

DISPELLING THE HYPE:

An Examination of SPAC Common Equity Performance

The U.S. SPAC market has faced explosive growth in recent years, but the financial performance of these investments is weakly understood. Therefore, this paper contributes an analysis on the long-term performance of SPAC common equity for SPACs that completed acquisitions between 2016 and 2018. Using hand-collected data from the Compustat – Capital IQ and SEC EDGAR databases, this paper runs a two-sample t-test assuming unequal variances and constructs an Ordinary Least Squares (OLS) regression model. In conclusion of the t-test, the results suggest that SPAC common shares do not outperform the market over a three-year holding period. In addition, the regression model identifies SPAC behaviors that signal long-term positive yields in common share price. These findings inform investment strategies, and the paper goes on to discuss further positions an investor can create to gain exposure to this rising investment class.

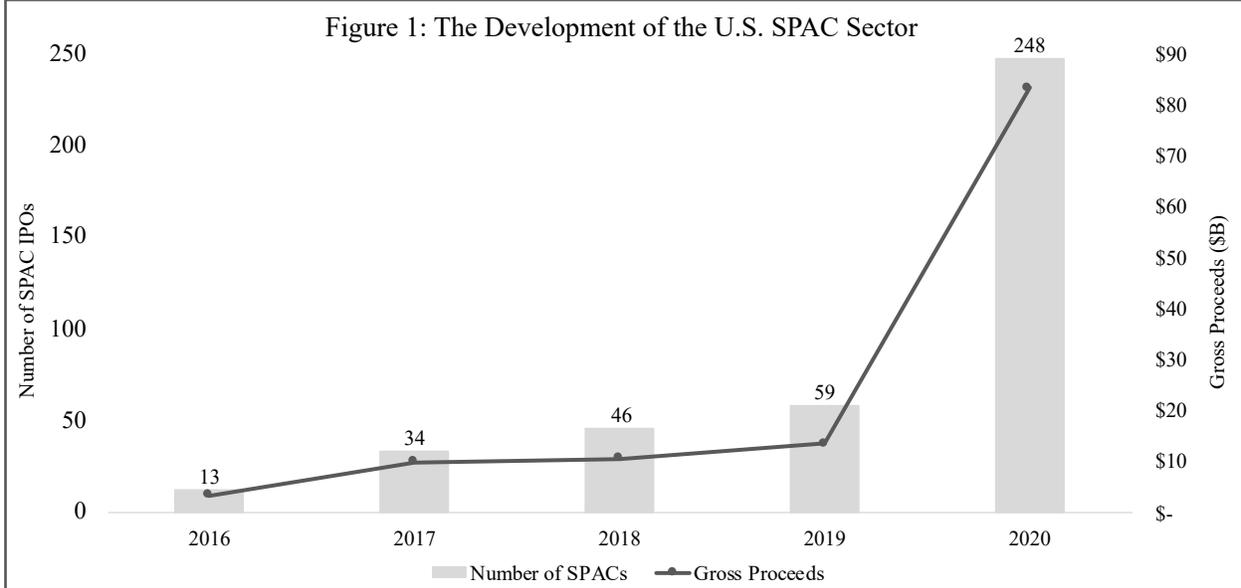
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1. Introduction

In the last decade, gross proceeds raised by Special Purpose Acquisition Companies (SPACs) per year grew from \$502.6 million in 2010 to \$83,042.2 million in 2020 (SPACInsider, 2021). A SPAC is a company created by a management team with no operational assets, also known as a blank check company, that aims to raise equity through an initial public offering (IPO) and eventually purchase a private firm at a future date. As demonstrated by Figure 1, the U.S. SPAC sector has experienced a five-year compound annual growth rate (CAGR) of 88.53% from 2016 to 2020. With this explosive growth, SPACs have continued to pull market share from traditional IPOs; as of 2020, approximately 50% of the total IPO market consisted of SPAC transactions (Potter, 2021).



Note: Figure 1 represents how many SPACs performed IPOs in the U.S. market from 2016 to 2020 as well as the gross proceeds raised from these IPOs per year. 5-Year CAGR of 88.53%. Data sourced from the SPACInsider database.

SPACs originally debuted in the 1990’s as an alternative way to take private companies public. Despite the increased cost to go public through a SPAC, private companies are allured by the advantages of financial projections disclosed to investors and the accelerated timeline that

SPACs provide (Pomerantz et. al, 2021). In addition, investors in public equity markets have welcomed these unique investments with overwhelming amounts of capital. In comparison to traditional equity issued at an IPO, SPACs enable public investors access to private equity investments with increased transparency and downside protection (Boyer and Baignet, 2008).

