



Lisbon School
of Economics
& Management
Universidade de Lisboa

**MASTER
IN FINANCE**

**MASTER'S FINAL WORK
DISSERTATION**

**SPACs: PERFORMANCE ANALYSIS OF A CONSTANTLY EVOLVING
TREND AMONG COMPANIES**

EDOARDO MARINO

OCTOBER - 2022



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**SUPERVISION:
PROFESSOR VICTOR BARROS**

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Dedicated to those who have always supported me throughout this long way and gave me the force to never give up, to my family, my friends, and the people who I met during this incredible path. I learned a lot from all of you, but there is still a lot to do and to grow. This is just the beginning.

GLOSSARY

CAAR – Cumulative Average Abnormal Return

CAR – Cumulative Abnormal Return

IPO – Initial Proposal Offer

PIPE – Public Investors Private Equity

SPAC – Special Purpose Acquisition Company

ABSTRACT

This dissertation aims to evaluate the performance of a set of special purpose acquisition companies (SPAC) in the US market, comparing it with previous results obtained with similar methodologies and with results from a traditional IPO. From the companies' point of view, SPAC represents a quicker and more efficient method to raise capital both from public markets and institutional investors, avoiding the heavy costs in time and expenses of the IPO procedures. The literature (i.e., Lakicevic and Vulcanovic, 2013; Dimitrova, 2017) has suggested that the market has a positive trend when considering M&A announcements, regarding SPAC. However, the enthusiasm around this tool may be related to the IPO phase, as the returns turn negative quickly. The analysis over the trend denotes that returns have been traced in the last decade because the market is getting more efficient as time pass. The process of maturation is constantly going on and it is leveling out the gap in terms of performance between short and medium/long term performance.

KEYWORDS: Retornos anormais; investimento, IPO, performance, SPAC

JEL CLASSIFICATION: G15; G23; G34

RESUMO

Esta dissertação tem como objetivo avaliar o desempenho de um conjunto de empresas de aquisição de propósito específico (SPAC) no mercado dos EUA, comparando-o com resultados anteriores obtidos com metodologias semelhantes e com resultados de um IPO tradicional. Do ponto de vista das empresas, a SPAC representa um método mais rápido e eficiente de levantar capital tanto dos mercados públicos quanto dos investidores institucionais, evitando os altos custos em tempo e despesas dos procedimentos de IPO. A literatura (isto é, Lakicevic e Vulcanovic, 2013; Dimitrova, 2017) sugeriu que o mercado tem uma tendência positiva quando se consideram as anúncios de Fusões e Aquisições, em relação às SPAC. No entanto, o entusiasmo em torno dessa ferramenta pode estar relacionado à fase de IPO, já que os retornos se tornam negativos rapidamente. A análise sobre a tendência indica que os retornos têm sido rastreados na última década porque o mercado está ficando mais eficiente à medida que o tempo passa. O processo de amadurecimento está constantemente em andamento e está nivelando a diferença em termos de desempenho entre o curto e o médio/longo prazo.

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1. INTRODUCTION

Looking at the latest trends among companies that are currently, or in recent years, willing to get publicly quoted we cannot exempt from mentioning the Special Purpose Acquisition Companies method. Although many consider it a recent and completely new way to seek public funds for companies, this method has deep roots in the most important stock markets since the latest years of the 90s. A naïve definition given to these new vehicles was 'blank checks companies', claiming the concept of investors signing a check without knowing anything of it. This definition, although simplified, expresses one of the main aspects of SPAC, indeed the level of uncertainty of investors towards the destination of their money.

To give a brief but useful explanation about the SPAC mechanism we must think of a shell company, with no operational purpose, that makes an IPO and raises funds on a specific market intending to merge at a later stage with a target company. This target company should be selected among different players that are seeking public funds and preliminary studies like due diligence must be conducted to certify the 'compatibility' between the SPAC and the target company. Once the merger declaration is announced, companies have some time to set up all the documentation and present further evaluations on the company's financial situation, appoint a new management board, including members from the SPAC company, and conclude the deal.

In the past years, especially after the first boom in 2007/08, many academics focused their attention on different aspects of SPACs, trying to understand the main advantages and returns of using this particular method instead of the traditional IPO: Riemer (2007), Heyman (2007) and Sjoström (2008) give a first approach trying to present the SPAC structure and their benefit as an alternative to traditional financing means. Others like Howe and O'Brien (2012) analysed the drawbacks of this tool showing the cons of using it, demonstrating both with qualitative and quantitative arguments that the other side of the coin is an irregular performance trend following the public quotation. Regarding the return for companies and investors, it has emerged a common aspect that shows a positive return immediately after the merger announcement and a negative, in some cases extremely negative, return in the medium and long term. As it will be presented in the literature review this is a concept that appears frequently in different research.

It is however true that the SPAC market has been evolving and constantly growing through the last years, with a relevant improvement in terms of regulation, attention of companies towards quality and transparency of the deal, and investors' interest towards the vehicle they were using. This is bringing us to a gradual shift of trend on the return and studies like Ganhg et al. (2022) and Purohit (2022) already noted this.

The aim of this dissertation is therefore to evaluate the performance of a set of SPAC companies from a precise time span, comparing it with previous results obtained with similar methodologies and with results from a traditional IPO data set, to assess the precise moment of maturity that the SPAC market is facing. This evaluation will be performed through computation of the Abnormal Return, starting from the daily stock of 80 SPAC companies following the merger and applying the Market Adjusted method subtracting the return of the reference market. Starting from the main assumption obtained from the analysis of previous studies that present SPAC as a profitable instrument just in the short-term, the analysis will try to assess whether and how this negative trend in the medium-long term has been evolving in the last year.

2022 figures show a decrease in new SPAC merger deals but according to studies like Ganhg et al. (2022) it is not due to a drop in public consideration of this means but rather to an increasing level of maturity and safety of the players taking part in it, that brought to a slowdown of new entries in the market. Starting from the consideration that the level of return expected in the medium term is negative, supported by the results already found by academics such as Lakicevic and Vulcanovic (2013) and Dimitrova (2017) who report negative returns on the periods after the merger, it will be assessed the trend of this negative return in 2022 to delineate assumptions for future times. It will also be discussed whether some factors like Market Cap, Average Trading Volume, or % Shares traded are correlated with the abnormal return level or if other variables are more relevant at this stage. Through a regression analysis of the abnormal return, we will be able to understand whether these independent factors affect directly the negative trend of SPAC, otherwise, external factors will show up to be more important.

With the results obtained we hope to have a clearer idea of the evolution path that SPAC companies are undertaking; the market for SPAC companies has been characterized by low regulation and high speculation in the past. However, recent data

indicates that the market is becoming more mature. The goal of analysing this data is to gain a better understanding of the trajectory of SPAC companies and how the market is evolving. This information can be used to make more informed investment decisions, as well as to inform regulatory and policy decisions related to SPACs.

In addition, having the opportunity to make an interview with a relevant figure inside a recent Italian company that is set to merge with a US SPAC, gave different interesting insights that confirm the increasing attention and importance of this instrument, which has become from a simple speculative mean to a leading trend and relevant alternative to the traditional IPOs that are globally used. The interview with the company is presented in the dedicated section following the “Literature review” section.

2. LITERATURE REVIEW

The first studies regarding SPACs were conducted during the late 2010 decade when after the 2003 pike of this methodology, a few researchers pointed their attention to this event. Much of this primal research was mostly centered on explaining the difference between SPAC and blank check companies that were widely used during the 90s and pointing out the main advantages and issues that these new and almost unknown instruments presented. In many of these studies, like Riemer (2007), Heyman (2007), and Sjostrom (2008), no empirical analysis was conducted, and the conclusions obtained were based on legal assumptions and comparisons among the different methods.

