank test. *, ** and *** indicate a significance at the 10%, 5% and 1% confidence level, respectively. See Appendix 4 for variable definitions.

Table 18: Industry-Adjusted One Year Post-Listing

	Post-merger SPACs		Conventional IPOs	
	Median change		Median change	
Income statement variables - industry adjusted				
Adj. Sales	10%	***	10%	***
Adj. COGS	8%	***	11%	***
Adj. OPEX	11%	**	24%	***
Adj. EBT	2%		21%	***
Adj. EBIT	18%	*	26%	***
Adj. EBITDA	20%	***	23%	***
Adj. Net income	1%		16%	***
Balance sheet variables - industry adjusted				
Adj. Total Assets	26%		31%	***
Adj. Total Debt	- 30%	***	- 4%	***
Adj. Total Equity	- 88%	***	- 42%	***
Adj. Market Capitalization	4%		3%	
Adj. Enterprise value	- 20%		- 12%	***
Income statement variables - industry adjusted				
Adj. Operating Cash Flows	6%		11%	
Adj. Financing Cash Flows	- 31%		0%	
Adj. Investing Cash Flows	0%		21%	***
Adj. Capital expenditures	1%		15%	***
Ratios - industry adjusted				
Adj. Operating margin	- 2%		- 6%	***
Adj. ROA	- 22%	*	- 32%	***
Adj. ROE	- 24%	**	- 45%	***
Adj. Operating cash flow to total assets	- 47%	***	- 48%	***
Adj. Total asset turnover	- 16%	***	- 22%	***
Adj. Current ratio	- 25%		-5%	
Adj. Debt ratio	- 27%	***	- 75%	***
Adj. Debt-to-enterprise	- 47%	**	- 14%	
Adj. Price to book	- 100%	***	- 101%	***
Adj. EPS	- 7%		11%	**
Adj. Price to sales	- 51%		- 44%	***

Note: The table reports the median change in the characteristics of post-merger SPACs and conventional IPOs of the first year as a public company, listed on an US exchange, NASDAQ or NYSE, of each route, from the 2014-2020 period. The industry-adjusted change is the deviation from the industry median in the same year. The null hypothesis of medians equal to zero is tested using the Wilcoxon signed rank test. *, ** and *** indicate a significance at the 10%, 5% and 1% confidence level, respectively. See Appendix 4 for variable definitions

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