Although the innovations of SPACs have led to tremendous market hype, minimal research has been done to determine how SPAC investments perform in practice. The most recent analysis on SPAC returns was studied by Lakicevic and Vulcanovic (2013) who examined a sample of SPACs from 2003 to 2009. However, the evolving nature of these investments renders past literature outdated. In order to understand the SPAC transactions being completed in the current market, research in this field must be continually conducted.

This demand for updated analysis leads to the research question: how do the returns on SPAC common equities, that made acquisitions between 2016 and 2018, compare to NASDAQ returns in an equivalent three-year holding period? Using hand-collected data from the Compustat – Capital IQ and SEC EDGAR databases, this paper evaluates if SPACs outperform the market through a two-sample t-test assuming unequal variances. Then, indicators of long-term SPAC success are identified with an Ordinary Least Squares (OLS) regression model.

This paper is organized into eight sections. In the following section, the details of SPACs as an asset are further explained. Then, in Section 3, existing literature on SPACs is presented, highlighting two literature focuses: management interests and shareholder interests. In Section 4, the differing risk profiles between SPACs and the NASDAQ are outlined in order to predict model outcomes. Section 5 details the process of hand-collecting the data sample and presents summary statistics. Section 6 specifies the two approaches, a t-test and an OLS regression model, used to address the research question. Then, in Section 7, the significance of the results is

discussed and compared to previous research. In Section 8, I explore how the results of this paper inform investment decisions and suggest two alternative positions an investor can take to gain exposure to SPACs. Lastly, Section 9 offers a conclusion of the findings within this paper and provides recommendations for further research.

2. SPACs as an Asset

The SPAC process begins once a management team of experienced executives forms a SPAC and pursues an IPO as a blank check company. During the SPAC IPO, units, composed of common shares and warrants, are initially priced at \$10. Shortly after the issuance of units, the SPAC will issue common stock and warrants under respective tickers. The IPO proceeds are then held in an interest-bearing trust account invested in U.S. government securities while the management team searches for an acquisition target. The timeline for a SPAC acquisition is outlined in a SPAC's S-1 filing; typically, a management team has between 18 to 24 months. If a management team is unable to complete an acquisition within the specified timeframe, the SPAC is liquidated, and proceeds are returned to investors. However, SPACs that do proceed with an acquisition target are often subject to a proxy vote to receive shareholder approval of 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 (Dimitrova, 2017).

The advantages of SPAC's innovative structure and accelerated timeline has allured private firms and allowed SPACs to emerge as a prominent alternative route to accessing public equity. When going public through a traditional IPO, financial projections are not included in an SEC registration statement due to class action litigation risk. However, in a SPAC transaction, forward-looking financial statements are protected under the Private Securities Litigation Reform

Act. Therefore, target companies disclose financial projections in the proxy statement and S-4 registration statement filed with the SEC. The ability to include forward-looking financial statements allows investors to visualize the target company's financial growth, adding tremendous value for pre-revenue and pre-profit companies. In addition, the SPAC private-to-public timeline is completed in 3 to 6 months while a traditional IPO may take approximately one year to complete. However, the advantages of a SPAC come at a cost. While the professional fees associated with an IPO and a SPAC transaction are relatively similar, ranging from 3-7% of gross proceeds raised, a SPAC transaction requires an additional sponsor fee paid. At the close of a SPAC merger, the acquired company must compensate the SPAC management team by allowing them to purchase 20% of the firm's common equity for only \$25,000 (Pomerantz et. al, 2021).

Compared to traditional common equity issued at an IPO, SPACs also provide public investors unique alternative investment opportunities. Previously, private equity investments were exclusive to institutional investors, but SPACs gave the public access to invest in substantial acquisitions. Furthermore, the public status of a SPAC subjects the company to specific SEC reporting requirements and to the voting rights of shareholders to approve an acquisition, implying more transparency than private equity investments (Boyer and Baignet, 2008). Although the business combination is not known at the time of the IPO, the structure of SPACs presents limited downside to investors. When the business combination is eventually introduced to shareholders, each shareholder has the right to redeem their shares for the initial investment and accrued interest of approximately 2% from the trust account (Gahng et al., 2021).

3. Literature Review

Existing literature in this field studies SPACs through two lenses: management interests and shareholder interests. Within this section, I first introduce management-centered literature that provides insight on optimal SPAC structure. Then, I discuss a series of studies focusing on shareholder interests through an examination of the SPAC acquisition approval process as well as an analysis on the investment return of SPAC securities. Next, I explore the structural changes of SPACs that followed the financial crisis. With these adaptations, I assert that previous research is outdated and its relevance to SPACs observed in the current market is limited. The findings within paper overcome this research limitation and contribute an updated analysis on SPAC behavior in public equity markets.

