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Are SPAC Projections More Biased Than Traditional Merger Projections? Implications for Rival Firms

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Abstract

Historically, companies undergoing a SPAC merger have benefited from a "safe harbor" allowing them to project revenue streams for several years ahead. However, these have been shown to be inaccurate. Using hand-collected data from SEC filings, I compare SPAC revenue projections with traditional merger projections to see if the former are exceptionally inaccurate or within the usual error for projections. I find that SPAC projections are significantly more biased than traditional merger projections. Also, the effects of SPAC projection errors may extend beyond the SPAC firms and their investors, as industry rivals experience negative stock returns around SPAC merger announcements.

1. Introduction

In the years of 2020 and 2021 there was an explosion of companies going public via SPAC mergers. While to the casual observer it may seem that this was a new type of alternative to an IPO, SPAC mergers have been around for quite a while, although prior to 2020 they were not particularly popular.

So, what exactly is a SPAC? A SPAC is a public shell company that is created just for the purpose of merging with a private operating company to bring it public. The SPAC is started by a sponsor and brought public at a price of $10 a share; the SPAC's common shares generally come with a warrant, which allows the holder to purchase future stock at a preferential rate after the merger is completed. Once the SPAC company is brought public the funds from the IPO are invested in safe short-term investments which earn interest for the investors. At this point the management, or sponsor, of the SPAC has about 2 years to find a suitable company to merge with. If no suitable company is found the funds are returned to the original shareholders along with their share of the interest earned.

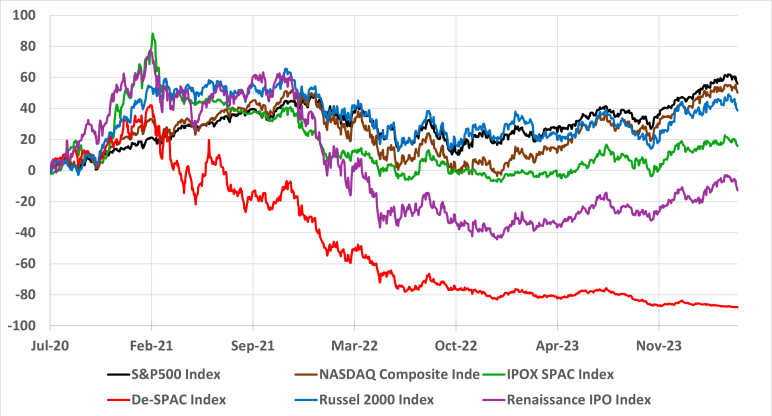
If a suitable private operating company is found, then the SPAC can start the process of merging with it – this is also called the de-SPAC phase. At this point the initial investors in the SPAC can pull out their money or leave it in as part of the consideration paid for the private company. Often the private company demands a minimum amount of cash for the merger to be completed, and as such the SPAC management might bring in additional private investment in public equity, or PIPE investment, to supplement the cash from the original shareholders. If there is enough money for the merger to go through the private company and SPAC combine and the private company is now publicly traded. At this point the ticker is usually changed to something more appropriate for the operating company and the name of the new company is normally changed to that of the operating company.

While this may seem like a pretty cut and dry merger there are several factors that make SPAC mergers somewhat different. While it is a merger, it performs the same function as an IPO, which has several legal and practical differences. One of the differences I will focus on is the safe harbor that mergers have regarding projections. Under the Private Securities Litigation Reform Act (PSLRA) of 1995, management of companies that are merging can make forward looking statements and project revenue and are protected from liability if the projections do not materialize, unless it can be proven that they intentionally mislead people. This safe harbor is absent from IPOs, and it is for that reason that management of a company IPOing never project earnings or revenue or otherwise make forward looking statements.

However, as a de-SPAC is a merger, historically management has used this as an opportunity to make forward looking statements. Proponents of SPACs claim that this is an advantage of going public via a SPAC merger as it gives investors more information that they can use to make educated decisions.

While it is generally true that having more information is helpful to investors this is only so if the information is actually accurate and unbiased. Further-

Figure 1: The Performance of Selected Stock Market Indices



Notes: The figure plots cumulative returns since the inception of the De-SPAC Index (July 30, 2020). The De-SPAC Index was discontinued on April 15, 2024. Source: Bloomberg

more, the payoff structure of a SPAC to the sponsor is such that they are set to make a windfall should the company merge and nothing if they don't. The payoff structure is as follows; they receive a block of shares equal to 20% of the value of the SPAC. This is a very significant number of shares and contributes to significant dilution on the part of any other shareholders. What this payoff structure implies, however, is that management of the SPAC has a strong incentive to ensure that the merger goes through, leading one to think that they might have an incentive to exaggerate the future potential of the operating company they will merge with to ensure that more capital is invested, and the minimum amount of cash needed for the merger to complete is reached.