Riemer (2007) analyzes and explains the reasons behind the large exploitation of the SPAC method in the first years of the decade, stating that they could be considered as an alternative form of financing for private equity firms and an easier and less restricted way for small firms to get access to public funds, avoiding the strict regulation imposed by governments with the 2002 Sarbanes-Oxley act. Following the same path, analyzing the reliability of this method, Heyman (2007) focused his study on the comparison between black checks companies operating in the 90s and the recent SPAC created and active in the financial markets in the period 2003-2006, concluding that SPACs represent a more efficient and effective way of financing with comparison to their predecessors. In his dissertation, he also argues about the structure of SPAC, the degree of safety for investors, and the level of adherence to the SEC's regulation and compliance.

Sjostrom (2008) elaborates on the reason behind the creation of non-operating companies and concludes that this is convenient for corporates to obtain new cash injections and share liquidity. Most of these first approaches to the SPAC were based on a qualitative study of 90s SPAC events, where companies with no declared operational purpose started to raise funds on the public markets, especially in the US. In this period the above-mentioned academics focused their attention on explaining why to use this new methodology rather than evaluating its performance of it, and this led to broad use in the following years.

A first attempt to understand and identify the main roots of the SPAC behind the success in those years, came in 2009 when some academics took on a more quantitative lens the study.

Kim (2009) focuses his attention on the biennium 2007-2008 when a peak in SPAC IPOs was registered, and tried to understand firstly the causes and then evaluate the performance of these IPOs. He analyzed a set of 158 SPAC, that went public within the 2003-2008 period and reports as the main results the fact that normally SPACs have managers with a higher level of knowledge and long experience in the same industry in comparison with IPO companies. This implies a greater level of knowledge of the market in which the organization will operate, so a safer investment from the investors' point of view; will attract a higher number of investors and result in a greater market valuation of the initial proposal. In conclusion, Kim (2009) stretches the fact that a higher level of experience on the board of management of the SPAC results in greater possibilities of being acquired. This conclusion differs importantly from the focus that many other studies had, focusing more on a corporate aspect, than on the pure financial return of it.

Instead, Howe and O'Brien (2012) studied a set of 116 SPACs that completed IPO in the period between 2003 and 2008 focusing more on the financial return that those SPAC show. The result was an abnormal return of +1.7% around the announcement date; relating also to the independency level of the board of directors, finding that the return was higher in the long run for SPAC with a higher number of independent directors. However, they also find out that the average long-term performance of these SPAC is negative with a -33% one-year return and -54% three-year return. These results from Howe and O'Brien (2012) opened the way for future studies aimed at testing effectively the return in the medium-long term of the SPAC method, widening the view without just considering the immediate return for investors and the liquidity level that companies were able to raise.

The relevant plunge in SPAC's usage in the US capital market in 2008 was noticed and analyzed by Tran (2012) considering a set of SPACs within the period 2003-2009; although he did not focus on econometrics, the results are still important to understand one of the main roots that made more and more companies choose this new methodology.

The main reasons behind this large increase can be described as the higher degree of specialization of managers, the ownership structure, and the role of long-term institutional investors. In conclusion, SPAC allows corporates to conclude more focused acquisitions and to negotiate an additional 7,6% discount in comparison with the traditional public offering.

An isolated, but still relevant, case came from Ignatyeva, Rauch, and Wahrenburg (2013) as they are the firsts to select and analyze a set of European SPACs, explaining their structure and trying to assess their performance. Their research show that there is no evidence that European SPACs have merging targets in Europe nor that their investors are fully European, and their performance is variable. Studies among European SPACs are still very rare at the moment and the number of SPAC activities in the EU is not comparable with the US ones; for different reasons many European companies decide to rely on the US SPAC market rather than seek capital in their market. The European market is not seen as appealing to SPAC that are willing to enter the market and, as things stand now, the US market is considered a way more fertile soil for these companies.

Following the path set by Howe and O'Brien (2012), Lakicevic and Vulcanovic (2013) focus their attention on different returns when announcements are made on the three different assets issued, namely, units, stocks, and warrants.

Firstly, they conducted an analysis on 88 SPAC that went public in 2003 and that announced merger in 2009; they conclude that the abnormal return was -6.3% around the merge date and increasingly negative after the completion. They explained this negative return due to the purely speculative nature of SPAC at that time when investors' transactions around the merging date increased with parties in favor of the merger purchasing shares at a premium. As reported in the analysis, based on a set of 160 SPACs, they generally show positive announcements returns but the performance returns vary differently.

They conclude that SPAC shows a -28% return to unit shareholders after acquisition and a -9.59% cumulative abnormal return after 10 days of the acquisition. This confirms the negative trend of SPAC performance in the medium term.

The first evidence of comparison of SPAC against traditional IPOs came from Rodrigues and Stegemoller (2012); in their analysis, they found that SPACs show relatively higher abnormal returns on the announcement date, compared to similar IPO, and that they pay a similar amount of underwriting fees.

Another piece of evidence of SPAC from a long-term post-IPO perspective, comparing a set of 73 SPAC with other IPO companies in the same period, was carried on by Dimitrova (2017).

She finds out that generally, IPOs show a positive return by 1.5% 3 days after the merger announcement and that SPAC performance is strongly influenced by the managerial pressure to complete the deal; furthermore, she analyzed the accounting performance of SPACs and, selecting operating margins and ROS as benchmark indicators, it showed that SPAC underperformed. Furthermore, she points out that one clause of SPAC mergers is that the target company's fair value must be at least 80% of SPAC's fair value; surprisingly in mergers where this requirement is closely satisfied the abnormal return is negative, concerning mergers where the management chooses a target company with the only purpose to close the deal and gain the profit on investments. Somehow the abnormal return, she finds out is correlated to the period between the IPO announcement and the merger conclusion: the longer this range of time, the higher the abnormal return.

Always Dimitrova (2017) conducts a regression analysis, indagating the relationship between abnormal returns in short/long term periods with different variables linked to ownership, governance, firm, and deal SPAC. She analyzed both the IPO phase, when the companies show a positive return of around 4.4%, and the post-merger phase which shows a completely inverse trend, with negative returns of up to -56% in the 2 years. Analyzing different variables, she finds out that mergers that take more time between the IPO and the merger announcement are seen as more valuable by the market since it assumes that preliminary evaluation and due diligence are performed on the target company by the firm management. In contrast, mergers announced shortly after the IPO or close to the deadline for finding a target company are less appealing to the market and evaluated negatively.

Kolb and Tykvova (2016) as well tried to understand and explain the reason behind why companies decide to go public through SPAC merging and not with traditional IPO, but all these studies were related to the SPAC dataset preceding 2016; after that date, the basic characteristics of SPAC changed almost completely as anticipated in the introduction.

It can be assumed that results in terms of performance and financial indicators are not easily comparable between SPAC that successfully merged before 2012 for different reasons: following the plunge in SPAC usage in 2012, and later on in 2020, the number of players in the market, both referring to SPAC, investors or target companies, the supply/demand curve changed radically.

Before 2011 all the SPACs were traded over the counter, while, after the increasing number of companies using this method, almost all of the SPACs are now traded in organized exchanges, NYSE and NASDAQ above all. As Ganhg et al. (2021) explain in their work, the structure of SPACs after 2010 changed radically in 2 main features: firstly, the separation of rights between voting and redemption made shareholders active part of the deal, with the possibility to redeem their shares in case of 'bad deal', and secondly, as sponsors put more money into the organizations, it made redemptions tools more attractive for investors.

All these analyses bring us to the conclusion that, at least based upon historical results, the correlation between time to the announcement and abnormal return constitutes a relevant aspect of the performance analysis of SPAC and that the trend later 2010 is not coherent with the results previously obtained due to substantial changes and evolution of the market.

In recent studies like Gangh et al (2021) and Purohit (2022), researchers preferred to break down the life period of SPAC into normal SPAC period and deSPAC period: the SPAC period goes from the IPO to the conclusion of the merger or liquidation, while the deSPAC period indicates the period from when the SPAC becomes publicly traded with operative purpose under a new name.

Among the recent studies that are related to ours, we find Klausner et al. (2022) which analyzed a set of 47 SPAC in the deSPAC phase in the period January 2019 and June 2020; the main result was that shareholders that redeemed their successfully merged SPAC shares earned an 11.6% return, including both the market value of the shares and the warrants and rights value.