Given the approval of an acquisition enables a SPAC to generate returns for the management team, Cumming et al. (2014) conducted research on how SPACs should be structured and managed to increase the probability of acquisition approval. Through a logit model, the researchers analyzed twenty-three explanatory variables in order to identify key characteristics of a SPAC that influence deal approval in a proxy vote. The results of this analysis suggest that younger SPAC management teams and increased funds in a trust are both factors that positively affect deal approval. In addition, approval probabilities decrease when the number of underwriters increases.

However, the management-focused research of Cumming et al. (2014) fails to consider the losses shareholders will incur in the event that a flawed transaction is approved. Conversely, Jenkinson and Sousa (2011) published research on the deal approval process through a shareholder-interested lens. In conclusion of their study, the researchers determined that investors should specifically look at how the share price of a SPAC reacts to the announcement of a potential acquisition when voting on a transaction. Investors should only vote to approve

acquisitions that react positively to the announcement as this decision will yield low risk returns. Otherwise, by not carefully evaluating how the market reacts to an acquisition, shareholders will contribute to value-destroying decisions.

Boyer and Baignet (2008) further contributed to shareholder-focused research by publishing one of the first papers quantifying the returns on SPAC common stock. Within their study, they examined the one-year returns on SPACs that went public between 2003 and 2006. The results indicate that returns vary greatly based on the year of issuance; in 2006, the average SPAC returned 3.50% whereas the NASDAQ returned 8.48%. In 2005, the average SPAC returned 13.76% whereas the NASDAQ returned 3.25%, and in 2004, there was one SPAC issued that yielded a return of 33.80% compared to the NASDAQ return of 9.62%. The authors provided further insight on SPAC patterns by conducting an OLS regression model that determined how select factors are correlated to the one-day returns on SPAC common stock. This model identified that the gross proceeds at offering, unit price to offer price ratio, and months allowed to complete an acquisition had a significant relationship to the initial share price of a SPAC.

Lakicevic and Vulcanovic (2013) expanded upon the research of Boyer and Baignet (2008) and evaluated the returns on SPAC units, warrants, and common stock from 2003 to 2009 at varying points in a SPAC's lifecycle. With an additional three years of SPACs in the sample, the authors' research captures the effect of large investment banks entering the market and underwriting deals on SPAC performance. In conclusion of the study, the researchers found that SPAC securities did not reveal a pattern when reacting to announcements regarding changes in their corporate status. However, they did observe all three types of securities realized positive

abnormal returns on the merger announcement day, and warrants demonstrated the strongest reaction of these three securities.

While Lakicevic and Vulcanovic (2013) studied a more recent sample than Boyer and Baignet (2008), it is important to recognize that both papers are limited by the infancy of the U.S. SPAC market at the time of research. Murray (2017) proposes that SPACs are continuing to change as regulators have allowed the market to try new designs to reinforce their position while continuing to protect investors. Therefore, as the market approaches maturity, research must continually adapt to analyze new trends in SPAC structure; this is particularly evident with the next generation of SPACs that arose following a shift in investor preferences during the financial crisis. During 2008, no SPACs were formed, but by 2009, SPACs re-emerged with two significant adaptations. First, SPACs no longer required shareholder approval when acquiring a target firm. Instead, SPACs issued a tender offer to buy back shares from any shareholders who did not agree with the acquisition. This change eliminated the power of hedge funds to withhold their approval until gaining concessions from SPAC managers. Second, SPACs restructured fees so that the management team was not awarded 20% of the common equity at the close of a merger. Rather, the SPAC management team would be awarded portions of the common equity at different milestones. In turn, this incentivized management to be interested in longer term profits for shareholders (Rodrigues and Stegemoller, 2013). The research within this paper will capture these two structural changes and build off the work of Boyer and Baignet (2008) and Lakicevic and Vulcanovic (2013) in order to contribute an updated analysis on the long-term performance of SPAC common equity.

4. Conceptual Model

To develop a conceptual model surrounding the financial performance of SPAC common equities, I assume that SPAC transactions are structured to acquire companies with increased risk. Recall that unlike IPOs, SPACs provide acquired firms the ability to include forward-looking financial statements within SEC filings (Pomerantz et. al, 2021). Companies with less proven business models benefit greatest from this structure as it enables investors to more clearly visualize the target company's financial growth. Given SPACs are a more costly alternative to traditional IPOs, I assume that riskier companies will pay the additional cost to access capital through this method. In addition, the risk profile of SPACs greatly differs from the NASDAQ; the NASDAQ is a diversified index composite whereas SPAC common stock is equity in a single company.