Recently the Securities and Exchange Commission has adopted new rules that remove the statutory safe harbor under the PSLRA for SPAC financial projections [Securities and Exchange Commission, 2024]. However, the new rules do not completely prohibit projections at the de-SPAC stage: under the "bespeaks caution" doctrine, companies may still use projections if they are made on a reasonable basis [Brewer, 2024].

2. Summary of Literature

In this research I contribute to the recent and growing literature on SPACs and SPAC projections. Dambra et al. [2023], showed that higher revenue growth projections lead to underperformance and a more likely chance of class action lawsuits. Blankespoor et al. [2022] showed that only 35% of revenue projections are met and that after going public high projections are often lowered to more reasonable levels. Castellani et al. [2024] showed how overoptimistic revenue projections often lead to increased purchases on the retail investor side, but with a lower effect on the institutional side. As Figure 1 shows, investors in de-SPACs experience significantly lower returns than the market as a whole, so it's easy to see how investors are potentially harmed if they hold projections in high regard.[1] While SPACs may be past their peak of 2020 and 2021 [Huang et al., 2023] they are still very relevant, and I hope to add to the literature by showing how the projections of SPACS compare to those of traditional mergers. In the context of my analysis, "traditional mergers" refers to mergers involving a private target and an operating public acquirer, as opposed to a SPAC acquirer.

[1] To illustrate the historical (under)performance of SPAC firms, Figure 1 shows the comparative returns for the IPOX SPAC and De-SPAC Indices since their inception in July 2020. The de-SPAC Index clearly underperformed the market, and also the IPO Index, and it was discontinued on April 15, 2024.

Table 1: The SPAC Merger Sample

Panel A: De-SPAC mergers with revenue projections

SPAC Firm	Target	Target Sector	Target Industry	Announcement Year	Completion Year	Outcome as of 5/27/2024
Quartet Merger Corp.	Pangaea Logistics Solutions Ltd/Old	Industrials	Marine Shipping	2014	2014	Active
Quinpario Acquisition Corp.	Jason Inc	Industrials	Metalworking Machinery	2014	2014	Bankruptcy
Levy Acquisition Corp	Del Taco Holdings Inc	Consumer Discretionary	Restaurants	2015	2015	Acquired
Hennessy Capital Acquisition Corp.	School Bus Holdings Inc	Industrials	Commercial Vehicles	2014	2015	Active
Cambridge Capital Acquisition Corp	Ability Computers & Software Industries Ltd	Industrials	Defense	2015	2015	Delisted
Boulevard Acquisition Corp.	AgroFresh Inc	Materials	Specialty Chemicals	2015	2015	Acquired
Capitol Acquisition Corp. II	Lindblad Expeditions Inc	Consumer Discretionary	Cruise Lines	2015	2015	Active
FinTech Acquisition Corp.	CardConnect LLC	Technology	Data & Transaction Processors	2016	2016	Acquired
WL Ross Holding Corp.	Nexeo Solutions LLC	Materials	Chemicals Distribution	2016	2016	Acquired
Terrapin 3 Acquisition Corp.	Yatra Online Inc	Communications	Internet Media & Services	2016	2016	Active
Gores Holding Inc.	Hostess Brands LLC	Consumer Staples	Packaged Food	2016	2016	Acquired
Arowana Inc	VivoPower International PLC	Utilities	Power Generation	2016	2016	Active
Hennessy Capital Acquisition Corp. II	Daseke Inc/Old	Industrials	Trucking	2016	2017	Acquired
Pace Holdings, Corp.	Playa Hotels & Resorts BV	Consumer Discretionary	Lodging	2016	2017	Active
Pacific Special Acquisition Corp.	Borqs International Holding Corp	Technology	Application Software	2016	2017	Delisted
GP Investments Acquisition Corp.	Rimini Street Inc/NV	Technology	IT Services	2017	2017	Active
Double Eagle Acquisition Corp.	Williams Scotsman International Inc	Industrials	Industrial Wholesale & Rental	2017	2017	Active
Capitol Acquisition Corp. III	Cision US Inc	Technology	Infrastructure Software	2017	2017	Acquired
Boulevard Acquisition Corp. II	Estre Ambiental S/A	Industrials	Waste Management	2017	2017	Delisted
M III Acquisition Corp.	IEA Energy Services LLC	Energy	Renewable Energy Project Dev.	2018	2018	Acquired
Landcadia Holdings, Inc.	Waitr Inc	Communications	Internet Media & Services	2018	2018	Bankruptcy
JM Global Holding Company	China Sunlong Environmental Technology Inc	Industrials	Pollution Control Equipment	2017	2018	Active
Easterly Acquisition Corp.	Sirius International Insurance Group Ltd	Financials	Insurance Brokers & Services	2018	2018	Acquired
Global Partner Acquisition Corp.	Purple Innovation LLC	Consumer Discretionary	Furniture	2017	2018	Active
GTY Technology Holdings Inc	CityBase Inc	Technology	Application Software	2018	2019	Acquired
Jensyn Acquisition Corp.	Peck Electric Co	Energy	Renewable Energy Project Dev.	2019	2019	Delisted

