

SPAC sponsors and their effects on SPAC prices



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ผู้สนับสนุน SPAC และผลกระทบต่อราคา SPAC



สารนิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต

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กานดา กาญจนนันท์ : ผู้สนับสนุน SPAC และผลกระทบต่อราคา SPAC. (SPAC sponsors and their effects on SPAC prices) อ.ที่ปรึกษาหลัก : รศ. ดร. คณิสร์ แสงโชติ

วิจัยนี้มีวัตถุประสงค์เพื่อค้นหาผลกระทบจากชื่อเสียงผู้สนับสนุน SPAC หลังการประกาศควมรวมกิจการ วิจัยฉบับนี้ศึกษา SPAC IPOs ซึ่งมี SPAC และบริษัทเป้าหมายที่จะเข้าควมรวมในประเทศไทยสหรัฐอเมริกา และมีการ IPO ระหว่างเดือนมกราคม 2563 ถึงธันวาคม 2564 วิจัยฉบับนี้มีตัวอย่าง 186 SPAC และมี The Forbes 400 ในปี 2564 เป็นตัวแทนสำหรับชื่อเสียงของสปอนเซอร์ ใช้วิธีการศึกษาเหตุการณ์(Event Study)เพื่อทดสอบชื่อเสียงของผู้สนับสนุน SPAC และผลกระทบที่มีต่อราคา SPAC จากผลการศึกษาพบว่าไม่มีหลักฐานทางสถิติว่าชื่อเสียงของผู้สนับสนุนมีผลกระทบต่อราคาของ SPAC ในวันที่ประกาศการรวม มีคำอธิบายที่เป็นไปได้สองประการสำหรับการค้นพบนี้ 1) SPACs มีโครงสร้างและประพฤติไม่เหมือนสินทรัพย์ประเภทอื่นในตลาด 2) Forbes 400 ในปี 2564 ที่ใช้เป็นตัวแทนชื่อเสียงของผู้สนับสนุนในบทความนี้อาจไม่เหมาะสำหรับการศึกษาวิจัย นอกจากนี้ ยังไม่พบหลักฐานว่า SPAC ที่ควมรวมกับบริษัทในอุตสาหกรรมเทคโนโลยีมีผลกระทบต่อราคา SPAC ในวันที่ประกาศการรวม เนื่องจากพฤติกรรมการซื้อขายของนักลงทุนนั้นแปลกประหลาด และ SPAC ก็มีโครงสร้างและประพฤติไม่เหมือนสินทรัพย์ประเภทอื่นๆ ในตลาด

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สาขาวิชา การเงิน

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KEYWORD SPAC, IPO, Special Purpose Acquisition Company,

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Kanda Karnjanonun : SPAC sponsors and their effects on SPAC prices. Advisor: Assoc. Prof. Kanis Saengchote, Ph.D.

The purpose of this paper is to find the effect from SPAC sponsor after the merger announcement. I study SPAC IPOs which had acquiror and target nation in the United States and were public between January 2020 and December 2021. The final sample has 186 SPACs. I select The Forbes 400 in 2021 as a proxy for sponsor reputation. I use event study methodology to test for SPAC sponsors and their effects on SPAC prices. I find that there is no statistical evidence that sponsor reputation has impact on SPACs price on the announcement date of combination. There are two possible plausible explanations for this finding. 1) SPACs are structured and behave unlike any other asset class in the markets. 2) The Forbes 400 in 2021 that use as a proxy for sponsor reputation in this paper may not be appropriate for the study. Moreover, I cannot find the evidence that SPACs with technology company has impact on SPACs price on the announcement date of combination. Because investor trading behavior is bizarre, and SPACs are structured and behave unlike any other asset class in the markets.



Field of Study:	Finance	Student's Signature
Academic Year:	2021
		Advisor's Signature
	

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Kanda Karnjanonun

TABLE OF CONTENTS

	Page
.....	iii
ABSTRACT (THAI)	iii
ABSTRACT (ENGLISH).....	iv
ACKNOWLEDGEMENTS.....	v
TABLE OF CONTENTS.....	vi
1. Introduction	8
1.1 Background and Significance of the problem	8
1.2 Research Question	13
1.3 Objective and Contribution	13
2. Literature review	13
2.1 SPAC	13
2.2 The Law of One Price.....	16
2.3 Sentiment.....	16
2.4 Sponsor Reputation and Influencer Endowment	18
2.5 Technology industry.....	20
3. Hypothesis development	24
4. Data.....	28
5. Event Study Methodology	36
6. Results	40
6.1 Abnormal Returns	40
6.2 Cumulative Abnormal Returns.....	45
6.3 Regression results.....	48
7. Conclusions	50
REFERENCES	51
VITA.....	55



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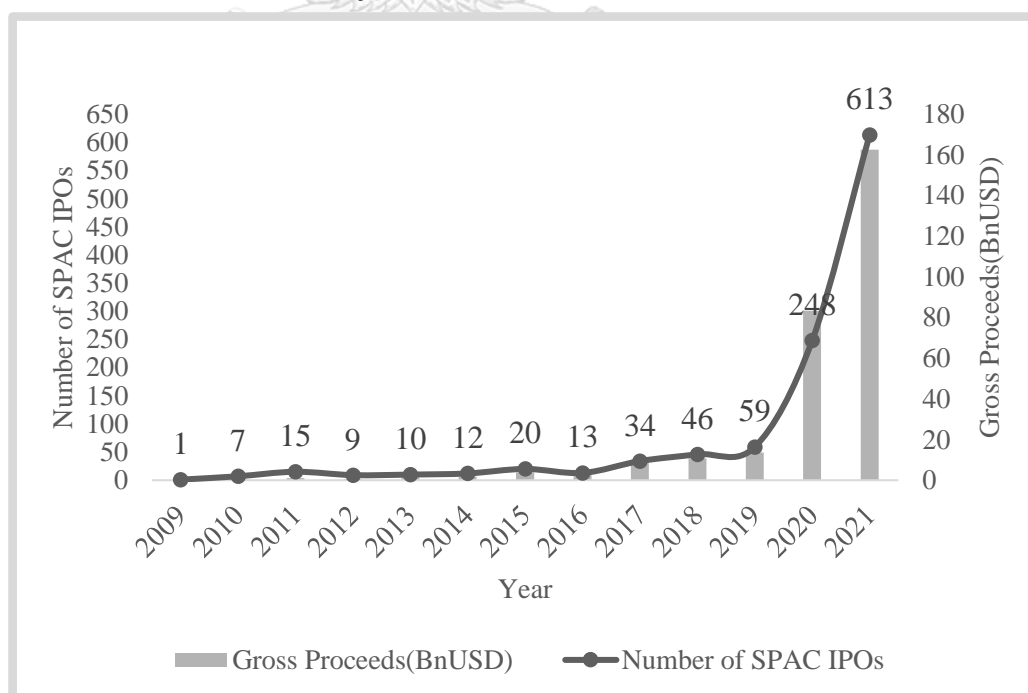
1. Introduction

1.1 Background and Significance of the problem

A Special Purpose Acquisition Company or SPAC is a blank check company which does not yet have its own commercial operation. SPAC raises capital at unit price of \$10 each in the IPO while has 2 years for finding a private company to merger and then bring the company public. Unlike traditional IPO, SPACs lack historical performance, asset, and product. The thing investors know about SPAC is Sponsor which has very important role for consummating the merger. SPAC cannot have the target company before going to the IPO which required by The Securities and Exchange Commission or SEC. If SPAC cannot complete the merger within a timeframe, typically 2 years. It liquidates and return all capital with interest to investors.

In 2020, SPAC IPOs list hits a high record by raising \$ 83.3 billion from 248 SPACs. While there are traditional IPO of 165 raising \$61.9 billion. SPACs raising trend is continuing. In 2021, There are SPACs total of 613 with raising \$ 162 billion.

Figure 1 : The total number of SPAC IPOs and Gross Proceeds(BnUSD)



Source : spac insider

After SPAC IPOs, SPACs are capital pools having a known value that can be used. These capital pools are ready for the merger. SPAC IPO is \$10 per unit which is typically included common stock, warrant and right. Price for combination with the target company is approximately \$10 as well because \$10 is amount of cash per unit in an escrow account (trust). At the time of the merger, SPAC delivers cash in an escrow account (trust) to the target company, which will be calculated in proportion to the target company's value. As a result, a certain amount of SPAC cash will be delivered in exchange for a smaller percentage share of the merged company if the target has higher value (Saengchote 2021). Moreover, when sponsors invite a Private Investment in Public Equity (PIPE) which is sponsor itself or third parties providing additional cash to offset redemptions. This share price is also \$10. Therefore, it should trade at around \$10 until merger consummation date. However, many SPACs price in 2020 trade more than \$10 (Saengchote 2021). These seem to be continued and there are mispricing in the market.

Capital markets have long been seen to follow the efficient-market hypothesis in traditional finance theory. The efficient-market hypothesis assumes share prices fully reflect all available information at any time. Therefore, it is not easy to earn abnormal return. The efficient market also holds another assumption, all investors are rational. In reality world, however, many individual investors make decisions based on biases or irrational that may occur from many behaviors. Such as the problem with overconfidence, investors tend to overestimate their abilities, knowledge and control on investment as better than they are. It may come from limited time or information. Another example (Steib 2021) indicate case of Hertz going to the bankruptcy that many retail investors did not fully understand that the shares most likely to fall to zero. They still bought this share. This show that many investors logic is irrational. As a result, bias or irrational behavior leads to make a poor decision and create a anomalies price in the market. These anomalies price contradict to the principle of market efficiency.

The basic economic theory about price is the law of one price (also known as LOOP). This theory states that identical products must have the same price in different markets. The assumption is no transaction costs, no barriers to trade, identical products in different market, and no restrictions on pricing adjustment. In financial market where competition is likely to be perfect and transaction costs are low. The law of one price can be apply in many aspects of financial markets. At the time of combination for SPACs, price per share should trade around \$10 because this price is amount of cash per share SPAC having to deliver to the target company. Moreover, PIPE also purchases share at price \$10 to replenish some cash that SPAC paid out to redeem its shares after the combination announcement. Consider of the case of SPACs, many SPACs trend to have price deviated from \$10 on the combination announcement date and after the announcement date. However, this mispricing happens only in some specific case of SPACs. For example, mispricing appears in the case of merger with related electric vehicle (EV) targets(Saengchote 2021) or in the case of having sponsors that get interested from investors on the market.