With the conclusion that SPACs as an asset class have a greater risk profile than the NASDAQ, I predict that SPAC common equity will generate higher returns than the NASDAQ. Financial theory asserts that riskier assets require a greater premium to fairly compensate investors for the amount of risk they take on. Thus, SPACs investors will require a higher yield on their investments. In addition, I predict that the returns on SPAC common equities will be more volatile than returns on the NASDAQ. According to the modern portfolio theory, an investor should not be looking at the expected risk and return of only one stock. Instead, an investor can create a portfolio of assets that maximizes returns with an optimal amount of risk. Pursuing this investment method allows an investor to benefit from diversification that reduces volatility and nearly eliminate unsystematic risk.

When considering the OLS regression model, I predict two variables, one-day return post-merger announcement and initial warrant price, will be significantly associated with the outcome variable, three-year share price following initial issuance. The one-day return following

a SPAC merger announcement is reflective of investors' perception of an acquisition's value. Jenkinson and Sousa (2011) determined that this return serves as a signal for the post-merger performance of SPAC common shares, and investors who went against the market signal lost around 39% of their investments within six months and 79% of their investment after one year. Furthermore, the price of a warrant is tied to the performance of its underlying asset, common stock. When the price of common stock trades closer to the warrant's exercise price, the warrant is more likely to be exercised and will be subsequently valued at a higher premium. This leads me to expect that the warrant price's initial appreciation will reflect investor enthusiasm about the SPAC and indicate long-term positive yields.

5. Data

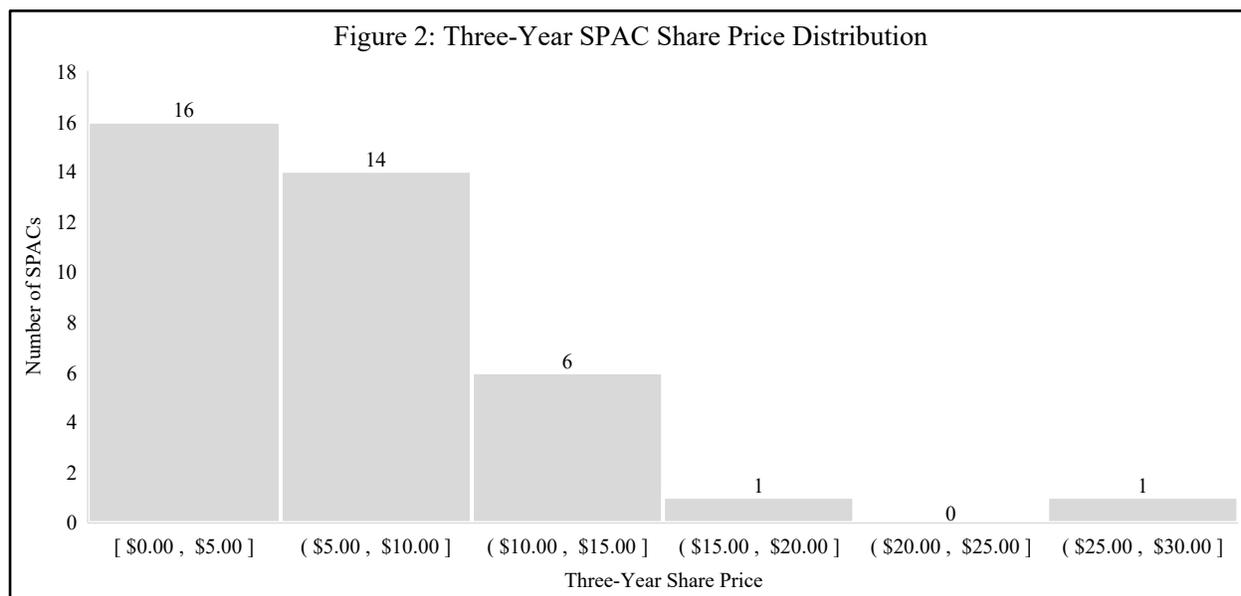
My data sample is composed of SPACs that made acquisitions between 2016 and 2018. By focusing on this recent three-year period, the analysis within this paper reflects the notable structural changes regarding shareholder approval and revised compensation structure that existing literature has yet to capture following the financial crisis. For this reason, my data sample is more similar to the SPACs observed in the current market, and my results will be more comparable than research conducted on SPACs over a decade ago.

The data is cross-sectional and measures variables related to a SPAC and its acquired firm during single events throughout the SPAC's lifetime. In order to collect this data, I first obtained a list of SPACs that made an acquisition between 2016 and 2018. Then, I utilized the Compustat – Capital IQ database to source the share prices of SPACs, acquired firms, and the NASDAQ index composite at varying points in time. This share price data was imperative to calculate returns of interest: three-year return, one-day return post-merger announcement, and one-year return post-merger. In addition, I gathered the IPO details, gross proceeds at offering

and months allowed to complete an acquisition, from S-1 and 8-K filings within the SEC EDGAR database. After completing this process, I created my data sample of 38 SPAC acquisitions; select acquisitions that occurred between 2016 and 2018 were excluded from the sample due to missing information in the Compustat – Capital IQ Database.

