



M2 / International Business Major

Master Thesis

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**What is the influence of institutional shareholders on SPACs
performance during their search phase?**

Public Thesis

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Abstract

In our sample of 97 U.S. SPACs, we find that institutional shareholders represent on average 68.8% of the total ownership just before combination announcement, which is substantially above the institutional ownership of all publicly traded companies according to the existing academic literature. Thanks to a very simple model representing the trade-offs made by the sponsors during the search phase, we show that high levels of institutional ownership are associated with longer search period and lower financial performance. Additionally, we find that SPACs with higher institutional ownership are associated with lower volatility of financial performance which could explain at least partially the negative relation between institutional ownership and financial performance we have uncovered.

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Introduction

As of March 31, 2021, U.S. SPACs have raised \$87.9 billion in just three months¹, which is more than what they have raised in 2020 even though 2020 already marked an extremely large increase over 2019 with over six times more funds raised². As a consequence, if SPACs IPO continue in 2021 with the same volume observed during the first quarter, 2021 volume raised would therefore reach around 24 times the level observed in 2019, thus definitely confirming the emergence and rise of SPACs in the United States. SPACs are also coming to Europe³ with the biggest IPO on Euronext Paris in 2020 that was raised in less than a week by a French SPAC called 2MX Organic which raised 300 million euros, about three times the amount raised by the second largest IPO of the year on this stock exchange⁴.

This “SPAC mania”⁵ is confirmed by the Figure 1 that exposes the number of U.S. SPACs raised, the average size of the U.S. SPACs raised and the total amount raised by U.S. SPACs between 2003, with the first ever SPAC raised⁶, and 2020.

What SPACs are and how they function

“Special Purpose Acquisition Company” (SPAC) is defined by the Securities and Exchange Commission (SEC) as a type of “blank check company”, that is to say, “a development stage company that has no specific business plan or purpose or has indicated its business plan is to

¹ Yun, L. (2021, March) SPACs break 2020 record in just 3 months, but the red-hot industry faces challenges ahead *CNBC* <https://www.cnbc.com/2021/03/19/spacs-break-2020-record-in-just-3-months.html>

² SPAC Data (2021) Retrieved from Spacdata.com

³ Croft, A. (2021, March) Two age-old European trading rivals are at loggerheads again—this time over SPACs *Fortune* <https://fortune.com/2021/03/04/brexit-europe-finance-london-amsterdam-spacs-financial-center-eu/>

⁴ Nacon that raised 100 million euros in March 2020. See Boisseau, L. (2020, December) 2020, année noire pour les introductions en Bourse en France *Les Echos* <https://www.lesechos.fr/finance-marches/marches-financiers/2020-annee-noire-pour-les-introductions-en-bourse-en-france-1276969>

⁵ Attias, E. (2021, February) La "Spac mania" de Wall Street va-t-elle déferler en Europe? *Challenges* https://www.challenges.fr/finance-et-marche/la-spac-mania-de-wall-street-va-t-elle-deferler-en-europe_751866

⁶ Provasi, R. (2019). Evidence of the Italian Special Purpose Acquisition Company.

engage in a merger or acquisition with an unidentified company or companies, other entity, or person”⁷.

According to this classification, a SPAC is a sub-type of blank check company that has indicated its business plan is “to engage in a merger or acquisition”. As a vehicle dedicated to acquiring another company, the life of a SPAC naturally starts with an Initial Public Offering (IPO) to raise funds from investors, either institutional investors (hedge funds, mutual funds, pension funds, etc.) or households, in order to finance the acquisition. A SPAC is set up for a limited period of time, usually 18 to 24 months⁸ and during this timeframe, the management team looks to acquire or combine with an operating private company. In the prospectus of the IPO, the management team has the opportunity - but not the obligation - to define (i) the sector in which the target company should be operating, (ii) the size of the company and (iii) the geography in which the company should be operating. Once the funds have been raised, SPAC managers will start looking for a target to propose to their shareholders who will be able to vote for or against the proposed combination. If the minimum number of votes mentioned in the prospectus is not reached, the SPAC managers must look for a new target to propose to their shareholders. If at the end of the set timeframe the SPAC did not succeed in carrying out a combination, it has to give back the money raised during the IPO to the investors⁹. Please, see *Appendix A* that summarizes the different stages in the life of a SPAC.

In this master thesis, we will focus on the influence of institutional shareholders on the performance of SPACs with a specific focus on the search period, i.e., the period during which the managers of the SPAC are looking for a target company. Therefore, the research question we plan to answer in this master thesis is: What is the influence of institutional shareholders on SPACs performance during their search phase?

⁷ Blank Check Company. (2021). Retrieved from <https://www.investor.gov/introduction-investing/investing-basics/glossary/blank-check-company>

⁸ PwC (2021) How special purpose acquisition companies (SPACs) work <https://www.pwc.com/us/en/services/audit-assurance/accounting-advisory/spac-merger.html>

⁹ “If the SPAC is unable to make a deal within that time period, it has to return the money to its investors and the SPAC’s sponsor loses whatever initial investment it has made.” As explained in Forbes article. AllBusiness (2020, November) *Forbes* <https://www.forbes.com/sites/allbusiness/2020/11/11/10-key-questions-and-answers-about-spacs/?sh=27c70bf12f83>

Before moving on to the literature review, let us explain here in more detail how SPACs work.

The SPAC management team

The management team at the origin of the SPAC is called the sponsors. They will be the ones looking for a target company during the set timeframe. Because the investors are partly blind at the IPO stage, they often rely on a management team with a strong track-record in Entrepreneurship, Mergers and Acquisitions (M&A) or Private Equity (PE). For example, Pershing Square Tontine Holdings Ltd., the largest SPAC IPO to date (\$4Bn) is led by William Ackman, a renown American investor and hedge fund manager. Other examples in France are the only two French SPACs so far: Mediawan¹⁰ and 2MX Organic¹¹ that are both led by Matthieu Pigasse, a former M&A Managing Director at Lazard, and Xavier Niel, the founder of Iliad, the holding company owning Free.

SPAC's main specific feature: the ability to redeem shares at the combination stage

SPACs allow their shareholders to redeem their shares before the combination. They can redeem their shares whether or not they vote for or against the business combination and the price at which they can redeem their shares is the IPO price per share plus accumulated interest (as the money raised during the IPO is placed in an escrow account that is remunerated). This interesting feature explains most of the recent success of SPACs because it enables investors to have a very limited downside risk while being exposed to an unlimited upward potential¹².

With this feature, there is a risk that automatically arises: the risk that there are too many shares' redemptions at the time of the combination and therefore that the amount available on the SPAC escrow account is no longer sufficient to purchase the stake agreed upon with the owners of the target company. To address and mitigate this risk, sponsors often bring in additional investors at the time of the combination. These are called Private Investments in Public Equity (PIPE)

¹⁰ Mediawan's sponsors are Xavier Niel, Matthieu Pigasse and Pierre-Antoine Capton. About Mediawan. (2021). Retrieved from <https://www.mediawan.com/fr/about>

¹¹ 2MX Organic's sponsors are Xavier Niel, Matthieu Pigasse and Moez-Alexandre Zouari. 2MX Organic Governance. (2021). Retrieved from <https://www.2mxorganic.com/>

¹² Moore, S. (2020, October) The Risk And Returns For The Increasingly Popular SPAC Trade *Forbes* <https://www.forbes.com/sites/simonmoore/2020/10/19/the-risk-and-returns-for-the-increasingly-popular-spac-trade/?sh=394bc9a73297>

investors. They are wall crossed before the combination is made public¹³ so that they can enter the SPAC capital at the time of the combination at a price equal to that of the IPO of the SPAC or even sometimes with a discount¹⁴. Not only are these additional investors allowing the sponsors to guarantee a minimum of cash to the target's owners by bridging the gap between the cash available in the SPAC trust account at the time of the announcement and the cash finally available when the merger takes place, they are also offering additional flexibility for the owners of the target company. Indeed, they allow to bridge the gap between the stake that the owners of the target company want to sell and the stake that SPAC can buy thanks to the money it raised in its IPO. Thus, PIPE investors are key in structuring the combination of a SPAC with a target company by allowing, on the one hand, to fill the number of shares that are redeemed by SPACs shareholders and, on the other hand, to allow the sellers to sell the exact percentage they want of their company and to keep the rest.

Existing Research on SPACs

The question that directly arises when seeing the growing importance of SPACs exposed in Figure 1 is: why are more and more managers raising funds through SPACs and why are more and more investors choosing this kind of investment vehicle in their investment strategy? There must be something typical and new about SPACs that make them unique and that explain why they are being more and more chosen in the whole spectrum of the investment vehicles available today. Indeed, SPACs have been innovating on three main different areas. Hale¹⁵ (2007) explains that a SPAC is “a financing tool that has something for everyone”, i.e., something for management, investors and the target company. In order to structure this quick literature review, we are going to present the innovations brought by the SPACs for each of these three actors: for the management, for the investors and for the target company.

¹³ Pinedo, A. (2020, October) *Mayer Brown LLP* <https://www.mayerbrown.com/-/media/files/perspectives-events/publications/2020/10/top-10-practice-tips-pipe-transactions-by-spacs.pdf>

¹⁴ According to CNBC, “Investors in the PIPE usually receive their securities at a discount at least to the market price and sometimes they even get shares below the IPO price”. Picker L. (2021, January) How financing SPAC takeovers became Wall Street’s new favorite trade CNBC <https://www.cnbc.com/2021/01/25/how-financing-spac-takeovers-became-wall-streets-new-favorite-trade.html>

¹⁵ Hale, L. M. (2007). SPAC: A Financing Tool with Something for everyone. *Journal of Corporate Accounting & Finance*, 18(2), 67-74.

Innovations brought by the SPACs for the management

Hale¹⁶ (2007) explains that SPAC enables experienced managers “to obtain substantial capital to fund their goals for the next phase of their careers and avoid the cost of an equity sponsor”. Therefore, SPACs can be considered as an innovation in the sense that they are allowing experienced managers to develop personally and professionally in a new setting by being at the head of a dedicated structure. Even if the sponsors do not receive a monthly wage for their position, they are incentivized to find a target company because if they succeed to merge with a target company, they receive about 20% of the shares of the SPAC at the time of the combination¹⁷.

Innovations brought by the SPACs for the investors

Tran¹⁸ (2010) demonstrated that by giving incentives to the management through “high level of ownership”, “SPACs make better acquisitions than other public acquirers: they negotiate an additional discount of about 7.6 percentage points compared to other public acquirers that bid for private targets”. Therefore, SPAC as an investment vehicle can be considered as an innovation for the investors by giving to everyone the opportunity to invest in an experienced management team.

SPACs can also be considered as an innovation for investors when we consider it as a new asset class with a specific risk-reward profile that allows investors to diversify their portfolio of investments. Klymochko¹⁹ (2020) shows that “SPAC arbitrage is one of the lowest-risk investment opportunities”. He explains that “the key aspect of SPAC arbitrage is the existence of untouched capital from the IPO invested in risk-free U.S. government securities, giving investors a baseline return of short-term treasury yields, combined with a set deadline offering the ability to redeem shares for the underlying net asset value”. According to him, SPACs therefore combine an “equity upside [...] with the risk profile of treasury bills”. Thanks to SPACs, investors are therefore able to invest in a new asset class with a risk-reward profile that is unique.

Innovations brought by the SPACs for the target company

¹⁶ Hale, L. M. (2007). SPAC: A Financing Tool with Something for everyone. *Journal of Corporate Accounting & Finance*, 18(2), 67-74.

¹⁷ Oblis (2021, February) Les SPAC, dernière folie à la mode <https://www.oblis.be/fr/news/2021/02/23/spac-derniere-folie-mode-552151>

¹⁸ Tran, A. L. (2010). Blank check acquisitions.

¹⁹ Klymochko (2020). The art of SPAC Arbitrage

SPACs can also be considered as an innovation from the target company perspective. Although the main traditional exit strategies include IPO, strategic acquisition and management buy-out²⁰, being acquired by a SPAC can achieve the same exit purpose if those options are not available, more complicated to carry-out or less advantageous. Indeed, being acquired by a SPAC can be a new exit option available for the owners of private companies, not only for start-ups²¹ but also for non-start-up companies²². Warner and Lee²³ (2019) explain that “for certain portfolio companies that are strong public market candidates it can be an advantageous way to exit by taking some cash off the table in connection with the sale, rolling the remainder of your equity into publicly-traded securities to benefit from potential future appreciation and by sharing the SPAC sponsor’s favorable economics.”

Arellano-Ostoa and Brusco²⁴ (2002) first tried to understand why some companies prefer a reverse merger to an IPO. They proved that during the 1990 – 2000 period in the US market, it was much cheaper to go public through a reverse merger than it was to go public through an IPO. On the one hand, they estimate the cost of a reverse merger to be between US\$300,000 and US\$700,000 depending on the shell company. On the other hand, they rely on the work of Chen and Ritter²⁵ (2000) that showed that for more than 90% of IPOs raising US\$20-80 million, the cost was around 7% of the amount raised, that is to say between US\$1.4 million and US\$6.4 million depending on the size of the offering. As a consequence, the cheapest way to go public seem to be acquired by a SPAC rather than filing for an IPO.

Not only did Arellano and Brusco²⁶ (2002) show that it was cheaper to go public through a reverse merger, but they also demonstrated that it was easier, especially for low-type companies. They constructed a model and showed that “an equilibrium exists in which a high-type firm will prefer IPO and a low-type firm will prefer a reverse merger” and these predictions were supported by empirical evidence with 32.6% of the reverse merged firms that were delisted from the exchanges

²⁰ Hayes, A (2020, March) Exit Strategy <https://www.investopedia.com/terms/e/exitstrategy.asp>

²¹ Beacon VC (2021, January) SPAC – a new potential exit strategy for startups <https://beaconvc.fund/2021/01/13/spac-a-new-potential-exit-strategy-for-startups/>

²² BlankRome (2008, June) SPACs: An Emerging Exit Strategy <https://www.blankrome.com/publications/spacs-emerging-exit-strategy>

²³ Warner, D. & Lee, D. (2019). PE Sale of Portfolio Company to a SPAC <https://corpgov.law.harvard.edu/2019/09/15/pe-sale-of-portfolio-company-to-a-spac/>

²⁴ Arellano Ostoa, A., & Brusco, S. (2002). Understanding reverse mergers: a first approach.