Gahng et al. (2021) analyzed a set of SPACs between January 2010 and September 2021 including 905 SPAC both liquidated or successfully merged. The analysis breaks down the periods into short and long terms and the companies analyzed are both completed deSPAC or liquidated SPAC. This study showed how investors earned on average 15.9% return on liquidation or merger date, but closely looking at the deSPAC period had a -8.21% return over the first year.

In a similar analysis Purohit (2022) analyze through a regression analysis a dataset of recent SPAC mergers with several different variables that might have influenced the trend of the post-acquisition return. In his results he marks the fact that many variables do not show a relevant relationship with the abnormal return, however, the average trading volume in the week before the merger and the return shortly after are strongly correlated. As in many other papers, the conclusion is focused on the volatility of the SPAC market, showing positive results in terms of new IPOs and deals concluded in 2020 and 2021, but a rapid downturn for 2022.

From the majority of the works previously mentioned it may be assumed that the market has a positive trend when considering M&A announcements, in particular regarding SPAC, although the enthusiasm around this tool is purely related to the IPO phase as return turns negative quickly. Indeed, analyzing the increase in value over time of SPAC IPOs in the US market investors in the last years has increased interest in this kind of instrument. Together with this increased interest among investors, it has also increased the level of 'specialization' of SPACs and the regulatory environment has evolved and introduced new restrictions and rules, increasing inevitably the timing and complexity of mergers.

An increasing number of SPACs that got quoted on the market in the last 5 years still do not have a selected target company and are doomed to be liquidated if they will not

find one shortly; while other SPACs in some specific industries (e.g., aero spatial, biotechnology) are subject to high demand and somehow overvalued.

2.1. Interview: Insights from An Italian SPAC Case

One of the key aspects that are discussed in the dissertation is to understand also how and why SPAC decide to merge with a precise target company rather than a similar one.

A general distinction between the European market and the US market must be done when dealing with SPAC: the US market presents an element called PIPE (Public Investments Private Equity) investors that changes almost radically the operating environment. SPAC have access to public funds raised during their IPO and hedge funds, private equity funds, and other private financial investors.

PIPE investments are a feasible solution for SPACs that want to increase their level of funding without recurring to traditional secondary financing methods (e.g., secondary equity offerings or convertible securities) that might be time-consuming and more expensive.

The amount that PIPE investors decide to invest in SPAC is strictly correlated to the vision that the market has of that SPAC, sequent to the IPO and the perspectives of the target company that it is pursuing.

About the timing of the SPAC deal conclusion, the estimated amount is 2-3 months, where most of the time is dedicated to the due diligence process taken on by the SPAC board towards the target company and, vice versa, possibly also a vendor due diligence. Normal IPO processes take at least 6 months to be effective.

To better understand how the decision-making process is taken on in a SPAC merger, we entered into contact with the Investor Relations of a recent and successful Italian company that is about to get quoted through a merger with a US SPAC. The company name is D-Orbit, its core business is aero spatial logistics, and they are leaders worldwide in the designing, projecting, and realization of microchips, flying parts, and other components of orbital satellites.

Contacts with NASDAQ-quoted SPAC, Breeze Holding began last year with a general agreement reached in January 2022 for a quotation greater than \$1,2 billion, and the merger conclusion was planned for April/May of this year. Unfortunately, following the political situation in Europe and the consequent economic difficulties of the global markets, the board of directors of D-Orbit decided to postpone the market quotation process, following the trend of many other aero spatial companies, like Space-X that delayed the new Starlink launch.

The main aspects that emerged from talking with the Investment Relations of D-Orbit were the reasons behind this decision and what are the main practice for this kind of transaction.

"We analyzed accurately all the possible alternatives both from a financial and practical point of view, and at this stage, the most convenient choice is going public through a SPAC," says Patrizia Tammaro Silva, IR at D-Orbit during a live interview we had. Regarding the current situation of this new trend, she adds: "at the moment the SPAC market is highly favorable for relatively small companies, with low turnover but with high growth potential, like us"; the nature of the US market made it easier for many companies that are seeking for a good level of capital in a short time rang. The main reasons that made D-Orbit choose the SPAC quotation method were, in fact, the high level of liquidity that the market can offer and the efficiency by which the whole process is taken over.

This particular situation presents however cases that might be in some way controversial: "to better explain what was going on in the SPAC market, consider the case of a company called Momentus whose business is very similar to ours" adds Patrizia "they got quoted last year through a SPAC with a valuation of over \$80 million but they had just 5 years of life back and they have never flown in the space!". This gives us the idea that, in particular industries, the SPAC market is overpopulated, with investors willing to invest based on a high level of confidence regarding the technological development of the next years; this partially explains the high level of SPAC that are still pending merge or that got liquidated without founding a target company to merge with.

Regarding the due diligence process with the SPAC Breeze Holding, Patrizia says that the major factor that led them to choose this SPAC instead of the many others that were considered as the direct link with the Oil & Gas market, that nowadays is the leading consumer of space satellites at a global level. In addition, Breeze Holdings was managed by Major General Charles F. Bolden, a former administrator at NASA and 4-time shuttle astronaut, which gave the right level of confidence regarding the future board composition following the merger.

3. SAMPLE AND DATA SOURCES

The data used in the analysis were obtained from different sources: Yahoo Finance (it.finance.yahoo.com), SPAC Track (spackrack.io/), Stock Track MBA (stockmarketmba.com/index.php), and Stock Analysis (<https://stockanalysis.com/>).

After having identified a total number of more than 300 active SPACs that got quoted in the last 3 years, we decide to raffinate the research on a set of SPACs that completed the merge process in the last year. Many of the previous studies on the performance analysis of SPAC took into consideration a higher number of samples from time ranges of 5-10 years; as underlined also in the studies by Purohit (2022) and Gahng et al (2021), selecting periods with an elevate number of years will lead to contrasting results in the short and medium-long period. However, as we have noticed, the SPAC market is constantly evolving in regulation, investors' trustfulness, the number of participants in the market, etc. Identified 80 SPAC from different stock exchanges (mainly NASDAQ and NYSE) that merged with their target company in August 2021-March 2022, we aim to confirm effectively this negative trend in the medium term, narrowing the set of companies taken into consideration and reducing the possible biases of companies entering the market in completely different “economic environmental” situations. The selection of a narrow time window comes from the reduced number of IPOs after February 2022 as Figure 3 shows, as a result of the unstable political situation due to the Ukraine war. As new IPOs reduced, also deals concluded reduced and made it harder to select suitable samples.

