



SPAC Warrants

EVERYTHING YOU WANTED TO KNOW
BUT WERE AFRAID TO ASK

Disclaimer

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Jonathan J. Tang, ASA, CFA



212.714.0122

jtang@empireval.com

350 Fifth Avenue
Suite 6115
New York, NY 10118

Jonathan is a Managing Director at Empire Valuation Consultants, where he has worked since 2007. He is an Accredited Senior Appraiser (ASA) of the American Society of Appraisers, and a Chartered Financial Analyst® (CFA) Charterholder.

He has extensive expertise in valuations related to complex securities, carried interest, intangible assets, and mergers and acquisitions. Jonathan has advised private equity, hedge fund, venture capital and corporate clients through complex audit processes since joining the firm in 2007. He has managed over 600 engagements for financial reporting purposes, including Fair Value Measurements (ASC 820), Business Combinations (ASC 805), Stock Compensation (ASC 718/IRC 409(a)), and impairment testing related to Intangible - Goodwill and Others (ASC 350) and Property, Plant and Equipment (ASC 360). He has also performed numerous valuations for tax reporting, acquisition and divestiture, transfer pricing, fairness opinions, ESOPs, estate planning and general corporate planning purposes.

Jonathan has presented on various valuation topics at industry conferences, including valuation of unicorn and early-stage companies, discount for lack of marketability (DLOM), option pricing models, cheap stock issues and valuation of contingent considerations, and is involved with the development of The Appraisal Foundation's valuation advisories. He is a member of Empire's Technical and Standards Committee.

Prior to joining Empire, Jonathan was a senior engineer in the telecommunications industry, first at Lucent Technologies/Agere Systems, then at GlobespanVirata/Conexant Systems, where he designed and tested Very Large Scale Integration (VLSI) Systems on a Chip (SoC) for Digital Signal Processing (DSP) applications.

Taylor B. Rosanova, ASA, CFA



215.297.2322

Taylor.Rosanova@marcumllp.com

1601 Market Street
Fourth Floor
Philadelphia, PA
19103

Taylor Rosanova is a senior manager in the Advisory Services Group of Marcum's Philadelphia office. Mr. Rosanova is a valuation professional with eight years of experience in the appraisal of business enterprises, ownership interests, intangible assets and various equity and liability securities. He has worked for both private and public clients across a variety of industries. His experience includes valuations for financial reporting purposes including, but not limited to, purchase price allocations, impairment testing, equity compensation, and fair value measurements which include the analysis of complex financial instruments. In addition to financial reporting, Mr. Rosanova has also performed numerous valuations for mergers and acquisitions, litigation support, strategic planning, and tax reporting. He has participated in appraisals involving worldwide business enterprises ranging in value from less than \$10 million to greater than \$2.5 billion.

Mr. Rosanova has obtained his CFA Charter from the CFA Institute and is a graduate of Pennsylvania State University with a Bachelor of Science degree in Finance. Prior to joining Marcum, Mr. Rosanova held a similar position at a large national accounting firm. In a previous role at a large healthcare company, he focused on data aggregation and analysis in assisting the financial reporting team.

Polling Question #1

Please describe your familiarity with SPACs and SPAC warrants

- A) Not familiar at all
- B) Understand SPACs but have not performed any valuation
- C) Performed SPAC-related valuation but not SPAC warrants
- D) Very familiar with both SPACs and SPAC warrant valuations

SPACs

What are SPACs?