²⁵ Chen, H. C., & Ritter, J. R. (2000). The seven percent solution. *The journal of finance*, 55(3), 1105-1131.

²⁶ Arellano Ostoa, A., & Brusco, S. (2002). Understanding reverse mergers: a first approach.

within 3 years of the listing. This was confirmed years later by Adjei, Cyree and Walker²⁷ (2008) that also note that the firms choosing reverse merger over IPO have some common features: they are “smaller, poorer performing and younger” firms. They also compare the ex-post survival rate to conclude that reverse merged companies are inferior to IPO companies. After 3 years of going public, 43% of reverse merged companies were delisted while this proportion is only 27% for private companies that chose to go public through IPO.

Additional literature review and research question

Looking at this list of innovations being brought by the SPACs, we see directly an imbalance. While there is a wealth of research explaining the value of SPACs to target companies, very little of it focuses on innovations for investors, and even less on innovations for sponsors. This is a bit of a paradox since sponsors and investors are the ones at the origin of a SPAC and even if we can easily understand the advantages that SPACs represent as a new way to exit an investment, it is not the interest for the target company’s owners that motivates the sponsors and the investors to launch a SPAC but rather their own interest. And it is this interest that seemed to have been overlooked by the academic literature so far.

In this master thesis, we try to fill this research gap on sponsors and investors of SPACs by exploring the role of institutional shareholders during the research phase of the SPACs. The underlying assumption of this master thesis is that this role is key for SPACs mainly because institutional investors, thanks to their knowledge and network, could be able to help the sponsors of the SPACs at various stages of the SPAC life cycle. Indeed, this institutional ownership can be key at the inception of the SPAC to secure the IPO, at the searching phase to provide the sponsors with an additional flow of target companies that are potentially of higher quality, at the voting stage where they can be pivotal due to their large ownership and finally at the structuring stage where they can help the sponsors to secure PIPE investors that are key in the structuration of a SPAC combination as previously explained. Some researchers have tried to understand the role and influence that institutional investors could have in a SPAC, but it is often limited and it does not focus on the specific role of institutional shareholders during the search phase of the SPACs.

²⁷ Adjei, F., Cyree, K. B., & Walker, M. M. (2008). The determinants and survival of reverse mergers vs IPOs. *Journal of Economics and Finance*, 32(2), 176-194.

For example, Boyer and Baigent²⁸ (2008) explain that SPACs appeal to some institutional investors that believe they can influence the sponsors to focus on a specific industry they are interested in while it is more complicated to do so in the private equity but do not explain how this influence is applied onto the sponsors. Is it because of the fact that institutional shareholders are more educated that make them more listened to by the sponsors or is it linked to their larger share they own in the SPAC? And their study does not attempt to understand whether this influence is exerted in the same way throughout the life cycle of a SPAC. Perhaps institutional investors are more able to influence sponsors at specific points in the life of a SPAC such as during its IPO, its search for a target company, its voting stage or its structuration of the combination with the target company.

In the same way, while there is a wealth of research on the role of institutional investors for non-SPAC publicly traded companies, it does not seem to be the case for SPACs. In the case of non-SPAC publicly traded companies, institutional investors are said to enhance firm value as evidenced by Chen, Harford and Li²⁹ (2007), McConnell and Servaes³⁰ (1990), Hartzell and Stark³¹ (2003) and Bushee³² (1998). In the case of SPACs, Tran³³ (2010) explains that SPACs make better acquisitions than non-SPAC public acquirers by obtaining an additional discount and his results suggest that this discount is higher when SPACs are focused on a specific sector and not generalist and when the level of ownership from institutional shareholders is higher. But this positive influence of institutional shareholders is questioned by Howe and O'Brien³⁴ (2012) that indicate that neither managerial nor institutional ownership are associated with the performance of

²⁸ Boyer, C. M., & Baigent, G. G. (2008). SPACs as alternative investments: an examination of performance and factors that drive prices. *The Journal of Private Equity*, 11(3), 8-15

²⁹ Chen, X., Harford, J., & Li, K. (2007). Monitoring: Which institutions matter?. *Journal of financial Economics*, 86(2), 279-305.

³⁰ McConnell, J. J., & Servaes, H. (1990). Additional evidence on equity ownership and corporate value. *Journal of Financial economics*, 27(2), 595-612.

³¹ Hartzell, J. C., & Starks, L. T. (2003). Institutional investors and executive compensation. *The journal of finance*, 58(6), 2351-2374.

³² Bushee, B. J. (1998). The influence of institutional investors on myopic R&D investment behavior. *Accounting review*, 305-333.

³³ Tran, A. L. (2010). Blank check acquisitions.

³⁴ Howe, J. S., & O'Brien, S. W. (2012). SPAC performance, ownership and corporate governance. In *Advances in Financial Economics*. Emerald Group Publishing Limited.

SPAC securities. Cumming, Haß and Schweizer³⁵ (2014) also tried to investigate the key success factors for taking firms public with SPACs and find a “negative relation between the presence of active investor (hedge funds and private equity funds) shareholdings in a SPAC and approval probability”. Therefore, it seems that the influence of institutional investors on the sponsors is at least unclear and that this influence has not yet been linked to SPACs performance by the academic literature so far. Furthermore, this academic literature does not seem to have specifically focused on the search phase of the SPAC.

Research question

In this master thesis, we analyze SPACs from the investors’ perspective and, more specifically, we investigate the role that institutional investors might have during the search phase.

In our sample of 97 U.S. SPACs³⁶, we find that institutional investors represent on average 68.8% of the shareholder base before combination announcement. The median is even higher, at 76.3%. Table 1 summarizes the main data regarding institutional ownership in our sample of 97 U.S. SPACs and Figure 2 shows the distribution of the 97 U.S. SPACs that are in our sample ranked by institutional ownership.

This level of ownership from institutional shareholders is substantially larger than the one observed when we consider the total share of the stock market held by these institutional investors which is estimated to be between 51%³⁷ and 52%³⁸.

Thus, it appears that institutional investors are by far the main investors in SPACs and that even if SPACs can be considered as an asset class that bears strong resemblance with the private equity³⁹

³⁵ Cumming, D., Haß, L. H., & Schweizer, D. (2014). The fast track IPO—Success factors for taking firms public with SPACs. *Journal of Banking & Finance*, 47, 198-213

³⁶ Please refer to the methodology section to see how this sample of U.S. SPACs was built

³⁷ Chen, X., Harford, J., & Li, K. (2007). Monitoring: Which institutions matter?. *Journal of financial Economics*, 86(2), 279-305

³⁸ Gompers, P. A., & Metrick, A. (2001). Institutional investors and equity prices. *The quarterly journal of Economics*, 116(1), 229-259.

³⁹ For example see:

Lewellen, S. (2009). SPACs as an asset class. *Available at SSRN 1284999*.

Ignatyeva, E., Rauch, C., & Wahrenburg, M. (2013). Analyzing European SPACs. *The Journal of Private Equity*, 17(1), 64-79.

and can be perceived as a way to democratize this asset class reserved for high net worth individuals⁴⁰, in reality, small investors account only for a small part of the SPACs' shareholders.

To explore the role of institutional shareholders during the research phase of the SPACs, we will try to see if there is a relation between the shareholder structure of a SPAC and its performance during the search phase.

Research question: What is the influence of institutional shareholders on SPACs performance during their search phase?

Schumacher, B. (2019). A New Development in Private Equity: The Rise and Progression of Special Purpose Acquisition Companies in Europe and Asia. *Nw. J. Int'l L. & Bus.*, 40, 391.

⁴⁰ Dimitrova, L. (2017). Perverse incentives of special purpose acquisition companies, the “poor man's private equity funds”. *Journal of Accounting and Economics*, 63(1), 99-120.

1. Model to understand the influence of institutional shareholders

The underlying assumption of this simple model is that institutional shareholders of a SPAC can influence the quality of the targets that the SPAC sponsors analyze during the search phase. To model this influence, we introduce the θ parameter to understand how it affects the quality of the targets received by the sponsors and the time required to find a target company.

Influence of θ on the quality of the target that the sponsors are being presented with at each stage

In this model, at each period in time, the sponsors are presented with a target that they can choose to accept, and therefore the search phase is terminated, or to refuse, and therefore to wait for a better target in the coming periods. If there were no time constraint, the sponsors' expectations would be very high for each period in time as they would always have the possibility to wait more to find a better target in the coming periods. In real life, sponsors have a limited timeframe to find a target to combine with (usually it is between 18 and 24 months as explained in the introduction). Therefore, to simulate the trade-offs faced by the sponsors when they are presented with a target, we limit the number of periods to n , with $n \in \mathbb{N}$. Therefore, we limit the total number of target companies that the sponsors can analyze during their search phase to n .

The first period (the beginning of the search for a target) is the period 1 and the last one (the deadline of the SPAC) is the period n . Therefore, whatever the period i (with $i \in \llbracket 1; n \rrbracket$), the sponsors know that if they refuse the target proposed at stage i they will still have $(n - i)$ targets they can choose to be proposed with before the deadline.

It means that at stage n (i.e., the deadline), the sponsors are forced to accept the target that they are presented with regardless of its quality. On the contrary, when they are at any stage before stage n , that is to say before the deadline, there are able to choose between the target they are proposed with or wait for the target that they will be proposed at the next stages.

At each period i , the quality of the target that is proposed to the sponsors can be represented by a continuous random variable X_i taking values between 0 and 1. $\forall i \in \llbracket 1; n \rrbracket$, the probability density function of X_i is defined by:

$$\forall i \in \llbracket 1; n \rrbracket, \forall x \in \mathbb{R}, f_{X_i}(x) = \begin{cases} \theta x^{\theta-1} & \text{if } x \in [0; 1] \\ 0 & \text{if } x < 0 \text{ or } x > 1 \end{cases}$$

Having defined the density f_{X_i} , the cumulative distribution function of X_i is therefore:

$$\forall i \in \llbracket 1; n \rrbracket, \forall x \in \mathbb{R}, F_{X_i}(x) = \begin{cases} 0 & \text{if } x < 0 \\ x^\theta & \text{if } x \in [0; 1] \\ 1 & \text{if } x > 1 \end{cases}$$

Having defined this random law, it is possible to calculate the expected value of $X_i \forall i \in \llbracket 1; n \rrbracket$, that is to say expected quality of the target that the sponsor can expect at any point in time during the search phase:

$$\forall i \in \llbracket 1; n \rrbracket, E(X_i) = \int_{-\infty}^{+\infty} t \times f_{X_i}(t) dt$$

$$\forall i \in \llbracket 1; n \rrbracket, E(X_i) = \int_0^1 t \cdot \theta \cdot t^{\theta-1} dt$$

$$\forall i \in \llbracket 1; n \rrbracket, E(X_i) = \theta \int_0^1 t^\theta dt$$

$$\forall i \in \llbracket 1; n \rrbracket, E(X_i) = \theta \left[\frac{t^{\theta+1}}{\theta+1} \right]_0^1$$

$$\forall i \in \llbracket 1; n \rrbracket, E(X_i) = \frac{\theta}{\theta+1}$$

We also introduce a cost c that is incurred each time that the sponsor analyses a target to account for the resources deployed and the time spent by the sponsor in order to conduct his analysis. This cost can also be interpreted as an impatience from the sponsors to find a target.

$\forall i \in \llbracket 1; n \rrbracket$, we will write V_i the quality of the target that the sponsors can expect when they are at stage i , before being presented with the target i . As defined like this, we see that $\forall i \in \llbracket 2; n \rrbracket$, $V_i - c$ is going to be the threshold required by a sponsor to accept a target at stage $i - 1$, meaning that a SPAC sponsor will only accept at stage $i - 1$ a target X_{i-1} that is above $V_i - c$ and he will reject a target X_{i-1} that is below $V_i - c$.

It is also possible to start from the deadline to better understand what V_i represents. At stage n , the sponsor does not have the possibility to reject the target so he will accept everything regardless of the quality of the target X_n that he is presented with. Therefore, the expected value that the sponsor can expect at stage n , before being presented with the target n is only the expected value of X_n . And as $\forall i \in \llbracket 1; n \rrbracket$, $E(X_i) = \frac{\theta}{\theta+1}$, we have that $E(X_n) = \frac{\theta}{\theta+1}$. Therefore, $V_n = \frac{\theta}{\theta+1}$. But one period before the deadline, at stage $n - 1$, when the sponsor is proposed a target X_{n-1} , he has the possibility to accept X_{n-1} or to move to the last stage where he will be forced to accept X_n . Therefore, the sponsor will accept X_{n-1} only if $X_{n-1} \geq V_n - c = \frac{\theta}{\theta+1} - c$. This is why we say that $\forall i \in \llbracket 2; n \rrbracket$, $V_i - c$ is the threshold required by a sponsor to accept a target at stage $i - 1$.

Therefore, V_{n-1} , the value that the sponsor can expect before being presented with X_{n-1} , is:

$$V_{n-1} = \int_{V_n - c}^1 t \times f_{X_{n-1}} dt + (V_n - c) \times p(X_{n-1} \leq V_n - c)$$

In the formula above, $\int_{V_n - c}^1 t \times f_{X_{n-1}} dt$ represents the expected value of X_{n-1} if $X_{n-1} \geq V_n - c$, that is to say if the sponsor accepts the target X_{n-1} .

And $(V_n - c) \times p(X_{n-1} \leq V_n - c)$ represents the expected value of X_n if the sponsor refuses the target X_{n-1} and decides to move on to stage n .