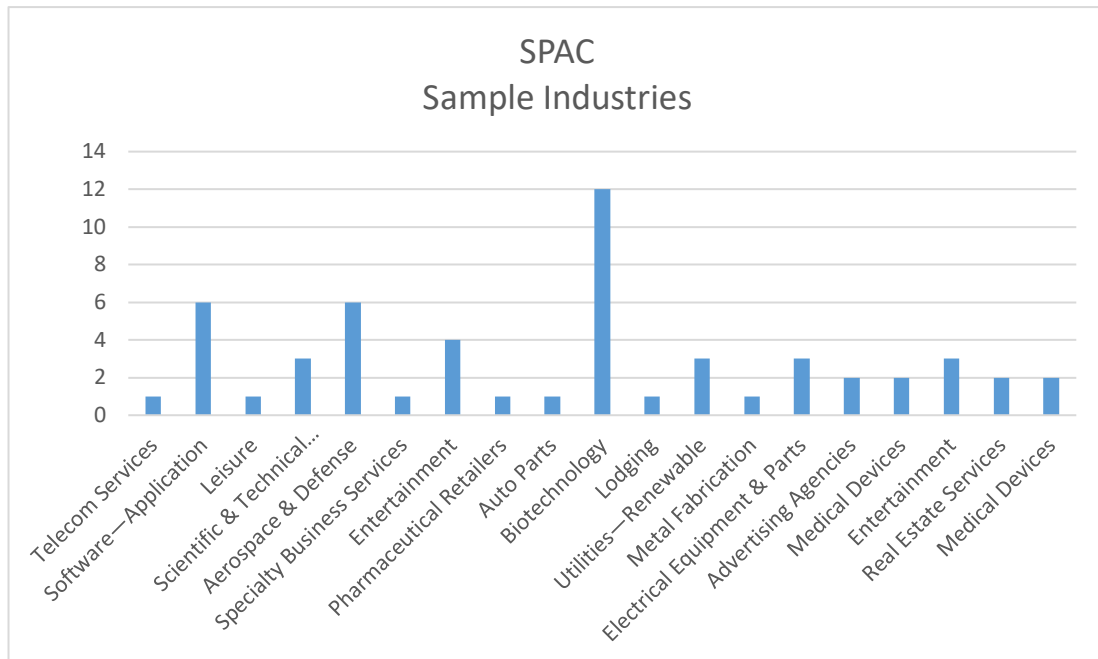


FIGURE 1 - Industries frequency of SPAC dataset

To make further analysis to compare the SPAC return, we selected a set of 80 companies that quoted themselves through the traditional IPO process from the same period and computed the return in the same way. The traditional IPO companies were selected carefully looking at the timing of the IPO, the stock exchange in which they went public, and the main industries to which they belong, to have results consistently comparable with the SPAC returns.

In the SPAC dataset, we also included some relevant info regarding the company, useful for the last part of the analysis in which we tried to identify the factors that mostly influence the return after the merger: market capitalization, last close price (as of the download date), shares outstanding, average trading volume and % traded were the variables included. These variables were selected as they represent the most important financial figures related to the stock return; some academics like Dimitrova (2017) and Purohit (2022) conducted a similar analysis but did not take into consideration those basic figures, focusing more on corporate or specific investment variables (composition of the management board, institutional investors presence, presence of top tier banks in the transactions, etc.).

As previously stated, the period under analysis will be a 6-month time range, split into two sub-ranges of 2 and 6 months in order to monitor the trend over the medium term.

Selecting the relevant data for the analysis was a clue part since the number of SPAC transactions in the last 3 years increased exponentially with 2021 facing a boom in new quotations, but relatively low deals concluded; 2022 is now showing an inverse trend toward this phenomenon. In 2021 around 200 SPAC deals were concluded with more than 600 IPOs, while in 2022 as of October 7th, 79 IPOs were conducted and only 75 deals have been concluded (see Table 1).

Period Activity	This Year Count	This Year Trust, \$B	Last Year Count	Last Year Trust, \$B
S-1s Filed	73	9.4	810	202.2
IPOs	79	12.9	613	152.3
Deals Announced	116	17.1	237	48.8
Deals Closed	75	20.7	199	63.8
SPACs Liquidated	26	11.3	1	0.1

Last updated Oct 7, 2022 11:06 AM

FIGURE 2 - SPAC TREND IN THE US MARKET IN 2022-21 (SOURCE STOCK ANALYSIS)

Another relevant piece of information looking at Figure 2 is the liquidation rate that increased importantly, from 1 SPAC liquidated last year to 26 liquidated in 2022 at the moment.

Looking at the figures presented, we can assume that in 2021 the SPAC phenomenon reached its peak, while in 2022 the curve started to flatten with a reduction both in the number of new IPOs and in SPAC deals completed. One of the main reasons for this decline is due to the current economic and political situation not favorable for public markets and new joiners, but other factors may have influenced the negative trend. Among the other factors that strongly affect the SPAC environment, as already mentioned

in other academic papers, the increasing regulation by the SEC that in the last years has been monitored closely; on March 30, 2022, the SEC approved the issuance of proposed rules regarding the SPAC. SEC Chairman Gary Gensler stated that the proposal "would strengthen disclosure, marketing standards and gatekeeper and issuer obligations by market participants in SPACs, helping ensure that investors in these vehicles get protections similar to those when investing in traditional IPOs".

As stated directly on the SEC website (www.sec.gov/), the new monitoring regulation on SPAC will affect mostly the deSPAC phase and is composed of different key points:

1. New disclosure and financial statement requirements in certain SEC filings by SPACs, including financial projections and fairness determinations in de-SPAC transactions.
2. New registration requirements under the Securities Act of 1933, as amended (the "Securities Act"), for de-SPAC transactions and the elimination of the safe harbor for forward-looking statements under the Private Securities Litigation Reform Act of 1995 (the "PSLRA") for disclosure in those registration statements.
3. Securities Act liability for "underwriters" in de-SPAC transactions; and
4. A 20-calendar day minimum dissemination period for disclosure documents in a de-SPAC transaction.

3.1. Methodology

To assess the 6-month performance of the SPAC dataset, we focus on the daily abnormal return of the SPAC, computed using the Market Adjusted model. This methodology is in line with what was already done by previous academics Gahng et al (2021) and Dimitrova (2017) and adopted to have easily comparable results in line with past literature. We acknowledge also that the computation method is not in line with traditional finance literature, as it constitutes a simplified and more straightforward alternative to AR traditional computation.

Computing the abnormal return, we intend to consider the percentage of return that lies outside the normal trend of the market that influences the trend of almost all companies.

To compute the daily abnormal return using the Market Adjusted model, we subtract the return of the reference market on day t from the daily return of the firm analyzed, as follows:

$$(1) \text{AR}_{i,t} = R_{i,t} - R_{m,t}$$

Where $R_{i,t}$ is the daily return of the SPAC company and $R_{m,t}$ is the daily return of the reference market. In this case, we use the Russell 2000 as a reference market for continuity reasons with many other studies previously carried on, that use it as a benchmark for comparison (see Kiesel et al, 2022; Dimitrova, 2017; Kolb & Tykvova, 2016).

Table 1: Descriptive Statistics financial variables

	<i>Market cap</i>	<i>Last Close Price</i>	<i>Shares outstanding</i>	<i>Average trading volume</i>	<i>% traded</i>
Mean	925.540.056,2625	6,9646	135.565.266,7750	1.359.453,2375	0,0192
Standard Error	123.005.746,7562	0,6477	21.747.128,5404	303.726,2616	0,0056
Median	560.120.336,5000	5,7500	73.770.765,0000	586.701,0000	0,0042
Standard Deviation	1.100.196.845,4798	5,7936	194.512.230,9275	2.716.610,2695	0,0499
Sample Variance	1.210.433.098.803.800.000	33,5661	37.835.007.980.383.700	7.379.971.356.499	0,0025
Kurtosis	5,6724	31,6163	17,1497	25,8130	24,4543
Skewness	2,2466	4,7765	3,5603	4,6969	4,6555
Range	5.780.553.731,0000	47,0100	1.310.783.159,0000	19.121.117,0000	0,3348
Minimum	-	0,9200	-	18.303,0000	-
Maximum	5.780.553.731,0000	47,9300	1.310.783.159,0000	19.139.420,0000	0,3348
Sum	74.043.204.501,0000	557,1700	10.845.221.342,0000	108.756.259,0000	1,5374
Count	80,0000	80,0000	80,0000	80,0000	80,0000

Once we computed the AR for every trading day for the 6-month period of each company, we proceed with the calculation of the Cumulative Abnormal Return (CAR) as the sum of all the AR over the period analyzed, and the Cumulative Average Abnormal Return (CAAR), which consists in the average of the sum of all the abnormal returns for the period taken into consideration.

The CAAR computed as follows, gives us the final input for the last part of the analysis, and in order to have a comparable result we calculate also the mean CAAR between all the abnormal returns of the 80 SPAC companies analyzed:

$$(2) \quad CAAR_{(T1,T2)} = \frac{1}{N} \sum_{i=1}^N CAR_{i(T1,T2)}$$

As the period is taken into consideration for the analysis, I choose to extend up to 6 months after the merger conclusion and split the results into two different periods of 2 and 6 months to check for any possible change in the short-medium term.

To test whether the CAARs are statistically different from 0, a Cross-Sectional test (abbr. CSect T). To test the CAAR as significantly different from 0: $H_0: E(CAAR) = 0$ we proceed with the test:

$$(3) \quad t_{CAAR_t} = \sqrt{N} \frac{CAAR_T}{S_{CAAR}}$$

where S_{CAAR} denotes the standard deviation of the cumulative abnormal returns across the sample.

