Goldman Sachs | Global Macro Research

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TOP of MIND

THE IPO SPAC-TACLE

The IPO market slammed shut in the first part of 2020 as pandemic uncertainty set in, only to open up with gusto in 2H even as risks around the virus and its economic impact remained high. This surprising strength following years of tepid IPO markets, as well as lofty valuations for newly public companies, have led to fears of an IPO "bubble", especially in tech. Adding to these concerns has been a surge in IPOs via Special Purpose Acquisition Companies (SPACs)—public investment vehicles created to merge with a company, thereby bringing it public—which comprised over half of US IPOs in 2020. With these trends continuing into 2021, whether they're sustainable, and the implications for companies and investors, is Top of Mind. We ask experts for their answer, including GS's own capital markets/SPAC experts, David Ludwig and Olympia McNerney (Yes, as long as the economic recovery continues), University of Florida's Jay Ritter (Yes, as long as the stock market holds up) and Stanford Law School's Michael Klausner (No, at least re: SPACs, unless their structure evolves.)

"The only way to really justify such high valuations is by making optimistic assumptions about the outlook for these companies. But there's a reason to make such assumptions."

- Jay Ritter

"The goal is for companies to use the listing structure that meets their objectives and creates outcomes that they're ultimately happy with—there isn't a one size fits all answer."

- David Ludwig

"Without substantial evolution in their terms, I expect SPACs will eventually die out, or at least become much rarer once again."

- Michael Klausner

WHAT'S INSIDE

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Macro news and views

We provide a brief snapshot on the most important economies for the global markets

US

Latest GS proprietary datapoints/major changes in views

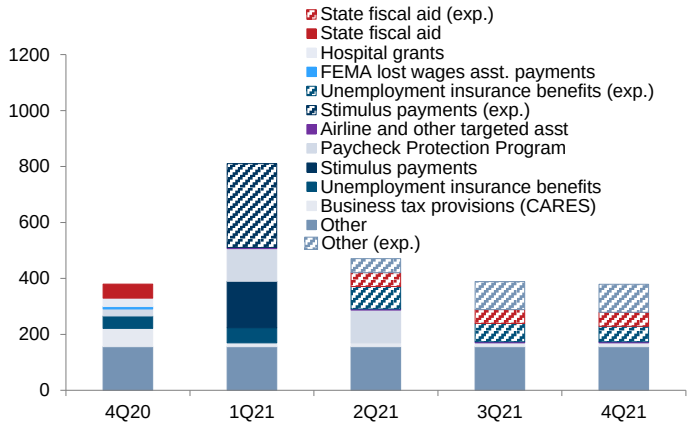
- We now expect the passage of an additional $1.1tn in fiscal support between mid-February and mid-March, and recently raised our full-year 2021 growth forecast to 6.6% to reflect the larger expected fiscal boost.
- We now expect the unemployment rate to fall to 4.5% and core PCE inflation to rise to 1.8% by year-end 2021.

Datapoints/trends we're focused on

- Virus/vaccine developments; virus spread has improved on net over the past few weeks across all four Census regions and the pace of vaccinations has picked up; we expect the US to vaccinate 50% of its population by May.
- Fed tapering, which we expect to begin in 2022.

A greater US fiscal boost

Fiscal stimulus measures in response to COVID-19, $ billions



Source: Congressional Budget Office, Goldman Sachs GIR.

Japan

Latest GS proprietary datapoints/major changes in views

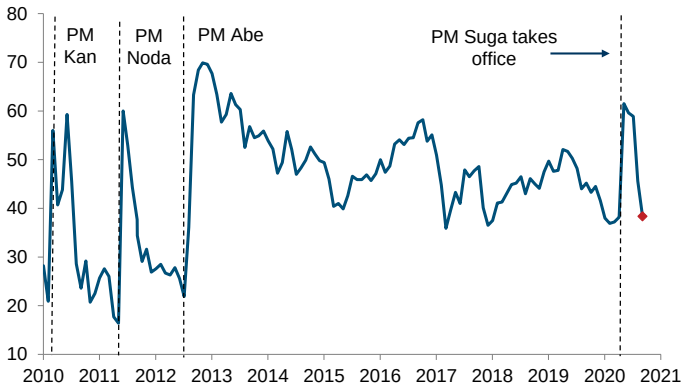
- We lowered our 1Q21 growth forecast to 0.2% qoq. ann. following a renewed state of emergency, but expect a robust pickup starting in the spring as vaccines are administered.