Table 1. The SPAC Merger Sample (continued)

Panel B: Sample distribution by target sector

Sector	*N*
Industrials	8
Consumer Discretionary	4
Materials	2
Technology	5
Communications	2
Consumer Staples	1
Utilities	1
Energy	2
Financials	1
Total	26

Panel C: Sample distribution by outcome

Outcome as of 5/27/2024	*N*
Active	10
Acquired	10
Bankruptcy	2
Delisted	4
Total	26

Sources: SPACInsider, SEC EDGAR, Bloomberg.

3. Data

I start with the list of SPACs from SPACInsider, focusing on the 55 SPACs that had their IPOs between 2013 and 2016. For each of these 55 SPAC firms, I then use the SEC EDGAR database to search the statements regarding the de-SPAC merger, very often the definitive proxy statement for the merger (form DEFM14A). Many of the SPAC firms in my sample issued forward-looking projections in connection with the de-SPAC mergers, and 26 projected revenues specifically, for up to 5 years. Table 1 presents the list of the de-SPAC mergers with revenue projections, as well as the target sector, industry, and outcome. As shown in Panel B of Table 1, these SPAC deals in my final sample span a broad range of sectors and industries, including both traditional industries such as chemicals, machinery, marine shipping and trucking, as well as high-tech industries (internet media & services, software) and renewable energy. For each of these deals, I also follow the de-SPAC target (the company that gets listed through a SPAC transaction) and record the current status of the company: as shown in Panel C of Table 1, only 10 (38%) out of the 26 firms in the sample are still active (and publicly listed) as of May 27, 2024; 10 firms were acquired, 2 firms filed for bankruptcy, either Chapter 11 (Jason Inc) or Chapter 7 (Waitr Inc), and the other 4 firms were delisted for performance-related reasons, specifically for failure to meet exchange requirements. Overall, the broad range of industries covered, as well as the poor post-listing performance indicates that my sample is fairly representative of the universe of SPAC firms.

For each of the 26 de-SPAC deals, I hand-collect projected revenues from the SEC merger filings and I download actual revenues post-merger as well as transaction-level variables from Bloomberg. After dropping firms with missing actual revenues, the final sample includes 21 SPAC deals.

In order to compare SPAC projections with traditional merger projections, I then construct a sample of traditional mergers as follows: I use the MA function in Bloomberg to screen for all M&A deals completed during the period 2013-2016 for which the acquirer is a publicly traded US firm and the target is a private US firm. I require the target to be a private firm in order to ensure comparability with the SPAC sample, since, for many private firms, merging with a public operating firm may be an alternative to going public, either via an IPO or via a SPAC transaction. In addition, I require the target to be in the same industry as at least one target firm in the de-SPAC merger sample. Specifically, I start by matching the traditional mergers involving public US acquirers and private US targets to the SPAC mergers based on the Bloomberg variable Target Industry Subgroup; I then expand the list of traditional mergers matching on the Target Industry Group in order to achieve the same sample size as for the SPAC sample (26 deals, out of which 24 deals have nonmissing revenues for at least one year post-merger).

