SPACS: Structure and performance

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ABSTRACT

A SPAC is a Special Purpose Acquisition Company which is a publicly listed pool of capital with a two-year duration. Its purpose is to merge with a private company as an alternative way to bring the target company public. A unique characteristic of a SPAC is that investors are unaware of the underlying private company at the time of initial investment. Only after the SPAC has been fully funded will it identify an opportunity, then negotiate the merger pending shareholder approval.

The goal of this paper is to detail the characteristics of SPACs and examine their short- and medium-term performance. Investors may be interested in the low-risk initial investment offered by the sponsoring companies with the benefit of potential high post-merger returns. However, SPAC sponsors have a strong incentive to undertake a merger, even if it is suboptimal, because they will only earn a significant return with any completed merger. There is also a question if the less scrutinized SPAC process, as opposed to a traditional IPO, will draw weaker merger candidates.

The paper examines the performance of SPACs around the target announcement date, merger date, and longer post-merger periods as the data allows. Findings include significant variation in returns with losses more common than gains. Evidence is mixed on whether industry characteristics or SPAC sponsor expertise impact performance.

Keywords: SPACs, initial public offerings, investments

INTRODUCTION

Special Purpose Acquisition Companies (SPACs) were introduced in the 1990's as an alternative to a traditional initial public offering. There were relatively few transactions during the first two decades of their existence, but interest and volume increased dramatically over the past several years. Recently, SPACs have attracted significant attention as a means of taking a company public. SPAC IPOs raised more funds in 2020 than over the entire preceding decade combined, and 2021 saw even more deals and dollar volume. (Chamberlain, 2021). SPAC IPOs accounted for more than half of total IPOs among firms that went public in those two years.

SPAC Structure

There are two separate transactions by which a SPAC brings a company public: the SPAC first goes public through its own IPO, and then later merges with a private company. The process begins once a management team forms a SPAC and pursues an IPO in what is referred to as a blank check company. The management team could include a group of executives, a private equity firm, another organization, or even a celebrity. During the SPAC IPO, units made up of both common shares and warrants, are conventionally initially priced at $10. The management team invests its own seed money, then shortly after the issuance of units, the SPAC will issue common stock under a ticker symbol. At that point, individual investors may purchase shares of the SPAC. The IPO proceeds are held in an interest-bearing trust account invested in U.S. government securities while the management team searches for an acquisition target. The target company is unknown initially, and in fact, every SPAC prospectus must state that the sponsors do not have an acquisition under consideration and have not had any conversations with anyone about a potential transaction (Klausner, Ohlrogge, & Ruan, 2022). Investors are therefore strictly relying on the expertise of the management group to find an acceptable target. However, they do possess the right to redeem their shares once a target is announced as described later.

The SPAC's charter typically gives the SPAC two years to identify a merger target and to complete the merger. If a management team is unable to complete an acquisition within the specified timeframe, the SPAC is liquidated, proceeds are returned to investors, and the sponsor loses its investment. This creates a significant incentive for the sponsor to find a deal. Importantly, SPACs that do proceed with an acquisition target are subject to a shareholder vote to receive approval for the transaction. With majority approval, the SPAC management team will use the proceeds raised to acquire the target and eventually execute a reverse merger, dissolving the blank-check company and leaving the acquired firm publicly listed.

Stage two of the SPAC lifecycle begins with the management team identifying a target firm to take public. This merger brings the private company public and is typically combined with an additional capital raise (Klausner, Ohlrogge, & Ruan, 2022). A key feature of SPACs is when the SPAC proposes a merger, shareholders have the right to redeem their shares at a price equal to the $10.00 IPO price of the SPAC's units plus interest accumulated in the trust. Investors can redeem their shares even if they vote yes on the proposed merger. It is important to note, however, that the warrants and rights included in the units, remain outstanding and trade separately. Thus, investors in a SPAC's IPO can redeem their shares and keep their warrants and rights at no cost (Klausner, Ohlrogge, & Ruan, 2022). The warrants and rights effectively serve as compensation for the investors in the SPAC's IPO for allowing their cash to be used to establish the SPAC as a public company.