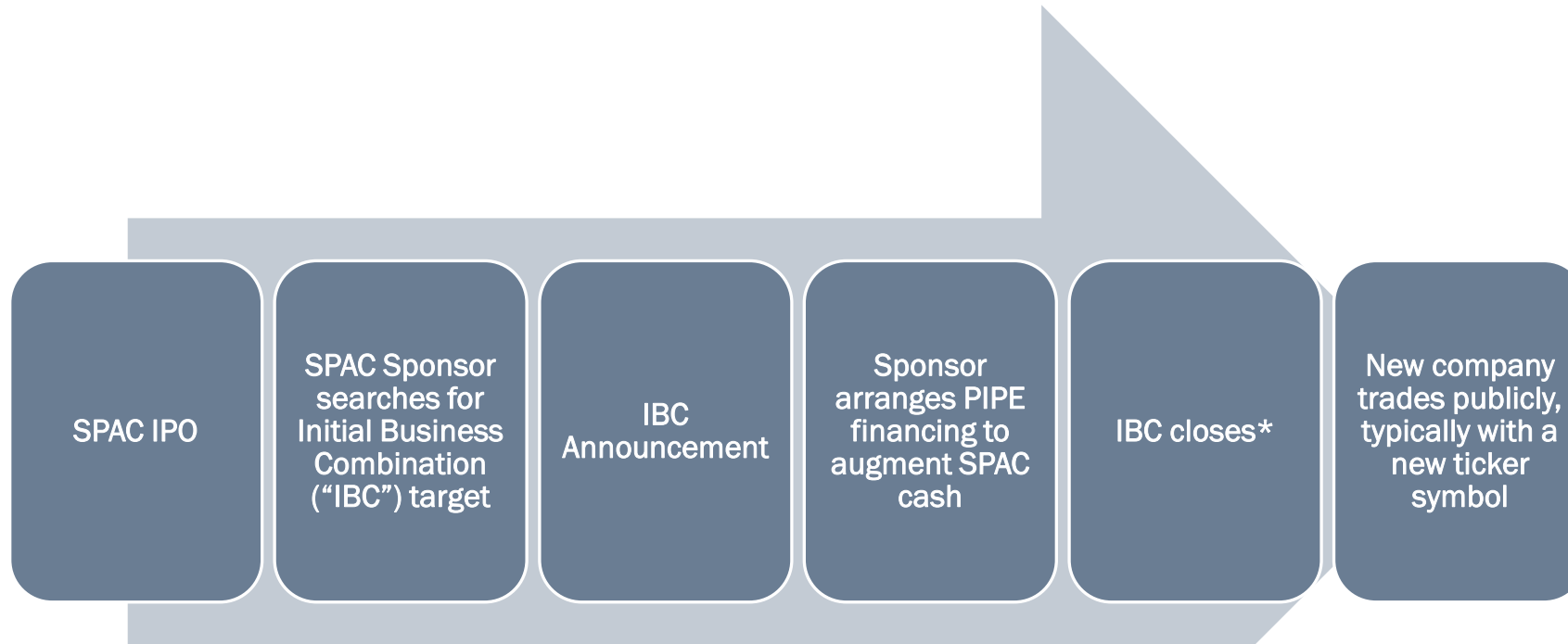
A **Special Purpose Acquisition Company**, also known as a “blank check” company, is a publicly listed shell company created for the purpose of acquiring a yet-to-be-identified private operating company *

SPACs have existed since the 1990s

SPACs provide a relatively easy and inexpensive way for private companies to become public