As a starting point, Kiesel et al. (2022) analyzed the really short-term return, from the day before the announcement to day 3 and got interesting results that confirm the positiveness of the short-term return. Although they try to explain what are the factors that influence the most the return trend around the announcement day, they just assume how the return can change in the medium term.

A further comparison will be done with the dataset of companies that went public through the traditional IPO process, selecting companies that entered the market in the

same period, belonging to similar industries, and computing the CAAR with the same market-adjusted method using the same reference market.

Comparing the results we obtained, with the one that Kiesel et al. (2022) had and the CAAR from the normal IPO companies set will allow us to have a clear overview of how the SPAC trend has been evolving in the last year and discuss the main pros and cons from the companies and investors point of view.

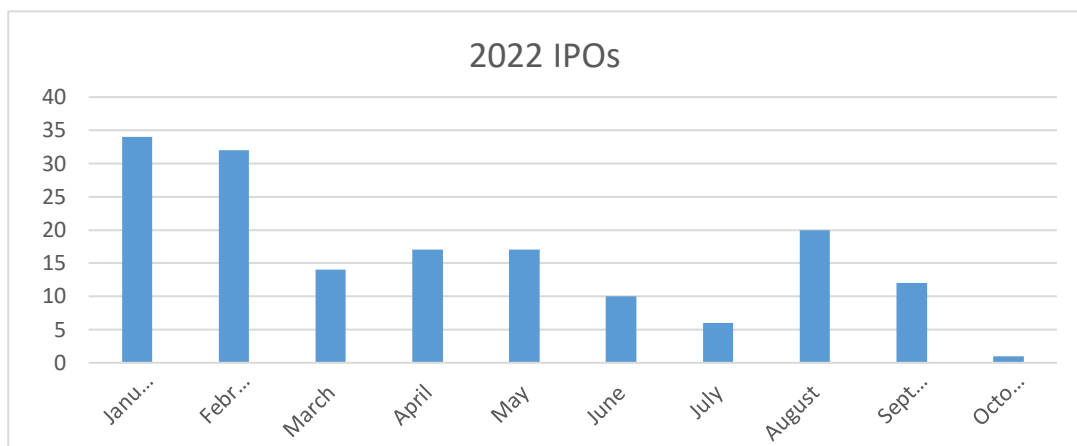


FIGURE 3 - IPOs CONCLUDED IN 2022

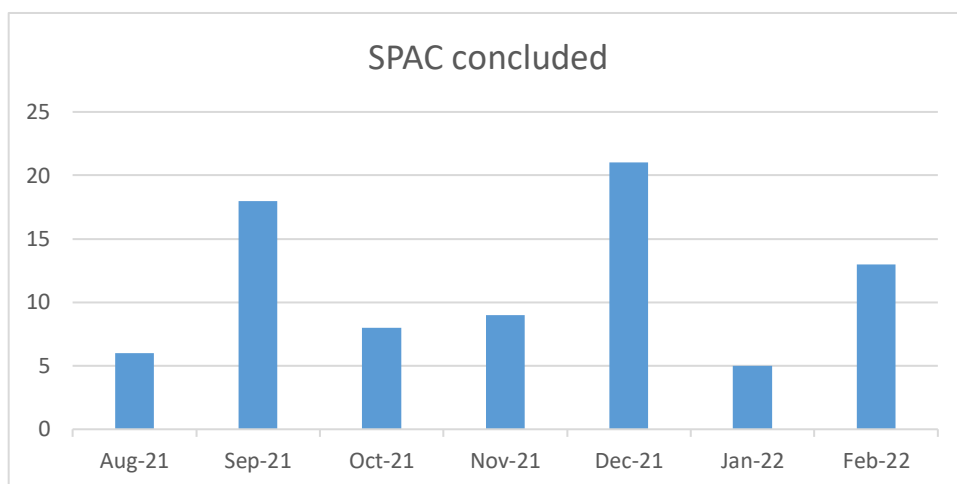


FIGURE 4 - SPAC MERGERS CONCLUDED IN THE PERIOD ANALYZED

As the last step of the analysis, we tried to understand what were the factors that most influenced the results we obtained for the periods analyzed: conducting a regression analysis will eventually allow us to establish whether one of the independent variables selected can explain the CAAR for the 2-months and 6-months' period.

The variables included are the ones already presented with the descriptive statistics in Table II, so namely Market Capitalization, Last Closing Price, Shares outstanding, Average trading volume, and % of shares traded. We select those variables as they might represent a clear explanation for the trading activity around the SPAC; we expect the average trading volume to be the most relevant variable as already explained by Purohit (2022), SPAC trend around merger announcements is significantly influenced by the number of shares traded publicly.

The model used is a regression analysis setting as dependent variables the CAAR on 2 and 6 months and the above-cited variables as independent ones; I choose to analyze numerical variables that can be strictly related to the return trend, instead of focusing on qualitative or external factors that can hardly be assessed from a numerical point of view. We take into consideration some relevant info, like the industry, related to the companies to evaluate the results.

Taking on this analysis we should be able to understand if and to what extent these financial values influence the return at the deSPAC phase in the medium term.

To further investigate the behavior of CAAR towards these variables, we present also the correlation matrix and take into consideration the Mean Standard Error to assess the predictability of the model for forecasted values.

4. RESULTS

4.1. Medium-term performance analysis

As a first step in the analysis of the results we point out what the calculation of the CAR and CAAR has evidenced in both time spans of 2 and 6 months analyzed: for the 2-month time span the CAAR is -0,4089% and for the 6-month period it is -0,4241%. According to the results of the cross-sectional parametric test t and the non-parametric sign test z , the CAARs are statistically significant at a 10% level.

These results show a relatively low discrepancy between the 2 periods of time, but, most importantly, they are in line with the results obtained by Dimitrova (2017) and Kiesel (2022). The results demonstrate the negative trend of abnormal return in the medium term, but the figures obtained slightly differ from the results obtained in the previous analysis.

Kiesel et al (2022) demonstrated that around the merger announcement date the abnormal return stands around +6%, however, studies from precedent years show that for the same time range the CAR shows a smaller percentage, around +1,7%.

Results obtained in previous studies show much more extreme negativity on the return in the medium-long term: Howe and O'Brien (2012) find a return of -14% and -32% on the 6 and 12-month period following the proxy vote, which happens shortly before the merger announcement. At the same time, Kiesel et al. (2022) compute the long-run return after the merger announcement on a 6- and 12-month basis and on average they report a negative return of around -14%.

This difference in results obtained might be due to the inclusion or not of the pre-announcement period in the analysis: this period which might last from a couple of days up to several weeks, is strongly influenced by information leakage regarding the merging process and notoriously positively influence the trend of return of the SPAC.

In our analysis, we did not include the pre-announcement period, as we want to focus exclusively on the deSPAC phase performance on companies.

As cited also by Kiesel et al. (2022), another possible explanation for the difference between the results obtained in our analysis and the previous ones comes from studies of

Klausner et al. (2022) and Gahng et al. (2021): based on their arguments they state that long term performance analysis in SPAC environment is statistically demonstrated to be negative, but not as negative as the pre-2010 period.

The almost complete deregulation of the operating market together with a plunging trend among naïve investors increased the level of volatility between the short and long run, with mergers concluded without the necessary previous evaluations and a low degree of trustfulness from investors.

We can therefore say that the SPAC market has become more efficient over the last decade, reducing the level of uncertainty after the merger date and this partially explains also the wide use of this method over the 2020-21 period, even though it is still showing a negative trend shortly after the merger date.