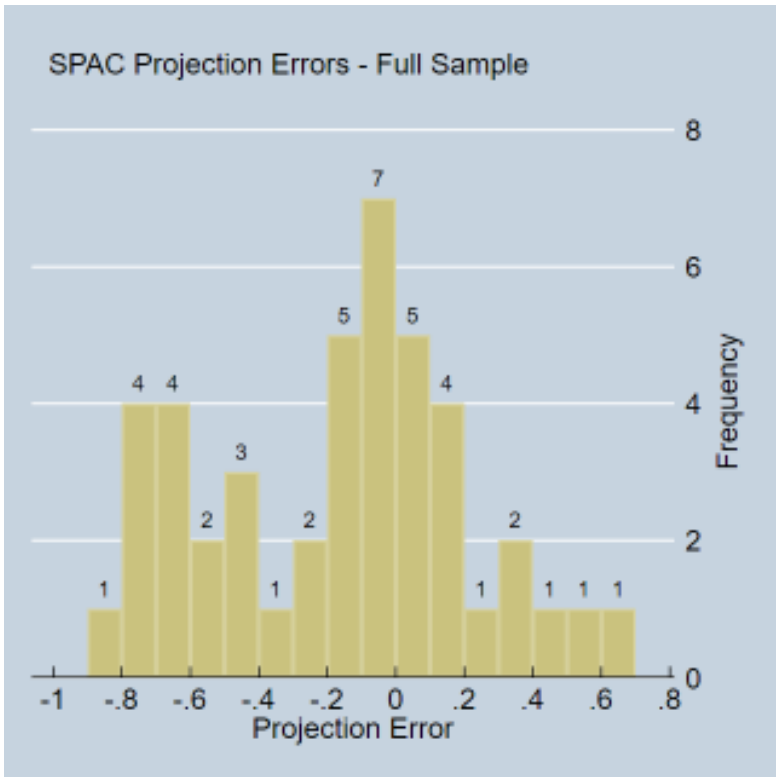
4. Results

4.1 SPAC Projections to Traditional Merger Projections

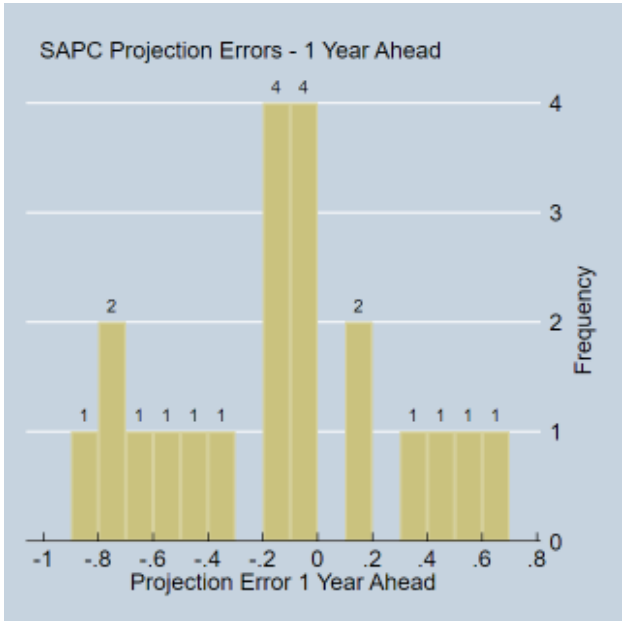
Figure 2 shows the distribution of SPAC projection errors (calculated as actual revenues minus projected revenues, over projected revenues), for both the full sample and broken down by length of projection.

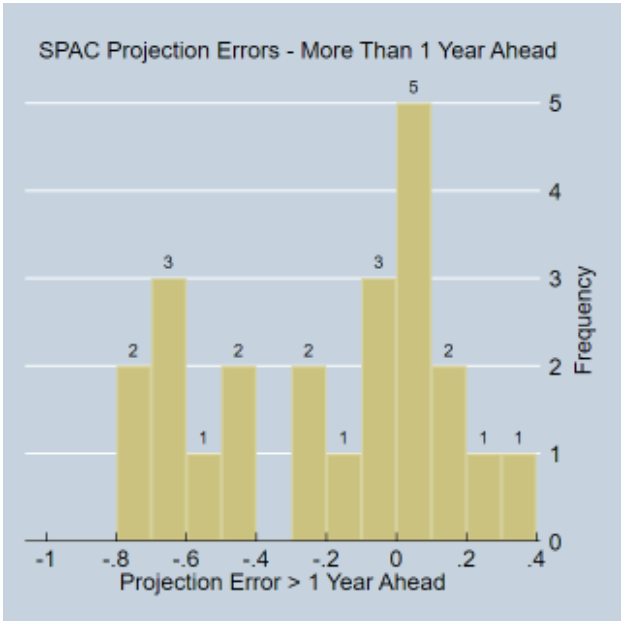
Figure 2: The Distribution of SPAC Projection Errors

Panel A: Full sample



Panel B: Conditional on the forecast horizon





Notes: Projection errors are calculated as actual revenues minus projected revenues, divided by projected revenues.