Datapoints/trends we're focused on

- Elections, which we think PM Suga is increasingly likely to call for just before Lower House members' terms end in Oct.
- BOJ policy review, which is likely to focus on expanding the ETF/J-REIT purchase program and funds-supplying measures.
- Suganomics policies, which we believe could propel growth and enhance Japan's industrial structure and financial system.
- Summer Olympics, which we expect to happen, but in a significantly downscaled form, and with rising uncertainties.

Suga's falling approval narrows the election window

Approval rating of Japanese prime ministers, %



Source: Nikkei, Asahi Newspaper, Real Politics Japan, Goldman Sachs GIR.

Europe

Latest GS proprietary datapoints/major changes in views

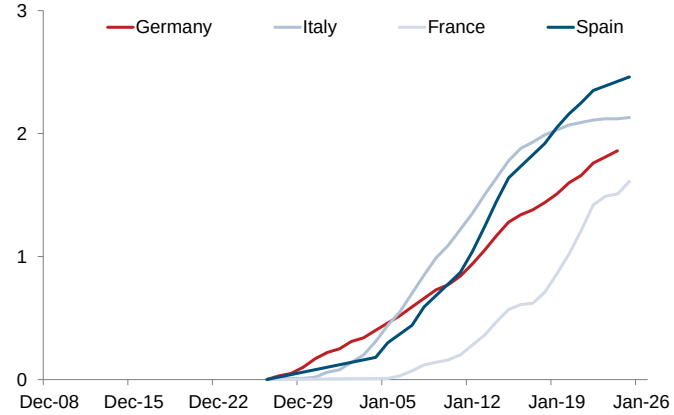
- We now forecast a 1Q21 EA contraction of 0.1% qoq-na and a more significant double-dip recession in the UK given continued virus spread and a slow start to vaccinations.

Datapoints/trends we're focused on

- COVID-19 hospitalizations and deaths, which remain elevated.
- The pace of COVID-19 vaccinations, which has been off to a slow start, particularly in Germany and Italy.
- Inflation; we expect the ECB to adopt a symmetric 2% inflation aim but include "soft" elements of AIT when the strategy review concludes in September.
- Early elections in Italy, which we think remain very unlikely.

Vaccinations have been off to a slow start

Vaccinated with first dose, % of population



Source: Our World in Data, JHU Centers for Civic Impact, Goldman Sachs GIR.

Emerging Markets (EM)

Latest GS proprietary datapoints/major changes in views

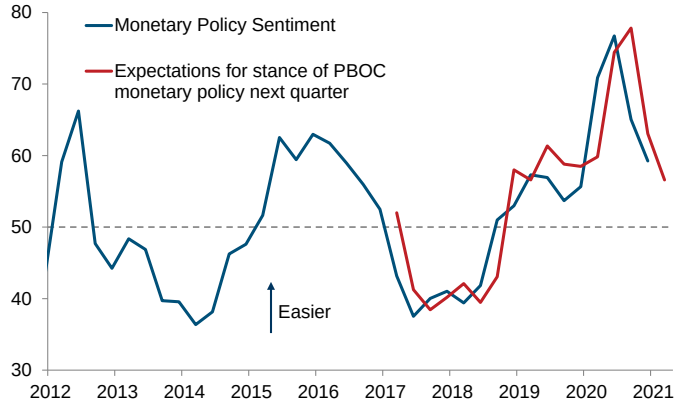
- No major changes in views.

Datapoints/trends we're focused on

- Virus spread; daily new cases continue to increase in LatAm but decline in CEEMEA.
- Vaccine developments; we do not expect 50% vaccination to be achieved in most EMs before late 2021.
- The stance of Chinese monetary policy, which is likely to stay neutral in 2021 with a more structural tilt towards lending to SMEs, rural development, and green financing.
- LatAm political developments; a packed 2021 political calendar may keep investment spending subdued across LatAm.