Variable	Mean	Std. Dev.	Min	Max
Share Price 3 Years Post-IPO	\$6.72	\$5.45	\$0.00	\$29.66
Gross Proceeds at Offering	\$264.61	\$214.21	\$40.00	\$1,035.00
Months Allowed to Complete Acquisition	22.18	3.38	12.00	24.00
Unit/Offer Price	1.00	0.01	0.96	1.05
Initial Warrant Price	\$0.48	\$0.42	\$0.09	\$1.75
One-Day Return Post-Announcement	0.63%	3.45%	-17.00%	7.00%
One-Year Return Post-Merger	-24.59%	42.16%	-97.00%	59.00%
Binary Variable: Target Acquired in 2016	0.21	0.41	0.00	1.00
Binary Variable: Target Acquired in 2017	0.34	0.48	0.00	1.00
Binary Variable: Target Acquired in 2018	0.45	0.50	0.00	1.00

Note: Table 1 summarizes the mean, standard deviation, minimum, and maximum values of the variables included in the OLS regression model. Each variable has 35 observations; 3 deals of the total sample were excluded due to missing warrant prices. Data was hand-collected from the Compustat – Capital IQ Database and the SEC EDGAR Database.



Note: Figure 2 displays the distribution of three-year SPAC share prices over 6 pricing bins. Data was hand-collected from the Compustat – Capital IQ Database.

Table 1 displays the summary statistics of variables included in the OLS regression model. The data sample is weighted as follows: 21% 2016 acquisitions, 34% 2017 acquisitions, and 45% 2018 acquisitions. Given the growth of the U.S. SPAC market, it is reasonable that more recent years have a higher weighting in the sample. In contrast, the three-year share price variable led to unexpecting findings. The average share price three years after initial issuance is \$6.72, a considerably lower value than the average initial closing price of \$9.90. Investors put capital into SPACs in the hopes of generating a positive return overtime; however, as demonstrated by Figure 2, only 8 of the 38 SPACs in the sample closed above \$9.90 in three years. This alarming distribution calls for further investigation of the viability of SPACs as long-term investments.

It is imperative to note that a sample size of 38 observations limits the precision of estimates within this paper. SPACs are an increasingly utilized tool to go public, and at the time of observation, there simply were a limited quantity to observe. However, the number of SPAC IPOs rose dramatically in 2019 and 2020. To put this into context, 248 SPACs went public in 2020 whereas only 13 SPACs went public in 2016 (SPACInsider, 2021). Therefore, as the recent SPACs begin to acquire target firms, there will be a substantially larger number of acquisitions to be observed in future research.

6. Empirical Framework

Recall that financial theory suggests investors require an equity risk premium on assets with increased risk. Thus, when considering the research question, I hypothesize that the returns on SPAC common equity will be significantly greater than the returns on the NASDAQ index composite. To address this, my approach is to conduct a two-sample t-test assuming unequal variances for each of the three years as well as the total data sample. While this method

determines if SPACs outperform the market, I am also interested in understanding indicators of value-generating behavior for SPACs. Therefore, my second approach is to conduct an OLS regression model. Given that there are no aspects of randomization within my data sample, the analysis in this paper is purely descriptive, not inferential. Associations can be distinguished, but a causal relationship cannot be concluded.

6.1 Two-Sample T-test Assuming Unequal Variances

Within the two-sample t-test, I hypothesized that there is a mean difference of 0 between the three-year return of SPAC common equities and the return on the NASDAQ in equivalent holding periods. Given that the NASDAQ is a diversified index composite, its returns are inherently less variable than individual SPAC common equities, so it is important to assume unequal variances. The resulting one-tail t-stat value will determine the direction and significance of the relationship between these two assets.

$$tStat = \frac{(\bar{X} - \bar{Y})}{\sqrt{\frac{s_x}{n_x} + \frac{s_y}{n_y}}} \quad \text{where X represents the NASDAQ \& Y represents SPAC Common Equity} \quad (1)$$

6.2 Ordinary Least Squares Regression Model

My OLS regression model will be run in STATA and determine independent variables related to the outcome variable, common stock share price three years after the SPAC's initial issuance. These variables include gross proceeds at offering, months allowed to complete an acquisition, first-day closing unit price to offer price ratio, initial warrant price, the one-day return on common stock following a merger announcement, and the one-year return on common stock following the close of the merger. In addition, I included binary variables to indicate the year each SPAC acquired a target firm; in turn, these binary variables allow for fixed effects to

control for unobservable and observable factors that are changing each year. Specifically, I am interested in controlling for the market sentiment surrounding SPACs as these financial vehicles gained momentum year-over-year during this period.