Moreover, Table 2 reports descriptive statistics for projection errors for the SPAC sample (Panel A) and the traditional merger sample (Panel B), for different horizons up to 5 years after the merger. The results indicate that SPAC projections overestimate the actual revenues by approximately 16.7% (significant at the 1% level) on average across all projection years, while traditional merger projections overestimate the actual revenues by only 7.5% on average (significant at the 5% level). However, there is also significant cross-sectional heterogeneity, and the median projection error in the SPAC sample is in fact positive.

In order to compare SPAC projections and traditional merger projections directly, I conduct a t-test analysis between the two samples. For this analysis, I restrict the sample of SPAC mergers to those completed between 2013 and 2016, in order to cover the same time period as the traditional merger sample. This setting also offers the advantage that it allows for at least 3 post-merger years in the pre-covid period, so the projection errors are not caused by the covid crisis. Panel C of Table 2 shows that the mean and median projection errors are negative for both SPAC mergers and traditional mergers. Furthermore, the mean and median projection errors are always larger (more negative) in the SPAC sample, and the t-test for differences in means is significant in the pooled sample (including all the projection years), and also when excluding projections at the 1-year horizon. In addition, the spread between the average projection errors in the two samples widens as the forecast horizon increases, suggesting that SPAC projections tend to be more biased, relative to traditional merger projections, for long-term forecasts. Overall, the t-test analysis supports the recent SEC rules that eliminate the safe harbor protection for SPAC projections [Securities and Exchange Commission, 2024]. At the same time, the Wilcoxon rank-sum test for differences in medians, reported in the last two columns of Table 2 Panel C, is not significant. From a regulatory perspective, if traditional merger projections are as biased as the SPAC projections, that should perhaps lead to stricter regulations for traditional mergers as well.

4.2 The Effect of SPAC Merger Announcements on Rival Firms

As established in the previous section, and in line with previous literature [Blankespoor et al., 2022, Dambra et al., 2023, Castellani et al., 2024], SPACs provide overoptimistic projections. In this context, the unsophisticated investors (e.g. retail investors) who cannot see through the optimism bias, experience losses that sophisticated investors (e.g. institutional investors) are able to avoid by redeeming their shares on the redemption date or otherwise selling their shares in the open market in the period surrounding the close of a combination [Castellani et al., 2024]. Castellani et al. [2024] also document that SPAC mergers with optimistic projections significantly underperform in the two years following the merger, which suggests that, overall, the market buys into the optimism associated with SPAC projections. In line with their findings, Figure I in this paper shows comparative returns for the IPOX SPAC and De-SPAC Indices since their inception in July 2020. The de-SPAC Index clearly underperformed the market. An implication of this result is that, if indeed the investors buy into the "SPAC-hype", that could hurt other firms in the same industry, at least in the short run. For example, rival firms could have a hard time raising new funds if the investors naively believe that the SPAC firms will reach their high revenue targets by displacing rival firm sales. To test this hypothesis, in this section I study the effects of SPAC merger announcements on rival firms.

Specifically, starting with the sample of 26 de-SPAC mergers described above, I conduct an event study of rival firm stock returns around the de-SPAC merger announcement dates. To identify rival firms, I use the text-based network industry classifications (TNIC) data provided by Professors Hoberg and Phillips, and available at https://hobergphillips.tuck.dartmouth.edu/. As discussed in detail in [Hoberg and Phillips, 2010, 2016], the text-based industry classification data is based on firm pairwise similarity scores from text analysis of 10K product descriptions. As such, the text-based industry classification offers many advantages over traditional industry classifications such as SIC codes, which often don't provide accurate descriptions of the company's businesses, especially in innovative industries. For example, in my sample, Yatra Online, Inc, an online travel agency, is classified as a media firm based on the Bloomberg industry classification system (BICS), but it is assigned an SIC code of 4700 (Transportation Services) also in Bloomberg. Searching the Hoberg-Phillips database for firm pairs within one calendar year before and after the year of the SPAC merger announcement date, I was able to find industry rivals for 21 SPAC merger targets. In order to focus on the rivals that are the most similar to the focal firm (the SPAC merger target), I restrict the sample to the 10 firms (rivals) with the highest similarity scores to the focal firm each year.