Table 2: Descriptive statistics on results

	CAAR 2-MONTH		CAAR 6-MONTH
Mean	-0,40888%	Mean	-0,42409%
Standard Error	0,25060%	Standard Error	0,05944%
Median	-0,72496%	Median	-0,35376%
Standard Deviation	2,24147%	Standard Deviation	0,53161%
Sample Variance	0,05024%	Sample Variance	0,00283%
Kurtosis	825,68277%	Kurtosis	94,36580%
Skewness	201,86474%	Skewness	-25,95167%
Range	16,06431%	Range	3,04822%
Minimum	-5,10375%	Minimum	-1,90829%
Maximum	10,96055%	Maximum	1,13993%
Sum	-32,71004%	Sum	-33,92722%
t Stat	0,066300776	t Stat	0,09438002
z test	0,059111466	z test	0,07602560
MSE	0,000426145	MSE	0,0000269
Count	80	Count	80

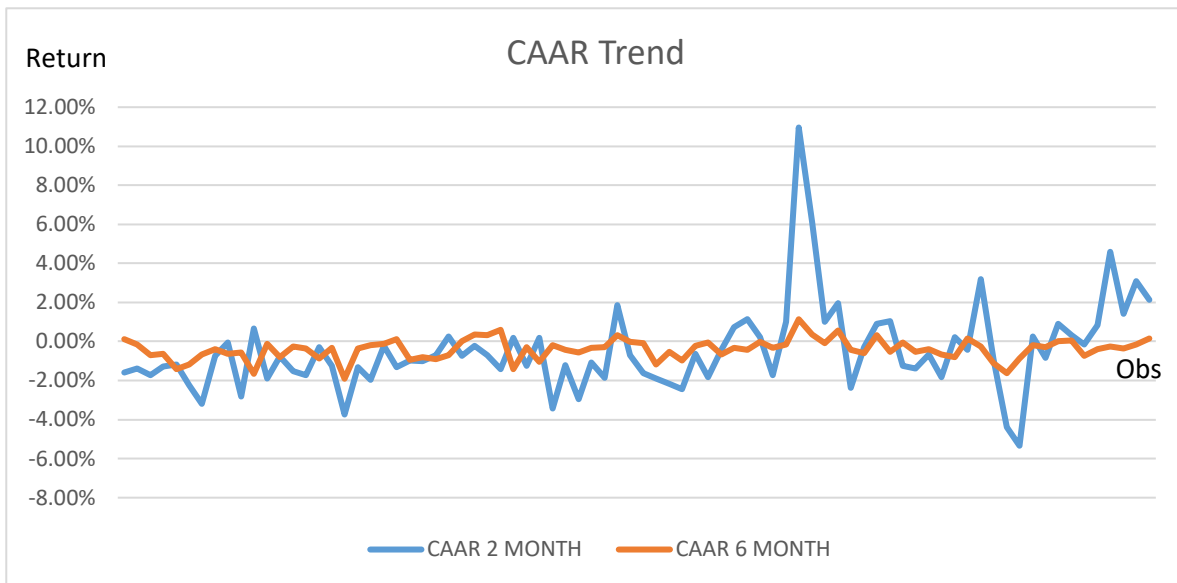


FIGURE 5 - CAAR TREND ON THE SPAC SAMPLE

To further analyze and comprehend the results obtained, we look singularly at the mean CAR for the periods over the SPAC dataset to understand whether some peculiarities might have influenced the output.

A first approach might be to interrogate the industry variable: as mentioned before we choose the data set trying to build a heterogenous sample of SPAC companies, whose target company is operating in different industries. The first result that we got from this lookup is that almost 30% of the companies that faced a positive return in the 2 months were operating in the Biotechnology industry. This gives us an important insight regarding the effective relationship between the perception of the investors in particular markets. We can therefore reinforce the argumentation that certain markets show a higher level of interest from the SPAC market both in the number of SPAC deals concluded, Make reference to Figure 1, and in the level of return in the short-medium term.

As the last step of the performance evaluation of the set of 80 SPAC companies, we compare the results obtained with the abnormal return obtained with the same Market Adjusted model on a set of 50 companies that entered the public market in the same period

through traditional IPO. The results obtained computing the CAAR on the IPO companies show a positive trend of +0,6698% in the 2 months and +0,3208% in the 6 months. What comes up first is the positive trend that IPO companies show: relying on previous studies like Rodrigues and Stegemoller (2014) that already focus their attention on the comparison between SPAC and traditional IPOs, we can infer that SPAC shows a relatively higher abnormal return on the announcement date, but in the medium term they assume a negative trend visible already after 2 months from the merger completion.

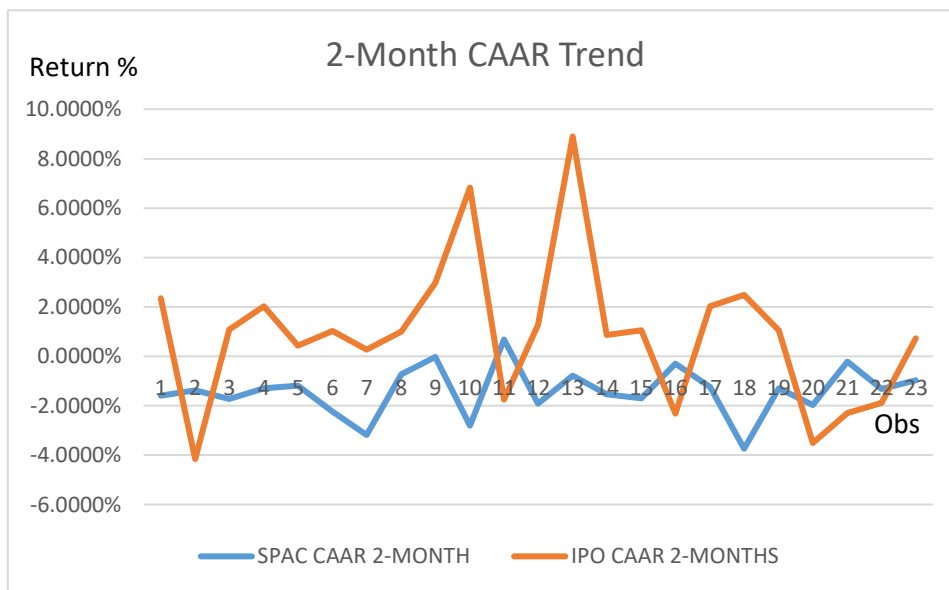


FIGURE 6 - CAAR 2-MONTH TREND ON IPO AND SPAC

According to these results, we can give a prime evaluation of the reasons why companies and investors choose the SPAC method instead of the traditional IPO: from the companies' point of view, SPAC represents a quicker and more efficient method to raise capital both from public markets and institutional investors, avoiding the heavy costs in time and expenses of the IPO procedures. In a SPAC deal conclusion, it is essential to the level and quality of the due diligence process carried on both from the target company towards the SPAC and vice versa. From the investors' perspective, what we can deduct from the results obtained through the last years is that in the first periods the SPAC activity around the announcement date was high and this led to abnormal returns

extremely positive in that time frame, but immediately after the trend inverted its root with extremely negative returns in the following months. It seems that as the years go by the SPAC market is maturing, with companies conducting more precise and focused preliminary studies to conclude optimal merger transactions. As displayed in the data presentation, 2022 shows a reduction in terms of deals concluded but the turnaround is compensated with a reduction in a negative return in the medium term, with respect to previous years' studies.

4.2. Regression analysis

Additional insights regarding the SPAC method might come from a further analysis regarding the main variables that affect the trend of return in the medium run. In order to establish whether some key financial variables that are normally correlated with the daily stock return, are effectively correlated with the return we perform a regression analysis on the set of 80 SPAC companies present in the data set.

The identifying variables will be Market Capitalization, Last Closing Price, shares outstanding, Average trading volume, and % of shares traded, all information easily accessible and that normally come with the daily return of a stock.

However, the results displayed in Table IV deny any possible correlation between the abnormal return and the explanatory variables, as the model explains only a relatively small percentage of the sample set; the R-Squared for the 2 months is about 0,083 as displayed in Table IV and looking at the p-values of the variables the only variable that is statistically significant is the Average Trading Volume.

The results obtained are in line with what was already found by Purohit (2022) who, after having developed two different regression analyses on abnormal returns computed with the Market Adjusted model, found out that there is no effective correlation between the independent variable and other financial factors like the IPO size or PIPE size. Although in his study he evidences the possible correlation between return and average trading volume, the hypothesis is confirmed also in our analysis as it can be considered the only statistically significant variable.