$$\begin{aligned}
 y_i = & \alpha + \beta_1 \text{Gross Proceeds}_i + \beta_2 \text{Months to Complete Acquisition}_i \\
 & + \beta_3 \text{Unit to Offer Price}_i + \beta_4 \text{Warrant Price}_i \\
 & + \beta_5 \text{One Day Return Post Announcement}_i \\
 & + \beta_6 \text{One Year Return Post Merger}_i + \beta_7 2017_i + \beta_8 2018_i + \varepsilon_i
 \end{aligned} \tag{2}$$

where y_i represents Share Price Three Years After the SPAC IPO

This regression model is similar to the regression ran in Boyer and Baigent (2008)'s paper. In their model, they studied the relationship between the first-day closing price of SPAC common stock and eight independent variables: gross proceeds at offering, current trust per share, offer price, warrant, unit to offer price ratio, unit price first-day return, time allowed to find acquisition target, and time allowed to complete acquisition. Although, our models are similar in the fact that they both evaluate the association of structural characteristics and the pricing of related assets to a SPAC share price, the motivations vary. Rather than looking at short-term pricing, my model studies the long-term performance of SPACs and determines how significant events, such as announcing a merger and completing a merger, are correlated to share price. In addition, as the SPAC market continually matures, the structure of SPACs evolves and not all variables within Boyer and Baigent (2008)'s original regression model remain relevant. For example, when the researchers studied SPACs from 2003 to 2006, unit offer prices varied based on the SPAC. However, a decade later, each SPAC prices units at \$10, eliminating the need for the unit price variable (Dimitrova, 2017).

When interpreting the results of this model, my analysis will first identify variables of significance and then interpret the sign of their coefficient to determine the direction of its

relationship to share price. The associations noted from the results of this model will educate investors on the behavior of SPACs in public equity markets and highlight indications of value-generating behavior. By understanding these significant associations, institutional traders and retail traders can make more informed investment decisions.

7. Results

In this section, I first present the results of the two-sample t-test assuming unequal variances in Table 2. To answer the research question, I compare the total sample t-stat to the appropriate critical value and determine how the returns on SPACs compare to the NASDAQ in an equivalent holding period. Next, I quantify the relationship between three-year SPAC share price and eight independent variables by estimating the specified OLS regression model. Then, I discuss variables of significance, presented in Table 3, and evaluate the soundness of these estimations in comparison to existing literature.

	2016		2017		2018		Total	
	SPACs	NASDAQ	SPACs	NASDAQ	SPACs	NASDAQ	SPACs	NASDAQ
Average	-11.38%	47.16%	-12.53%	50.18%	-57.94%	54.55%	-32.60%	51.50%
Variance	0.110	0.005	0.492	0.010	0.104	0.028	0.279	0.017
Median	-3.81%	46.34%	-28.61%	50.35%	-61.65%	52.72%	-43.09%	50.07%
Max	28.26%	61.52%	182.48%	66.68%	3.50%	80.70%	182.48%	80.70%
Min	-65.74%	37.23%	-84.92%	36.60%	-99.97%	17.03%	-99.97%	17.03%
tStat	4.897***		3.192***		12.769***		9.534***	
Observations	8		13		17		38	

Note: Table 2 summarizes the average, variance, median, minimum, and maximum values by year for the three-year returns on SPAC common stock and the NASDAQ index composite in equivalent holding periods. Tstats assume unequal variances and are included to distinguish the relationship between the returns of these two assets. Share price data was hand-collected from the Compustat – Capital IQ Database. *p<0.10, **p<0.05, ***p<0.001

The resulting t-stat for the total data sample is 9.534, a value much greater than the corresponding one-tail critical value of 2.418. Therefore, I conclude that the three-year returns on the NASDAQ index composite are statistically greater than the returns of SPAC common

equities at the 1% level. Within the conceptual model section of this paper, I outlined the differing risk profiles between these two assets. I assumed SPACs are intrinsically riskier and that investors in this asset class require a higher equity risk premium. This led me to hypothesize SPACs would yield a superior three-year return. However, the results of this t-test clearly indicate that SPACs do not outperform the market. While the maximum three-year return on SPACs was a lucrative 182.48%, the returns were highly variable, and the average SPAC returned -32.60%. In contrast, the buy-and-hold strategy on the NASDAQ proved to be very effective as the returns were far more consistent and averaged 51.50%.