By replacing the density function as defined previously we have that:

$$V_{n-1} = \int_{V_n - c}^1 t \times \theta t^{\theta-1} dt + (V_n - c) \times p(X_{n-1} \leq V_n - c)$$

$$V_{n-1} = \theta \left[\frac{t^{\theta+1}}{\theta+1} \right]_{V_n-c}^1 + (V_n - c) \times (V_n - c)^\theta$$

$$V_{n-1} = \frac{\theta}{\theta+1} - \frac{\theta(V_n - c)^{\theta+1}}{\theta+1} + (V_n - c)^{\theta+1}$$

$$V_{n-1} = \frac{\theta}{\theta+1} + \frac{(V_n - c)^{\theta+1}}{\theta+1}$$

Therefore, using recursively this relation between V_n and V_{n-1} , we have that:

$$\forall i \in \llbracket 1; n-1 \rrbracket, V_i = \int_{V_{i+1}-c}^1 t \times f_{X_i} dt + (V_{i+1} - c) \times p(X_i \leq V_{i+1} - c)$$

$$\forall i \in \llbracket 1; n-1 \rrbracket, V_i = \int_{V_{i+1}-c}^1 t \times \theta t^{\theta-1} dt + (V_{i+1} - c) \times \int_0^{V_{i+1}-c} \theta t^{\theta-1} dt$$

$$\forall i \in \llbracket 1; n-1 \rrbracket, V_i = \theta \left[\frac{t^{\theta+1}}{\theta+1} \right]_{V_{i+1}-c}^1 (V_{i+1} - c) \times [t^\theta]_0^{V_{i+1}-c}$$

$$\forall i \in \llbracket 1; n-1 \rrbracket, V_i = \frac{\theta}{\theta+1} - \frac{\theta(V_{i+1} - c)^{\theta+1}}{\theta+1} + (V_{i+1} - c)^{\theta+1}$$

$$\forall i \in \llbracket 1; n-1 \rrbracket, V_i = \frac{\theta}{\theta+1} + \frac{(V_{i+1} - c)^{\theta+1}}{\theta+1}$$

Therefore:

$$\forall i \in \llbracket 1; n-1 \rrbracket, V_i = \frac{\theta}{\theta+1} + \frac{(V_{i+1} - c)^2}{\theta+1}$$

And:

$$V_n = \frac{\theta}{(\theta + 1)}$$

Therefore, we see that this model enables us to calculate the threshold at which a sponsor will choose to accept a target company that he has been proposed with at any stage in time.

Figure 3 is an Excel simulation to see the evolution of V_i from period 1 (beginning) to period 100 (deadline) when the cost to analyze a target (c) increases, with θ being constant ($\theta = 1$).

We see that whatever the cost c per period, V_i decreases over time which was predictable because as the periods pass, sponsors get closer to the deadline and therefore have fewer and fewer opportunities they can analyze, which reduces the quality of the target company they can expect to get.

We also see that when the cost (c) to analyze a target increases, the threshold at which the sponsors of a SPAC accept a target company and stop searching becomes lower and lower whatever the stage we are considering which was also predictable as this cost devaluates the quality of the target companies that would have been obtained by waiting longer.

We can also fix c and change θ in order to see how θ can influence the quality of the targets that the sponsors are proposed with. Figure 4 is an Excel simulation to see the evolution of V_i from the period 1 (beginning) to the period 100 (deadline) with $c = 0.01$. We see that whatever the θ , V_i decreases over time which is logical because as the periods pass, sponsors get closer to the deadline and therefore have fewer and fewer opportunities they can analyze, which reduces the quality of the target company they can expect to get.

We can also see that, unsurprisingly, as θ increases, V_i increases which means that the threshold at which the sponsors will be accepting a target company is higher for each period. It was also predictable because at each period they receive a target that have an expected quality that increases with θ (as $\forall i \in \llbracket 1; n \rrbracket, E(X_i) = \frac{\theta}{\theta+1}$ and that the function $f(x) = \frac{x}{x+1}$ is growing on $\mathbb{R}_{\geq 0}$).

Influence of θ on the expected time to find a target

Now that we have seen the influence of θ on the expected quality of the target companies being analyzed by the sponsors at each period in time, we will expose in this section the influence of θ on the time needed by the SPAC sponsors to find a target company.

To calculate this expected time to find a target company, we have to calculate the probability that sponsors stop at each period. If we note T the random variable that is equal to the number of periods needed for a sponsor to find a target company, we have $[T = i]$ the event “the sponsor has accepted the target company at stage i and does not want to be presented with other targets”.

As the probability that a sponsors stops at a specific stage i is equal to the probability that $X_i \geq V_{i+1} - c$, that is to say that the target that the sponsor is being presented with at stage i is of higher quality than what he can expect before being presented with the target $i + 1$ taking into account the cost c incurred by the analysis of one supplementary target, we can distinguish two different cases:

If $i = 1$, we have that

$$P(T = 1) = P(X_1 > V_2 - c)$$

$$P(T = 1) = 1 - P(X_1 \leq V_2 - c)$$

$$P(T = 1) = 1 - (V_2 - c)^\theta$$

And for $i \in \llbracket 2; n \rrbracket$, we have that:

$$\forall i \in \llbracket 2; n \rrbracket, P(T = i) = P(X_i > V_{i+1} - c) \times P\left(\bigcap_{k=1}^{i-1} [X_{i-k} \leq V_{i-k+1} - c]\right)$$

$$\forall i \in \llbracket 2; n \rrbracket, P(T = i) = (1 - P(X_i \leq V_{i+1} - c)) \times \prod_{k=1}^{i-1} P(X_{i-k} \leq V_{i-k+1} - c)$$

$$\forall i \in \llbracket 2; n \rrbracket, P(T = i) = (1 - (V_{i+1} - c)^\theta) \times \prod_{k=1}^{i-1} ((V_{i-k+1} - c)^\theta)$$

With these two formulas for $i = 1$ and for $i \in \llbracket 2; n \rrbracket$, it is possible to calculate the expected number of periods needed to find a target and to express it as a function of θ and c :

$$E(T) = \sum_{i=1}^n i \times P(T = i)$$

$$E(T) = p(T = 1) + \sum_{i=2}^n i \times P(T = i)$$

$$E(T) = (1 - (V_2 - c)^\theta) + \sum_{i=2}^n i \times ((1 - (V_{i+1} - c)^\theta) \times \prod_{k=1}^{i-1} (V_{i-k+1} - c)^\theta)$$

We can run Excel simulations with $n = 100$ to see that $E(T)$ is decreasing in c (Figure 5) and in θ (Figure 6). This decrease of the expected time to find a target in θ is interesting because we saw earlier that the expected quality required at each stage (V_i) was increasing in θ . Therefore, the model suggests that the higher the θ , the better the target and the shorter the search period.

How institutional ownership affect the θ parameter?

Now that we understand that in our model the θ parameter increases the expected quality of the companies analyzed by the sponsors and that it decreases the time needed to find a target, we need to see how institutional ownership affects the θ parameter to understand the influence of institutional shareholders on SPACs performance.

Let us write s the share held by institutional shareholders in a SPAC. Therefore, $s \in [0; 1]$.

Here we have two alternative hypotheses:

- (i) s increases θ and hence bigger s should be associated with shorter time to combination announcement and better financial performance;

- (ii) s decreases θ and hence bigger s should be associated with longer time to combination announcement and worse financial performance.

To see how s affects θ , we need to gather and analyze some public data on the financial performance and on the time needed to find a target company for a large sample of SPACs. In the following section, we are going to expose the methodology we followed to gather and analyze this dataset.

2. Methodology

Selection of a sample of SPACs

For this master thesis, we analyzed 97 U.S. SPACs that combined with a target company between January 2019 and the 18th of February 2021. The February 18, 2021 time point was chosen simply to have a fixed sample to work with during the writing phase of this master thesis. On the other hand, January 2019 has been chosen arbitrarily in order to have a limited period in time of about two years. As SPACs are quite recent and rapidly changing⁴¹, having a limited period in time allows for a certain homogeneity in the regulatory characteristics of SPACs and facilitates the comparison of SPACs' performance. Choosing a wider time window would certainly have allowed us to have more U.S. SPACs in our sample but would probably have affected their homogeneity and thus their comparability. For the same reason, we have decided to focus only on U.S. SPACs in order not to have a bias related to different regulations relative to different regions. In addition to these geographical and temporal constraints, we decided to focus only on SPACs having announced their business combination and having successively merged with their target company, always for the sake of homogeneity. Indeed, having in the same sample SPACs that have not yet found a target, or that have announced an acquisition without having finalized it, would probably have prevented us from being able to compare the performance of the SPACs simply because they were not at the same stage of their life cycle. Having set all of these constraints, we used the database from spactrack.net⁴² in order to have a complete list to form our sample. We decided not to take a sample of SPACs that was limited to a specific acquisition sector because although this might have increased the homogeneity of our sample, it would likely have been too small a sample size to draw any conclusions, especially since, without this constraint, our sample is already quite small with only 97 U.S. SPACs in it.

IPO, announcement of the business combination and completion of the merger

⁴¹ Lakicevic, M., Shachmurove, Y., & Vulcanovic, M. (2014). Institutional changes of specified purpose acquisition companies (SPACs). *The North American Journal of Economics and Finance*, 28, 149-169.

⁴² SPAC Track (2021) Retrieved from <https://spactrack.net/closedspacs/>

These 97 U.S. SPACs have a number of common characteristics. They were raised between May 11, 2017 and September 2, 2020. They announced that they found a business combination between September 29, 2018 and November 24, 2020 and they successfully completed that combination between March 19, 2019 and February 16, 2021. They are mainly traded on the NASDAQ, the NYSE and AMEX stock exchanges. The IPO date, the date of announcement of the business combination and the date of completion of the merger we take into account are always the dates of the press releases issued by the SPACs.

Out of our sample of 97 U.S. SPACs, the average number of days in the period that goes from the IPO of the SPAC to the completion of its merger with a target company was 573 days. This period can be divided in two sub-periods: the one that goes from IPO to combination announcement (435 days on average) and the one that goes from combination announcement to merger completion (138 days on average). Table 3 summarizes this data regarding the number of days for each period in the life cycle of SPACs for our sample of 97 U.S. SPACs.

IPO size

The size of the SPACs IPOs in our sample of 97 U.S. SPACs ranges from \$40 million to \$1,100 million with an average of \$254.6 million and a median of \$207.0 million. Table 4 summarizes the repartition of the size of the IPO in our sample of 97 U.S. SPACs.

Ownership structure of the SPACs

To specify the ownership structure of each SPAC, we used Capital IQ, a leader provider of financial data⁴³, which aggregates the shares held by investors who are required by regulation to report their positions in each company in which they are shareholders to the Securities and Exchange Commission (SEC 13Fs, 13Ds, 13Gs, Proxies, N30Ds, SEDAR filings and Forms 4s and Forms 144s). In this master thesis, we will consider these investors who are required to disclose their holdings as "institutional investors". Most of the information aggregated by Capital IQ comes from the 13F Forms which are quarterly reports that are required to be filed by all institutional

⁴³ Capital IQ Platform (2021) Retrieved from <https://www.spglobal.com/marketintelligence/en/solutions/sp-capital-iq-platform>

investment managers with at least \$100 million in assets under management (AuM). Thus, some institutional investors with less than \$100 million in AuM and therefore not required to complete the 13F Form may not appear in the data aggregated by Capital IQ. For this reason, the percentage of ownership by institutional investors that we have identified should be considered as low estimates of the actual share held by institutional investors. As for when to look at this percentage ownership of SPACs by institutional investors, as we focus in this master thesis on the role of institutional investors during the SPAC search phase, we decided to look at the shareholder structure after the SPAC IPO and before the announcement of its business combination with its target company. As discussed above, institutional investors required to complete the 13F Form must do so at the end of each quarter. Thus, we decided to look at the shareholder structure of the SPACs at the end of the quarter of their IPO (as this is the first date for which we have shareholder data) and at the end of the quarter preceding the announcement of their combination (so that the shareholding structure of a SPAC is not impacted by the announcement of the target company that could potentially result in shareholders selling their shares or buying additional shares following the announcement). Thus, in the remainder of this master thesis, these two points in time will be referred to as "shareholding just after the IPO" and "shareholding just before the announcement of the business combination" respectively.

Due to the availability of these 13F forms only at the end of each quarter, the percentage owned by institutional investors at the moment of the IPO might be overestimated or underestimated due to the fact that between the IPO and the end of the quarter in which the IPO has occurred it can take up to 90 days. The same overestimation or underestimation can occur when it comes to the percentage owned by institutional investors at the moment of the business combination because of the similar delay between the announcement of a business combination and the end of the quarter preceding this announcement.

Measurement of the financial performance of the SPACs

To measure the financial performance of each SPAC, we decided to assimilate the financial performance with the share price performance even though the financial performance can have a broader meaning. Because SPACs are focusing on different sectors and can focus on companies that are really different in terms of size, capital structure and geography, we felt it was more

relevant to consider that the financial performance of SPACs could be assimilated with their share price performance and not with their valuation multiples. Although valuation multiples can be a good proxy of the financial performance of a stock⁴⁴, the fact that these valuation multiples vary greatly with the sector in which a company is operating may have made it difficult to compare these multiples from one SPAC to another. Furthermore, the fact that until merger completion SPACs are shell companies with no operations make it difficult to use the valuation multiples methods. Therefore, in the rest of this master thesis, financial performance of SPACs will be understood as share price performance of SPACs. We used the Capital IQ Excel add-in which allowed us to have the stock price of each SPAC at any moment in time in order to gather the historical stock prices for our 97 U.S. SPACs. Then, from this data we were able to calculate the financial performance of the SPACs over different periods in time.

As we focus on the search phase of SPACs, we looked at the performance over the period that goes from the IPO of a SPAC to its announcement of a business combination with a target company. We could also have looked at performance between the time of the IPO and merger completion, but the period that goes from the announcement of the business combination to merger completion is problematic for several reasons. First of all, this period can be longer or shorter depending on how long the SEC takes to analyze and validate the transaction, which is no longer the responsibility of the SPAC sponsors or institutional investors and which could have therefore polluted the analyses and comparisons that we wanted to conduct. Furthermore, as in this master thesis we are focusing on the SPAC search phase, we have considered that in a strict sense it stops as soon as the combination is announced and that the period following this announcement and up to merger completion can be more considered as an execution period and no longer as a search period.