4.2.1 Event Study

For each rival firm in the sample, I download from the CRSP database the daily stock returns starting in 2010. Then, for each event (announcement of SPAC merger), I estimate the parameters of the following stock return models: [2]

[2] I download the data for all factors from Professor French's website: https://mba.tuck.dartmouth.edu/pages/faculty/

Table 2: Descriptive Statistics for Revenue Projections

Panel A: SPAC sample ($N = 21$ deals with at least one year of projected and actual revenues)

Projection Error (%)	N	Mean	St. Dev.	25th Pctile	Median	75th Pctile	t-test p-value
Year 1	21	−0.131	0.435	−0.140	0.108	0.714	0.183
Year 2	10	−0.162	0.336	−0.071	0.046	0.600	0.162
Year 3	7	−0.143	0.293	−0.031	0.039	0.571	0.242
Year 4	5	−0.243	0.403	−0.062	0.068	0.600	0.248
Year 5	1	−0.758	—	−0.758	−0.758	1.000	—
Year > 1	23	−0.200***	0.340	−0.062	0.046	0.609	0.010
Year 1 to 3	38	−0.141**	0.379	−0.076	0.046	0.658	0.027
Year 4 & 5	6	−0.329	0.417	−0.319	0.068	0.667	0.111
All Projection Years	44	−0.167***	0.385	−0.082	0.057	0.659	0.006

Panel B: Traditional merger sample ($N = 24$ deals with at least one year of projected and actual revenues)

Projection Error (%)	N	Mean	St. Dev.	25th Pctile	Median	75th Pctile	t-test p-value
Year 1	24	−0.102**	0.212	−0.099	−0.010	0.792	0.027
Year 2	22	−0.090*	0.214	−0.075	−0.015	0.818	0.062
Year 3	21	−0.055	0.379	−0.098	−0.035	0.810	0.517
Year 4	16	−0.031	0.503	−0.147	−0.032	0.750	0.811
Year 5	4	−0.039	0.260	−0.028	0.133	0.500	0.784
Year > 1	67	−0.065	0.370	−0.098	−0.011	0.776	0.155
Year 1 to 3	67	−0.083**	0.272	−0.087	−0.012	0.806	0.015
Year 4 & 5	24	−0.051	0.475	−0.147	0.000	0.708	0.601
All Projection Years	91	−0.075**	0.335	−0.098	−0.011	0.780	0.036

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2: Descriptive Statistics for Revenue Projections (continued)

Panel C: Differences in projection errors — SPAC mergers vs. traditional mergers (mergers completed 2013–2016)

	SPAC Mergers				Traditional Mergers				SPAC vs. Traditional			
Projection Error (%)	N	Mean	Median	St. Dev.	N	Mean	Median	St. Dev.	Diff. in Means	p-value	Diff. in Medians	p-value
Year 1	10	−0.208	−0.153	0.293	24	−0.102	−0.099	0.212	−0.106	0.245	−0.054	0.496
Up to Year 2	17	−0.198	−0.147	0.281	46	−0.096	−0.081	0.210	−0.102	0.125	−0.066	0.430
Up to Year 3	23	−0.192	−0.147	0.282	67	−0.083	−0.087	0.272	−0.109	0.105	−0.060	0.413
Up to Year 4	28	−0.201	−0.125	0.298	83	−0.073	−0.098	0.326	−0.128*	0.069	−0.027	0.435
Up to Year 5	29	−0.220	−0.147	0.311	87	−0.071	−0.090	0.322	−0.149**	0.032	−0.057	0.263
Year > 1	19	−0.227	−0.102	0.327	67	−0.065	−0.098	0.370	−0.162*	0.089	−0.005	0.402
All Proj. Yrs	29	−0.220	−0.147	0.311	91	−0.075	−0.098	0.335	−0.146**	0.041	−0.049	0.299

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Projection error is calculated as (actual revenue − projected revenue) / projected revenue.

- the Market Model
- the Fama-French Three-Factor Model [Fama and French, 1992, 1993], FF3
- the Fama-French Three-Factor Plus Momentum Carhart, 1997 Model, FF3 + Momentum
- the Fama-French Five-Factor Model [Fama and French, 2015], FF5
- the Fama-French Five-Factor Plus Momentum Model, FF5 + Momentum

using data for the 250 trading days ending 60 days prior to the event (the estimation period), and requiring at least 60 nonmissing returns during the estimation period.

I then calculate the *Abnormal Return (AR)* for each day during the event window, either (−1 day, +1 day) or (− days, +3 days) around the SPAC merger announcement date. Finally, I calculate the *Cumulative Abnormal Return (CAR)* for each SPAC merger–rival firm pair by summing the abnormal returns over all days in the event window. The results, reported in Table 3, indicate a significant negative effect of SPAC merger announcements on rival firms, except for the Market Model. In addition, the effect is larger and more significant for the cumulative abnormal return in the 3 days surrounding the an-

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Table 3: The Effect of SPAC Merger Announcements on Rival Firms