Even a SPAC with little cash remaining after redemptions can close a merger and bring a target company public. If a large number of investors in a SPAC's IPO exit their investment by the time of the merger, the sponsor may raise additional capital. They can do this by either investing additional cash themselves or by targeting new shareholders by engaging in the equivalent of a second roadshow to raise equity once it has proposed a merger. Those supplying this secondary capital are called Private Investment in Public Equity (PIPE) investors.

Advantages and Disadvantages

SPACs have several potential advantages. The targeted private companies benefit from gaining an additional option for raising capital and public listing. Retail investors benefit by being able to invest in young growth companies that otherwise would only be accessible to larger investors through venture capital partnerships. Additionally, IPO investors bear no downside risk through a functional put that can be exercised after a merger announcement (Gahn, Ritter, & Zhang. 2021). Finally, if a SPAC fails to complete a merger within its lifespan of typically two years, it liquidates and returns all funds to its shareholders with interest.

A significant disadvantage of SPACs outlined in literature is poor post-merger return. This could be due to several reasons, including costs of the merger, incentives to complete a merger, and poor management at the target company. One cost is the dilution that results from what is labeled the sponsor's "promote." The promote is 20% of the SPAC's post-IPO shares which goes to the plan sponsor.

A second cost stems from the dilution caused by the warrants and rights given to IPO-stage investors. A SPAC provides IPO investors with free warrants and rights in order to induce them to buy units and thereby establish the SPAC as a public vehicle that can later bring a private company public. These warrants and rights are a cost incurred to create a SPAC, and they dilute the value of its SPAC's shares. After a SPAC's IPO, warrants and rights trade separately from shares and are not subject to redemption. So, when shareholders redeem shares for $10.00 plus interest, the keep the warrants and rights for no cost (Klausner, Ohlrogge, & Ruan, 2022). These authors find that IPO investors that redeemed their shares, on average, reaped an 11.6% annualized return on their investment - an investment with no downside risk given this guaranteed redemption right.

A third cost consists of the underwriting fee and other fees and expenses associated with a SPAC's merger. SPAC underwriting fees are typically 5.5% of IPO proceeds, which is slightly less than the typical underwriting fee in a traditional IPO of comparable size, but redemptions at the time of the merger increase the impact of these costs on the shareholders that remain invested in the merger (Valanociv, 2017). If a large number of shares are redeemed prior to merger, that fee actually increases to the remaining shareholders because it is not typically adjusted for redemptions. For example, if 50% of a SPAC's public shares are redeemed, the effective fee is 11%.

LITERATURE REVIEW

Since SPACs are an alternative to traditional IPO's, it is important to examine prior studies which explore pricing and performance of securities around IPO events. The majority of evidence shows that issued shares exhibit above market returns during their first trading day. Ljungqvist (2007) compiles the literature on underpricing and shows that the phenomena could

be explained either by asymmetric information models, institutional theory models, or behavioral theories. However, those explanations are not applicable to SPAC offerings. The firmly set structure of the SPACs before the IPO date, the establishment of the escrow accounts where almost all proceeds are placed, in addition to zero uncertainty about the offered unit price, create no incentives for new investors to enter into significant speculative positions on the first day of trading (Lakicevic and Vulanovic, 2013). Ritter (1991) finds that IPOs significantly underperformed a set of comparable firms matched by size and industry in the three years after going public. Jenkinson and Sousa (2011) conclude that the majority of research finds that IPO firms subsequently experience stock price under-performance relative to non-IPO control firms in the long run.

Literature specifically on the performance of SPACs shows a great deal of variability of returns depending on factors such as investor class, timing of initial investment, size of SPAC, and quality of the sponsor. Overall returns are reviewed first, then the distinct characteristics that impact return are discussed.

Overall Returns

In an early paper, Jenkinson and Sousa (2011) find SPACs value-destroying. They report that abnormal returns on SPACs' common stock on the announcement day is 0.85 percent, which is unexpected because announcements should not be surprising. They further find that SPAC equity holders experience a negative 3.81 percent return on the day of merger completion. They do find a significant difference in return (positive) for investors in high quality and larger SPACs.