Looking at the correlation matrix in Table VI we can denote that there is a positive correlation between the CAAR 2-month and the Average Trading Vol. meaning that, on average, increasing the trading volume brings a higher return in terms of CAR. This contrasts with what was found by Purohit (2022), whose correlation index was negative.

The regression models rely on historical data that are clustered in a specific time span and therefore might be affected by some time series biases although we tried to eliminate the background noise with the Market Adjusted method. In order to evaluate the reliability of predicted variables, we analyze the residual values: computing the Mean Squared Error we can assess the difference between the observations and the predicted values from the model and establish whether these predicted values will be close to future observations. For the 2 months, the MSE is 0,00042615 which can be considered acceptable, always limiting the trustfulness of the model up to the results of the regression.

The same argumentation applies to the 6 months regression analysis, which indeed shows a negative R-squared meaning an overpopulation in explanatory variables for the sample analyzed. We deduce therefore that the independent variables are not a good fit to explain the variation in abnormal return over time.

The rationale coming from the interpretation of the results is focused on the nature that SPAC has assumed in the last years: as already said before, the SPAC market has been evolving in recent times and some factors like the transparency of the merger process, the level of safety of investors, the institutional investors and banks involved in the process became more relevant than mere financial factors.

From the regulating perspective, the SEC is constantly trying to implement regulations that turn to increase the level of safety and knowledge of investors, limiting at the minimum the concept of 'blank checks' on which the SPAC based their success. Especially in the deSPAC phase, the perspective towards the SPAC market is moving is the alignment with the traditional IPO, stabilizing the current situation, avoiding sub-optimal deals closed just to make speculative investors benefit from short-term profit and creating a quicker, more efficient way of going public for companies that benefit in a safe and clear way also the different investors.

5. CONCLUSION

This study focuses on the performance analysis of a set of 80 SPAC that successfully completed the merger with their target companies in a period that ranges from August 2021 to February 2022. The results show a negative return on the 2 months with a CAAR of -0,4089% and -0,4241% for the 6 months following the merger announcement.

Comparing the results with the CAAR of a set of IPO companies computed with the same methodology is visible the difference in medium-term performance: traditional IPO shows a positive return both in the 2-month and in the 6-month. As things appear, the SPAC method would not be considered the most profitable solution for companies and investors but there are several factors to be considered. SPAC represents a quicker and most efficient solution for companies to go public as they can save time and money in comparison to lengthy and expensive IPO quotation processes.

The results obtained are in line with the previous analysis that shows a negative trend in the periods following the announcement, however, they differ importantly in terms of magnitude from the previous results. Considering recent studies from Kiesel et al (2022) and Ganhg et al (2021), report negative returns to range from -14% to -12% over 1 year time period; if we look back at pre-2010 studies like Howe and O'Brien (2012) the returns were extremely negative with -33% on 1 year. What we can denote from the trend that returns have been tracing in the last decade is that the market is getting more efficient as time pass, the process of maturation is constantly going on and it is leveling out the huge gap in terms of performance between short and medium/long term performance.

From the further step of the analysis where through a regression analysis we analyze the relationship between the CAAR and some of the key financial information related to the company profitability, we can deduce that there is no real correlation between the SPAC return and those variables. The only variable statistically significant is the average trading volume which, as already stated by Purohit (2022), presents a relevant grade of correlation with the dependent variable CAAR. From these results, we can assume that factors external to the strict financial trend are assuming more important roles both for the return performance over time and for the feasibility of merger deals. We denote that the industry of belonging is an influent factor both for the number of SPAC mergers and in terms of

their performance; other academics like Kim (2009) focused their attention on non-financial factors that affect the SPAC performance and the composition of the board of management, the industry in which it is operating, and the regulatory policies are among the most cited factors. The 2022 downturn in terms of new IPOs and SPAC deals concluded might be explained, excluding unfavourable political and economic factors, by the fact that companies have become more resilient to accept deals profitable strictly in the short-term, but are considering as relevant factors the quality of the deal to assure a long-lasting return to their stakeholders. A possible limitation of the work can be identified in the increasing importance of governmental and corporate aspects that were not included in the numerical analysis; these factors, like the selection of the board members or the knowledge of the industry/market of a specific member in the target company, are assuming key roles in the selection and deal closing process of a SPAC and should be analysed case by case in order to have a market overview.

In conclusion, SPACs represent an innovation that has paved its way thanks to important favourable benefits to companies and investors; looking back at the past years it has made an important step forward to overcome some issues like the speculative nature of investors or the conflict of interests of companies that forced the closure of deals to gain extra funds. The SPAC market is expected to continuously grow in number of new investors, funds raised and competition in the market. From a regulatory perspective, the SEC has been promoting a series of measures aimed at guaranteeing the correct level of safety for investors and a more transparent and monitored way of action for the companies entering the market through the SPAC agreement. Investigating how the SPAC trend will react to this regulatory changes might lead to further knowledge in this field and understanding the factors, beside the pure financials, that lead the deal closing phase will be a value-added to the process of maturity of this instrument. In addition, the increasing level of data and information available, together with a progressive standardization of financial statements will prove to be a valuable resource for future research purposes and an increasing level of knowledge regarding the key figures that characterize the market.

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APPENDICES

Table IV: Regression analysis on 2-month CAAR SPAC

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,37559966
R Square	0,14107511
Adjusted R Square	0,08303964
Standard Error	0,02146387
Observations	80

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	5	0,00559942	0,00111988	2,43084299	0,04270243
Residual	74	0,03409162	0,0004607		
Total	79	0,03969104			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-0,007677	0,00437365	-1,7552968	0,08334709	-0,0163917	0,00103763	-0,0163917	0,00103763
Market cap	9,9539E-14	4,6798E-12	0,02127	0,98308752	-9,225E-12	9,4242E-12	-9,225E-12	9,4242E-12
Last Close Price	1,416E-05	0,0004733	0,02991847	0,97621262	-0,0009289	0,00095723	-0,0009289	0,00095723
Shares outstanding	-7,358E-12	2,5743E-11	-0,2858208	0,77581396	-5,865E-11	4,3936E-11	-5,865E-11	4,3936E-11
Average trading volume	3,1805E-09	1,5078E-09	2,10938525	0,03829406	1,7617E-10	6,1848E-09	1,7617E-10	6,1848E-09
% traded	0,00370833	0,07874914	0,0470904	0,96256803	-0,1532027	0,16061941	-0,1532027	0,16061941

Table V: Regression output on 6-month CAAR SPAC

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,18684789
R Square	0,03491214
Adjusted R Square	-0,0302965
Standard Error	0,00539606
Observations	80

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	5	7,7946E-05	1,55893E-05	0,53539126	0,74880769
Residual	74	0,0021547	2,91175E-05		
Total	79	0,00223264			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-0,0054927	0,00109954	-4,99546243	3,8006E-06	-0,0076836	-0,0033018	-0,0076836	-0,0033018
Market cap	5,757E-13	1,1765E-12	0,489324937	0,626059	-1,769E-12	2,9199E-12	-1,769E-12	2,9199E-12
Last Close Price	6,7481E-05	0,00011899	0,567120383	0,57234877	-0,0001696	0,00030457	-0,0001696	0,00030457
Shares outstanding	1,1035E-12	6,4718E-12	0,170505349	0,86507805	-1,179E-11	1,3999E-11	-1,179E-11	1,3999E-11
Average trading volum	-2,426E-10	3,7906E-10	-0,63989601	0,52421647	-9,979E-10	5,1274E-10	-9,979E-10	5,1274E-10
% traded	0,02233272	0,01979771	1,1280457	0,26294474	-0,0171151	0,06178051	-0,0171151	0,06178051