Once we defined this time period over which we were going to measure the financial performance of the 97 U.S. SPACs in our sample, we decided to calculate two types of performance. A gross performance and an annualized performance taking into account the duration of the research period in order to standardize and compare these performances. Although we use both types of performance throughout the rest of this master thesis, we prefer most of the time to focus on the

⁴⁴ Yoo, Y. K. (2006). The valuation accuracy of equity valuation using a combination of multiples. *Review of Accounting and Finance*.

gross performance. If gross performance has the disadvantage of not aligning the respective financial performances of the SPACs over the same time horizon, it has the advantage of being a good indicator of the quality of the target chosen by the sponsors. Indeed, the annualized performance amplifies the market's reaction to the announcement of the target (both upward and downward) and therefore prevents the comparison of the quality level of two targets that required a different search time. For example, two targets of similar quality would generate a very different annual performance for their respective SPAC if one of them required only 6 months of research while the other took 1 year to find, even though they have the same intrinsic quality. The gross performance does not suffer from this flaw since its calculation is not amplified by the time needed to find a target company.

Having this gross and annualized performance was not sufficient because over the period considered, market conditions independent of the SPACs' sponsors and institutional shareholders could have polluted the performance of these SPACs. This is why it was necessary to introduce a control sample to neutralize these global market variations. This control sample is very problematic in the context of a SPAC for two main reasons. The first one is linked to the nature of the SPACs' shares: at the IPO, a fraction of a warrant is attached to a share to form a unit. It is this unit that is purchased by investors (usually for \$10). But this unit splits into a share and a fraction of a warrant after a certain period of time (this period of time is stated in the S1 filing and is maximum one year after the IPO and minimum thirty days after the IPO⁴⁵) and these two financial instruments are listed and traded separately. Thus, considering only the stock portion of a SPAC minimizes the upside that can be generated by the warrant. The ideal would be to consider the share and the fraction of the warrant as a whole, in order to have the value of the complete unit and to therefore have the best measurement of the financial performance of a SPAC. For this master thesis, it seemed to us too long and complex to gather the price of this unit and of its fraction of warrant and we thus decided to focus only on the value of the share of the SPACs, which thus minimizes the performance of a SPAC since the upside of the warrant is not taken into account. The second problem specific to SPACs with regard to the definition of a control sample concerns the fact that the downside risk is not the same for a SPAC share as for an ordinary share even if we ignore the previously mentioned problem of the warrants attached to SPAC shares. Indeed, a

⁴⁵ Nguyen, D. (2020, October) SPACs warrant basics for beginners *Wolves of investing*
<https://wolvesofinvesting.com/spac-warrant-basics-for-beginners/>

share of a SPAC can be redeemed at the time of the business combination for its value at the time of the IPO plus the accrued interests. Indeed, at the time of the IPO of a SPAC, the amounts raised are placed on a trust account and are being remunerated over the lifetime of a SPAC and thus generates accrued interests over the search phase. As a consequence, for a share issued at \$10 at the time of the IPO, the shareholder will have the possibility to redeem his share at the time of the business combination for \$10 plus accrued interest while even keeping the fraction of the warrant he obtained at the time of the IPO. This limited downside risk is not at all characteristic of traditional stocks that cannot be redeemed for a certain price and that therefore do not benefit from the same downside protection.

Thus, for these two reasons, it is complicated to consider that a SPAC and an ordinary share are comparable but in this master thesis we still considered it to be the best asset class against which to compare the performance of a SPAC because it is even harder to compare a SPAC stock with any other asset classes. The closer asset class to a SPAC share could be an investment into a private equity fund, with the possibility to opt-out when the GPs announce a combination, but this type of transactions and the performance of such investments is really difficult to measure as the data is often not available. It is so difficult to have this performance data regarding private equity transactions that some researchers have even used SPACs transaction as a proxy for private equity transactions⁴⁶. So, in the absence of a better control sample, we decided to take a set of common stocks to adjust the performance of the SPACs. For each SPAC in our sample, we looked at which stock exchange the SPAC was listed on in order to take a relevant sample of comparable publicly traded companies. Thus, when a SPAC was listed on the NASDAQ, the control sample was the Nasdaq Composite Index while when a SPAC was listed on the NYSE, its control sample was the NYSE Composite. The same methodology was followed for the few SPACs that were listed on other stock exchanges.

Once a control sample was assigned to each SPAC of our sample, we decided to adjust the performance of each SPAC by simply subtracting from the SPAC share price performance the

⁴⁶ Lewellen, S. (2009). SPACs as an asset class. *Available at SSRN 1284999*. This example is later developed in more details.

share price performance of the control sample over the same period. Thus, to calculate the adjusted performance of each SPAC between period A and B we did the following calculation:

$$\text{gross performance for a SPAC} = \left(\frac{\text{Share price at time B}}{\text{Share price at time A}} - 1 \right) - \left(\frac{\text{Index price at time B}}{\text{Index price at time A}} - 1 \right)$$

Annualized performance for a SPAC

$$= \left(\left(\frac{\text{Share price at time B}}{\text{Share price at time A}} \right)^{\frac{365}{\text{Number of days between A and B}}} - 1 \right) - \left(\left(\frac{\text{Index price at time B}}{\text{Index price at time A}} \right)^{\frac{365}{\text{Number of days between A and B}}} - 1 \right)$$

In the rest of this master thesis, whenever reference is made to the financial performance of a SPAC, it will mean the adjusted performance (gross or annualized) as defined above.

As explained above, most of the time, the period over which we analyze the performance of a SPAC is between the IPO of a SPAC and its combination announcement, but we will also expose sometimes the performance of a SPAC during the day following the announcement of a business combination.

3. Results

Thanks to the model exposed in part 1 and thanks to the data gathered on 97 U.S. SPACs following the methodology described in part 2, we were able to expose the influence of institutional investors on the financial performance of SPACs and on the time needed to find a target company.

The data we gathered suggest⁴⁷:

- A positive relation⁴⁸ between the percentage of the SPAC that is owned by institutional shareholders and the time needed to find a business combination measured in days;
- A negative relation⁴⁹ between the percentage of the SPAC that is owned by institutional shareholders and the share price performance of the SPAC between its IPO and the announcement of the business combination.

The results mentioned above suggest that having a higher level of institutional shareholders decreases the SPAC performance and increases the time needed to find a target and that therefore, we are in the second hypothesis, that is to say that s decreases θ . Bigger institutional ownership (s) is associated with longer time to combination announcement and worse financial performance.

To give the reader an example of what the negative relationship between θ and s can be, Figure 12 is an Excel simulation that shows how the expected number of periods needed to find a target increases with s in the example where $\theta = 1 - 0.5s$.

⁴⁷ Please refer to the Table 2 that presents the regression summary output from Excel

⁴⁸ Please refer to Figure 7 that presents the positive relation between the institutional ownership just before combination and the time to find a target company

⁴⁹ Please refer to Figure 8, 9, 10 and 11 that present the negative relation between the returns (gross or annualized) and the level of institutional ownership (just after IPO or just before combination announcement)

4. Robustness of the analysis

The results presented in this master thesis must be taken with caution since the coefficient of determination that shows the robustness of our results is rather low. Whatever regressions we conducted, it was always lower than 0.2. For example, the coefficient of determination presented previously in table 2 is 0.15925 which is quite low and which shows that there are other factors to take into account in order to better explain SPACs performance.

That is why we decided to run four additional analyses to try to understand what additional factors should be taken into account in order to fully explain the financial performance of SPACs.

We will first adjust our sample by removing some extreme SPACs and we will then look at the industry focus of the SPACs to see if institutional shareholders tend to invest more in a specific sector that has underperformed when compared to other sectors. Third, we will change our definition of the SPAC performance to focus on the share price performance on the day following the combination announcement and not on the period that goes from the SPAC IPO to its combination announcement. Fourth, we will try to see if institutional investors tend to focus on SPACs that have a lower volatility in terms of returns which could also explain the negative relation between institutional investors and SPACs performance.

Adjusting our sample of SPACs by removing extreme SPACs performers

The underlying assumption behind removing some SPACs that had abnormal performance from our sample was that these extreme performances were polluting our sample by disproportionately influencing the analyses that were made from this sample.

Therefore, we ranked our sample of 97 SPACs according to their gross performance between IPO and combination announcement in order to exclude the two best and the two worst performers. But even with this change the relation is still negative whether we are looking at the institutional ownership just after IPO (See Figure 13) or just before combination announcement (See Figure 14).

We also tried to remove the top five and the worst five performers from our sample and the negative relation between institutional shareholders and SPACs performance does not persist for the institutional ownership just after IPO (See figure 15) but is still very negative for the institutional ownership just before combination announcement (See figure 16).

Therefore, trying to adjust our sample by removing the top and worst performers does not seem very concluding.

Adjusting our sample of SPACs by differentiating the SPACs according to their industry focus

In our sample of 97 SPACs, we have SPACs that were looking to acquire a target company in a specific sector while others could invest in any sector (generalist SPACs). As explained in the methodology section, we believe that differentiating the SPACs according to their industry focus could have increased the homogeneity of our sample but that at the same time it could have made the number of SPACs in our sample too small to be meaningful. In this section, we investigate to understand if the negative relation between institutional shareholders and SPACs performance can be explained by an industry bias with institutional shareholders investing mainly in some sectors that have underperformed over our time window.

Our sample of 97 SPACs can be divided into two sub-samples: 19 generalist SPACs and 78 SPACs with an industry focus.

When looking at the 19 generalist SPACs, we find that institutional investors represent on average 65.0% of the shareholder base just before business combination which is slightly lower to what we observed in our main sample of 97 SPACs (with institutional shareholders representing on average 68.8%). Therefore, it does not appear that institutional shareholders have been investing significantly more or less in generalist SPACs.

We also looked at the 78 SPACs that are focused on a specific industry to see if there was a sector that had been attracting more institutional shareholders (or that had been more ignored by institutional shareholders). Out of this sub-sample, we can group SPACs according to their industry focus. The sector that has the more SPACs is the tech sector (including fintech) for which we have 18 SPACs in our sample followed by the healthcare with 13 SPACs. The other sectors did not have enough dedicated SPACs to be relevant: the consumer and retail sector had only 5

SPACs and the energy sector had only 3 SPACs. Other SPACs were focusing on other industries or were looking at a mix of different industries. In the tech sector institutional shareholders represent on average 73.8% of the shareholder base just before combination announcement while in the healthcare sector this proportion is only 61.6%. Therefore, it can be said that institutional shareholders tend to focus more on some sectors (like tech) and to be less present in other sectors (like healthcare), but it is hard to say that they are only investing in specific sectors or that they are totally ignoring other sectors.

Adjusting our performance analysis by focusing on the performance following the combination announcement and not on the performance between IPO and combination announcement

Another analysis that we wanted to conduct in order to see if we could explain the underperformance of the SPACs that have a higher share of institutional shareholders is to change the performance indicator by not looking at the performance between the IPO of the SPACs and their combination announcement but by just looking at their performance the day following their combination announcement. The underlying assumption of this adjustment is that the performance of the SPACs between IPO and combination announcement might not be the best proxy to measure the quality of the target chosen by the SPAC as it can incorporate other price reactions during the period that goes from the IPO to the day before the combination announcement. Maybe looking at the reaction following the day of the announcement can better measure the quality of the target chosen by the sponsors.

Therefore, we adapt the performance measure that we have defined in the methodology section as follows:

$$\begin{aligned}
 & \text{gross performance for a SPAC} \\
 & = \left(\frac{\text{Share price at time of combination announcement}}{\text{Share price at IPO}} - 1 \right) \\
 & \quad - \left(\frac{\text{Index price at combination announcement of the SPAC}}{\text{Index price at IPO of the SPAC}} - 1 \right)
 \end{aligned}$$

And we change it to:

gross performance for a SPAC

$$= \left(\frac{\text{Share price at the day following the combination announcement}}{\text{Share price at the day before the announcement}} - 1 \right) - \left(\frac{\text{Index price at the day following SPAC combination announcement}}{\text{Index price at the day before SPAC combination announcement}} - 1 \right)$$

But even with this new definition of performance, the relation between SPAC performance and institutional ownership is still negative whether we consider the share of institutional shareholders just after IPO (see figure 17) or just before business combination (see figure 18).

Thus, even when we adopt a new definition of performance as the share price performance of the SPACs the day following the announcement of the combination and not the share price performance from IPO to combination announcement, the relation is still negative between institutional ownership and SPACs performance.

Adjusting our performance analysis by taking into account the volatility

Maybe the underperformance of SPACs that have institutional shareholders can be explained by the fact that this type of investors has some risk constraints that do not allow them to invest in the riskier SPACs. To assess the accuracy of such hypothesis, we divided our sample of 97 SPACs into two sub-samples: the 48 SPACs that have the highest share of institutional shareholders and the 48 that have the lowest share of institutional shareholders to see if we could find some difference in terms of volatility.

The 48 SPACs that have the lowest share of institutional shareholders have an institutional ownership that goes from 8.8% to 74.8% and have a variance of their gross performance between IPO and combination announcement of 7.2%. The 48 SPACs that have the highest share of institutional shareholders have an institutional ownership that goes from 76.5% to 98.6% and have a variance of their gross performance between IPO and combination announcement of only 5.5%. Therefore, it appears that in the sub-sample of 48 SPACs with the highest share of institutional shareholders, the volatility is slightly lower than it is in the sub-sample of 48 SPACs with the lowest share of institutional shareholders.

This difference in volatility is confirmed and is even higher when we divide the 97 SPACs into two other sub-samples: the 24 SPACs that have the highest share of institutional ownership and the 24 that have the lowest share of institutional ownership.

The 24 SPACs that have the lowest share of institutional shareholders have an institutional ownership that goes from 8.8% to 52.7% and have a variance of their gross performance between IPO and combination announcement of 7.5%. The 24 SPACs that have the highest share of institutional shareholders have an institutional ownership that goes from 85.2% to 98.6% and have a variance of their gross performance between IPO and combination announcement of only 3.8%. Therefore, it appears that in the sub-sample of 24 SPACs with the highest share of institutional shareholders, the volatility is substantially lower (about half as much) than it is in the sub-sample of 24 SPACs with the lowest share of institutional shareholders.

As a consequence, it appears that the volatility of the SPACs performance may explain at least partially the underperformance of the SPACs that have a higher share of institutional shareholders.

Conclusion regarding those four additional analyses

To conclude about those four additional analyses that we ran in order to understand what were the additional factors that could explain our results, we can say that the lower volatility observed in the financial performance of the SPACs with the largest share of institutional investors may explain at least partially the relative underperformance of these SPACs. This would suggest that, because of their specific investment constraints, institutional shareholders tend to focus on SPACs that may have less upward potential but that are able to have lower volatility.