Arbitrage is the driving force behind LOOP in financial market. An example of arbitrage is the acquisition of an asset in one market and simultaneous sale of that asset at a higher price in another market. Therefore, investors can get a profit from the difference in price between two markets. This profit can be used as an award to arbitrageurs to have an incentive to do arbitrage. As a result, security prices follow the law of one price. One strategy of arbitrage is short selling which is if arbitrageurs believe that security price will decrease. They will borrow securities. Then, sale these securities to buyers who willing to buy at the market price. Thus, arbitrageurs have to bet with the market that price will go to decline. They can purchase it at lower price and then return it to lenders with fees. Arbitrageurs face a risk that security price will not go to decline. There is no limit to the amount of money arbitrageurs can lose if the price go higher. Moreover, in some cases fees from short selling are very high. Shorting cost can be used as a reason why arbitrageurs avoid to short sell some

securities. The violation of the law of one price happens in market from shorting cost. Therefore, mispricing can be caused by bias or irrational investors and arbitrage costs.

In 2020, Individual investors' share of US equity trading activity is expected to have risen to around 20%. However, there are retail investors in July 2020 accounted for up to 25% of the stock market's activity. The trend of increased retail investor participation in the market is unlikely to fade away. Main driven is from apps like Robinhood, trade with no commission and no per contract fee when purchasing or selling options, which continues to attract new investors. Robinhood is easy to use, investors are able to access the system to trade via their phone, and provide a collection of all information from the internet such as social media instead of research paper in traditional way. Base users of Robinhood are youth and irrational in some case. Many investors are the first trader and mainly use information from social media like Reddit, Facebook, Instagram, and Twitter(Steib 2021). The rise in retail investors is coming together with SPAC IPOs' boom and rising trend of these is continuing. At the same time, COVID-19 spread around the world. To control this pandemic, physical separation and quarantine were required to use during this outbreak. The lockdown order announced around the world. Human behaviors changed from offline to online attempting to maintain the ordinary activity (e.g., shopping, learning, working, meeting, and entertaining). Resulting in revenue increased in technology company causes the share price increase during the pandemic(Pisal 2021). This impact on SPAC that has target company in technology industry.

For SPACs, The majority of SPAC sponsors come from a background in private equity and hedge funds(Klausner and Ohlrogge 2020), (Gahng, Ritter et al. 2021), and(Bai, Ma et al. 2021). Due to the SPAC's non-existent historical performance, Sponsor reputation effect on its combination from selecting the target company. The high VC reputation creates strong the post-IPO long-term performance (Siang 2009)(Krishnan, Ivanov et al. 2009). Other things that effect the performance of venture

capitalists are their network. VC firms with better networks have much greater fund performance(Hochberg, Ljungqvist et al. 2007). Furthermore, Sponsors can be seen in the same way that celebrity endorsements are. They have also been connected to a rise in the company's stock and created an abnormal return on stock on the announcement day of the endorsement contracts(Agrawal and Kamakura 1995). Therefore, Sponsor reputation have impact to SPAC price.

In this paper, I study SPAC IPOs which had acquiror and target nation in the United States and were public between January 2020 and December 2021. I choose this time period because this time SPAC IPOs boomed and mispricing start to appear in the market. I collected information from Refinitive SDC Platinum. After excluding SPACs traded in Over-The-Counter (OTC) markets and SPACs that missing information. I manually cross-checked with U.S. Securities Exchange Commission's Electronic Data Gathering Analysis and Retrieval website (SEC EDGAR) database, SPAC Track, SPAC insider and news. The final sample has 186 SPACs. For the SPAC stock price and CRSP index, I collected information from Refinitiv Datastream.

For the sponsor detail, I manually collected information from U.S. Securities Exchange Commission's Electronic Data Gathering Analysis and Retrieval website (SEC EDGAR) database, Form S-1. I classify high reputation sponsor as a influencer or celebrity that get well-known and interesting from public. Therefore, I select The Forbes 400 in 2021¹. I use event study methodology to test for SPAC sponsors and their effects on SPAC prices.

Many existing research studies SPAC in term of IPOs and structure. In 2020, SPAC IPOs list hits a high record, and it seems to appear mispricing in the market(Saengchote 2021). In this paper, I focus on SPAC price that caused by a behavioral investor who was influenced by SPAC sponsor.

¹ <https://www.forbes.com/forbes-400/>

1.2 Research Question

In this paper, I aim to answer the question “SPAC sponsors effects on SPAC prices” and fill the gap in the existing research.

1.3 Objective and Contribution

The purpose of this paper is to find the effect from SPAC sponsor after the merger announcement. Moreover, This research offers empirical evidence for the relationship between SPAC sponsor and SPAC price when announcement for combination which is not many studies ever tested before. I make the following literature's contributions. First, my paper contributes to the SPAC investment dimension literature by identifying mispricing from key person, Sponsor, can directly influence SPAC price after the announcement date of combination. Second, the paper provides a extensive literature review with the significant findings about SPAC, retail investors, venture capitalists' reputation and network

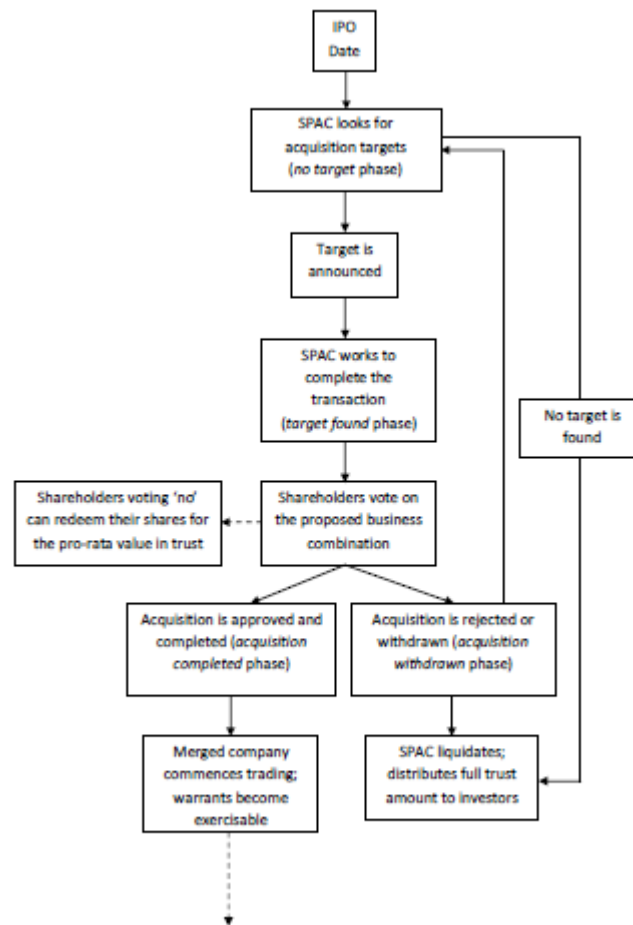
This paper can be beneficial for all investors or whoever is interested in SPAC.

2. Literature review

2.1 SPAC

(Lewellen 2009) represents SPAC as a new and interesting asset class within the U.S. public equity markets and describe the fundamental differences between SPACs and other types of public equity. The finding is that SPACs are structured and behave unlike any other asset class in the markets. They are similar to a risk-free asset with a beta of zero in the early stages of their lifetime, yet many of them instantly transform into "typical" common stock with a beta near one. Their trading behavior is bizarre, and their shareholders do not appear to be rational.

Figure 2 : Lifecycle of SPAC from (Lewellen 2009)



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There are many aspects that SPAC IPOs are different from traditional IPOs. (Gahng, Ritter et al. 2021) find that it is significantly more expensive to merge with a SPAC than to conduct a typical IPO but there are several relative benefits of combination with SPAC over a traditional IPO. During SPAC period, it has been 9.3% of average annualized return while during DeSPAC period was underperform the market. In the same way, (Klausner and Ohlrogge 2020) analyze the SPAC structure and cost. They find that costs built into the SPAC structure are the implicit costs which higher than traditional IPO cost. Moreover, The majority of SPACs' share prices fall after the merger, and These price declines are strongly related to the SPAC's dilution, or cash shortfall, in the SPAC. Similar to traditional IPOs, SPACs' volume

swings over time. (Blomkvist and Vulanovic 2020) interest in the time-series determinants of the fluctuations in the SPAC share and volume. According to their findings, The SPAC share and volume are negatively related to both the market uncertainty(VIX) and the variance risk premium(VRP) . On the other hand, They also mention to a positive correlation between the Sponsor stock and both the market uncertainty (VIX) and the variance risk premium(VRP)

Other different aspects of the SPAC target firms and traditional IPO firms are characteristic. (Bai, Ma et al. 2021)define that SPAC target firms are smaller, younger, and riskier traditional IPO firms when they go public. There are statistics that SPAC firms grow in term of asset, market capitalization, and revenue at similar or higher rates as compared to IPO companies after going public in the three years. Moreover, they find the co-movement between equity market sentiment and SPAC activity. In addition, The SPACs market share is significantly associated with the sentiment of the equities market.

Due to SPAC lack of operational history, Sponsors or CEOs can create trustworthiness to investors when SPAC going public. (Blomkvista, Nocera et al. 2021)examine whether the SPAC CEOs characteristic correlated with SPAC IPO outcome and find that SPAC CEOs are likely to have a degree of Doctor and MBA comparing to traditional IPO firms. In addition, more reputable and financial expert CEOs can credibly convey the value of the offering to outsiders, thus reducing information asymmetries surrounding the SPAC listing, resulting in larger SPACs and increased demand of the offering.

(Saengchote, 2021) focus on the investment dimension from a behavioral finance perspective. The finding is that many SPACs are trading at prices considerably over the \$10 in 2020, which can be viewed as mispricing. Many mispriced SPACs are associated with electric vehicle-related businesses, which may be due to the "Tesla effect," which can reflect behavioral bias.

2.2 The Law of One Price

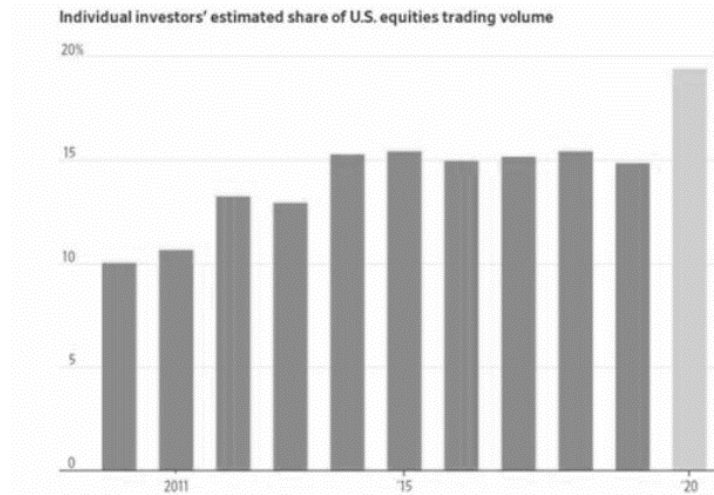
The law of one price (also known as LOOP) is an economic theory that states that identical products must have the same price in different markets. However, LOOP is based on several assumptions such as no transaction costs, no barriers to trade, identical products in different market, and no restrictions on pricing adjustment. Most of traditional finance relies on models which economic actors are believed to be rational, which implies they are efficient and unbiased consumers of relevant data and make decisions that maximize utility. To buy overpriced security, (Lamont and Thaler 2003) explain that one needs investors who are (in our specific case) irrational, woefully uninformed, or endowed with very strange preferences. A rational arbitrageur fails to short the overpriced security due to shorting costs. Irrational investors' demand for certain shares was too strong compared to the market's ability to supply these shares via short sells, As a result, price was unreasonably high which is similar to (Kabir 2017). Moreover, he also defines that investor's financial decisions can be not fully rational because of behavioral biases. Overconfidence and overoptimism are an example of behavioral bias. Investors overestimate their ability and the accuracy of the information they have due to regret aversion, mental accounting, frame dependence and anchoring, availability bias, conservatism, and representativeness.