Panel A: Cumulative abnormal returns (in %) around SPAC merger announcements

Model	N	Mean	St. Dev.	25th Pctile	Median	75th Pctile	p-value
$CAR(-1,+1)$							
Market Model	195	−0.538	4.644	−1.556	−0.069	1.181	0.107
FF3 Model	195	−0.984**	6.014	−1.886	−0.219	1.035	0.023
FF3 + Momentum	195	−0.884**	5.908	−2.220	−0.264	1.040	0.038
FF5 Model	195	−1.029**	6.596	−1.970	−0.084	1.413	0.031
FF5 + Momentum	195	−0.890*	6.612	−2.335	−0.194	1.208	0.062
$CAR(-3,+3)$							
Market Model	195	−0.008	0.094	−0.021	−0.001	0.021	0.263
FF3 Model	195	−0.012*	0.099	−0.028	−0.001	0.021	0.084
FF3 + Momentum	195	−0.013*	0.097	−0.028	−0.002	0.021	0.072
FF5 Model	195	−0.011	0.092	−0.026	0.000	0.023	0.109
FF5 + Momentum	195	−0.011*	0.095	−0.031	−0.001	0.022	0.098

Panel B: Excluding the top and bottom 1% of observations

Model	N	Mean	St. Dev.	25th Pctile	Median	75th Pctile	p-value
$CAR(-1,+1)$							
Market Model	191	−0.421	3.705	−1.368	−0.069	1.176	0.118
FF3 Model	191	−0.727**	3.926	−1.884	−0.219	0.967	0.011
FF3 + Momentum	191	−0.642**	3.846	−2.151	−0.264	1.010	0.022
FF5 Model	191	−0.677**	4.056	−1.905	−0.084	1.377	0.022
FF5 + Momentum	191	−0.639**	4.110	−2.238	−0.194	1.190	0.033
$CAR(-3,+3)$							
Market Model	191	−0.004	0.061	−0.019	−0.001	0.021	0.398
FF3 Model	191	−0.007*	0.061	−0.028	−0.001	0.021	0.096
FF3 + Momentum	191	−0.008*	0.062	−0.027	−0.002	0.019	0.080
FF5 Model	191	−0.007	0.061	−0.023	0.000	0.023	0.119
FF5 + Momentum	191	−0.007*	0.061	−0.030	−0.001	0.021	0.097

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. CARs are computed as the sum of daily abnormal returns over the event window, using each model's parameter estimates from a pre-event estimation period.

nouncement date, CAR(−1,+1), than for the 5-day window, CAR(−3,+3). In addition, the results are robust to excluding the highest 2 and the lowest 2 CARs, corresponding to the top and bottom 1% observations (Table 3, Panel B).

4.2.2 Regression Analysis of Cumulative Abnormal Returns

In order to understand which firms are more likely to be affected by SPAC mergers (with potentially inflated revenue projections), in a final set of tests, I regress the cumulative abnormal returns calculated above (Table 3, Panel B) on the following rival firm characteristics, calculated using data from Compustat:

- *3 Yr. Revenue Growth* — the CAGR in sales over the last 3 years: $\left(\frac{\text{Revenues}_{y-1}}{\text{Revenues}_{y-4}}\right)^{1/3} - 1$, where y is the year of the SPAC merger announcement.
- *Zero Revenues* — a variable that takes the value 1 if the rival firm had zero revenues in year $y-1$, and 0 otherwise.
- *Ln(Revenues)* — calculated as $\ln(1 + \text{Revenues}_{y-1})$, in order to include firms with zero sales.
- *Tobin's Q* — calculated as (Market Capitalization + Total Liabilities) / Total Assets, in year $y-1$.
- *ROA* — calculated as Operating Income Before Depreciation / Total Assets, for year $y-1$.
- *Leverage* — calculated as Total Liabilities / Total Assets, for year $y-1$.
- *Cash* — calculated as Cash and Cash Equivalents / Total Assets, for year $y-1$.

The regression results, presented in Table 4, indicate that rival firms with lower revenue growth experience lower stock returns, i.e., are more affected by a SPAC merger announcement.[3] For firms with an established record of revenue growth (high *3 Yr. Revenue Growth*) and profitability (high *ROA*), a SPAC listing

[3]In columns (1), (3), (5), and (7) of Table 4, the variable *3 Yr. Revenue Growth* is missing when the denominator (Sales_{y-3}) is zero. In columns (2), (4), (6), and (8), when revenues are 0 for both years $y-1$ and $y-3$, I set the revenue growth variable, *3 Yr. Revenue Growth*, equal to 0, and I include in the regression an indicator variable for *Zero Revenues*. The results are very similar, as shown in Table 4.