Table VI: Correlation matrix

	CAAR 2-MONTH	CAAR 6-MONTH	Market cap	Last Close Price	Shares outstanding	Average trading vol	% traded
CAAR 2-MONT	1						
CAAR 6-MONT	0,459000761	1					
Market cap	0,06915173	0,09082107	1				
Last Close Pric	0,006423523	0,103706208	0,16863758	1			
Shares outstar	0,069599405	0,061512291	0,84065795	-0,0855131	1		
Average tradir	0,370735462	0,06470661	0,30809605	-0,0103835	0,339489226	1	
% traded	0,272649588	0,104989746	-0,1740629	0,05839849	-0,146270773	0,66332938	1

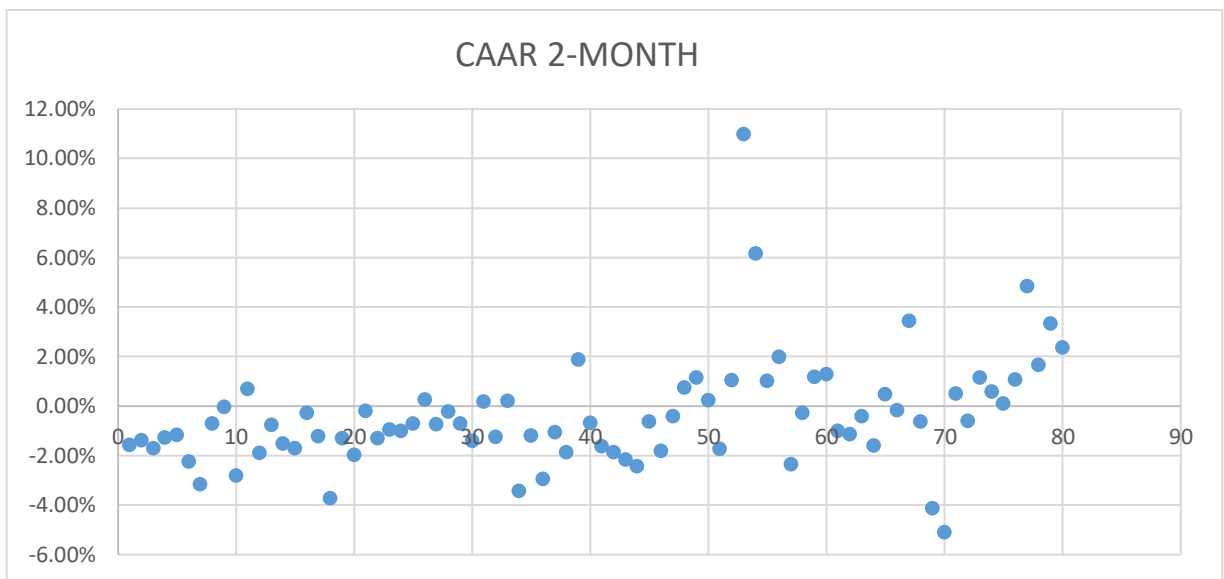


FIGURE 7: CAR 2-MONTH SCATTER PLOT

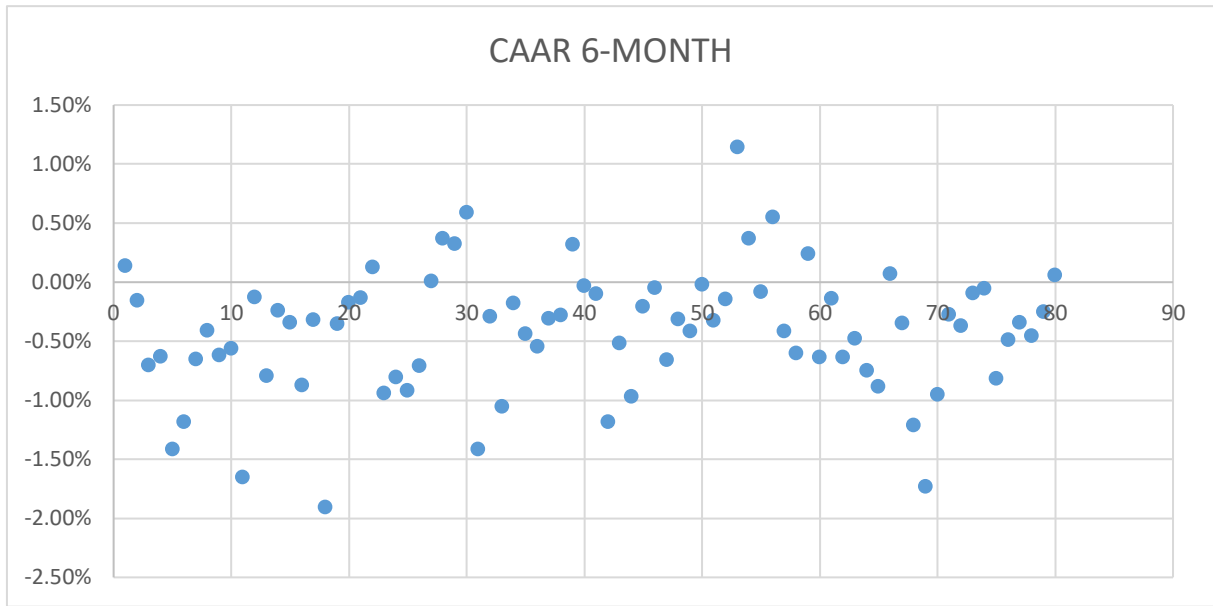


FIGURE 8: 6-MONTH CAAR SCATTER PLOT

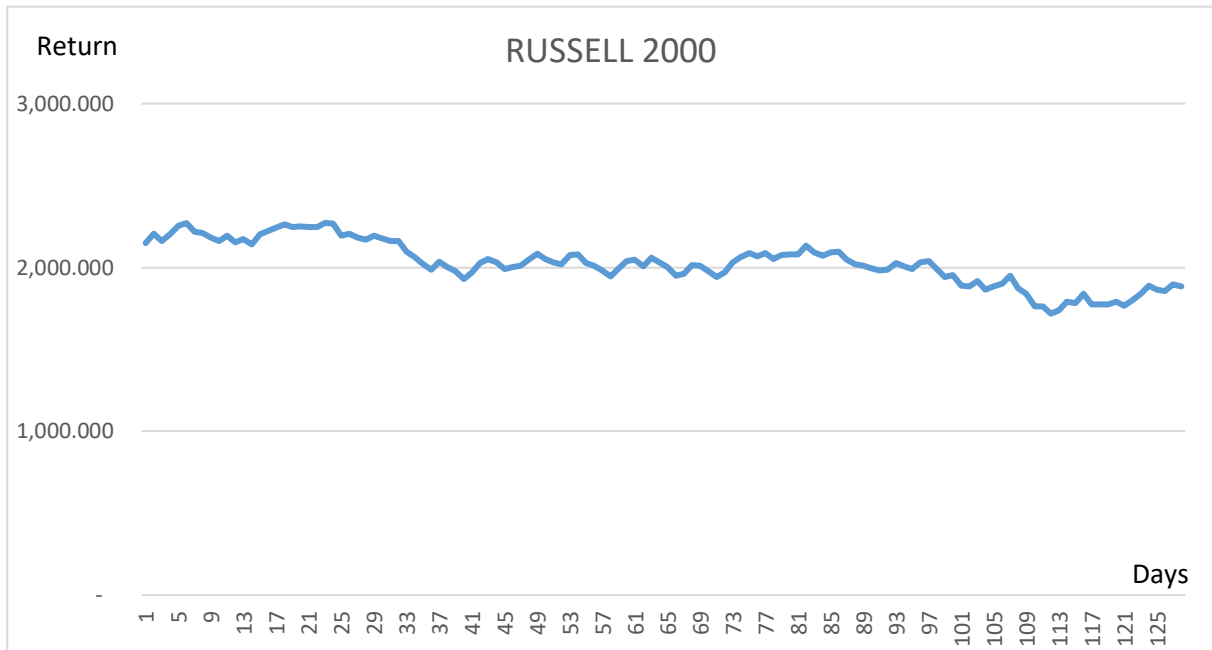


FIGURE 9: RUSSELL 2000 TREND OVER THE PERIOD ANALYSIS