Long term returns for the companies brought public through a SPAC appear to be lower than market. Vulanovic (2017) finds average buy and hold return one month after the merger is −3.00 percent, average return three months after the merger is −19.00 percent and average return one year after the merger is −40.00 percent. Chamberlain (2021) finds SPAC common shares do not outperform the market over a three-year holding period. These findings are interesting primarily because original SPAC shareholders had the power to veto the merger, and as a result of not exercising this power, they engaged in value-destroying activities. Vulanovic (2017) further finds SPACs' failure rate is at the level of 58.09 percent, higher than any previously reported failure rate in the post-IPO survival literature.

Different Classes of Investors

Historically, SPAC IPO investors and deal sponsors have earned remarkably high returns, but with the dramatically increased volume in both dollars investment and number of transactions, this trend may not continue (Gahng, Ritter, and Zhang, 2021). Public investors in the merged company have earned very low market-adjusted returns, although high redemptions on the worst deals have limited the amount of money that they lost. In this section, the returns to different subsections of investors are discussed.

Due to the structure of the SPAC, specifically the right of investors to opt out after the merger announcement and receive a guaranteed return, the costs of the merger and following public offering are born by a subset of investors. Klausner, Ohlrogge, and Ruan (2022) find that nearly all investors in SPAC IPOs redeem or sell their shares by the time of a SPAC's merger, leaving a new group of shareholders to bear the costs embedded in SPACs as they merge. For

SPACs that merged during the period of January 2019 through June 2020, mean and median net cash per share were $4.10 and $5.70, respectively. They conclude that SPAC costs are not borne by the companies they take public, but instead by the SPAC shareholders who hold shares at the time of the merger. These investors experience steep post-merger losses, while SPAC sponsors profit to a great degree. SPAC redemptions amplify the effects of dilution and dissipation of cash on a per-share basis. Overall, mean and median market-adjusted returns to non-redeeming SPAC shareholders as of November 1, 2021, are negative 64% and negative 88%, respectively (Klausner, Ohlrogge, and Ruan, 2022).

The incentives of SPAC founders, underwriters, and investors are interdependent and successful business combinations generally result in significant returns to founders (Lakicevic and Volanovic, 2022). Returns to third-party PIPE investors (those investors sought out to provide any additional funds needs to close the merger after redemptions) are higher than returns to public shareholders. This is largely because SPACs with high-quality sponsors attracted more PIPE funds than other SPACs attracted. In addition, PIPE investors often purchased shares at a discount to the $10.00 price that public shareholders in effect pay by choosing not to redeem their shares.

Additionally, SPAC warrants consistently outperform the return on common stock following the close of a SPAC merger (Chamberlain, 2021). Since investors retain these warrants even if they redeem their shares pre-merger, this may yield higher returns than simply staying in the investment. All SPACs in their sample issue some additional shares after merger, most of them being used to redeem warrants.

Klausner, Ohlrogge, and Ruan (2022) find that twelve months after the merger, during which time post-merger share prices have underperformed the market, the average sponsor returns are over $100 million. Gahng, Ritter, and Zhang (2021) find the one-year and three-year returns on warrants to be 44.3% and 52.8% respectively. In contrast, the one-year and three-year returns on common stock were -16.9% and -20.9% respectively.

DATA

The data for this study include a population of 288 SPACs that completed a merger in between January 2016 and December 2022 and for which pricing data before and after their mergers could be matched. Mergers for each year are listed in Table 1 (Appendix). There was a steady rise in SPAC mergers through 2020, then a spike in 2021 followed by a decline in 2022. While he number of SPAC IPO's remained strong, actual deal closings dropped significantly.