Table 4: Determinants of Rival Firm Abnormal Returns Around SPAC Merger Announcements

	FF3 CAR$(-1,1)$		FF5+Mom CAR$(-1,1)$		FF3 CAR$(-3,3)$		FF5+Mom CAR$(-3,3)$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
3 Yr. Revenue Growth	0.0342***	0.0342***	0.0502***	0.0502***	0.0548**	0.0548**	0.0833***	0.0833***
	(3.317)	(3.321)	(4.440)	(4.454)	(2.483)	(2.492)	(4.486)	(4.504)
Zero Revenues		0.0416*		0.0420		0.00687		0.00500
		(1.791)		(1.595)		(0.146)		(0.128)
Ln(Revenues)	0.00294*	0.00294*	0.00133	0.00133	0.00189	0.00189	−0.000398	−0.000399
	(1.695)	(1.699)	(0.679)	(0.681)	(0.527)	(0.529)	(−0.134)	(−0.134)
Tobin's Q	−0.00154	−0.00151	−0.00262	−0.00260	−0.00337	−0.00336	−0.00795***	−0.00794***
	(−0.908)	(−0.892)	(−1.366)	(−1.361)	(−0.976)	(−0.978)	(−2.734)	(−2.744)
ROA	0.117***	0.117***	0.125***	0.124***	0.0409	0.0408	0.106**	0.106**
	(4.576)	(4.587)	(4.267)	(4.281)	(0.777)	(0.779)	(2.409)	(2.418)
Leverage	0.00500	0.00506	0.00917	0.00921	−0.00827	−0.00825	−0.00288	−0.00286
	(0.433)	(0.440)	(0.697)	(0.703)	(−0.353)	(−0.354)	(−0.148)	(−0.147)
Cash	0.0254	0.0253	0.0416**	0.0415**	−0.0693**	−0.0693**	−0.0251	−0.0251
	(1.543)	(1.541)	(2.214)	(2.219)	(−2.060)	(−2.070)	(−0.888)	(−0.893)
Constant	−0.0436***	−0.0437***	−0.0397***	−0.0398***	−0.00531	−0.00533	0.00235	0.00234
	(−3.765)	(−3.782)	(−3.050)	(−3.064)	(−0.226)	(−0.228)	(0.121)	(0.120)
N	130	132	131	133	129	131	128	130
Adj. R^2	0.216	0.209	0.183	0.177	0.0580	0.0511	0.145	0.139

Notes: t-statistics in parentheses. $^{*}p<0.10$, $^{**}p<0.05$, $^{***}p<0.01$. The dependent variable is the cumulative abnormal return (CAR) for rival firms in the indicated event window, computed using the indicated factor model. Variable definitions are provided in the text.

in the same industry is less disruptive. The coefficient on *Zero Revenues* is positive and marginally significant for the 3-day event window using the Fama-French 3-factor model. The positive coefficient suggests that, for firms with zero revenues, a SPAC listing can be interpreted as a signal of favorable growth prospects for the industry as a whole, despite the increased competition due to the newly-listed firm; however, the coefficient on *Zero Revenues* is not significant in the other specifications.

5. Conclusion

In this study I have analyzed revenue projections for SPAC mergers and traditional mergers and I compared them with the actual revenues and found that that SPAC merger projections are not only inaccurate, but are even less accurate than traditional mergers revenue projections. This leads one to believe that it is possible that the incentive to ensure that the merger is completed is potentially clouding management's judgment. Furthermore, SPAC mergers are also associated with negative abnormal stock returns for industry rivals. All this would seem to imply that the decision of the SEC to classify de-SPAC transactions as IPO's and not mergers seems to be well founded. Going forward it will be interesting to see if SPACs continue to exist given these stricter rules.

These results add to the literature on SPACs in several ways. First, they add to the existing and growing literature on SPAC projections by showing not only that SPAC merger projections are inaccurate but also that they are less accurate than the forecasts issued in connection with traditional mergers. This basis of comparison puts a lot of the material questioning the effectiveness of SPACs in perspective. Comparing the accuracy of SPAC forecasts with traditional merger forecasts is important not only from a methodological and regulatory point of view, informing the debate as to whether the specific SPAC structure and incentives lead to biased projections – but it is also relevant from a practical business perspective, as a large fraction of the firms that go public via a SPAC transaction (10 out of 26, or 38% in my sample) end up being acquired within a few years after the SPAC listing – so perhaps it could be optimal to skip the SPAC listing and seek a potential acquirer in the first place. Furthermore, I contribute to the literature by showing the negative impact of SPACs on competitors of SPACs, which indicates that exaggerated SPAC projections may have real effects that extend beyond the SPAC firm and its investors.

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