2.3 Sentiment

According to Bloomberg news², Individual investors' share of US equity trading activity has ranged between 10-15 percent over the last ten years, and is expected to have risen to around 20% by 2020. However, there are retail investors in July 2020 accounted for up to 25% of the stock market's activity.

² <https://www.bloomberg.com/news/videos/2020-07-09/citadel-s-mecane-says-volatility-behind-rise-in-retail-investing-video>

Figure 3 : Individual investors share of US Equity trading volume



Source : The Wall Street Journal via Bloomberg

The trend of increased retail investor participation in the market is unlikely to fade away. Main driven is from apps like Robinhood(Steib 2021), trade with no commission and no per contract fee when purchasing or selling options, which continues to attract new investors. Due to the pandemic which is COVID-19 in 2020, the United States and the rest of the world were under lockdown. People are adopting a new work-from-home lifestyle. Moreover, students went home to study mainly taught via Zoom. Technology firms were one of the industries that gained the most from the epidemic and lockdowns(Vargo, Zhu et al. 2020, Pisal 2021).(Steib 2021) find that Robinhood's user base is youth. Everyone has access to information via the internet by using platforms like Reddit, Facebook, Instagram, and Twitter. He also indicate from the example of Hertz going to the bankruptcy. Many retail investors still bought it due to they did not fully understand that the shares most likely to fall to zero. As a result, the shares leave them with a total loss. This indicate that retail investors logic is irrational.

Another literature review that investigates retail investors is(Barber and Odean 2008). They examine the attention-driven buying behavior by use the events which are likely to got investors'

attention that is stock with high abnormal trading volume, stock with extreme one-day return and stock in news. They find that individual investor are net buyers on high-volume days and when stock in news, even in negative or positive one-day return. While institutional investors have more resources and time to monitor a wider range of stocks. They are less likely to make impulsive purchases.

Moreover, (Bai, Ma et al. 2021) tests show that a one-standard-deviation increase in equity market sentiment index is associated with a 6.5 percentage point increase in the quarterly market share of SPAC IPOs. Therefore, they conclude that there are the co-movement between equity market sentiment and SPAC activity.

2.4 Sponsor Reputation and Influencer Endowment

(Ritter 2015) study a growth capital-backed IPO. He define a growth capital-backed IPO on the basis of three criteria : 1) The issuing business has a financial sponsor who invests actively and provides equity capital; 2) the financial sponsor does not necessarily take a controlling position, unlike a buyout; and 3) the issuer has been investing in tangible assets as a key portion of its business and/or making significant acquisitions, unlike pure venture capital. Growth capital investing is the financing of growing businesses that are investing in tangible. It is a subset of venture capital. Growth capital is correlated with the industry that the company operates in retailing, restaurant chains, and health care management, and represents 12% of all venture capital (VC)-backed initial public offerings (IPOs). He finds that investing in growth capital-backed IPOs has produced mean 3-year style-adjusted buy-and-hold returns of +25.2%, in contrast to style-adjusted returns of approximately zero for other VC-backed and buyout-backed IPOs.

(Gomez-Mejia, Balkin et al. 1990) investigates the role of the venture capitalist in the management of the high tech firm. Attention of this paper is directed toward the nature of venture capital influence, extent of influence, and factors moderating that

influence. They use a qualitative research method that included both interviews and participant observation in the research. Results show that CEOs see the venture capital 's influence as beneficial in terms of financial concerns, source of capital, financial management and boundary spanning activities that involved in networking, competitive market analysis. Involvement of the venture capital in internal management matters is often seen negatively. One interesting conclusion is that CEOs and venture capitals have opposing opinions on the venture capitals' contributions to the firm's internal management.

(Siang 2009)research on the reputation of a venture capital firm has an impact on the long-term operating performance and survival of its start-up company. He proxies venture capital reputation by market share, IPO share, and firm age. He finds that start-ups with a greater venture capital market share and a higher venture capital IPO share have a lower risk of de-listing. In other words, the survival rate is higher in startup companies with backing by higher venture capital's reputation. Furthermore, venture capital reputation have positive and strong correlation with the post-IPO long-term performance metrics which is similar to(Krishnan, Ivanov et al. 2009). Other things that can help venture capitalists are their network. (Hochberg, Ljungqvist et al. 2007)discover that venture capital firms with better networks have much greater fund performance. They measured by the percentage of investments that are successfully exited through an IPO or a sale to another company.

(Agrawal and Kamakura 1995)use an event study to investigate the impact of celebrity endorsement contracts on the expected profit of the firm. Resulting from the findings of an event analysis is celebrity endorsement contracts have a positive impact on stock returns on the announcement day of the endorsement contracts. They also suggest that celebrity endorsement contracts are viewed as a worthwhile investment in advertising. Another way to influence is through the internet. (Hirschey, Richardson et al. 2000)study the effect of buy/sell stock recommendations published on the Internet, the Motley Fool which is a popular stock chat website with high visibility, move prices and trading volumes by

using event study. They find that the effect on the nightly performance recap of The Motley Fool's Rule Breaker Portfolio, include high-flying internet stocks, small-cap high-tech stocks, larger-cap high-tech stocks, beaten-down DJIA stocks that provide buying announcements for small-cap growth stocks create statistically significant abnormal returns. The effects were generally larger than those following secondhand buy recommendations published in the print media or after a stock purchase recommendation on the television program "Wall Street Week". Moreover, The Motley Fool buy announcements are closely followed and acted on by Internet investors. These follow and act also created unusual trading volume. Similar to (Karniouchina, Moore et al. 2009) use an event study methodology to calculate the amount of the next-day anomalous market reaction to Mad Money with Jim Cramer suggestions who former hedge fund manager. Mad Money is an American finance television program airing on CNBC. It provides investment and speculation, particularly in public company stocks. They find that stocks recommended during the show experienced abnormal returns before the recommendation. Although viewers actively seek suggestions, the findings reveal that any individual suggestions is still subject to many of the same communication challenges as traditional advertisements. According to a regression analysis, typical advertising characteristics including message length, recency-primacy effects, information clutter, and source credibility affect the size of the market reaction to a "buy" recommendation.

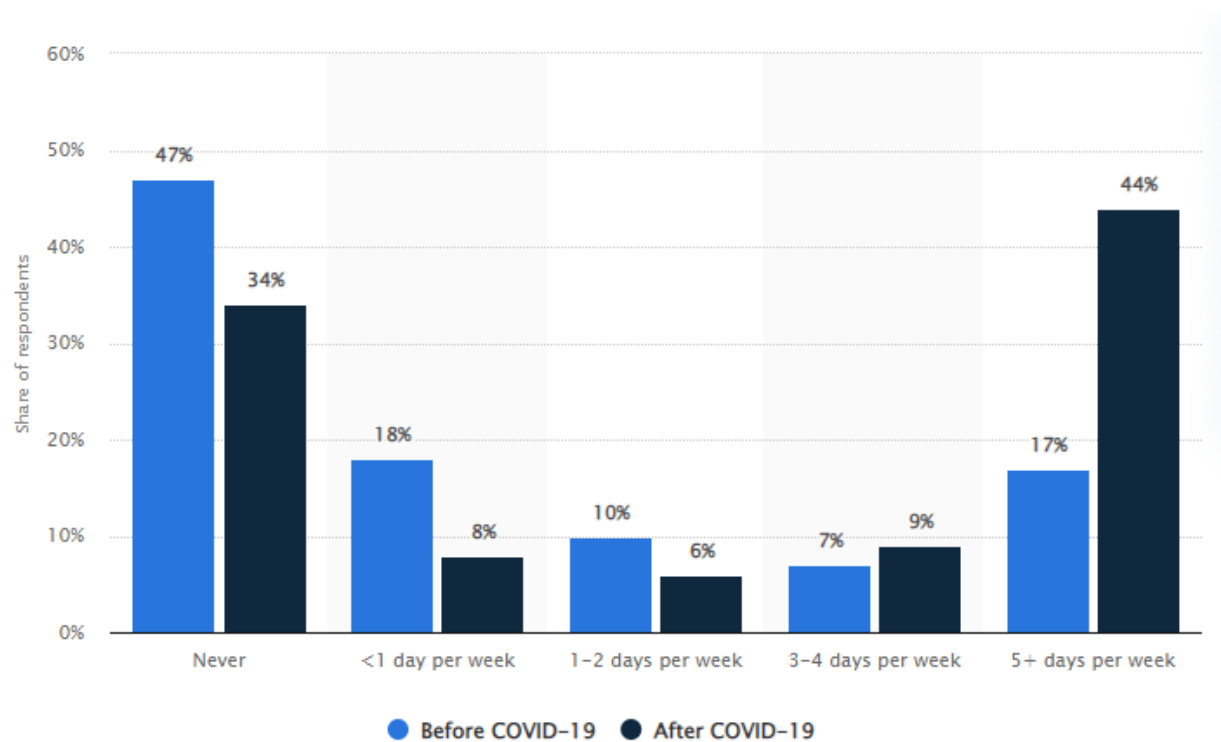
2.5 Technology industry

In recent years, the relationship between humans and digital technologies has been researched. (Vargo, Zhu et al. 2020) synthesizes the rapidly growing literature on the use of digital technologies during the present COVID-19 pandemic. It discusses the four topics listed below: (1) the specific digital technologies that were used, (2) the specific populations who used these digital technologies, (3) the specific activities in which individuals and groups used these digital technologies, and (4) the specific effects of using these digital technologies on humans during the COVID-19. They find that the 281 empirical papers. They discovered that

(1) 28 different types of technologies have been used, ranging from computers to artificial intelligence, (2) 8 different populations of users, primarily medical professionals, (3) 32 generalized types of activities are involved, such as providing health services remotely, analyzing data, and communicating, and (4) 35 different effects have been observed, such as improved patient outcomes, continued education, and decreased outbreak impact.