The dates associated with the sample are listed in Table 2 (Appendix). The earliest IOP date is January 20, 2015, and the latest is December 21, 2021. As stated earlier, each SPAC announces a merger target before the deal is finalized. The earliest announcement was March 7, 2016, and the latest was July 21, 2022. The first merger closed July 29, 2016, and the final one on December 12, 2022. The mean number of days from IPO to announcement to merger is 312, and from announcement to closing is 163. Each SPAC also has a deadline to complete find then complete a merger, which is generally two years from the SPAC IOP. The range of days until deadline for all mergers in the sample is 582 days prior to the deadline to -54 days (meaning past the deadline).

Valuations of completed SPAC mergers are listed in Table 3 (Appendix). Mergers ranged in size from $53M to $32.6B with a mean of $1.6B. These are much larger than the funds raised through SPAC IPO's which had a mean of $36M and illustrate the importance of the

PIPE investors. The need for additional funds on many mergers is also demonstrated by percentage of redemptions, ranging from 0 to 99.9%.

FINDINGS

The basic research question is what are the prices and resulting returns around SPAC merger announcements and deal closings. Therefore, two events and timelines are associated with each merger. First is the announcement date and the prices at intervals of 1 day, 3 days, and 30 days around that date. Results are shown in Table 4 Panel 1 (Appendix). Mean prices before announcement are very close to $10.00, which is expected because investors have no information about a potential merger target at that point. However, there is a considerable range of prices: from $6.80 to $19.51. The higher prices could be explained by rumors of an acquisition. The low price of $6.80 is an outlier with nearly all other prices above $9.60. There should not be downside pressure on prices since investors have the option of redeeming their shares for the $10 IPO price. However, it is likely the announcement of a target generates excitement around the merger which pushes the price higher after the announcement. The announcement is expected, but the date is uncertain.

Panel 2 of Table 4 (Appendix) lists the prices around the closing dates. The closing date itself is no surprise, so the prices are examined here to simply display the range in outcomes and to eventually measure returns for different investment periods. Thirty days prior to close, the mean price is $11.23 with a range of $9.10 to $44.40. It is interesting that the low price 3 days prior to close is $4.56. The assumption is that the typical redemption period ends between these two dates, so the effective floor price of the redemption value is removed. The prices at closing range from $2.68 to $44.91 with prices falling as low as $1.00 in the next 30 days and as low as $0.24 in the next year. The mean price 30 days post-merger is $10.97 while the one-year post-merger mean is only $6.83 for those with trailing prices.

Returns associated with the above time periods are listed in Table 5 (Appendix). Panel 1 lists the returns around the announcement date. For the period one day prior to announcement to one day after, the mean return is 5.4%, with a range of -20.06% to 136.74%. These returns are not annualized and illustrate a significant jump in price (on average) around the announcement of the target company. Actual return to investors should be similar to these on a percentage basis, although they will tend to have longer holding periods as most SPAC investors buy in at the IPO price on the IPO date. Returns from 1 day prior to announcement to 30 days post-announcement are also generally positive with a mean of 6.96% and a range of -42.00% to 359.57%.

Panel 2 details the return around the actual merger closing date. For the period of 1 day pre-close to 1 day post close, the mean return is -6% and the range is -89% to 248%. As with the other results, these returns show wide swings in SPAC prices and the volatility associated with more traditional IPOs. The time periods of 30 days and 360 days further demonstrate this volatility, although the longest returns are most negative at -37.12%

As mentioned previously, SPAC holders have the right to redeem shares at the IPO price plus a stated return which is generally about 2%. This allows investors to effectively hold a costless put at that price. This may keep the prices artificially at or above $10 even if a lower quality merger is proposed to investors. In fact, there is an incentive for investors to purchase shares after a sub-quality merger is proposed if the value falls below the redemption price. Originally, owners who voted for a merger could not redeem their shares, but this is no longer the case. To see if redemption patterns are changing over time, redemption rates are examined

for each year over the period, and results are shown in Table 6 (Appendix). Redemption percentages rose steadily from 2016 through 2019 but fell in 2020 and 2021. However, the figure increased dramatically again in 2022. This may be the result of large institutional investors becoming more involved in SPACs and seeking short term returns by taking advantage price increases around the announcement of a merger.