Table 3: SPAC Regression Analysis				
Variable	Coefficient	Std. Error	T-Stat	P-Value
Initial Warrant Price	4.069	(2.014)	2.02	0.054*
One-Day Return Post-Announcement	39.390	(15.392)	2.56	0.017**
One-Year Return Post-Merger	7.364	(1.443)	5.10	0.000***
Gross Proceeds at Offering	-0.007	(0.004)	-1.58	0.126
Months to Complete Acquisition	0.168	(0.192)	0.88	0.388
Unit/Offer Price	43.869	(47.569)	0.92	0.365
Binary Variable: Target Acquired in 2017	3.124	(1.452)	2.15	0.041**
Binary Variable: Target Acquired in 2018	-1.581	(1.531)	-1.03	0.311
Intercept	-39.869	(48.928)	-0.81	0.423
N = 35				
F-value = 11.50				
R-squared = 0.7797				
Adjusted R-Squared = 0.7119				

Note: Table 3 displays the output of the OLS regression. This output describes the relationship between the outcome variable, common stock share price three years after the SPAC's initial issuance, and eight independent variables. 3 deals of the total sample are excluded due to missing warrant prices. Data was hand-collected from the Compustat – Capital IQ Database and the SEC EDGAR Database. Standard Errors are in parentheses.

*p<0.10, **p<0.05, ***p<0.001

Furthermore, the OLS regression model found four variables of significance: initial warrant price, one-day return post-merger announcement, one-year return post-merger, and the 2017 binary variable. The model estimates β_4 , the coefficient on initial warrant price, to be 4.069 and statistically significant from 0 at the 10% level. The value of this coefficient suggests that,

on average, a \$1 increase in the first-day closing warrant price will generate \$4.07 in value for the common stock share price three years after initial issuance. This estimation is sound given that warrants represent the right to purchase a share of common stock at a specific exercise price within a certain window of time. As a stock trades closer to the exercise price, the warrant is more likely to be exercised and will be subsequently valued at a higher premium. Thus, this positive relationship suggests first-day appreciation signals positive long-term gains in common shares.

In addition, the coefficient on the one-day return following a merger announcement variable supports the previous work of Jenkinson and Sousa (2011). β_5 is estimated to be 39.390 and statistically significant from 0 at the 5% level. This is interpreted as, on average, a one percentage point increase in the one-day return following a merger announcement generates \$0.39 in value for the common stock share price three years after initial issuance. According to the study from Jenkinson and Sousa (2011), investors who went against the market signal lost around 39% of their investments within six months, rising to losses of over 79% after one year. Thus, investors should only invest in SPACs when the market reacts positively following a merger announcement.

Moreover, the three-year share price is significantly correlated with one-year post-merger performance. The model estimates the coefficient on the one-year return post-merger variable, β_6 , to be 7.354 and statistically significant from 0 at the 1% level. The estimation indicates that, on average, a one percentage point increase in the one-year return following merger completion will generate \$0.07 in value for the common stock share price three years after initial issuance. While this is a reasonable relationship considering SPACs, this does not appear to be consistent with the post-merger performance of an acquiror with operational assets. Agrawal et. al (1992)

studied the post-merger performance of acquiring firms that made acquisitions between 1955 to 1987. With a data sample of 765 mergers, the authors measured the cumulative abnormal average return (CAAR), adjusting for firm size and beta risk, over a 60-month period following the close of the merger. The authors concluded that the merger did not have a significant relationship with the acquiror's performance in the first year following the merger; however, they noted shareholders lost an average of 10.26% in wealth over the first five-year period following the merger.

Lastly, the model estimated the coefficient on the 2017 SPAC acquisitions binary variable, β_7 , to be 3.124 and statistically significant from 0 at the 5% level. In turn, this asserts that acquisitions made in 2017 are statistically different from the base case: acquisitions made in 2016. It is possible that acquisitions in 2017 faced more favorable economic conditions or heightened market sentiment, leading to increased value in future share price.

8. Discussion

The analysis in this paper concludes that SPACs do not outperform the market and on average generate a negative return over a three-year period. However, the record-breaking amount of gross proceeds raised by SPACs over the past five years clearly demonstrate that capital is flooding into these investments. This begs the question: why do individuals invest in SPACs in public equity markets? Although my research suggests that the NASDAQ index composite generates superior profits with a buy-and-hold strategy, investors can create a position on SPACs through alternative investment strategies: exchange traded funds (ETFs) and warrants.