(Mlitz 2021) conducted a study with 365 respondents. Participants were asked about their frequency of work - from home affected before and after Covid-19. The finding is that before the COVID-19 pandemic, during the pandemic, 17 percent of U.S. employees worked from home 5 days or more per week, rising to 44 percent. The COVID-19 pandemic increased the remote working trend, as quarantines and lockdowns made commuting and working in an office nearly impossible for millions of people around the world. Remote work, also known as telework or working from home (WFH), offers a solution, with people performing their responsibilities away from the office and backed by specialized technology, eliminating the need for employees to commute to an office in order to stay connected with colleagues and clients. Employees rely on remote work options to facilitate hybrid work and keep it secure amid the COVID-19 epidemic. Remote work technology, such as laptops, experienced a dramatic increase in demand, video conferencing firms such as Zoom increased in value, and employers were forced to adopt new communication methods and resources.

Figure 4 : Remote working frequency before and after COVID-19 from (Mlitz 2021)



(Watson 2020) conducted an online global survey from people age 16-64 years old. The findings are that the COVID-19 epidemic has had a direct impact on in-home media consumption around the world, with 35 percent of total respondents reporting that they have read more books or listened to more audiobooks at home, and 18 percent reporting that they have listened to more radio, whereas more than 40% of consumers spent more time on messaging services and social media. Surprisingly, while at least 50% of respondents in most nations claimed they were viewing more news coverage, statistics for Australia and the United States were lower, at 42 and 43%, respectively. Australians were also the least likely to be reading more newspapers; only 5% of consumers reported doing so, compared to a global total of 14%. While 60% of Italians were spending more on texting services, only 8% of respondents in Japan agreed, while survey participants from China and the Philippines were by far the most likely to be spending more time on music streaming services.

Figure 5 : In-Home Media Consumption during the COVID-19 Pandemic from (Watson 2020)

Characteristic	Worldwide	Italy	Spain	France	Germany	China	United States
Watching more news coverage	67%	67%	63%	50%	60%	77%	43%
Watching more shows/films on streaming services (e.g. Netflix)	51%	53%	58%	31%	21%	63%	42%
Watching more TV on broadcast channels	45%	55%	43%	53%	35%	46%	42%
Spending longer on messaging services (e.g. WhatsApp, Facebook Messenger, etc)	45%	60%	61%	24%	22%	59%	17%
Spending longer on social media (e.g. Facebook, Instagram, Twitter etc)	44%	52%	49%	27%	21%	50%	32%
Spending more time on computer/video games	36%	41%	48%	39%	21%	29%	29%

Moreover, (Pisal 2021) investigated what were the primary elements that led to the rise of Facebook, Apple, Amazon, Netflix, and Google (FAANG) during the Covid-19 pandemic, while other small firms struggled to survive? The finding is that During the pandemic, not only FAANG's income rise, but so their stock prices. The increase in share prices was caused by increased revenue from firms during the COVID-19 pandemic, as well as a large number of people investing their money in the stock market during the pandemic. There are various factors in the research such as lockdown orders across the United States, an increase in social media consumption, an increase in online purchasing due to the closure of physical stores and shopping malls, and work from home all contributed to the rise of FAANG.

(Steib 2021) find that Robinhood's user base is youth. Everyone has access to information via the internet by using platforms like Reddit, Facebook, Instagram, and Twitter. (Pyun, 2021) discovered that live group chats assist investors uncover high alpha companies and are more informative than individual postings and comments in investment forums, based on data from investing-related chat rooms. Moreover, The 15 most-mentioned stocks and Top 5 Most Mentions by Month in Discord and Reddicit WSB are mainly from the technology sector. (Corbet, Yang (Greg), Yang , & Les , 2021) find evidence from the infamous Reddit-based/wallstreetbets forum. The forum user's growth are significantly increase in the same way with abnormal return and the reach of such comments. There is 5.6% abnormal return in technology stocks.

3. Hypothesis development

After SPAC IPOs, SPACs are capital pools having a known value that can be used. These capital pools are ready for the merger. SPAC IPO is \$10 per unit. Price for combination with the target company is approximately \$10 as well because \$10 is amount of cash per unit in an escrow account (trust). At the time of the merger, SPAC delivers cash in an escrow account (trust) to the target company, which will be calculated in proportion to the target company's value. The higher target company's value, The lower percentage share of the merged company(Saengchote 2021).

SPAC IPOs boomed starting in 2020 (Gahng, Ritter et al. 2021) and This trend come with the increase in retail investors³ more than expectation. At that time, there is the anomalous mispricing in many SPACs. It traded more than \$10(Saengchote 2021). The main increase in retail investors came from Robinhood app(Steib 2021). They do a lot of things that don't make sense(Lewellen 2009, Kabir 2017). Such as buying stock going to bankruptcy. Investors from Robinhood are first-time trader and age at average around 26 years old(Steib 2021). These investors can be easily influenced. Because they have not knowledge or

³ <https://www.bloomberg.com/news/videos/2020-07-09/citadel-s-mecane-says-volatility-behind-rise-in-retail-investing-video>

understanding in an investment. This causes them to make poor decisions and result in mispricing in the market(Lamont and Thaler 2003).

The majority of SPAC sponsors come from a background in private equity and hedge funds(Klausner and Ohlrogge 2020), (Gahng, Ritter et al. 2021), and(Bai, Ma et al. 2021). So SPAC target firms are smaller, younger, and riskier than traditional IPO firms when they go public(Bai, Ma et al. 2021). There is one type of venture capitalist that funds retail operations, growth capital investing(Ritter 2015). Due to the SPAC's non-existent historical performance, Sponsor reputation effect on its combination from selecting the target company. Then, operating performance after consummation. The exit strategy of venture capitalist can be seen as an initial public offering (IPO) or a sale to some other firm. The one method of exit strategy is Traditional IPO. The reputation of SPAC sponsors is seemed similar to those of venture capitalists. For venture capitalist, the high VC reputation creates strong the post-IPO long-term performance (Siang 2009)(Krishnan, Ivanov et al. 2009). Other things that effect the performance of venture capitalists are their network. VC firms with better networks have much greater fund performance(Hochberg, Ljungqvist et al. 2007). Furthermore, Sponsors can be seen in the same way that celebrity endorsements are. Celebrity endorsements are often used to promote products and enhance brands for a long time. They have also been connected to a rise in the value of a company's stock and created an abnormal return on stock on the announcement day of the endorsement contracts(Agrawal and Kamakura 1995). Another channel that are popular in receiving news is internet. Many Robinhood users has access to information via the internet by using platforms like Reddit, Facebook, Instagram, and Twitter(Steib 2021). While retail investors trend to be a net buyer compared to institutional investors when they saw stock in news(Barber and Odean 2008). Stock recommendations from internet create significant abnormal returns on day the recommendations published and the effect is very large comparing to the print media or on the television program(Hirschey, Richardson et al. 2000). Stock recommendations from television show also has impact on

stock return. Most of people immediately take action following the recommendation on television show. Therefore, There are abnormal returns during the show(Karniouchina, Moore et al. 2009).

H₁ : On the announcement date of the combination, sponsor reputation has positive impact on abnormal return.

During the pandemic, COVID-19 that is unprecedented. Physical separation and quarantine were required to control this outbreak. People were given orders to stay at home when lockdown was announced. Human behaviors changed from offline to online attempting to maintain the ordinary activity (e.g., shopping, learning, working, meeting, and entertaining). Working in an office seems to be a difficulty due to the physical separation order from the government. Working from home (WFH) rapidly increased compared to before the pandemic(Mlitz 2021). Technology supporting remote work is an necessary thing for work-from-home. Such as laptops, remote control computer software, a cloud-based software, or communication platform. Resulting in increase demand in technology supporting remote work(Vargo, Zhu et al. 2020, Mlitz 2021). People are spending more time at home, on social media news to connect with their friends, they use Facebook, WhatApp, Messenger when they are at home and watching more movies (Watson 2020, Pisal 2021). The education also has changed instead of student going to school. They go through online classes(Vargo, Zhu et al. 2020). Resulting in revenue increased in technology company causes the share price increase during the pandemic(Pisal 2021). (Steib 2021) Robinhood's user base is has access to information via the internet by using platforms like Reddit, Facebook, Instagram, and Twitter. (Pyun, 2021) discovered that live group chats assist investors uncover high alpha companies. The 15 most-mentioned stocks and Top 5 Most Mentions by Month in Discord and Reddict WSB are mainly from the technology sector. The same way with (Corbet, Yang (Greg), Yang , & Les , 2021) find evidence from the infamous Reddit-based/wallstreetbets forum that there is 5.6% abnormal return in technology stocks.

H₂ : On the announcement date of the combination, SPACs with a target company in technology industry has positive impact on abnormal return.



4. Data

In this paper, I study SPAC IPOs which had acquiror and target nation in the United States and were public between January 2020 and December 2021. I choose this time period because this time SPAC IPOs boomed and mispricing start to appear in the market. Moreover, this time is in during COVID-19 that United States had a lockdown. I am interested in technology industry because it is one of industry that benefits from the lockdown and pandemic. Many people are adopting a new lifestyle such as office workers started to work-for-home, students have to stay at home to joint classes taught online. Making products in technology industry very popular at that time.