5. Limits of this master thesis and other analyses that could be ran in order to investigate further the role of institutional shareholders in SPACs

In this section, we expose the main limits of our study and the additional research that could be conducted in order to allow the next research papers focusing on the relation between institutional shareholders and SPAC performance to eventually dig these issues.

Shareholding structure of SPACs

Even if the results that we exposed earlier regarding the shareholding structure of SPACs are quite strong as the data gathered for the 97 U.S. SPACs clearly suggest a substantially higher level of institutional shareholders when compared to other publicly traded companies, we think that this analysis could be ameliorated and refined for at least four reasons.

The first reason is that we only looked at two periods in time for the institutional ownership: the end of the quarter following the IPO of the SPAC and the end of the quarter preceding the combination announcement of the SPAC. It could be interesting to see how the institutional ownership evolves between those two dates. Does it increase or decrease? Is it linearly increasing or decreasing, or can we observe some patterns in the institutional ownership?

The second reason is that the analysis that we ran in this master thesis only concerns the searching phase of the SPACs. Maybe it could be interesting to extend the period after the combination announcement in order to see if SPACs stay invested with a large stake beyond the combination announcement and especially beyond the merger completion. As this master thesis suggests that during the search phase institutional shareholders are overrepresented when compared to the share of institutional investors in other publicly traded companies, it could be interesting to see if their stake in SPACs decreases after merger completion. Because once the business combination is completed and that the SPAC has merged with the target company, a SPAC should no longer be considered as a specific asset class that is different from other common stocks and therefore institutional investors might sell some of their shares to match the level of ownership that they have in ordinary companies.

The third reason is that the 97 U.S. SPACs that are in our sample come from a very narrow period in time (they have all combined between March 2019 and February 2021 as explained in the methodology section). As a consequence, it would be interesting to see if the higher level of institutional ownership is something that is also observed before 2019. Maybe that small investors are slowly becoming aware of the fact that, as exposed previously, SPACs bear strong resemblance with private equity type transactions and that investing in SPACs could be a way to access private equity with fewer barriers. If this assumption is true, it would mean that SPACs institutional ownership has been decreasing since the inception of SPACs in 2003 to nowadays.

The fourth reason is that the analysis we ran in this master thesis looks at the institutional ownership for each of the 97 U.S. SPACs that are in our sample but did not try to see if some institutional shareholders were investing in many SPACs or if they were only picking and investing in a few SPACs for which they strongly believed in the sponsors. Such analysis could maybe show that there are two types of institutional investors that currently invest in SPACs. On the one hand, we might find that some institutional investors are maybe investing in a lot of different SPACs because what they like about this asset class is the downside risk protection that they have, thanks to the possibility to redeem their shares, combined with a substantial upside potential. Those types of institutional investors would probably look a lot less at the sponsors and would maybe not spend time trying to influence the sponsors over the lifetime of the SPACs. On the other hand, we might find that some institutional investors are investing on a limited number of SPACs for which they strongly believe in the management and for which they are ready to spend a lot of time to try an influence the choices made by the sponsors all over the life cycle of the SPAC. It would then be interesting to run the same analysis that we ran in this master thesis in order to try and understand the role played by these active institutional investors. Maybe the negative relation that we find between the level of institutional ownership and the performance of SPACs comes from the fact that our data is polluted by institutional shareholders that do not try to help the sponsors of the SPACs they invest in but are rather following an arbitrage strategy by redeeming their shares and keeping the warrants attached to their shares for free⁵⁰.

⁵⁰ Please refer to the introduction and especially to the paragraph explaining the innovations being brought by the SPACs from the investors' perspective where reference is made to SPAC arbitrage as studied by Klymochko (2020).

Performance measurement

The main limitation of this master thesis is certainly related to the way of computing the performance of SPACs. As explained in the methodology section, the performance of a SPAC is measured over the period from the IPO to the announcement combination as the difference between the performance of the SPAC stock and the performance of a selected index over the same period.

First, the selection of the index could be improved. In this master thesis, we selected an index only by focusing on the stock exchange where the SPAC was listed. When a SPAC was listed on the NASDAQ, the control sample was the Nasdaq Composite Index while when a SPAC was listed on the NYSE, its control sample was the NYSE Composite. Thus, the index selection does not take into account several features of the SPACs that could influence the most relevant index to take into account. In order to improve the adjustment of SPACs performance, the choice of the benchmark index could also include the size of the SPAC in question (IPO size), its industry focus and its geographical focus when available.

Second, the very principle of a benchmark of stocks that would be representative of the equity market for each SPAC could be questioned. Indeed, as mentioned in the methodology section, SPACs have a very specific risk-return profile. On the one hand, it seems logical to compare the performance of a SPAC stock to an ordinary stock since after the combination with the target company a SPAC stock is just an ordinary stock. But on the other hand, the downside risk of a SPAC share is almost non-existent (since the shareholders can still redeem their shares at the time of the combination for the price they paid at the IPO plus the increased interest since the IPO) which is not the case for an ordinary share. Thus, it might be interesting to adopt a new type of index to adjust the performance of a SPAC. Perhaps a fine analysis would require distinguishing certain periods in the life of the SPAC. The first period could be the one that goes from the IPO to the business combination of the SPAC with its target. For this period, it would be interesting to try to adjust the performance of SPACs with an index composed of bonds rather than stocks. Indeed, during this period, the money raised at the time of the IPO is put into a trust account which is remunerated. The second period would start at the business combination of the SPAC with its target and for this period the adjustment of the performance of the SPACs could be done with an index composed of shares, since from the business combination onwards the shareholders no

longer have the possibility to redeem their shares at the IPO price and thus no longer benefit from a reduced downside risk. The analysis could also be further improved by taking into account the upside related to the existence of a fraction of a warrant for each unit of SPAC offered at the IPO. This fractional warrant adds upside potential for SPAC shareholders as it is retained by the shareholders even if they decide to redeem their shares at the time of the business combination.

Thus, it seems that there are interesting avenues for improving the measurement of SPAC performance by better adjusting the control index specific to each SPAC.

Choosing a sample of SPACs

In this master thesis, we made some choices regarding the SPACs to be included in our sample of 97 SPACs. These choices are exposed in the methodology section. Here we wanted to expose some other rules that could be followed in order to build a sample of SPACs that might be more relevant.

In our analysis we thought that it would be better to have a sample of SPACs that was consistent on the time window, that is therefore quite short (our 97 U.S. SPACs have completed their business combination between March 19, 2019 and February 16, 2021) and not to discriminate SPACs according to their industry focus in order to have enough SPACs in our sample. Another way of building a sample of comparable SPACs can be done the other way around with SPACs only focusing on a specific industry even if the analysis would therefore probably need to be conducted on a longer time window in order to have enough SPACs in the sample. It would be interesting to see if SPACs are more comparable when they are raised in the same narrow time window even if they have different industry focus or if they are raised over a longer period of time but with a specific industry focus.

Maybe the sample of SPACs could also focus on a specific SPAC size in order to eliminate SPACs that are too big or too small. The size of the SPACs IPOs in our sample ranges from \$40 million to \$1,100 million which is quite a large spectrum and might hinder the comparability of our SPACs. Removing SPACs that are too small or too big raises the question to know what are the limits to be set in order to be able to compare SPACs between themselves which is especially a tricky question as the average size of SPACs in the U.S. has been increasing over time: it was

\$55m on average in 2012, \$195m in 2015, \$234m in 2018 and \$336m in 2020⁵¹. So maybe the limits that have to be set in order to exclude SPACs that are too small or too big have to move with the average size of SPACs over time.

Therefore, it seems that the sample of SPACs could be adjusted following at least two new rules in the SPACs selection to try to have a sample that might be more relevant than the one we built.

Explaining and interpretating the negative relation between institutional investors and SPACs performance

If even with the adjustment of the performance measurement and the adjustment of the SPACs sample that we have just exposed the negative relation between institutional shareholders and SPACs performance persists, it could be interesting to analyze further the reasons that could explain such a puzzling result. In this master thesis, we mentioned that the main explanatory factor could be the investment constraints of institutional investors that could force them to invest only in SPACs that are less risky. In addition to this potential reason, it might also be interesting to look for other explanations that could at least partially explain such a negative relation, such as the previously mentioned potential negative effect from hedge funds that are having an arbitrage strategy by always redeeming their shares and keeping the warrants for free⁵².

But apart from all the explanations that can be found, it can also be interesting to dig into the interpretation that can be made of this negative relation. The negative relation between institutional ownership and SPACs performance does not necessarily mean that institutional shareholders are counterproductive to their own investment. This negative relation could be that institutional shareholders do not have a negative influence on the SPACs they invest in but rather that they are not able to identify the most talented sponsors to invest in, and that therefore they tend to invest in SPACs that have sponsors that are less successful i.e., those with the highest search time and the lowest performance (that is to say, sponsors that would have a low θ in our model).

⁵¹ Please see figure 1 in appendix where this evolution is evidenced.

⁵² Please refer to the introduction and especially to the paragraph explaining the innovations being brought by the SPACs from the investors' perspective where reference is made to SPAC arbitrage as studied by Klymochko (2020).

Another interpretation could also be that institutional shareholders decide to invest in SPACs at the IPO stage not so much for the investment itself but more to be welcomed at the structuring stage when they will be able to increase their ticket, often at preferential conditions being part of the PIPE investors⁵³. Therefore, one could argue that some institutional investors could not be very careful in the SPACs in which they invest because what is important for them is not so much to select the best SPACs at the time of the IPO but rather to have the opportunity to invest in the best SPACs at the time of the structuring stage where they have more visibility on the quality of the target that has been found by the sponsors. This interpretation could make sense in terms of volume: “For every \$100 million raised through a SPAC, a corresponding PIPE added another \$167 million” according to a Morgan Stanley study⁵⁴. Therefore, institutional investors could accept a lower performance during the period that goes from IPO to combination announcement in order to be able to participate with a bigger ticket at the time of the structuration of the transaction.

Refining the model we used

In this master thesis, we used a basic model for the sake of simplification. But our model could be refined in order to better represent what happens in real life. In our opinion, there are at least two refinements that could improve the model.

First, the model could take into account the possibility for the sponsors not to present any target to their shareholders. Indeed, the model we outlined earlier is based on the fact that, at the time of the deadline, sponsors are forced to accept the target that is offered to them regardless of its quality. But in real life this is not the case. They have the option of not proposing a target to their shareholders and thus dissolving the SPAC by reimbursing their shareholders and losing everything they have invested. Even if this choice is not ideal and no sponsor would like to have to do it, it is a choice that is made by some of the sponsors, notably in order not to take the risk of

⁵³ According to CNBC, “Investors in the PIPE usually receive their securities at a discount at least to the market price and sometimes they even get shares below the IPO price”. Picker L. (2021, January) How financing SPAC takeovers became Wall Street’s new favorite trade *CNBC* <https://www.cnbc.com/2021/01/25/how-financing-spac-takeovers-became-wall-streets-new-favorite-trade.html>

⁵⁴ Picker L. (2021, January) How financing SPAC takeovers became Wall Street’s new favorite trade *CNBC* <https://www.cnbc.com/2021/01/25/how-financing-spac-takeovers-became-wall-streets-new-favorite-trade.html>

being refused by their shareholders at the time of the vote or to see too many shareholders redeeming their shares making it impossible to structure the combination.

Second, the model could allow the sponsors to accept a target company that they have analyzed in the past few periods and not only the target that they are currently analyzing. Indeed, in our model, there is a simplistic assumption according to which the sponsors cannot go back in time and present to its shareholders a target that they have already analyzed. Of course, sponsors should not be able to come back in time to accept a target that they analyzed one year ago because in the meantime the quality of the target may have evolved and because the target may no longer be for sale. But maybe that allowing the sponsors to purchase a target company that they have screened in the past five periods would be more representative of what happens in real life. Indeed, in real life not only are SPAC sponsors always analyzing different targets at the same time, but they also have the possibility to submit an offer for a target that they have already analyzed recently, even if they have also analyzed other targets in the meantime.

Therefore, it seems that there are at least two refinements that could improve the model that we presented earlier. Even if those refinements could make it more complicated to understand the model, they might allow for a better understanding of the tradeoffs that the sponsors have at each period in time.

Conclusion

In this master thesis, we find that institutional investors own on average 68.8% of the 97 U.S. SPACs we have in our sample, which is substantially above the institutional ownership of all publicly traded companies. This result suggests that, as of today, institutional investors seem to be particularly attracted to this asset class, while this is not the case for small investors.

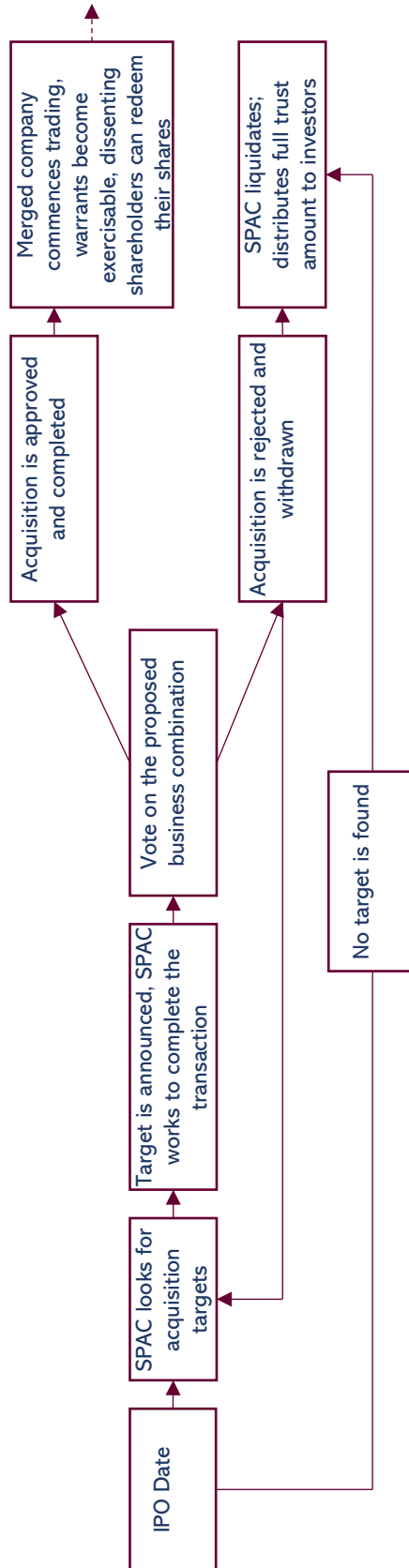
Thanks to a simple model that replicates the influence of institutional shareholders invested in SPACs on the sponsors during the search phase, our results suggest that institutional shareholders are not helping SPACs sponsors to find better targets or to decrease the number of days needed to find a target. On the contrary, it appears that institutional shareholders' influence could be negative for SPACs with higher institutional ownership being associated with lower returns and longer search period.