Typical SPAC Lifecycle



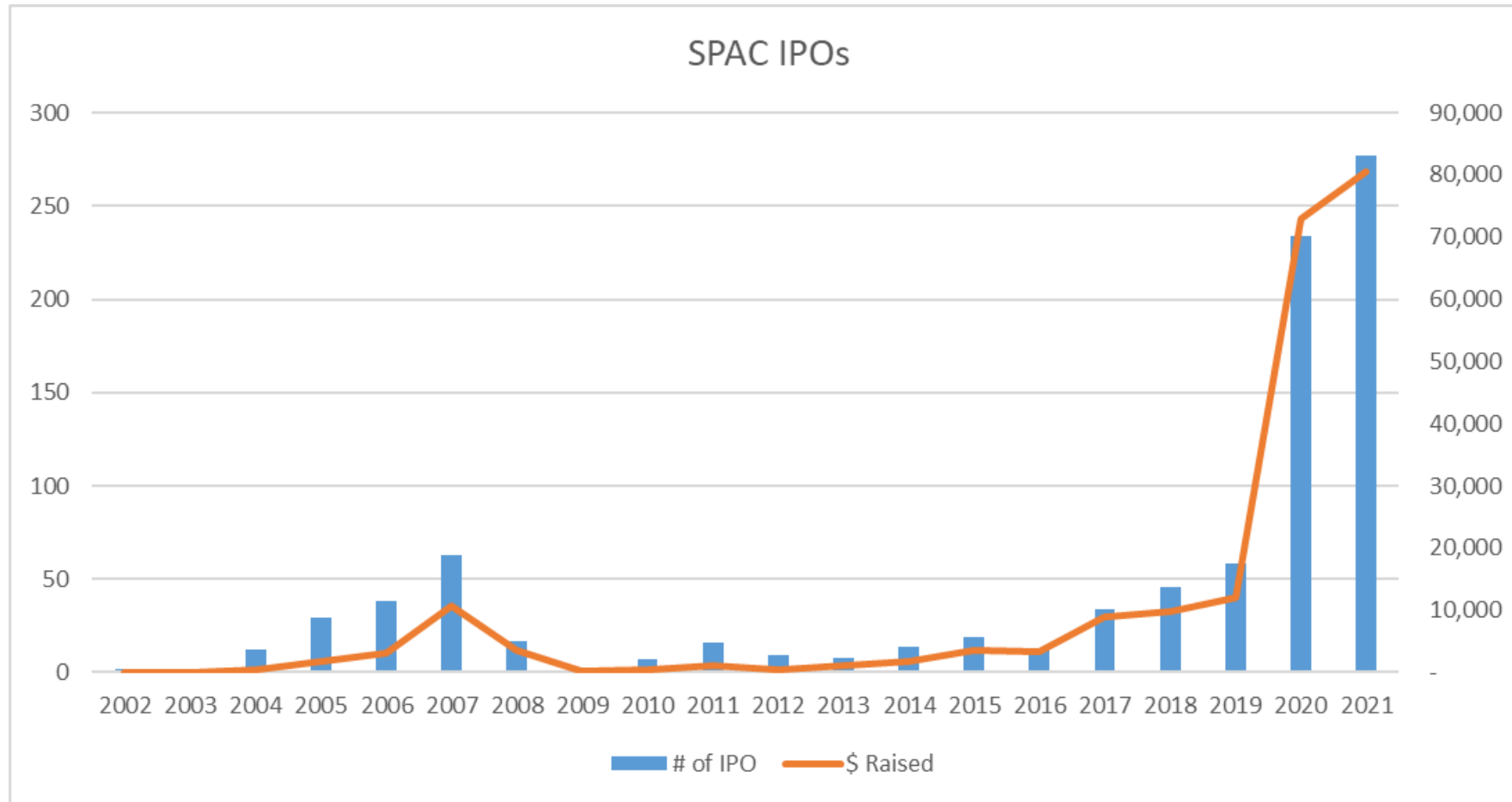
* Typical SPAC has 2 years to complete IBC

Polling Question #2

How many years does a typical SPAC have to complete an IBC?