I collected information from Refinitive SDC Platinum. For the deal status, I choose the company in deal status of pending, the company has been announced the combination but has not been completed or withdrawn, and completed, the combination has closed or known as DeSPAC. I classify the target merger company as a company in technology industry following Refinitive SDC Platinum. The list of high-technology industry from SDC Platinum including pharmaceuticals(28xx), biotechnology(35xx), chemical(36xx), computer(38xx), semiconductor(48xx), and service industries(73xx). After excluding SPACs traded in Over-The-Counter (OTC) markets and SPACs that missing information. I manually cross-checked with U.S. Securities Exchange Commission's Electronic Data Gathering Analysis and Retrieval website (SEC EDGAR) database, SPAC Track, SPAC insider and news. The final sample has 186 SPACs. For the SPAC stock price and CRISPR Therapeutics AG (CRSP), I collected information from Refinitiv Datastream using time period between January 2020 and December 2021. The summary information that I collected is below in Table 1

Table 1 : SPAC IPOs

IPO date	Number of IPO SPACs	Total proceeds (USD mm)	Average proceeds (USD mm)	S.D. proceeds (USD mm)	Median proceeds (USD mm)	Status		Number of Target Company in Technology industry
						Pending	Completed (DeSPAC)	
Jan-20	3	810.00	270.00	112.69	210.00	-	1	-
Feb-20	4	1,470.00	367.50	422.96	175.00	-	-	-
Mar-20	3	860.00	286.67	280.24	200.00	-	1	-
Apr-20	6	1,975.00	329.17	222.36	330.00	-	-	-
May-20	9	2,935.00	326.11	266.48	200.00	-	3	1
Jun-20	8	2,320.00	290.00	212.92	252.50	-	5	1
Jul-20	15	9,685.00	645.67	1,022.68	240.00	-	5	3
Aug-20	24	8,909.13	371.21	263.21	300.00	-	8	3
Sep-20	36	10,150.00	281.94	138.61	275.00	-	9	4
Oct-20	43	13,415.00	311.98	212.06	250.00	-	10	6
Nov-20	29	5,151.00	177.62	66.36	200.00	-	7	4
Dec-20	42	10,315.00	245.60	102.59	240.00	1	8	4
Jan-21	83	20,792.30	250.51	125.13	240.00	1	5	2
Feb-21	88	28,122.70	319.58	237.76	265.00	-	16	10
Mar-21	101	31,300.00	309.90	161.55	300.00	2	10	9
Apr-21	9	2,180.00	242.22	141.22	250.00	1	6	2
May-21	14	2,715.00	193.93	69.40	200.00	2	5	5

IPO date	Number of IPO SPACs	Total proceeds (USD mm)	Average proceeds (USD mm)	S.D. proceeds (USD mm)	Median proceeds (USD mm)	Status		Number of Target Company in Technology industry
						Pending	Completed (DeSPAC)	
Jun-21	26	5,395.00	207.50	96.01	220.00	4	7	8
Jul-21	22	4,425.00	201.14	78.75	200.00	5	7	7
Aug-21	26	4,470.00	171.92	70.47	150.00	7	4	8
Sep-21	29	5,825.00	200.86	70.52	200.00	6	-	2
Oct-21	48	8,375.00	174.48	55.00	180.00	7	-	4
Nov-21	51	9,664.91	189.51	69.45	200.00	12	-	5
Dec-21	36	5,892.00	163.67	65.16	170.00	21	-	14
All	755	197,152.05	261.13	219.74	220.00	69	117	102

For the sponsor detail, I manually collected information from U.S. Securities Exchange Commission's Electronic Data Gathering Analysis and Retrieval website (SEC EDGAR) database, Form S-1. According to Definitions⁴, it defined a celebrity as “a person who has a prominent profile and commands some degree of public fascination and influence in day-to-day media. The term is often synonymous with wealth, implied with great popular appeal, prominence in a particular field, and is easily recognized by the general public. Various careers within the fields of sports and entertainment are commonly associated with celebrity status. These fields have produced prominent figures within these two industries. While people may gain celebrity status as a result of a successful career in a particular field, in other cases, people become celebrities due to media

⁴ <https://www.definitions.net/definition/celebrity>

attention for their extravagant lifestyle or wealth; for their connection to a famous person; or even for their misdeeds. Celebrities may be known around the world, within a specific country; or within a region”.

In this paper, I classify reputation sponsor as a influencer or celebrity that get well-known and interesting from public. Therefore, I select The Forbes 400 in 2021⁵ because it provide source of wealth which 110 names on the list got rich from finance and investment industry. Many people in the Forbes list act like an influencer on the social media or the market. For example, Elon Musk who is the founder, CEO, and Chief Engineer of SpaceX. He always use twitter to sowing fear of missing out(FOMO) in the market. Most of his tweets effect on cryptocurrency market⁶ or Warren Buffett/ Peter thiel who is the most successful investor of all time. nowadays there are many individual investors attempting to invest in the way he did. Moreover, Some on the list are well-known around the world. For example, Mark Zuckerberg who is co-founder of the social media website Facebook that has more than 2.6 billion monthly active users today so it hard to say that someone does not know Mark Zuckerberg or Jeff Bezos who is the founder and executive chairman of Amazon that first is an online marketplace for books but nowadays it like “The Everything Store”. It has expanded into a multitude of product categories such as Amazon Web Services (cloud computing), Zoox (autonomous vehicles), Kuiper Systems (satellite Internet), Amazon Lab126 (computer hardware R&D). Moreover, Forbes first issues 104 years ago. It is a well-known American business magazine mainly owned by Integrated Whale Media Investments which nowadays provide public, private equity investments, and investment services. The Forbes 400 in 2021 consist of the first 400 definitive list of the richest Americans, ranking the country's wealthiest billionaires by their net worth. Billionaires, have aged 26-95 years old, in the list come from many source industry and have their net worth between \$2.1 billion and \$201 billion. There are 110 billionaires having their

⁵ <https://www.forbes.com/forbes-400/>

⁶ <https://www.coindesk.com/layer2/culture-week/2021/12/14/the-elon-effect-how-musk-tweets-move-crypto-markets/>

source of wealth from finance and investment industry. 77 billionaires are from technology industry. There are 45 new names on 2021 that include 2 new billionaires from the SPAC. 11 and 17 new names on the list which have source of wealth from technology and finance and investment industry. 23 names are from hedge funds.

Table 2 : 11 New names on The Forbes 400 in 2021 that have source of wealth from technology industry

RANK	NAME	CHANGE IN WEALTH KEY	AGE	STATE	INDUSTRY	SOURCE
97	Lin Bin	new to list	53	N/A	Technology	smartphones
160	Melinda French Gates	new to list	57	Washington	Technology	Microsoft
206	Bom Kim	new to list	43	N/A	Technology	online retailing
228	Robert Brockman	new to list	80	Texas	Technology	software
236	Matthew Prince	new to list	46	Utah	Technology	cybersecurity
281	George Kurtz	new to list	51	Arizona	Technology	security software
298	Michael Xie	new to list	52	California	Technology	cybersecurity
306	Steven Sarowitz	new to list	55	Illinois	Technology	payroll software
360	Ben Silberman	new to list	39	California	Technology	social media
382	Alexis Lê-Quôc	new to list	46	New York	Technology	cloud computing
398	Paul Sciarra	new to list	40	California	Technology	Pinterest

Table 3: 17 New names on The Forbes 400 in 2021 that have source of wealth from finance and investment industry

RANK	NAME	CHANGE IN WEALTH KEY	AGE	STATE	INDUSTRY	SOURCE
32	Sam Bankman-Fried	new to list	29	N/A	Finance and Investment	cryptocurrency
58	Jeff Yass	new to list	63	Pennsylvania	Finance and Investment	trading, investments
60	Brian Armstrong	new to list	38	California	Finance and Investment	cryptocurrency
102	Mat Ishbia	new to list	41	Michigan	Finance and Investment	mortgage lender(SPAC)
142	Michael Kim	new to list	58	N/A	Finance and Investment	private equity
148	Philippe Laffont	new to list	54	New York	Finance and Investment	hedge fund
216	Scott Shleifer	new to list	44	New York	Finance and Investment	private equity
266	Cameron Winklevoss	new to list	40	New York	Finance and Investment	cryptocurrency
267	Tyler Winklevoss	new to list	40	New York	Finance and Investment	cryptocurrency
283	Ramzi Musallam	new to list	53	New York	Finance and Investment	private equity
332	Fred Ehrsam	new to list	33	Florida	Finance and Investment	cryptocurrency exchange
340	Behdad Eghbali	new to list	45	California	Finance and Investment	private equity
379	J. Tomilson Hill	new to list	73	New York	Finance and Investment	investments
384	Jed McCaleb	new to list	46	California	Finance and Investment	cryptocurrency
389	Bajju Bhatt	new to list	36	California	Finance and Investment	stock trading app
392	Joseph Edelman	new to list	66	New York	Finance and Investment	hedge funds

RANK	NAME	CHANGE IN WEALTH KEY	AGE	STATE	INDUSTRY	SOURCE
400	Austin Russell	new to list	26	Florida	Finance and Investment	sensors(SPAC)

Table 4 : 23 names on The Forbes 400 in 2021 that have source of wealth from hedge funds

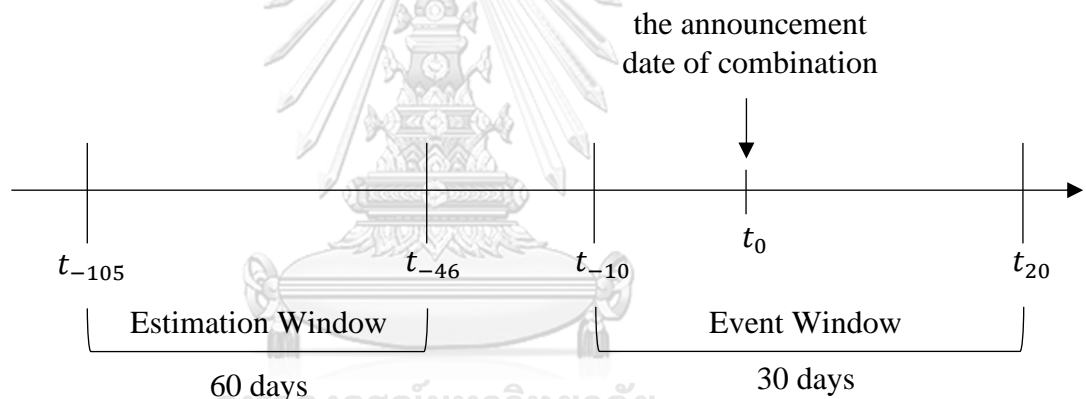
RANK	NAME	CHANGE IN WEALTH KEY	AGE	STATE	INDUSTRY	SOURCE
28	Jim Simons	up arrow	83	New York	Finance and Investment	hedge funds
36	Ray Dalio	up arrow	72	Connecticut	Finance and Investment	hedge funds
47	Ken Griffin	up arrow	52	Illinois	Finance and Investment	hedge funds
48	Steve Cohen	up arrow	65	Connecticut	Finance and Investment	hedge funds
49	David Tepper	up arrow	64	Florida	Finance and Investment	hedge funds
71	Israel Englander	up arrow	73	New York	Finance and Investment	hedge funds
93	George Soros	unchanged	91	New York	Finance and Investment	hedge funds
118	David Shaw	up arrow	70	New York	Finance and Investment	hedge funds
123	Paul Tudor Jones, II.	up arrow	67	Florida	Finance and Investment	hedge funds
138	Stanley Druckenmiller	up arrow	68	New York	Finance and Investment	hedge funds
148	Philippe Laffont	new to list	54	New York	Finance and Investment	hedge fund
149	John Overdeck	unchanged	51	New Jersey	Finance and Investment	hedge funds
150	David Siegel	unchanged	60	New York	Finance and Investment	hedge funds
164	Bruce Kovner	up arrow	76	New York	Finance and Investment	hedge funds
224	Julian Robertson, Jr.	up arrow	89	New York	Finance and Investment	hedge funds

RANK	NAME	CHANGE IN WEALTH KEY	AGE	STATE	INDUSTRY	SOURCE
261	Daniel Och	up arrow	60	Florida	Finance and Investment	hedge funds
264	Paul Singer	up arrow	77	New York	Finance and Investment	hedge funds
282	Daniel Loeb	up arrow	59	New York	Finance and Investment	hedge funds
284	John Paulson	down arrow	65	New York	Finance and Investment	hedge funds
292	Stephen Mandel, Jr.	up arrow	65	Connecticut	Finance and Investment	hedge funds
357	John Arnold	unchanged	47	Texas	Finance and Investment	hedge funds
367	William Ackman	up arrow	55	New York	Finance and Investment	hedge funds
392	Joseph Edelman	new to list	66	New York	Finance and Investment	hedge funds

5. Event Study Methodology

I use event study methodology to test for SPAC sponsors and their effects on SPAC prices. This method takes the market portfolio's returns as a benchmark for normal returns, then looks for any deviations. I assume that the event which is the announcement date of combination takes place at $t = 0$. I use a 60-day estimation window between days -105 and -46 to estimate the normal or expected return and minimize estimation window at 30 days. If SPACs have estimation window lower than 30 days, the samples will not be calculated in my study. For event window, I use a 30-day between -10 and 20 to analysis the pattern of abnormal returns (or mispricing in this case) responded to the announcement date of combination.