One explanation for this puzzling result could be that institutional shareholders tend to influence the sponsors towards safer target companies as we find that the higher the institutional shareholders level is the lower the volatility of the share price performance of the SPAC during the search phase. This influence towards safer targets could be linked to the investment constraints that are specific to institutional shareholders.

However, the low R-square that we expose suggests that additional explanatory factors should be taken into account to better understand the role of institutional shareholders, which opens the way for further research.

Appendix

Appendix A – General SPAC Life cycle



Appendix B – Additional Tables

Table 1: Institutional ownership at the end of the quarter following SPACs IPO and at the end of the quarter just before combination announcement

	Institutional ownership just after SPAC IPO	Institutional ownership just before combination announcement
Average	40.3%	68.8%
Median	39.8%	76.3%
25%	24.7%	53.7%
75%	53.5%	53.5%

Table 2: regression of SPAC institutional ownership (dependent variable) on SPAC performance between IPO and combination announcement (X Variable 1) and time needed to find a target (X Variable 2)

<i>Regression Statistics</i>	
Multiple R	0.39907
R Square	0.15925
Adjusted R Square	0.14136
Standard Error	0.19756
Observations	97

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>Significance F</i>	
Regression	2	0.69495	0.34748	8.90268	0.00029
Residual	94	3.66888	0.03903		
Total	96	4.36384			

	<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	0.58500	0.04330	13.50932	0.00000	0.49902	0.67098	0.49902	0.67098
X Variable 1	-0.25123	0.07809	-3.21728	0.00178	-0.40628	-0.09619	-0.40628	-0.09619
X Variable 2	0.00021	0.00009	2.39092	0.01880	0.00004	0.00039	0.00004	0.00039

Table 3: Number of days in each period of the SPAC life cycle in our sample of 97 U.S. SPACs

	Days between IPO and combination announcement	Days between combination announcement and merger completion	Days between IPO and combination completion
Average	435	138	573
Median	441	119	564
25%	238	93	349
75%	623	158	771

Table 4: repartition of the IPO size of our sample of 97 U.S. SPACs in million US dollars

	Size of the IPO (in million US dollars)
Average	254.6
Median	207.0
25%	143.8
75%	310.5

Appendix C – Additional Figures

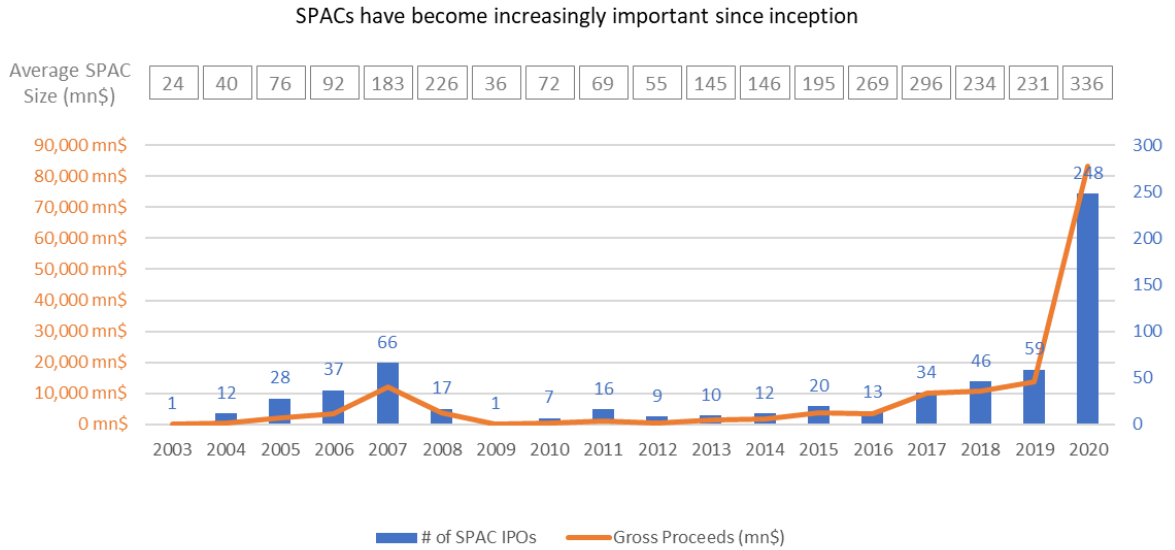


Figure 1: Number of U.S. SPACs raised, average IPO size and total amount raised by U.S. SPACs between 2003 and 2020⁵⁵

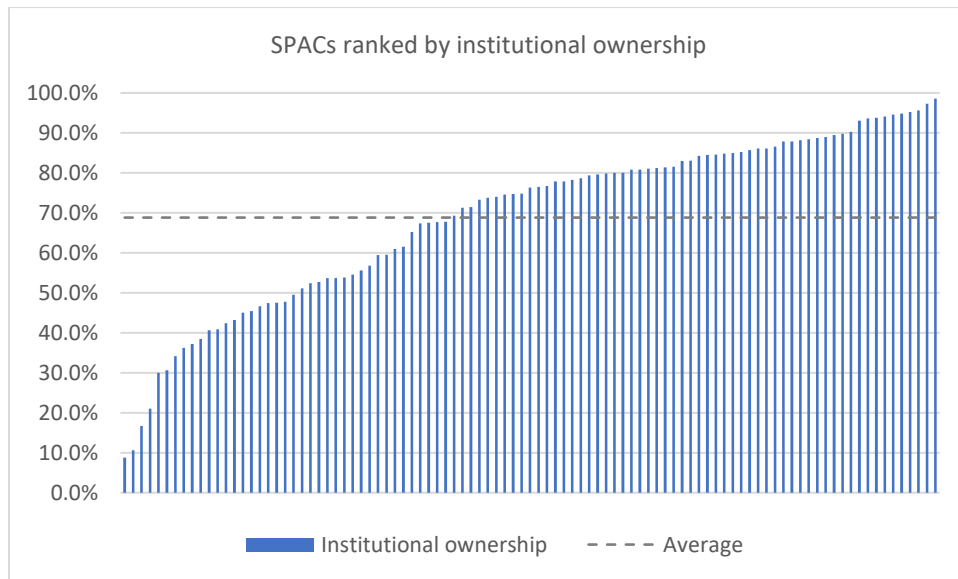


Figure 2: Ranking of the 97 U.S. SPACs that are in our sample. We observe that the percentage of institutional ownership varies greatly: it ranges from 8.8% to 98.6%.

⁵⁵ SPAC Data (2021) Retrieved from Spacdata.com

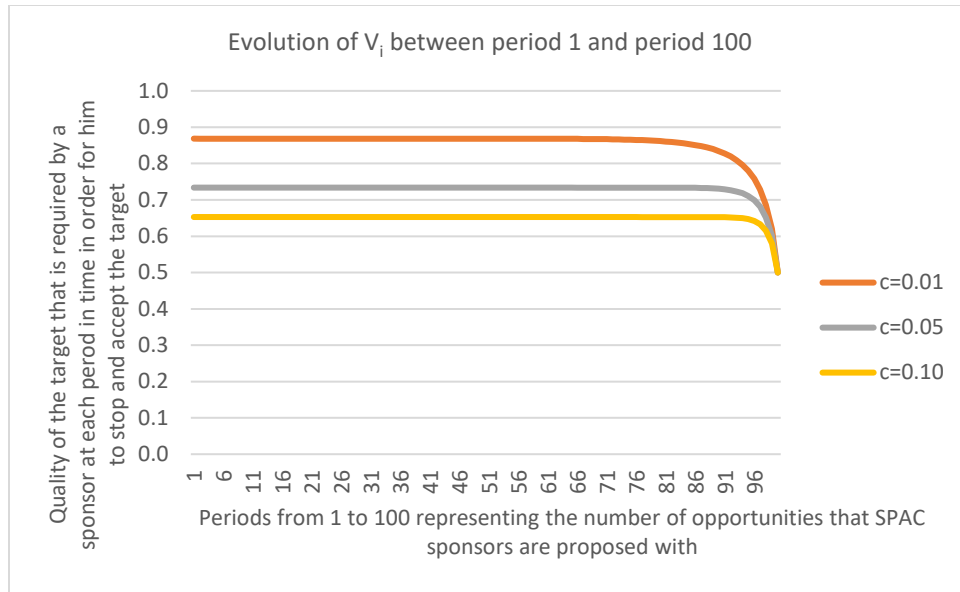


Figure 3: Excel simulation with three different scenarios for the cost c and θ constant ($\theta=1$) with $n=100$

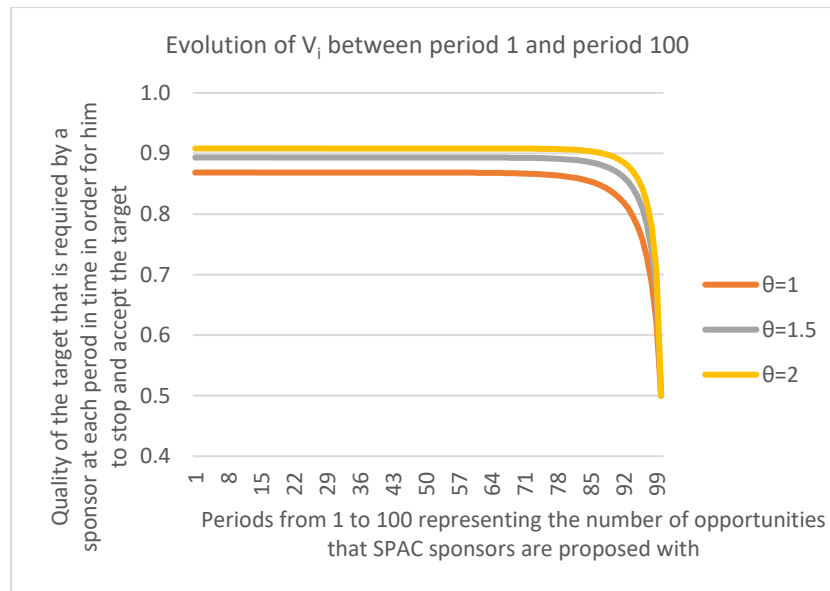


Figure 4: Excel simulation with three different scenarios for the share owned by institutional shareholders θ and c constant ($c=0.01$) with $n=100$

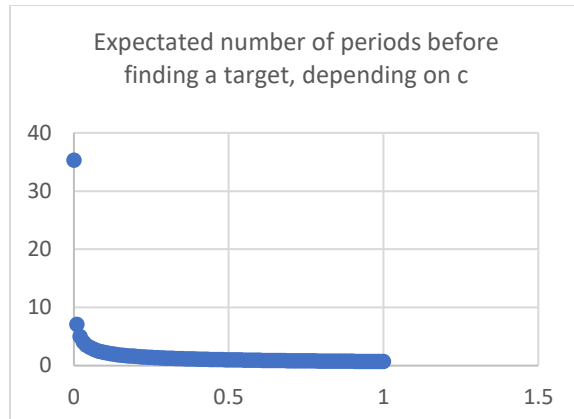


Figure 5: This chart shows that the expected number of periods needed to find a target decreases with c when $n=100$ and $\theta=1$

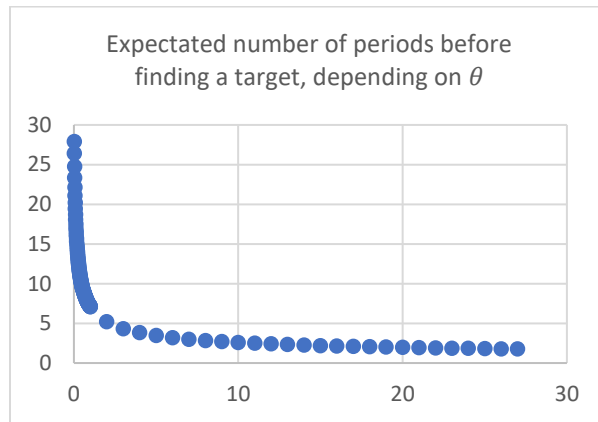


Figure 6: This chart shows that the expected number of periods needed to find a target decreases with θ when $n=100$ and $c=0.01$

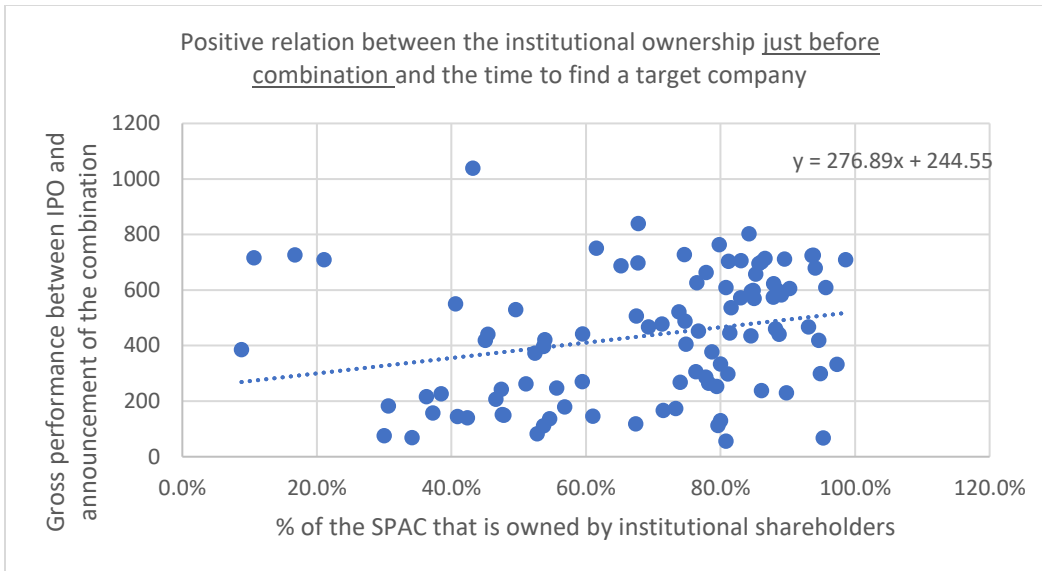


Figure 7: Positive relation between the institutional ownership just before combination and the time to find a target company with a low p-value of 0.010662