Less accommodative monetary policy expected in China

PBOC Monetary Policy Sentiment Index, sa



Source: PBOC, Wind, Goldman Sachs Global Investment Research.

The IPO SPAC-tacle

Amid the economic and market rollercoaster of 2020, the IPO market stood out—slamming shut in the first part of the year as pandemic uncertainty set in, only to open up with gusto in the second half of the year even as risks around the virus trajectory and its economic impact remained high. The result was more than $300bn raised through IPOs globally, including record-breaking issuance in the US. This reopening was all the more notable given the tepid IPO market only a handful of years ago. Companies were staying private for longer, aided by a surge in the availability of venture capital and private equity, and the number of US publicly traded companies in 2019 was at one of its lowest levels in two decades.

This renewed focus on public markets has therefore raised the question of whether the era of "staying private for longer" is truly behind us, especially as companies are increasingly receiving higher and more compelling public valuations. Indeed, lofty valuations have even begun to raise concerns of a "bubble" in public markets, especially in the tech sector, where the median company went public in 2020 at more than twice the price-to-sales ratio of 2018/19.

Adding to bubble concerns is the other exceptional feature of the recent IPO surge—the preponderance of Special Purpose Acquisition Companies (SPACs)—or "blank check" companies, which are publicly held investment vehicles created to merge with a company, thereby bringing it public. SPAC IPOs comprised over 50% of US IPOs in 2020—reaching by far the highest number on record. And in the first three weeks of 2021 alone, 56 US SPACs have been brought to market. With the IPO boom showing few signs of letting up and the number and size of SPACs continuing to break ever-new records, the sustainability of these trends, and the implications for companies and investors, is Top of Mind.

We first speak to Jay Ritter, Professor at the University of Florida, and David Ludwig, our head of Global Equity Capital Markets, to put the current IPO boom into context. Both view the recent strength of the IPO market as consistent with robust equity market performance as investors somewhat reasonably look through the current period of economic weakness to a period of more positive growth driven by vaccination progress, significant fiscal stimulus and continued low interest rates.

And neither Ritter nor Ludwig is particularly concerned about a bubble today--for two reasons. One, in contrast to the internet bubble, the companies going public today are generally much more established. And two, investors have good reason to be optimistic about the future performance of companies they see as potentially disruptive given recent huge success stories—think Zoom and Airbnb, among others. But both also acknowledge that a hit to investor sentiment should the economic outlook worsen or the quality of companies going public deteriorate poses risks to a strong 2021 IPO outlook.

But even if the broader IPO market isn't in a bubble, is the SPAC market in one? To help answer this question, we first turn to Olympia McNerney, who leads our US SPAC business, to walk us through the mechanics of a SPAC's lifecycle (see also pg. 17 for an admittedly simplified guide). And we then dissect the SPAC phenomenon from two perspectives—the companies that are going public by merging with SPACs, and SPAC investors.

From the company perspective, McNerney explains that the recent openness of the public markets, which has allowed companies to be more discerning about the way in which they go public, is driving increased company interest in SPACs. And, while SPACs aren't suited for all companies, some find the unique features of the SPAC process compelling, including the ability to provide projections to investors and to raise funds at multiple points in the process. The flexibility inherent in negotiating a SPAC merger, and, Ludwig adds, the "de-risking" that comes from agreeing to an acquisition price within the merger terms, is also attractive to many companies. Ritter, for his part, sees alternative IPOs as one way for companies to avoid "leaving money on the table," which is a growing problem for new listings given the first-day price "pops" that have become increasingly common and large (see pg. 8 for more basics on the different ways to go public.)

Given all of the above, these interviewees generally believe that SPACs, and alternative IPOs more broadly, will likely comprise a growing share of IPOs in the future, although Ludwig believes traditional IPOs are still likely to dominate. That said, Ludwig and Ritter also note that substantial evolution and innovation is taking place in the IPO space, with listing models already starting to adopt each other's best features—and they expect such innovation to continue.