- A) One year
- B) Two years
- C) Three years
- D) Five Years

SPAC IPO History



Data source:
Bloomberg LP

Data through
4/15/2021

SPAC Size

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Max Size	40,000,000	21,000,000	171,000,000	188,675,000	480,000,000	900,000,000	800,000,000	61,250,000	150,000,000	175,000,000
Average Size	23,915,000	21,000,000	34,909,375	64,390,393	80,376,578	169,307,937	213,988,235	48,625,000	70,142,857	65,593,750
Median Size	23,915,000	21,000,000	24,000,000	48,000,000	54,800,000	100,000,000	150,000,000	48,625,000	50,000,000	60,000,000
Min Size	7,830,000	21,000,000	1,312,500	2,625,000	3,400,000	25,000,000	28,800,000	36,000,000	22,000,000	16,500,000
Total	47,830,000	21,000,000	418,912,500	1,867,321,400	3,054,309,960	10,666,400,000	3,637,800,000	97,250,000	491,000,000	1,049,500,000
Count	2	1	12	29	38	63	17	2	7	16
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Max Size	75,000,000	300,000,000	435,000,000	480,000,000	600,000,000	900,000,000	600,000,000	600,000,000	4,000,000,000	1,500,000,000
Average Size	44,755,556	142,375,000	120,025,000	186,157,895	248,000,000	264,573,529	210,543,478	206,706,897	311,829,060	290,790,628
Median Size	40,000,000	137,500,000	70,000,000	150,000,000	235,000,000	237,500,000	200,000,000	220,000,000	250,000,000	250,000,000
Min Size	2,800,000	70,000,000	35,000,000	40,000,000	39,000,000	40,000,000	40,000,000	40,000,000	40,000,000	40,000,000
Total	402,800,000	1,139,000,000	1,680,350,000	3,537,000,000	3,224,000,000	8,995,500,000	9,685,000,000	11,989,000,000	72,968,000,000	80,549,004,000
Count	9	8	14	19	13	34	46	58	234	277

Data source:
Bloomberg LP

Data through
4/15/2021

SPAC Parties

Sponsors/Founders form the SPAC, fund pre-merger operations, responsible for looking for and negotiating with merger targets. Sponsors typically receive up to 20% of SPAC ownership upon IBC.

Public Investors invest in the public securities (units, shares, warrants, etc.) of SPAC.

Target Company Investors are previous investors/sellers of the target company. In larger deals, these investors typically retain significant ownership control of post merger company.

PIPE Investors augments the money raised through SPAC in order to complete the merger.

Polling Question #3

There have been more SPAC IPOs in Q1 of 2021 than the entire 2020 year

A) True

B) False

Questions

SPAC Private Securities

Sponsor shares: issued to Sponsors/Founders for minimal fee (\$25,000)

Private warrants: purchased by Sponsors/Founders, typically at a purchase price of \$1.00 per warrant

PIPE investment: privately negotiated investment to supplement SPAC proceeds to close the merger

SPAC Public Securities

Units: publicly traded at SPAC IPO, typically consists of one **public share** and a fraction ($1/2$, $1/3$, $1/4$, $1/5$, etc.) of one **public warrant**. Units typically trade at \$10 per unit at IPO.

Some time after IPO (typically 52 days after), the Units can be split into public shares and public warrants, each of which could be traded publicly.

On rare occasions, a Unit would also include the **right** to a fraction (typically $1/10$) of a share, which could also be traded publicly.

Public shares can be redeemed for \$10 at a later date should the holder vote against the merger.

Public warrants typically have a strike price of \$11.50 per share (among other terms).

Polling Question #4

All of the following are publicly traded, except:

- A) SPAC Units
- B) Public Warrants
- C) Sponsor Shares
- D) SPAC Rights

Questions

Warrant Agreements

Typical Common Elements

Strike price of \$11.50 per share for both Public Warrants and Private Warrants.

Exercise Period (A) commences on the *later* of (i) the date that is thirty (30) days after the first date on which the Company completes a Business Combination, and (ii) the date that is twelve (12) months from the date of the closing of the Offering, and (B) terminating at the earliest to occur of (x) 5:00 p.m., New York City time on the date that is five (5) years after the date on which the Company completes its initial Business Combination, (y) the liquidation of the Company if the Company fails to complete a Business Combination, and (z) 5:00 p.m., New York City time on the Redemption Date.

Maybe settled on **cash or cash-less** basis.