Figure 6 : Event Study timeline



Typically, the price of a capital asset is the present value of the future expected cashflows from the asset. However, SPAC price for combination with the target company should be around \$10 because \$10 is amount of cash per unit in an escrow account (trust) that SPAC delivers to the target company. To measure the impact of sponsor on price in the announcement date of combination. I measure the SPAC stock return by comparing the price at the event date

$$R_{it} = [P_{it} - P_{it-1}] / P_{it-1} \quad (5.1)$$

In this case, sometime SPAC price deviated from the price that should be approximately \$10. Therefore, mispricing in SPAC seems to appear in the market. According to (Campbell, Lo et al. 1997), I define the abnormal return is the actual ex post return of the security over the event window minus the normal return of the firm over the estimation window. The normal return is defined as the return that would be expected if the event did not take place. For each firm i and event date τ ,

$$AR_{it}^* = R_{it} - E[R_{it} | X_t] \quad (5.2)$$

Where AR_{it}^* , R_{it} and $E[R_{it} | X_t]$ are the abnormal, actual, and normal returns, respectively, and X_t is the conditioning information to determine normal performance. Among several models (e.g. constant expected returns model, market model, capital asset pricing model), the most one use for estimating expected or normal return is the “market model”. The market model assumes a stable linear relation between the market return and the security return (Fama 1970).

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (5.3)$$

where

R_{it} = the return of stock i at time t ,

R_{mt} = the monthly return on the CRISPR Therapeutics AG (CRSP) equally weighted index,

β_i = a measure of SPAC share i 's sensitivity to market changes,

ε_{it} = the error term.

(Hanssens and Srinivasan 2009) recommended to find a model that best fits the market to make the event study more efficient. (Fama & French, 1992) states three factors that explain cross-sectional differences among stock returns. The additional returns investors can expect to receive by investing in stocks of companies are explained by three factors: the excess return on a broad market portfolio (market risk factor), the difference in return between a large-cap and a small-cap portfolio (size risk factor), and

the difference in return between high and low book-to-market stocks (value risk factor).

$$R_{it} = \alpha_i + \beta_i R_{mt} + s_i \cdot SMB_t + h_i \cdot HML_t + \varepsilon_{it} \quad (5.4)$$

Adding the two factors are related to market anomalies which is size risk factor and value risk factor:

where

SMB_t = the difference between average returns of small and large cap portfolios

HML_t = the difference between average returns on high versus low B/M portfolios

According to the three-factor model, I define abnormal returns as $AR_{it}^* = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt} + \hat{s}_i \cdot SMB_t + \hat{h}_i \cdot HML_t)$ (5.5)

From equation 5.6, I estimate the coefficients $\hat{\alpha}_i, \hat{\beta}_i, \hat{s}_i, \hat{h}_i$ by using a linear regression over estimation window of 60 days between -105 to -46 days associate with the event day, $t = 0$ for the announcement date of combination.

To calculate the average abnormal return across stocks in the sample

$$\overline{AR}_t = \frac{1}{N} \sum_{i=1}^N AR_{i,t} \quad (5.6)$$

To calculate the cumulative abnormal return(CAR) across stocks, the abnormal return of each stock is aggregated over the event window a 30-day between -10 and 20.

$$CAR_{(T-10, T_{20})} = \sum_{t=T-10}^{T_{20}} \overline{AR}_t \quad (5.7)$$

According to the law of one price, identical products must have the same price in different markets. It implies that AR_{it}^* is a random variable with mean equal to 0. Because the deviation between actual and normal return of asset i should not be different from 0.

To test the significance of abnormal returns, I use a traditional time-series standard deviation t-statistics test(Brown and

Warner 1985) to detect the significance of the abnormal returns over a specified time frame.

$$t_{\overline{AR}} = \overline{AR}_t / \hat{S}(\overline{AR}_t) \quad (5.8)$$

where

$$\overline{AR}_t = \frac{1}{N} \sum_{i=1}^N AR_{i,t} \quad (5.6)$$

$$\hat{S}(\overline{AR}_t) = \sqrt{\sum_{t=-10}^{t=20} (\overline{AR}_t - \overline{\overline{AR}})^2 / 30}$$

$$\overline{\overline{AR}} = \frac{1}{29} \sum_{t=-10}^{t=20} \overline{AR}_t$$

I test $H_1 - H_2$ by estimating two regression equations, one for SPACs that a sponsor has a reputation and another one for SPACs that has a target company in technology industry. Because my goal is to determine the factors that effect to the mispricing in SPACs, I estimate a regression with the abnormal return on the announcement date of combination which is event window $[0, 0]$, AR_0 . I determine the model for H_1 as below:

$$AR_t = \beta_0 + \beta_1(rep) + \beta_2 \ln(Size) + \beta_3 NYSE + \beta_4 NASDAQ + \varepsilon$$

where AR_t is a dependent variable. rep is dummy variables (equal 1 when sponsor has reputation and equal 0 when sponsor has no reputation).

H_1 : On the announcement date of the combination, sponsor reputation has positive impact on abnormal return. I state the hypothesize:

$$\text{Null hypothesis} \quad : \quad \beta_1 \leq 0$$

$$\text{Alternative hypothesis} \quad : \quad \beta_1 > 0$$

Another one for SPACs that has a target company in technology industry, H_2 . The model for H_2 is below:

$$AR_t = \beta_0 + \beta_1(tech) + \beta_2 \ln(Size) + \beta_3 NYSE + \beta_4 NASDAQ + \varepsilon$$

where AR_t is a dependent variable. *tech* is dummy variables (equal 1 when SPACs' target company is in the technology industry and equal 0 when SPACs' target company is not in the technology industry).

H_2 : On the announcement date of the combination, SPACs with a target company in technology industry has positive impact on abnormal return. I state the hypothesize:

Null hypothesis : $\beta_1 \leq 0$

Alternative hypothesis : $\beta_1 > 0$

6. Results

6.1 Abnormal Returns

According to (Hanssens & Srinivasan, 2009), I use “market model” (Equation 5.3) and “three factors model” (Equation 5.4) to determine normal return. I estimated normal return by regressing actual return of each firm. I use estimation window between $t = -105$ days to $t = -46$ day relative to $t = 0$ which is the event day. If SPACs have estimation window lower than 30 days, the samples will not be calculated in my study. To test the significance of abnormal returns, I use a traditional time-series standard deviation t-statistics test (Brown and Warner 1985) to detect the significance of the abnormal returns over a specified time frame.

Table 5 show my result of the event study that there is an evidence at the 1% significant level that abnormal returns are significantly different from zero on the announcement date of combination ($t = 0$ or the event day). It is 5.74% and 5.75% under the “market model” and “three factors model” respectively. The results indicate that on average the announcement of combination create a positive excess return of 5.74% and 5.75% respectively. My results are the same direction of abnormal return as (Agrawal and Kamakura 1995), (Hirschey, Richardson et al. 2000) and (Karniouchina, Moore et al. 2009). Table 5 also presents the average abnormal return for all 186 samples on the event day and on the event window between $t = -10$ days to $t = 20$ day.

Table 5 : Market reaction to announcements date of combination (N=186)

Event Day	Market Model Average Abnormal Return (%)	T-statistic	Fama-French three-factor model Average Abnormal Return (%)	T-statistic	Market Model Cumulative Average Abnormal Return (%)	Fama-French three-factor model Cumulative Average Abnormal Return (%)
-10	0.14%	0.71	0.17%	0.64	0.14%	0.17%
-9	-0.08%	-0.65	0.13%	0.62	0.06%	0.30%
-8	-0.05%	-0.58	0.08%	0.45	0.01%	0.38%
-7	0.04%	0.33	-0.08%	-0.39	0.05%	0.30%
-6	0.29%	1.26	0.12%	0.45	0.34%	0.42%
-5	0.04%	0.31	0.21%	0.97	0.38%	0.63%
-4	0.30%	1.23	0.51%	1.75*	0.68%	1.14%
-3	0.18%	1.47	0.33%	1.64	0.86%	1.48%
-2	0.17%	0.64	-0.03%	-0.09	1.03%	1.45%
-1	0.33%	1.60	0.50%	1.50	1.36%	1.94%
0	5.74%	5.16**	5.75%	5.06**	7.10%	7.69%
1	0.04%	0.08	-0.21%	-0.39	7.13%	7.48%
2	-0.12%	-0.39	-0.03%	-0.10	7.02%	7.45%
3	-0.38%	-1.61	-0.73%	-2.27*	6.64%	6.72%
4	0.37%	1.33	0.82%	2.37**	7.01%	7.54%
5	0.48%	1.07	0.60%	1.21	7.49%	8.14%
6	0.39%	1.01	0.08%	0.19	7.88%	8.22%
7	-0.41%	-1.65	-0.71%	-2.24*	7.46%	7.52%
8	-0.17%	-1.00	-0.38%	-1.35	7.30%	7.13%
9	0.07%	0.34	-0.03%	-0.12	7.36%	7.11%
10	-0.17%	-0.89	-0.24%	-0.86	7.20%	6.86%
11	0.13%	0.73	-0.16%	-0.57**	7.33%	6.71%
12	-0.04%	-0.22	-0.24%	-0.82	7.29%	6.46%
13	-0.22%	-1.28	-0.25%	-0.96	7.07%	6.21%
14	0.05%	0.37	-0.01%	-0.02	7.12%	6.21%
15	0.14%	0.76	-0.03%	-0.09	7.26%	6.18%
16	-0.25%	-1.37	-0.11%	-0.43	7.02%	6.08%
17	0.03%	0.16	-0.21%	-0.81	7.04%	5.86%
18	0.32%	1.09	0.29%	0.81	7.36%	6.15%
19	0.28%	1.29	0.27%	0.99	7.64%	6.42%
20	-0.09%	-0.55	-0.21%	-0.85	7.55%	6.21%