A SPAC-focused ETF is an ideal tool that allows an investor to benefit from diversification and gain tactical exposure to this unique, rising class of assets. As outlined in the results section, it is difficult to identify a single winning SPAC; however, a SPAC-focused ETF

identifies a basket of SPACs to invest in and allocates each SPAC a specific weight in the fund. In turn, this structure profits from the select SPACs with growing positions and limits exposure to volatility that is common early on in a SPAC's lifetime. The first SPAC-focused ETF, SPAK, debuted on the New York Stock Exchange on October 1, 2020. Since this launch, a variety of SPAC-focused ETFs arose, including SPCX and SPXZ (Murphy, 2021). It is important to note that each ETF differs in the selection of SPACs, weighting allocation, and management strategy. Therefore, an investor should consider these various factors to select an ETF aligned with one's distinctive risk-tolerance and investment goals.

Furthermore, SPAC warrants consistently outperform the return on common stock following the close of a SPAC merger. Gahng et al. (2021) evaluated a buy-and-hold strategy on SPAC warrants and common stock by measuring the return on each asset over one-year and three-year holding periods. This approach assumes an investor purchased the warrant or common stock on the listing-switch date, effectively examining post-merger performance. With a data sample including 105 business combinations between January 2010 to September 2020, the researchers concluded 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. The data depicts the gap in returns between common stock and warrants to be widening overtime. Although the inherent riskiness of warrants merits greater returns, it is not clear as to why warrants prove to be a substantially more profitable investment under the buy-and-hold strategy. Gahng et al. (2021) point to the market undervaluing warrants during the merger as a possible reason.

Despite the advantages of these two alternative positions in SPACs, some investors will still continue to gamble on investments in individual SPAC common shares. I recommend that

these investors consider the previously discussed indicators of value-generating behavior, initial warrant price, one-day return post-merger announcement and one-year return post-merger, within their investment strategy. If these variables underperform, it signals potential losses in the long-term share price of the asset. In addition, each of these three variables occur during different phases in a SPAC's lifecycle, providing an investor with multiple checkpoints to re-evaluate their position.

9. Conclusion

This paper examined the long-term performance of SPAC common equity in order to contribute an updated analysis on SPAC behavior and inform investor decision-making. In the two-sample t-test assuming unequal variances, I concluded that the three-year return on the NASDAQ index composite is statistically greater than the return of SPAC common equities in an equivalent holding period. Thus, SPAC common equities do not outperform the market. Furthermore, I estimated the relationship between the three-year SPAC share price and eight independent variables in an OLS regression model. The results of this model found four variables of significance: initial warrant price, one-day return post-merger announcement, one-year return post-merger, and the 2017 binary variable. Although the lack of randomization in my data sample limits the ability to determine causal effects, the significant positive associations of these four variables distinguish indicators of future value-generating behavior.

Even with these indicators, the inconsistent nature of SPACs proves selecting a single winning SPAC to be difficult. Therefore, I suggested two alternative positions an investor can take to gain exposure to SPACs. With an ETF investment, an investor profits from select SPACs with growing positions and limits one's exposure to volatility that is common early on in a SPAC's lifetime (Murphy, 2021). However, for investors who still aim to invest in a single

company, one should consider an investment in warrants. Warrants require a minimal upfront capital investment, and they have outperformed SPAC common equity with a long-term buy-and-hold strategy post-merger (Gahng et al., 2021).

Looking forward, it is imperative that additional research is conducted to evaluate SPACs as alternative investments. The data sample within this paper, studying SPAC acquisitions between 2016 and 2018, consisted of 38 observations. However, SPAC IPOs increased dramatically in 2019 and 2020. For example, in 2016, only 13 SPACs went public, but in 2020, 248 SPACs went public. Thus, future research lends itself the opportunity to study a substantially larger sample of SPAC acquisitions, leading to the increased precision of estimates. In addition, Murray (2017) asserts that regulators have allowed the market to try new designs to reinforce a management team's position while protecting investors. This occurred during the financial crisis when two significant adaptations in SPAC structure arose from a shift in investors' preferences towards safer investments. With the recent explosive growth of the U.S. SPAC market, it is probable that the structure of these investments will continue to evolve and become increasingly efficient in years to come. Therefore, until the market stabilizes, literature in this field will continue to suffer from limitations associated with market infancy.

Beyond the continued study of SPAC financial performance, I recommend that the post-merger performance of SPACs and of traditional mergers be further examined. Recall that Agrawal et. al (1992) found that a merger did not have a significant relationship with the acquiror's performance in the first year following the merger. In comparison, the OLS regression model within this paper estimated that the one-year post-merger performance of a SPAC's target has a significant positive association with its three-year share price. It is unclear as to why the short-term price impact of a merger is significant to SPACs and not traditional mergers.

However, this relationship is important to understand for companies who are considering growth strategies through an IPO, SPAC, or strategic acquirer. If further studies continue to find that SPAC mergers face significant short-term price impacts and traditional mergers do not, these findings may deter select companies from pursuing SPACs and lead them to seek alternative growth opportunities.

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