Warrant Agreement Type 1

Public Warrant Redemption

6.1 Warrants may be redeemed, **at the option of the Company, at any time while they are exercisable and prior to their expiration**, at the price of \$0.01 per Warrant (the “Redemption Price”), **provided that the last sales price of the Common Stock reported has been at least \$18.00 per share, on each of twenty (20) trading days within the thirty (30) trading-day period ending on the third Business Day prior to the date on which notice of the redemption is given** and provided that there is an effective registration statement covering the shares of Common Stock issuable upon exercise of the Warrants, and a current prospectus relating thereto, available throughout the 30-day Redemption Period or the Company has elected to require the exercise of the Warrants on a “cashless basis”.

Warrant Agreement Type 1

2.6 The **Private Warrants** shall be identical to the Public Warrants, except that: (i) the Private Warrants may not be transferred, assigned or sold until after the completion by the Company of an initial Business Combination, and (ii) so long as they are held by the Purchasers or any of their Permitted Transferees, the Private Warrants (a) may be exercised for cash or on a cashless basis, (b) **shall not be redeemable by the Company**.

This type of warrant is common for SPACs that completed their IPO prior to the middle of 2020.

Warrant Agreement Type 2

Public Warrant Redemption

6.1 Redemption for Cash: Warrants may be redeemed, **at the option of the Company**, at any **time during the Exercise Period** at a Redemption Price of \$0.01 per Warrant, provided that (a) **the Reference Value equals or exceeds \$18.00 per share** and (b) there is an effective registration statement covering the issuance of the Ordinary Shares issuable upon exercise of the Warrants, and a current prospectus relating thereto, available throughout the 30-day Redemption Period.

“Reference Value” shall mean the last reported sales price of the Ordinary Shares for any twenty (20) trading days within the thirty (30) trading-day period ending on the third trading day prior to the date on which notice of the redemption is given.

Warrant Agreement Type 2

Public Warrant Redemption

6.2 Redemption for Ordinary Shares: Warrants may be redeemed, at the option of the Company, at any time during the Exercise Period at a Redemption Price of \$0.01 per Warrant, provided that **(i) the Reference Value equals or exceeds \$10.00 per share and (ii) if the Reference Value is less than \$18.00 per share**, the Private Warrants are also concurrently called for redemption on the same terms as the outstanding Public Warrants.

During the 30-day Redemption Period in connection with a redemption, Registered Holders of the Warrants may elect to exercise their Warrants on a “cashless basis” and receive a number of Ordinary Shares determined by reference to the **Make-Whole Table** (see next slide), based on the Redemption Date (calculated for purposes of the table as the period to expiration of the Warrants) and the “Redemption Fair Market Value”. The “Redemption Fair Market Value” shall mean the volume weighted average price of the Ordinary Shares for the ten (10) trading days immediately following the date on which notice of redemption is sent to the Registered Holders.

Redemption Fair Market Value of Ordinary Shares

Redemption Date (Months)	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00
60	0.261	0.280	0.297	0.311	0.324	0.337	0.348	0.358	0.361
57	0.257	0.277	0.294	0.310	0.324	0.337	0.348	0.358	0.361
54	0.252	0.272	0.291	0.307	0.322	0.335	0.347	0.357	0.361
51	0.246	0.268	0.287	0.304	0.320	0.333	0.346	0.357	0.361
48	0.241	0.263	0.283	0.301	0.317	0.332	0.344	0.356	0.361
45	0.235	0.258	0.279	0.298	0.315	0.330	0.343	0.356	0.361
42	0.228	0.252	0.274	0.294	0.312	0.328	0.342	0.355	0.361
39	0.221	0.246	0.269	0.290	0.309	0.325	0.340	0.354	0.361
36	0.213	0.239	0.263	0.285	0.305	0.323	0.339	0.353	0.361
33	0.205	0.232	0.257	0.280	0.301	0.320	0.337	0.352	0.361
30	0.196	0.224	0.250	0.274	0.297	0.316	0.335	0.351	0.361
27	0.185	0.214	0.242	0.268	0.291	0.313	0.332	0.350	0.361
24	0.173	0.204	0.233	0.260	0.285	0.308	0.329	0.348	0.361
21	0.161	0.193	0.223	0.252	0.279	0.304	0.326	0.347	0.361
18	0.146	0.179	0.211	0.242	0.271	0.298	0.322	0.345	0.361
15	0.130	0.164	0.197	0.230	0.262	0.291	0.317	0.342	0.361
12	0.111	0.146	0.181	0.216	0.250	0.282	0.312	0.339	0.361
9	0.090	0.125	0.162	0.199	0.237	0.272	0.305	0.336	0.361
6	0.065	0.099	0.137	0.178	0.219	0.259	0.296	0.331	0.361
3	0.034	0.065	0.104	0.150	0.197	0.243	0.286	0.326	0.361
0	0.000	0.000	0.042	0.115	0.179	0.233	0.281	0.323	0.361