** P-value \leq 0.01* P-value \leq 0.05

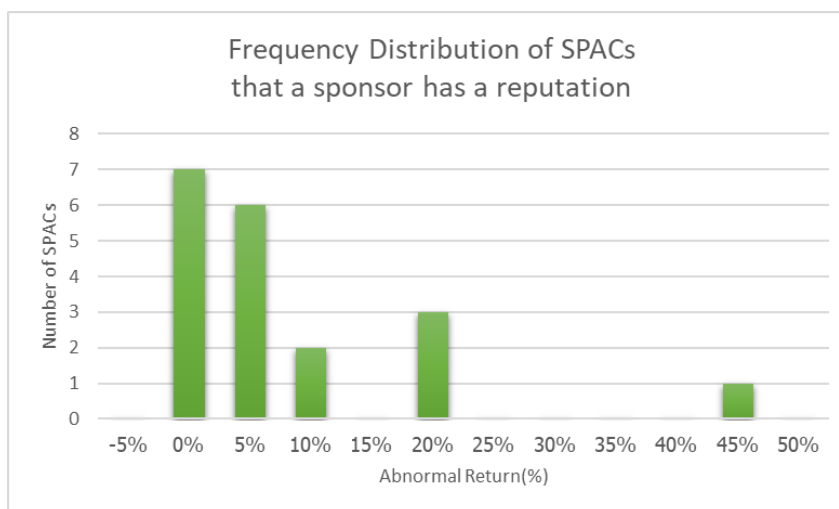
Not surprisingly, SPACs which a sponsor has a reputation creating excess return 5.48% (Table 6). The T-statistic on t = 0 or the event day is 2.08 at 5% significant level (P-value \leq 0.05). The results indicate that on average SPACs which a sponsor has a reputation creating excess return 5.48% on the announcement date of combination. I run the additional study. I find that SPACs that a sponsor does not have a reputation creating abnormal return as well which is 5.78% which is very significant at 1% significant level (P-value \leq 0.01). It is more positive than SPACs which a sponsor has a reputation. Furthermore, a sponsor with a no reputation has a positive average abnormal return between t = -10 and t = -1 over an 8 days. While SPACs which a sponsor has a reputation has a positive average abnormal return only 6 days. On the other hand,

the abnormal return after the announcement date of combination of SPACs which a sponsor has a reputation has 10-day positive that higher than SPACs that a sponsor does not have a reputation that has 7-day positive.

Table 6 : Market reaction to SPACs that a sponsor has a reputation and does not have reputation

Event Day	Fama-French three-factor model Average Abnormal Return (%)	Fama-French three-factor model Cumulative Average Abnormal Return (%)	Fama-French three-factor model Average Abnormal Return (%)	Fama-French three-factor model Cumulative Average Abnormal Return (%)
SPACs that a sponsor has a reputation (N=19)			SPACs that a sponsor does not have a reputation (N=167)	
-10	0.18%	0.18%	0.16%	0.16%
-9	-0.31%	-0.13%	0.18%	0.34%
-8	0.47%	0.34%	0.04%	0.38%
-7	-0.26%	0.08%	-0.06%	0.32%
-6	0.82%	0.89%	0.05%	0.37%
-5	0.10%	0.99%	0.22%	0.59%
-4	0.26%	1.26%	0.54%	1.13%
-3	-0.61%	0.64%	0.44%	1.57%
-2	-0.24%	0.40%	-0.01%	1.56%
-1	0.04%	0.44%	0.55%	2.12%
0	5.48%	5.92%	5.78%	7.89%
1	1.39%	7.32%	-0.39%	7.50%
2	-0.89%	6.43%	0.06%	7.56%
3	-1.59%	4.84%	-0.63%	6.93%
4	-0.49%	4.35%	0.97%	7.90%
5	0.47%	4.81%	0.61%	8.52%
6	-0.59%	4.22%	0.16%	8.68%
7	0.06%	4.28%	-0.79%	7.88%
8	-0.13%	4.15%	-0.41%	7.47%
9	0.02%	4.17%	-0.04%	7.44%
10	0.26%	4.44%	-0.30%	7.14%
11	-0.21%	4.23%	-0.15%	6.99%
12	0.35%	4.58%	-0.31%	6.68%
13	0.10%	4.68%	-0.29%	6.39%
14	-0.47%	4.21%	0.05%	6.44%
15	0.83%	5.03%	-0.12%	6.31%
16	0.69%	5.73%	-0.20%	6.12%
17	-1.51%	4.22%	-0.07%	6.05%
18	0.43%	4.65%	0.27%	6.32%
19	-0.88%	3.77%	0.40%	6.72%
20	-0.64%	3.14%	-0.16%	6.56%

Figure 7 : Frequency Distribution of SPACs that a sponsor has a reputation

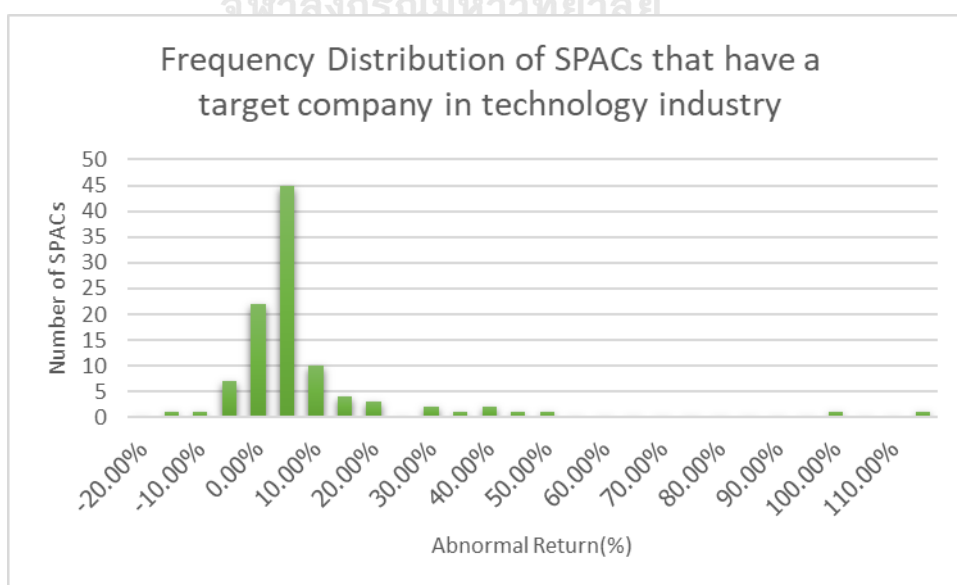


As you can see in the table 7, SPACs have a target company in technology industry have abnormal returns 5.94% at the 1% significant level (T-statistic is 3.38) on announcements date of combination. Their abnormal return is higher than SPACs do not have a target company in technology industry which has abnormal return 5.51%. These imply that a technology firm creates very significantly abnormal return. However, the date before the announcements date of combination which is $t = -10$ to $t = -1$ has 5 days negative abnormal return while SPACs that do not have a target company in technology industry have positive abnormal return in every day. The abnormal return after the announcements date of combination of SPACs have a target company in technology industry is 14 days negative. It is higher than SPACs that do not have a target company in technology industry which has 10 days negative abnormal return.

Table 7 : Market reaction to SPACs that has and does not have a target company in technology industry

Event Day	Fama-French three-factor model Average Abnormal Return (%)	Fama-French three-factor model Cumulative Average Abnormal Return (%)	Fama-French three-factor model Average Abnormal Return (%)	Fama-French three-factor model Cumulative Average Abnormal Return (%)
SPACs have a target company in technology industry (N=102)			SPACs do not have a target company in technology industry (N=84)	
-10	-0.05%	-0.05%	0.43%	0.43%
-9	-0.07%	-0.12%	0.38%	0.80%
-8	0.14%	0.02%	0.02%	0.82%
-7	-0.26%	-0.25%	0.14%	0.96%
-6	-0.16%	-0.41%	0.47%	1.44%
-5	0.24%	-0.17%	0.17%	1.60%
-4	0.29%	0.12%	0.78%	2.38%
-3	0.36%	0.48%	0.30%	2.69%
-2	-0.44%	0.04%	0.47%	3.15%
-1	0.64%	0.68%	0.32%	3.48%
0	5.94%	6.63%	5.51%	8.98%
1	-1.23%	5.39%	1.03%	10.01%
2	-0.24%	5.15%	0.22%	10.23%
3	-0.57%	4.58%	-0.92%	9.31%
4	1.09%	5.67%	0.50%	9.81%
5	0.72%	6.39%	0.45%	10.26%
6	0.45%	6.84%	-0.36%	9.90%
7	-0.98%	5.87%	-0.38%	9.52%
8	-0.13%	5.73%	-0.68%	8.84%
9	0.17%	5.90%	-0.27%	8.57%
10	-0.28%	5.62%	-0.20%	8.37%
11	-0.21%	5.42%	-0.10%	8.28%
12	-0.66%	4.76%	0.25%	8.53%
13	-0.40%	4.36%	-0.07%	8.46%
14	-0.29%	4.07%	0.34%	8.81%
15	-0.28%	3.79%	0.28%	9.09%
16	-0.34%	3.45%	0.18%	9.26%
17	-0.11%	3.34%	-0.34%	8.92%
18	0.32%	3.66%	0.25%	9.17%
19	0.38%	4.04%	0.13%	9.30%
20	-0.16%	3.88%	-0.26%	9.04%

Figure 8 : Frequency Distribution of SPACs that have a target company in technology industry



6.2 Cumulative Abnormal Returns

To analyze the abnormal return around the event day and capture the cumulative effect of the event, I perform the cumulative abnormal returns (CAR) around $t = -10$ to $t = 20$ relative to $t = 0$ which is the event day.

Table 8 show the cumulative average return (CAR) around the event day. All time interval show a significant CAR except $t = -1$ to $t = 0$. During the event day $t = 0$ create the highest significant abnormal return that make CAR between $t = 0$ to $t = 1$ of 6.88% with 5% significant level. Table 6 presents the positive abnormal return on the next day's combination announcement. These indicate that there is an effect of sponsor reputation from market reaction to the next day's combination announcement.

Table 8 : Cumulative Average Abnormal (CAR) around the event day of SPACs that a sponsor has a reputation

Time Interval	Fama-French three-factor model Cumulative Average Abnormal Return (%)	T-statistic
-10 ; +20	3.14%	8.67**
-10 ; +10	4.44%	5.37**
-5 ; +5	3.92%	4.21**
-1 ; 0	5.52%	1.16
0 ; +1	6.88%	9.49*

** P-value ≤ 0.01

* P-value ≤ 0.05

Figure 9 shows the cumulative average abnormal return (CAR) around the event day. SPACs that a sponsor has a reputation and does not have reputation have increased trends between $t = -10$ to $t = 0$ which is the date before the announcement date of combination. At $t = 0$, both have a high abnormal return making CAR increase a lot that day. However, after the announcement date of combination SPACs that a sponsor has a reputation have more negative abnormal return than SPACs that a sponsor does not have reputation. Therefore, CAR of SPACs that a

sponsor has a reputation has lower than SPACs that a sponsor does not have reputation.