From the investor perspective, our US Equity Strategists, David Kostin and Cormac Conners, discuss reasons why investor interest in SPACs surged in 2020, including SPACs' shifting focus from Value to Growth, an acceleration in retail trading activity, and their attractiveness as a cash substitute in today's low rate environment—none of which they see changing anytime soon.

But the key question is: are SPACs actually good investments? According to Ritter as well as Michael Klausner, Professor at Stanford Law School, that depends entirely on which investor you're talking about—the pre- or post-merger investor. The two groups of investors look virtually nothing alike, and their average return profiles are polar opposites—with pre-merger investors historically making solidly positive returns at little to no risk, and post-merger investors suffering negative returns (Kostin and Conners have similar findings.)

Ritter notes that history does not predict the future, and some recent SPAC mergers have moved in a more positive direction. But Klausner argues that even if that's true, substantial dilution is still inherent in the SPAC structure, imposing a large cost, which is borne almost entirely by post-merger shareholders. That's not sustainable, in his view, and without some evolution to their structure, he suspects SPACs will eventually die out.

Finally, our senior Credit Strategist, Amanda Lynam, looks at the broader surge in M&A activity in 2H20 and the risks it poses to corporate credit quality, concluding that this activity could have negative implications for credit investors should the recent shift towards financing this activity with cash extend.

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Interview with Jay R. Ritter

Jay R. Ritter is Joseph B. Cordell Eminent Scholar in the Department of Finance at the University of Florida. Below, he discusses the recent US IPO boom in the context of historical cycles, whether the current one can continue, and the rise of alternative paths to going public.

The views stated herein are those of the interviewee and do not necessarily reflect those of Goldman Sachs.

Allison Nathan: How does the recent boom period for IPOs compare to past cycles?

Jay Ritter: Any historical comparison depends on how we define IPOs. In a typical year in the '90s, more than 300 operating companies went public. Last year, by my count, 165 operating companies did so. But those numbers don't include foreign companies using ADRs or, more importantly, Special Purpose Acquisition Companies (SPACs). In the '90s, SPACs were almost unheard of, whereas last year 248 SPAC IPOs occurred. So including SPACs, over 400 IPOs occurred in 2020—the highest number in 20 years. Of the operating company IPOs, those of tech-oriented companies got the most attention, but the industry with the highest number of US IPOs was actually biotech, where 77 companies went public last year—the most of any year ever.

That said, from a sector perspective the biggest difference in the IPO market over the last 20 years has occurred in the technology sector, with the bursting of the internet bubble in 2000 marking an inflection point. Before then, lots of young tech companies went public, and since then almost none have done so while very young. These companies have instead turned to venture capital to nurture their growth. And even as they've become more successful, their value-maximizing strategy has largely been to sell out to big tech companies—which have often been willing to pay top dollar for acquisitions—rather than to go public.

Allison Nathan: So what's changed that's motivated more companies to pursue IPOs recently?

Jay Ritter: High valuations are a big part of it. Valuations have been high in private markets for years. Ample venture capital money, as well as late-stage money from sovereign wealth funds and mutual funds, has been available on attractive terms, which has allowed successful startups to remain private for longer. But the recent high public market valuations have helped convince viable standalone businesses, such as Airbnb, DoorDash, and Snowflake, that now is a good time to tap the public capital markets for liquidity.

Allison Nathan: Given these high valuations, do you see any risks of a bubble?

Jay Ritter: I am not that concerned about a bubble. It's true that valuations are high for many companies. For example, in a typical year during the last two decades, the median tech company going public had a price-to-sales ratio of about six. In 2018/19, that nearly doubled to 10 or 11. In 2020, the median tech company went public at a ratio of around 24. But these high valuations are partially a rates story. During the internet bubble, 30yr TIPS were yielding about 400bp plus inflation, compared to about -30bp today. So the risk-free rate has dropped by more than 400bp while the equity risk premium has remained the same, justifying much higher multiples.

That said, the only way to really justify such high valuations is by making optimistic assumptions about the outlook for these companies. But there's a reason to make such assumptions. The huge success stories of Google (now Alphabet), Facebook, and other companies that went public at relatively high multiples and still outperformed expectations has left the market willing to buy into higher valuations for companies that might have a great future.