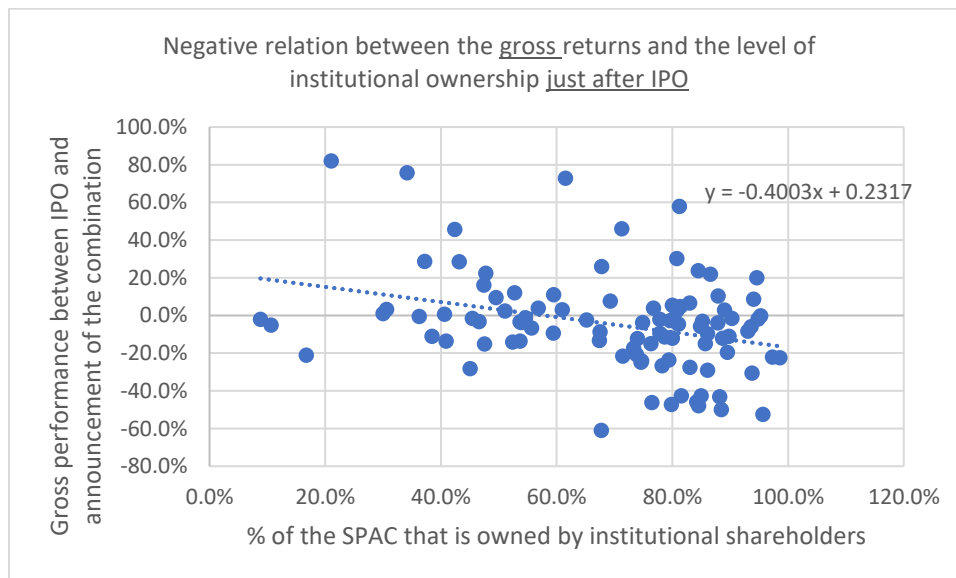


Figure 8: Negative relation between the gross returns and the level of institutional ownership just after IPO with a low p-value of 0.001

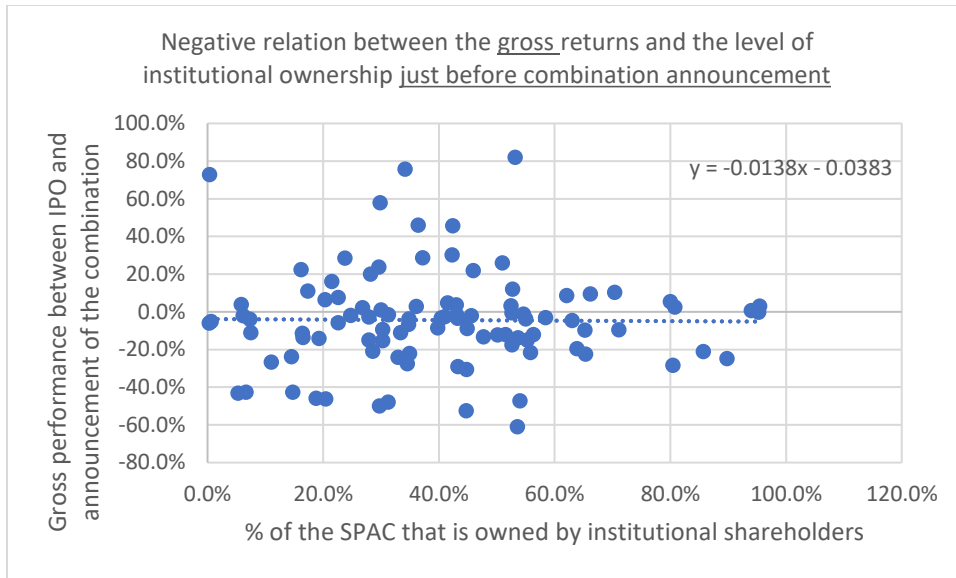


Figure 9: Negative relation between the gross returns and the level of institutional ownership just before combination announcement with a low p-value of 0.001007

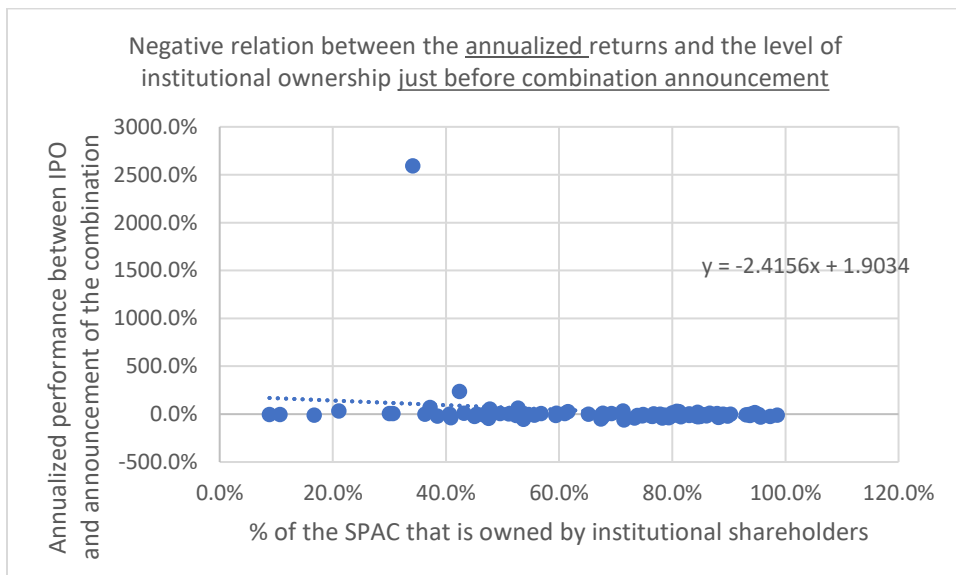


Figure 10: Negative relation between the annualized returns and the level of institutional ownership just before combination announcement with medium p-value of 0.0569

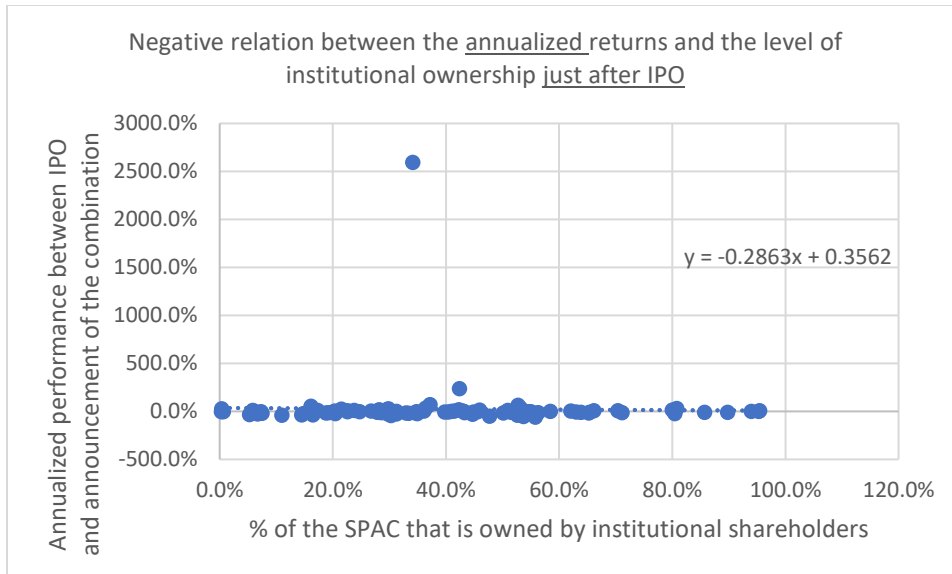


Figure 11: Negative relation between the annualized returns and the level of institutional ownership just after IPO with high p -value of 0.8146

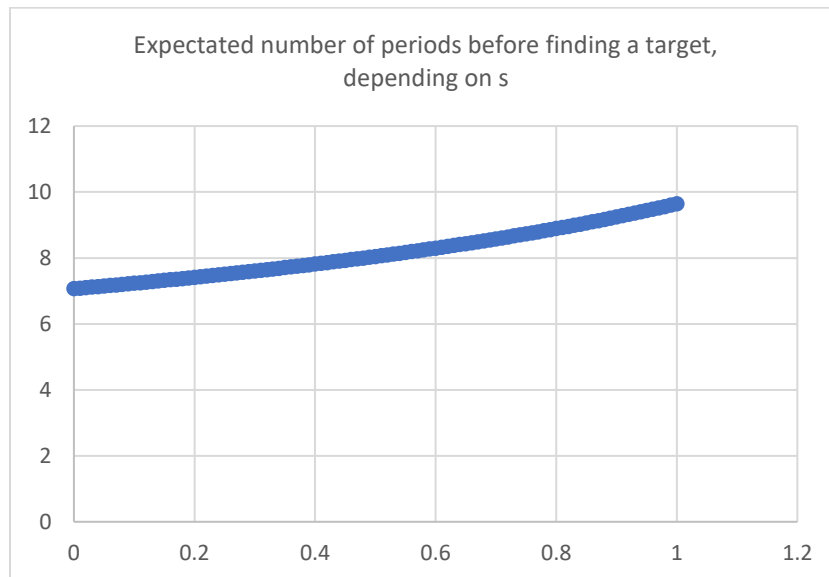


Figure 12: This Excel simulation shows that the higher the institutional ownership (s) the higher the expected number of periods needed by the sponsors to find a target (with $n=100$, $\theta = 1-0.5*s$ and $c=0.01$)

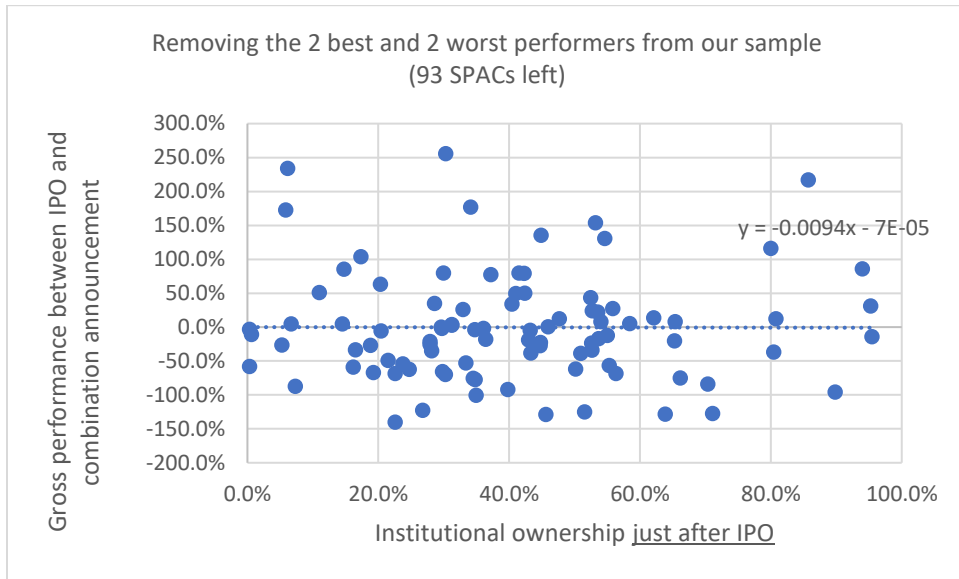


Figure 13: The negative relation between institutional ownership just after IPO and SPACs performance is still very clear when removing the two best and the two worst performers from our sample

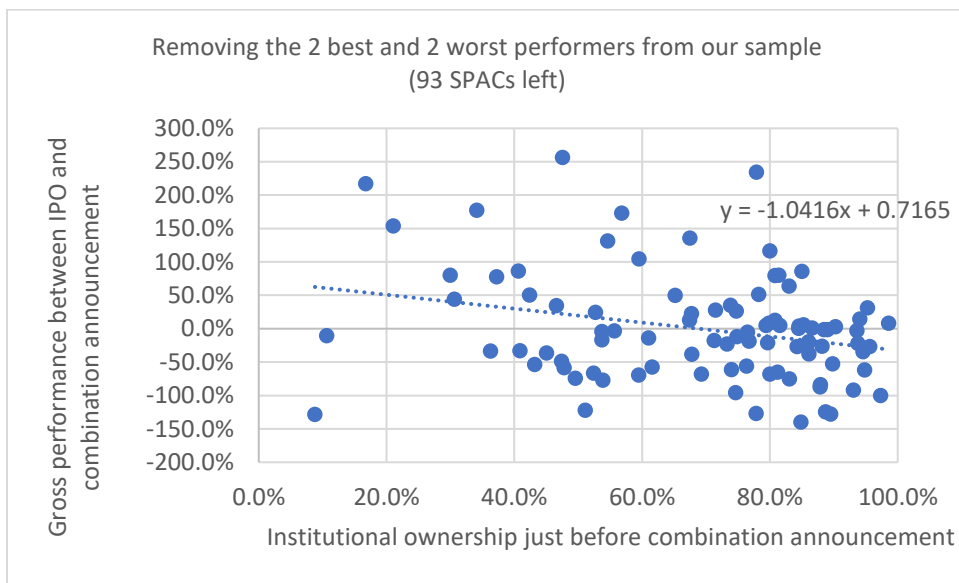


Figure 14: The negative relation between institutional ownership just before combination announcement and SPACs performance is still very clear when removing the two best and the two worst performers from our sample