Warrant Agreement Type 2

2.6 The **Private Warrants** shall be identical to the Public Warrants, except that so long as they are held by the Sponsor or any of its Permitted Transferees the Private Placement Warrants: (i) may be exercised for cash or on a “cashless basis”, (ii) including the Ordinary Shares issuable upon exercise of the Private Placement Warrants, may not be transferred, assigned or sold until thirty (30) days after the completion by the Company of an initial Business Combination, (iii) **shall not be redeemable by the Company pursuant to Section on Redemption for Cash** and (iv) **shall only be redeemable by the Company pursuant to Section on Redemption for Ordinary Shares if the Reference Value is less than \$18.00 per share**; provided, however, that in the case of (ii), the Private Placement Warrants and any Ordinary Shares issued upon exercise of the Private Placement Warrants may be transferred by the holders thereof.

This type of warrant agreement is common for SPACs that IPO'd since Q3 2020.

Warrant Agreement

The prior two are the most common types of warrant agreements. However, other variants exist as well.

Remember to always read the terms of the agreement carefully.

Example: “Reference Value” may refer to the last traded price three days before issuing redemption notice instead of 20 days out of 30.

Questions

Warrant Valuation

SEC Staff Statement

On April 12, 2021, the SEC issued Staff Statement on Accounting and Reporting Considerations for Warrants Issued by Special Purpose Acquisition Companies (“SPAC”).

The focus of the statement was to highlight potential accounting implications of terms contained within many SPAC warrant agreements.

Impacts:

- Equity vs. Liability
- Valuation, Financial Reporting, etc.

The “Marcum” Approach

At IPO and reporting periods until SPAC Unit split

- Private Warrants – Likely Modified Black Scholes or Monte Carlo
- Public Warrants – Likely Monte Carlo

Post SPAC unit split but pre-IBC

- Private Warrants – Likely modified Black Scholes or Monte Carlo
- Public Warrants – Level 1 Input

Post-IBC

- Private Warrants – Black Scholes or Monte Carlo
- Public Warrants – Level 1 Input

Black Scholes vs. Monte Carlo

Warrant features where Black Scholes may suffice

- Warrant contains no redemption feature (private warrants for type 1 agreements)

Warrant features that may require Monte Carlo simulation

- Reference Value: the last reported sales price of the Ordinary Shares for any twenty (20) trading days within the thirty (30) trading-day period ending on the third trading day prior to the date on which notice of the redemption is given.
- Redemption Fair Market Value: the volume weighted average price of the Ordinary Shares for the ten (10) trading days immediately following the date on which notice of redemption is sent to the Registered Holders.
- The Make-Whole Table

Modified Black Scholes

Inputs

- Probability of successful business combination (to be discussed)
- Time to successful IBC (to be discussed)
- Post-transaction volatility (to be discussed)
- Share price - \$10
- Strike price - \$11.50
- Warrant term – 5 Years
- Risk free rate

Methodology

- Use BS call option model to estimate value of warrant at the acquisition date
- Apply probability of IBC and discount to present