When a SPAC first introduces its stock, it lists in the prospectus the industry it is targeting for merger. Often, however, the eventual target operates in a different industry. To see whether this change of focus adversely affects performance, SPAC returns are categorized by those which match the merger to their original industry sector and those which do not. The results are shown in Table 7 (Appendix). Panel 1 includes only those mergers in which the sector of the merged company does not match the original target sector stated in the prospectus. The mean 30 day and 1 year post-merger returns are -6.78% and -47.24% respectively. Panel 2 shows the results for mergers in which the target sector matches that listed in the prospectus. The 30 day mean return is similar to the unmatched sample at -7.12%. However, the 1-year return, while still negative is still much higher at -17.83%. This may indicate a lack of expertise in those SPACs which seek an acquisition beyond their target area.

To further examine difference in return based up sector, the returns from the top six sectors in which the target firm operated are examined. Panel 1 of Table 8 (Appendix) lists the return from the announcement date to 30 days post announcement, this time grouped by the sectors listed. The highest returns are from the Energy and Healthcare sectors. Panel 2 lists the returns for 30 days post-merger. All sectors except Energy are negative, and Financial, Healthcare, and General are higher than Consumer and Technology. One year post-merger returns are listed in Panel 3 and show much less overall dispersion, except for Healthcare, which is driven mainly by one very highly performing stock.

CONCLUSION AND FURTHER STUDY

This paper provides a thorough exploration of the structure of SPACs, the returns to investors, and their comparison with traditional IPOs. Data from 288 SPAC cases provides an analysis of price fluctuations at different stages of SPAC development, the performance of various investor categories, and the multi-dimensional impacts on returns, including the timing of mergers. The results demonstrate that investing is SPAC's is risky but potentially rewarding. The most profitable holding period may be for those investors who buy into a SPAC prior to an announced merger but then sell shortly after the target announcement. Overall post-merger returns of those companies brought public through a SPAC appear to be much less than the market.

Further research in this line of study will incorporate additional variables into the analysis, which may include quality of sponsor, additional PIPE money invested, financial performance, growth prospects, or management quality of private firms involved in SPAC transactions. The goal of further analysis will be to identify the factors that tend to lead to the success of the final merged company. Continued study is planned to explore the reasons behind the inferior or superior returns compared to the overall market or industry peers. This may involve examining various factors such as market conditions, investor expectations, or market perception of the SPAC process itself.

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APPENDIX

Table 1: Mergers by Year	
Year	**Observations**
2016	4
2017	12
2018	17
2019	27
2020	69
2021	145
2022	14
Total	288

Table 2: Date and Timing Statistics					
	Obs	**Mean**	**Min**	**Max**	**Std Dev**
IPO date for those which closed	287	11/9/2019	1/20/2015	12/21/2021	
merger announcement date for those which announced	289	9/16/2020	3/7/2016	7/21/2022	
merger closed date for those which closed	287	2/27/2021	7/29/2016	12/12/2022	
Days Elapsed					
IPO date to announcement	287	312	34	1120	223
announcement date to closed	287	163	59	550	66
closing date to deadline	287	239	-54	582	188

Table 3: Valuation					
	Obs	**Mean**	**Min**	**Max**	**Std Dev**
total equity value of merger ($M)	288	1,651	53	32,600	2,576
total equity value of SPAC IPO ($M)	287	271	39	1,725	186
percentage of shares redeemed	287	50.69%	0.00%	99.90%	38.04%

Table 4: Pricing Statistics

Panel 1: days with respect to announcement

	Obs	Mean	Min	Max	Std Dev
price 30 days prior to announcement	266	10.26	9.61	13.93	0.686
price 3 days prior to announcement	289	10.52	6.80	19.51	1.249
price 1 day prior to announcement	289	10.59	9.62	17.76	1.290
price on announcement	289	11.26	9.68	25.20	2.580
price 1 day post announcement	289	11.24	6.62	23.00	2.464
price 3 days post announcement	289	11.17	9.75	26.38	2.455
price 30 days post announcement	289	11.28	9.24	54.00	3.732