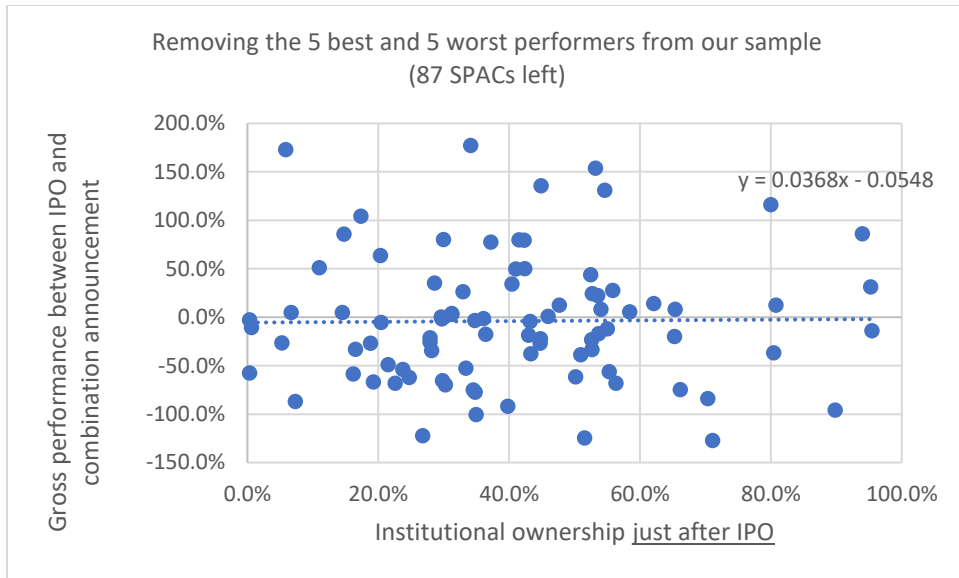


Figure 15: When removing the five best and the five worst performers from our sample, the negative relation between institutional ownership just after IPO and SPACs performance becomes unclear

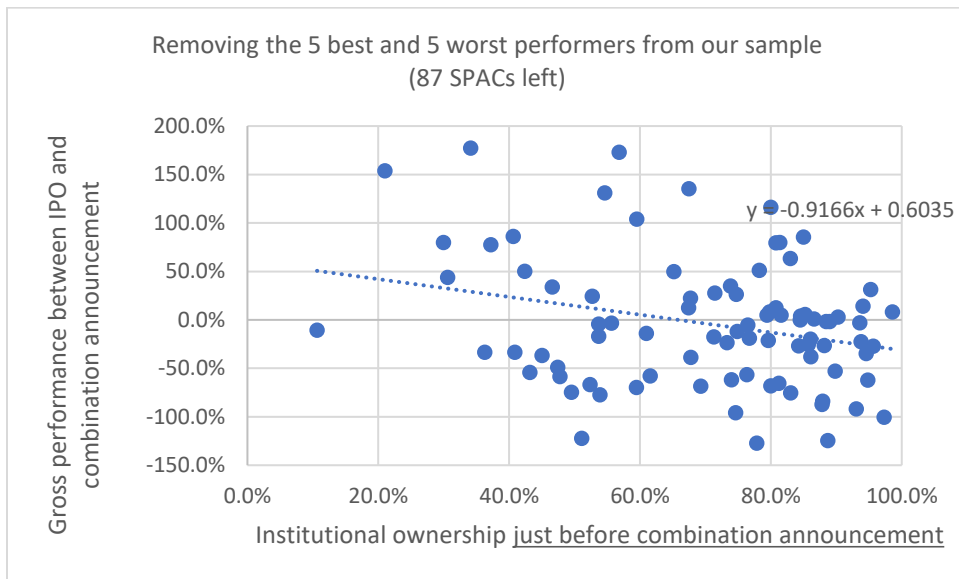


Figure 16: The negative relation between institutional ownership just before combination announcement and SPACs performance is still very clear when removing the five best and the five worst performers from our sample

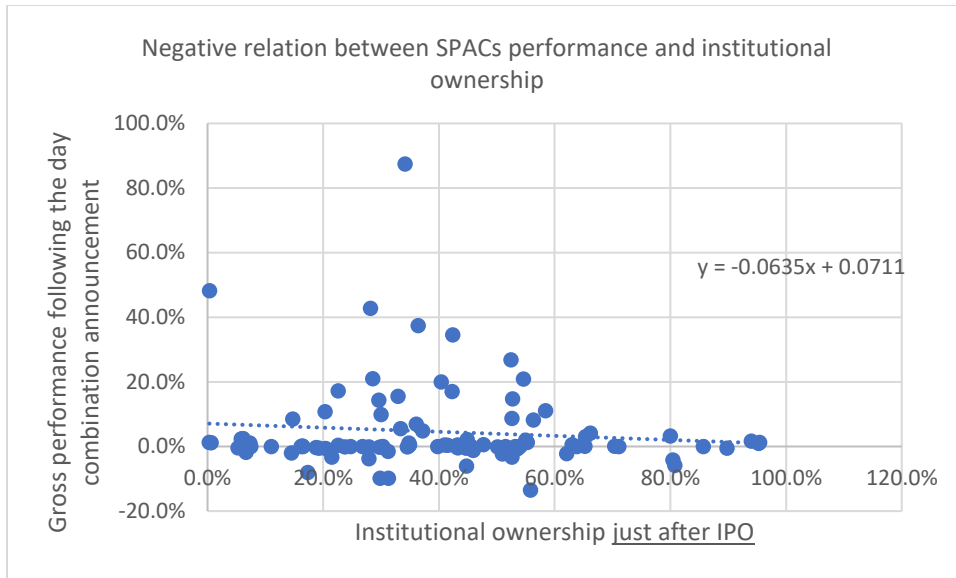


Figure 17: Changing the performance calculation to focus on the share price performance the day following the combination announcement does not remove the negative relation between institutional ownership just after IPO and SPACs performance

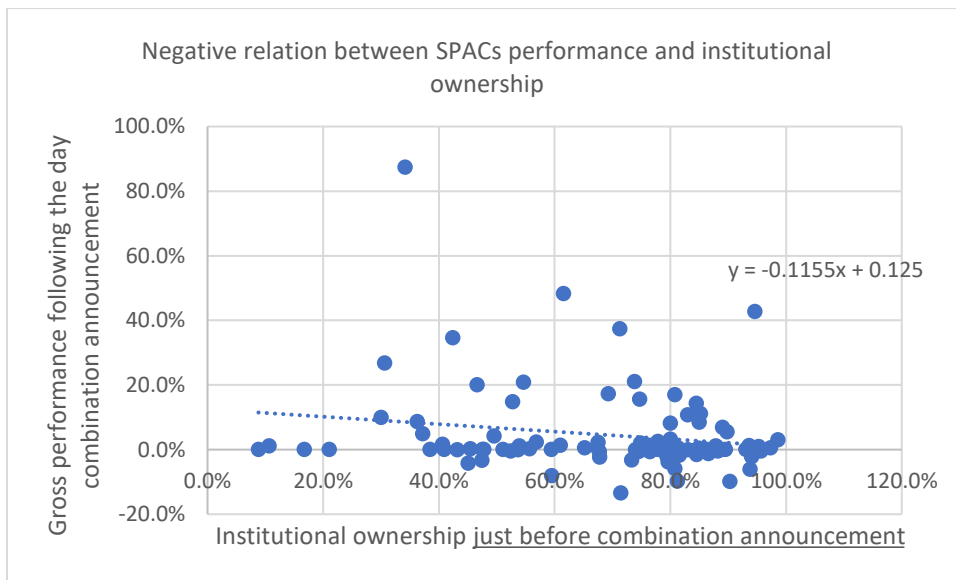


Figure 18: Changing the performance calculation to focus on the share price performance the day following the combination announcement does not remove the negative relation between institutional ownership just before combination announcement and SPACs performance

Bibliography

- 2MX Organic Governance. (2021). Retrieved from <https://www.2mxorganic.com/>
- About Mediawan. (2021). Retrieved from <https://www.mediawan.com/fr/about>
- Adjei, F., Cyree, K. B., & Walker, M. M. (2008). The determinants and survival of reverse mergers vs IPOs. *Journal of Economics and Finance*, 32(2), 176-194.
- AllBusiness (2020, November) Forbes
<https://www.forbes.com/sites/allbusiness/2020/11/11/10-key-questions-and-answers-about-spacs/?sh=27c70bf12f83>
- Arellano Ostoa, A., & Brusco, S. (2002). Understanding reverse mergers: a first approach.
- Attias, E. (2021, February) La "Spac mania" de Wall Street va-t-elle déferler en Europe? Challenges https://www.challenges.fr/finance-et-marche/la-spac-mania-de-wall-street-va-t-elle-deferler-en-europe_751866
- Beacon VC (2021, January) SPAC – a new potential exit strategy for startups
<https://beaconvc.fund/2021/01/13/spac-a-new-potential-exit-strategy-for-startups/>
- Blank Check Company. (2021). Retrieved from <https://www.investor.gov/introduction-investing/investing-basics/glossary/blank-check-company>
- BlankRome (2008, June) SPACs: An Emerging Exit Strategy
<https://www.blankrome.com/publications/spacs-emerging-exit-strategy>
- Boisseau, L. (2020, December) 2020, année noire pour les introductions en Bourse en France Les Echos <https://www.lesechos.fr/finance-marches/marches-financiers/2020-annee-noire-pour-les-introductions-en-bourse-en-france-1276969>
- Boyer, C. M., & Baigent, G. G. (2008). SPACs as alternative investments: an examination of performance and factors that drive prices. *The Journal of Private Equity*, 11(3), 8-15
- Bushee, B. J. (1998). The influence of institutional investors on myopic R&D investment behavior. *Accounting review*, 305-333.
- Capital IQ Platform (2021) Retrieved from
<https://www.spglobal.com/marketintelligence/en/solutions/sp-capital-iq-platform>
- Chen, H. C., & Ritter, J. R. (2000). The seven percent solution. *The journal of finance*, 55(3), 1105-1131.

- Chen, X., Harford, J., & Li, K. (2007). Monitoring: Which institutions matter?. *Journal of financial Economics*, 86(2), 279-305
- Croft, A. (2021, March) Two age-old European trading rivals are at loggerheads again—this time over SPACs *Fortune* <https://fortune.com/2021/03/04/brexit-europe-finance-london-amsterdam-spacs-financial-center-eu/>
- Cumming, D., Haß, L. H., & Schweizer, D. (2014). The fast track IPO—Success factors for taking firms public with SPACs. *Journal of Banking & Finance*, 47, 198-213
- Dimitrova, L. (2017). Perverse incentives of special purpose acquisition companies, the “poor man's private equity funds”. *Journal of Accounting and Economics*, 63(1), 99-120.
- Gompers, P. A., & Metrick, A. (2001). Institutional investors and equity prices. *The quarterly journal of Economics*, 116(1), 229-259.
- Hale, L. M. (2007). SPAC: A Financing Tool with Something for everyone. *Journal of Corporate Accounting & Finance*, 18(2), 67-74.
- Hartzell, J. C., & Starks, L. T. (2003). Institutional investors and executive compensation. *The journal of finance*, 58(6), 2351-2374.
- Hayes, A (2020, March) Exit Strategy <https://www.investopedia.com/terms/e/exitstrategy.asp>
- Howe, J. S., & O'Brien, S. W. (2012). SPAC performance, ownership and corporate governance. In *Advances in Financial Economics*. Emerald Group Publishing Limited.
- Ignatyeva, E., Rauch, C., & Wahrenburg, M. (2013). Analyzing European SPACs. *The Journal of Private Equity*, 17(1), 64-79.
- Klymochko (2020). The art of SPAC Arbitrage
- Lakicevic, M., Shachmurove, Y., & Vulcanovic, M. (2014). Institutional changes of specified purpose acquisition companies (SPACs). *The North American Journal of Economics and Finance*, 28, 149-169.
- Lewellen, S. (2009). SPACs as an asset class. Available at SSRN 1284999.
- McConnell, J. J., & Servaes, H. (1990). Additional evidence on equity ownership and corporate value. *Journal of Financial economics*, 27(2), 595-612.
- Moore, S. (2020, October) The Risk And Returns For The Increasingly Popular SPAC Trade *Forbes* <https://www.forbes.com/sites/simonmoore/2020/10/19/the-risk-and-returns-for-the-increasingly-popular-spac-trade/?sh=394bc9a73297>

- Nguyen, D. (2020, October) SPACs warrant basics for beginners Wolves of investing <https://wolvesofinvesting.com/spac-warrant-basics-for-beginners/>
- Oblis (2021, February) Les SPAC, dernière folie à la mode <https://www.oblis.be/fr/news/2021/02/23/spac-derniere-folie-mode-552151>
- Picker L. (2021, January) How financing SPAC takeovers became Wall Street's new favorite trade CNBC <https://www.cnbc.com/2021/01/25/how-financing-spac-takeovers-became-wall-streets-new-favorite-trade.html>
- Pinedo, A. (2020, October) Mayer Brown LLP <https://www.mayerbrown.com/-/media/files/perspectives-events/publications/2020/10/top-10-practice-tips-pipe-transactions-by-spacs.pdf>
- Provasi, R. (2019). Evidence of the Italian Special Purpose Acquisition Company.
- PwC (2021) How special purpose acquisition companies (SPACs) work <https://www.pwc.com/us/en/services/audit-assurance/accounting-advisory/spac-merger.html>
- Schumacher, B. (2019). A New Development in Private Equity: The Rise and Progression of Special Purpose Acquisition Companies in Europe and Asia. *Nw. J. Int'l L. & Bus.*, 40, 391.
- SPAC Data (2021) Retrieved from [Spacdata.com](https://spacdata.com)
- SPAC Track (2021) Retrieved from <https://spactrack.net/closedspacs/>
- Tran, A. L. (2010). Blank check acquisitions.
- Warner, D. & Lee, D. (2019). PE Sale of Portfolio Company to a SPAC <https://corpgov.law.harvard.edu/2019/09/15/pe-sale-of-portfolio-company-to-a-spac/>
- Yoo, Y. K. (2006). The valuation accuracy of equity valuation using a combination of multiples. *Review of Accounting and Finance*.
- Yun, L. (2021, March) SPACs break 2020 record in just 3 months, but the red-hot industry faces challenges ahead CNBC <https://www.cnbc.com/2021/03/19/spacs-break-2020-record-in-just-3-months.html>