Probability of Successful IBC

Sources of input

- Management estimate – management optimism/bias
- Historical data from previous SPACs (as of 4/15/2021)
 - Number of SPAC IPO between 2015 and Q1 2019: 127
 - Number of IBC completed: 113
 - Number of IBC still pending: 7
 - Number of SPAC Liquidated: 7
 - Number of post-IBC de-listings: 6
 - Calculated probability of successful IBC 90%+
- Other considerations
 - Number of SPACs looking for target now vs. historical period
 - Size of SPAC
 - Sponsor reputation and experience

Time to Successful IBC

Sources of input

- Management estimate – management optimism/bias
- Historical data from previous SPACs (based on 146 IBC from 2015 to 4/15/2021)
 - Maximum time: 3.4 years
 - Average time: 1.6 years
 - Median time: 1.6 years
 - Minimum time: 0.4 years
- Other considerations
 - Number of SPACs looking for target now vs. historical period
 - Size of SPAC
 - Sponsor reputation and experience
 - If time < 1 year, remember the exercise period does not start until at least 1 year after IPO

Volatility

Sources of input

- Post-merger volatility of comparable de-SPAC companies
- Implied Volatility
 - From Public Warrants of comparable SPACs
 - From own Public Warrants
 - Issue of Low Implied Volatility
- Reconciliation issues between the two

Alternative Approach

At IPO and reporting periods until SPAC Unit split

- Private Warrants – Black Scholes or Monte Carlo – Using the Implied Volatility of Comparable SPACs
- Public Warrants – Likely Monte Carlo – Using the Implied Volatility of Comparable SPACs

Post SPAC unit split but pre-IBC

- Private Warrants – Likely modified Black Scholes or Monte Carlo – Using the Implied Volatility of the Public Warrant
- Public Warrants – Level 1 Input

Post-IBC

- Private Warrants – Black Scholes or Monte Carlo
- Public Warrants – Level 1 Input

Questions

Monte Carlo Simulation

Methodology

- Simulate stock price from IBC transaction date to expiration of warrant
- Implement redemption and exercise decisions based on stock price
- Calculate warrant value at transaction date
- Apply probability of IBC and discount to present

Warrant features to be implemented

- Reference Value: the last reported sales price of the Ordinary Shares for any twenty (20) trading days within the thirty (30) trading-day period ending on the third trading day prior to the date on which notice of the redemption is given.
- Redemption Fair Market Value: the volume weighted average price of the Ordinary Shares for the ten (10) trading days immediately following the date on which notice of redemption is sent to the Registered Holders.
- The Make-Whole Table

Redemption Decision

When will the company redeem the warrants?

- First opportunity to redeem?
- Minimize payout?
- Make-Whole Table
 - Calculated using 40% volatility
- Observed historical redemption behavior
 - Companies do tend to redeem at first opportunity for Type 1 Warrants
 - Lack of observable data for Type 2 Warrants

Polling Question #5

Which warrant feature, if present, may require Monte Carlo simulation to model correctly?

- A) Reference Value above threshold for 20 out of 30 days
- B) Redemption Fair Value or 10-day average price
- C) The Make-Whole Table
- D) All of the above

Polling Question #6

All of the following should be considered to derive a reasonable volatility for valuation of SPAC warrants, except:

- A) Pre-merger volatility of comparable de-SPAC companies
- B) Post-merger volatility of comparable de-SPAC companies
- C) Implied volatility of public warrants of comparable SPACs
- D) Implied volatility of own public warrants, if available

Questions

Other Considerations

SPAC Return

SPACs' post-merger historical returns have been observed to lag behind the market

- 1-Year Post Merger SPAC Return

	SPACs	SPY	IPO Index	Excess over SPY	Excess over IPO
Maximum	325%	65%	199%	260%	129%
Average	-3%	13%	41%	-16%	-46%
Median	-20%	14%	23%	-32%	-53%
Minimum	-97%	-20%	-27%	-143%	-228%

Increase in number of SPACs looking for targets and agency problems

Additional Items to Explore

Keep tracking of SPAC IBC data

Keep tracking of SPAC post-IBC return

Further study of company redemption behavior?

Assumption of log-normal distribution?

Q&A