Figure 9 : Market reaction to SPACs that a sponsor has a reputation and does not have reputation

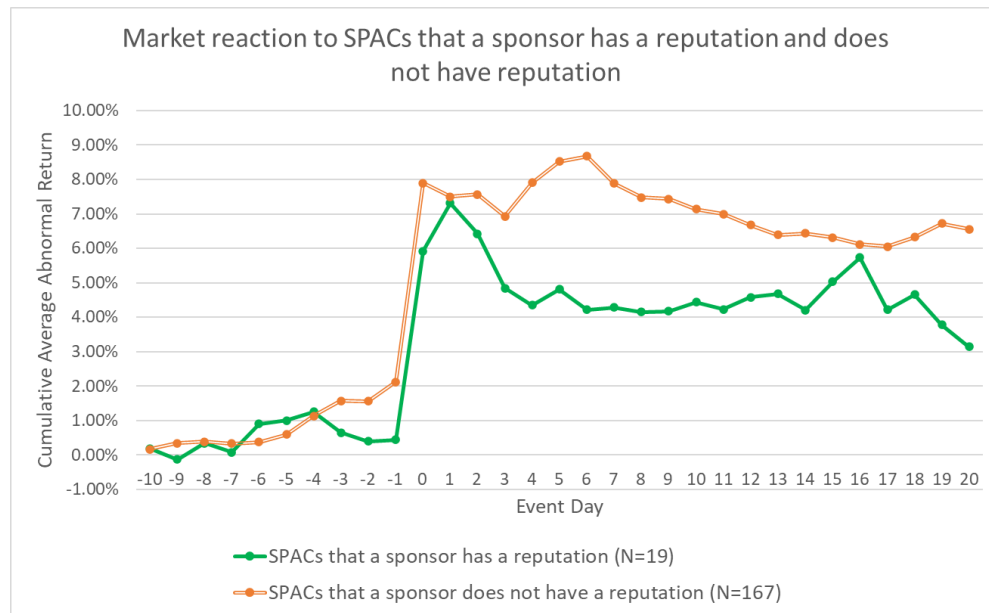


Table 9 show the cumulative average return(CAR) around the event day of SPACs have a target company in technology industry. There is only time interval $t = -1$ to $t = 0$ that does not significant. During $t = -5$ to $t = 5$ relative to the event date, $t = 0$, create the highest significant abnormal return that make CAR of 6.80% with 1% significant level. Table 7 presents the positive abnormal return on the next day's combination announcement. These indicate that there is an effect of technology industry from market reaction to the next day's combination announcement.

Table 9 : Cumulative Average Abnormal(CAR) around the event day of SPACs have a target company in technology industry

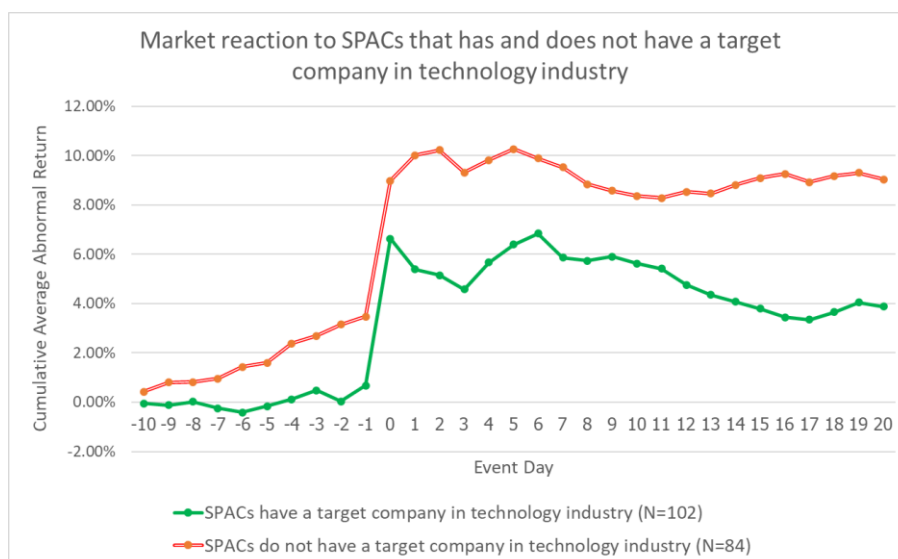
Time Interval	Fama-French three-factor model Cumulative Average Abnormal Return (%)	T-statistic
-10 ; +20	3.88%	7.48**
-10 ; +10	5.62%	4.67**
-5 ; +5	6.80%	3.65**
-1 ; 0	6.59%	1.23
0 ; +1	4.71%	9.74*

** P-value ≤ 0.01

* P-value ≤ 0.05

Figure 10 presents Cumulative Average Abnormal(CAR) around the event day of SPACs have a target company in technology industry. SPACs with a technology company have a stable CAR while SPACs with other companies have increased trends CAR between $t = -10$ to $t = 0$. At $t = 0$, both have a high abnormal return making CAR increase a lot that day. However, after the announcement date of combination SPACs with a technology company have CAR going down a lot because it has 14 days negative while SPACs with other companies has 10 days negative abnormal return. Therefore, SPACs with other companies have higher CAR than SPACs with a technology company.

Figure 10 : Market reaction to SPACs that has and does not have a target company in technology industry



6.3 Regression results

I test $H_1 - H_2$ by estimating two regression equations, one for SPACs that a sponsor has a reputation and another one for SPACs that has a target company in technology industry. Because my goal is to determine the factors that effect to the mispricing in SPACs, I estimate a regression with the abnormal return on the announcement date of combination which is event window $[0, 0]$, AR_0 .

In table 10, There is the regression result of my study. I test H_1 for finding a sponsor reputation effect (*rep*). As you can see from table 10. the coefficient of (*rep*) is positive at 0.0015. This implied that sponsor reputation has impact on SPACs price on announcements date of combination. However, I find its effect is not significant ($p > 0.1$) in both model 1 and 2. Therefore, there are no statistical evidence at 10% significant level to conclude that sponsor reputation has positive impact on abnormal return. There are two possible plausible explanations for this finding. First, Although the result is not consistent with a prior literature (Agrawal and Kamakura 1995)(Hirschey, Richardson et al. 2000) and (Karniouchina, Moore et al. 2009) that examine stock return, It is consistent with (Lewellen 2009) that find SPACs are structured and behave unlike any other asset class in the markets which make I cannot find the evidence that sponsor reputation has impact on SPACs price. Second, in this study I use The Forbes 400 in 2021 as a proxy for sponsor reputation. The Forbes 400 is the 400 richest Americans annual ranking by Forbes magazine. The list is rank by wealth. While a prior literature (Siang 2009) (Krishnan, Ivanov et al. 2009) proxy reputation by using VC market share, VC IPO share and VC firm age. Although VC firm age and people age are look similar, people age does not tell the working experience like firm age does. The Forbes 400 also does not mention to their network of people in the list. (Hochberg, Ljungqvist et al. 2007)The network of VC can create better performance. Therefore, the proxy of sponsor reputation may not be appropriate for this study.

I use H_2 for finding effect from merger with technology company. the coefficient of (*tech*) is also insignificant positive at 0.0026 ($p > 0.1$) in both model 3 and 4. Therefore, there are no statistical evidence at 10% significant level that SPACs with a target company in technology industry has positive impact on abnormal return as well. Although the result is not consistent with a prior literature (Pyun, 2021) that live group

chats assist investors uncover high alpha companies and (Corbet, Yang (Greg), Yang , & Les , 2021) that there is 5.6% abnormal return in technology stocks. It is consistent with (Lewellen 2009) that find SPACs are structured and behave unlike any other asset class in the markets. Moreover, Investor trading behavior is bizarre. Thus, I cannot find the evidence that SPACs with technology company has impact on SPACs price.

For the control variable, Although *Size* of SPACs IPO has a positive impact on abnormal return, there is not significant in all regression. However, I find the evidence at 5% significant level that SPACs listed on NASDAQ have positive impact to abnormal return.

Table 10 : Regression Result

	Abnormal Return			
	(1)	(2)	(3)	(4)
rep	-0.0061 (0.3672)	0.0015 (0.0368)		
tech			0.0033 (0.0228)	0.0026 (0.0227)
In(size)		0.0284 (0.0253)		0.0282 (0.0252)
NASDAQ		0.0397** (0.0236)		0.0395** (0.0235)
constant	0.0581*** (0.0120)	-0.0509 (0.0801)	0.0555*** (0.0170)	-0.0518 (0.0800)
N	186	186	186	186
R-squared	0.0002	0.0191	0.0001	0.0192

Standard error in parentheses

*** p<0.01, **p<0.05, *p<0.1

7. Conclusions

SPACs are capital pools having a known value that can be used. These capital pools are ready for the merger. SPAC IPO is \$10 per unit. It does not yet have its own having its own commercial operation. The thing investors know about SPAC is Sponsor which has very important role for consummating the merger. In this study, I aim to answer the question “SPAC sponsors effects on SPAC prices”. I study SPAC IPOs which had acquiror and target nation in the United States and were public between January 2020 and December 2021. The final sample has 186 SPACs. I select The Forbes 400 in 2021 as a proxy for sponsor reputation.

Based on the analysis, I find that there is no statistical evidence that sponsor reputation has impact on SPACs price on the announcement date of combination. There are two possible plausible explanations for this finding. 1) SPACs are structured and behave unlike any other asset class in the markets. 2) The Forbes 400 in 2021 that use as a proxy for sponsor reputation in this paper may not be appropriate for the study.

Moreover, I cannot find the evidence that SPACs with technology company has impact on SPACs price on the announcement date of combination. Because investor trading behavior is bizarre and SPACs are structured and behave unlike any other asset class in the markets.

I aim that this research can be beneficial for all investors or whoever is interested in SPAC.

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Appendix A
Definition of Variables

Variable	Hypothesis	Description
Abnormal Return	Dependent variable	AR_t or next-trading-day abnormal return for stock i .
rep	H_1	dummy variables equal 1 if sponsor has reputation
tech	H_2	dummy variables equal 1 if SPACs' target company is in the technology industry
Size	Control	The natural log of the SPAC IPO gross proceeds from the offering. Data is taken off Refinitive SDC Platinum.
NYSE, NASDAQ	Control	Market on which a given security i is traded.

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