Panel 2: days with respect to merger closing

	Obs	Mean	Min	Max	Std Dev
price 30 days prior to close	287	11.23	9.10	44.40	3.585
price 3 days prior to close	287	11.47	4.56	48.00	4.549
price 1 day prior to close	287	11.62	3.11	49.83	4.973
price on close	287	11.68	2.68	44.91	5.154
price 1 day post close	287	11.65	2.00	39.50	5.662
price 3 days post close	287	11.06	0.97	73.27	6.709
price 30 days post close	281	10.97	1.00	120.00	9.910
price 360 days post close	157	6.83	0.24	51.39	8.154

Table 5: Announcement and Closing Returns

Panel 1: Return with respect to announcement

	Obs	Mean	Min	Max	Std Dev
t-1 to t+1	289	5.40%	-20.68%	136.74%	17.765
t-1 to t+30	289	6.96%	-42.00%	359.57%	33.07%

Panel 2: Return with respect to merger closing

	Obs	Mean	Min	Max	Std Dev
t-1 to t+1	287	-6.00%	-89.00%	248.10%	31.49%
t-1 to t+30	281	-6.90%	-89.01%	1061.10 %	77.40%
t-1 to t+360	157	-37.12%	-98.05%	153.81%	126.55%

Table 6: Redemptions by Year					
Year	**Obs**	**Mean**	**Min**	**Max**	**Std Dev**
2016	3	3.73%	0.00%	11.20%	6.47%
2017	8	47.13%	0.00%	91.80%	41.40%
2018	15	54.68%	0.00%	99.40%	40.95%
2019	18	65.22%	0.00%	98.90%	31.85%
2020	48	37.25%	0.00%	99.90%	40.07%
2021	139	41.51%	0.00%	97.00%	35.75%
2022	56	82.29%	0.10%	99.50%	20.05%
Full Sample	287	50.69%	0.00%	99.90%	38.04%

Table 7: Returns by Initial IPO Target Sector Matching Actual Merger Sector					
Panel 1: No Sector Match					
	Obs	**Mean**	**Min**	**Max**	**Std Dev**
30 Day Ret	185	-6.78%	-85.69%	1061.10%	88.98%
360 Day Ret	108	-47.24%	-97.68%	199.65%	59.07%
Panel 2: Sector Match					
30 Day Ret	96	-7.12%	-89.01%	193.77%	48.18%
360 Day Ret	49	-14.83%	-98.05%	1353.81%	208.65%

Table 8: Returns by Sector

Panel 1: 30 Day Post Announcement Return

	Obs	Mean	Min	Max	Std Dev
Consumer	28	1.86%	-20.48%	40.02%	10.39%
Energy	23	16.09%	-42.00%	236.48%	55.95%
Financial	22	3.74%	-26.14%	60.00%	20.45%
General	84	4.07%	-29.29%	78.85%	15.16%
Healthcare	38	13.61%	60.30%	-24.33%	359.57%
Technology	56	5.50%	-27.86%	147.53%	25.28%

Panel 2: 30 Day Post Merger Return

	Obs	Mean	Min	Max	Std Dev
Consumer	28	-15.67%	-68.22%	79.65%	28.86%
Energy	22	32.83%	-78.64%	1061.10%	231.79%
Financial	22	-8.07%	-65.45%	186.35%	51.04%
General	81	-9.98%	-80.20%	141.62%	46.53%
Healthcare	37	-8.57%	-77.44%	141.52%	47.03%
Technology	54	-16.32%	-89.01%	99.57%	34.21%

Panel 3: 360 Day Post Merger Return

	Obs	Mean	Min	Max	Std Dev
Consumer	18	-44.51%	-96.04%	67.65%	47.54%
Energy	16	-51.53%	-93.96%	52.02%	42.05%
Financial	15	-51.12%	-94.91%	99.74%	53.05%
General	45	-42.30%	-96.18%	199.65%	62.91%
Healthcare	15	-20.61%	-98.05%	353.81%	167.90%
Technology	29	-44.30%	-95.98%	190.09%	71.92%