Allison Nathan: How common is such IPO outperformance?

Jay Ritter: Since 1980, the average company that has gone public has actually underperformed the market over the three years following its IPO, excluding the first day "pop." But this underperformance has been concentrated among small companies. Companies with less than $100 million in inflation-adjusted annual sales have underperformed on average, while companies with more than $100 million in sales have done as well as other investments. This just reflects the expected pattern that companies that have a proven product or service tend to perform better than companies that don't. That's not to say that every big company does well. Indeed, even the majority of companies in the S&P 500 underperform the index almost every year. Many of them underperform by a little bit, and a few outperform by a lot, and that's even more true with companies that have conducted an IPO.

There is also some differentiation between sectors. Tech stocks have historically been the best performing sector of the IPO market, with those from 1980-2018 actually beating broad market returns on average by 28% over a 3-year horizon from the offer price, when excluding the internet bubble. Last year, IPOs outperformed broader indices partly because so many IPOs were in the technology and healthcare sectors, both of which did especially well. But that doesn't mean this outperformance will persist in the future. As valuations have moved higher, especially in these sectors, it's become harder to beat or even match the market.

Allison Nathan: Can the recent high volume of IPOs be sustained in 2021?

Jay Ritter: I expect the volume of IPO activity will remain high as long as the stock market continues to perform well. The IPO market has always been hyper-sensitive to stock market movements, and so if the stock market takes a dive like it did last February, the IPO market would likely shut down pretty rapidly. While that's possible, the more likely scenario is that reasonably high volumes will continue and maybe even grow.

Allison Nathan: Amid the current IPO surge, why are so many more companies choosing alternative paths to going public, such as direct listings and SPACs?

Jay Ritter: There are several reasons, but a key one is that going public through the conventional route can be a very costly process. The costs of a traditional IPO are both the direct fees that companies pay to investment banks—as well as legal fees, auditing fees, etc.—and the indirect costs that can come from underpricing companies' shares in the IPO process, or "leaving money on the table" for the issuing company. Historically, this underpricing has been manageable, but in 2020 it was very large. The average first-day return on operating company IPOs was 41.6% last year. Including over-allotment options, $34 billion was left on the table, which works out to about $200 million per IPO. And for some companies like Airbnb it was substantially higher—in the billions of dollars.

Allison Nathan: But are alternative IPO paths less costly?

Jay Ritter: Not necessarily. For direct listings, in which companies go public by offering shares in an opening auction, this may be the case. SPACs, however, are by no means costless, in large part because their structure typically creates dilution for shareholders. For example, like a conventional IPO, SPACs involve a middleman—the "sponsor"—that launches the SPAC IPO and does the work of finding a company to merge with, negotiating the terms of the merger and raising sufficient funds to complete it. If the sponsor does not complete a merger within two years, the proceeds of the IPO are returned to the shareholders with interest. In exchange for this sweat equity, the sponsor takes a cut of the deal--typically 20% of the IPO shares for a nominal price—which ends up diluting the company and public shareholders once a merger goes through.

That said, shareholders have the right to redeem their shares once the proposed merger is announced. So, especially if redemptions are large, the sponsor often winds up giving up some of its 20%—either by putting in more of its own cash or providing inducements to others such as private investment in public equity (PIPE) investors—in order to make sure that there's enough cash to complete the merger. But given the dilution risk from the sponsor promote as well as other aspects of the SPAC structure, it's unclear whether SPACs are cheaper on average than a conventional IPO, and they're certainly not cheaper for all IPOs.

Allison Nathan: What percent of SPAC shareholders typically choose to redeem?

Jay Ritter: That varies greatly by deal. But research I've done with Donghang Zhang and Minmo Gahng finds that there tends to be a bimodal distribution of redemptions. If the redemption value—the $10 initially paid for the unit, plus interest—is less than the market price of a share, shareholders don't redeem because there's no incentive to ask for your money back when you can sell the share in the market at a higher price. But if the market price is below the redemption value, you're better off redeeming. So just by looking at the market price, all shareholders are basically going to be making the same decision. In a slight majority of the cases we've looked at, which includes all SPACs between 2010 and 2018, almost all of the shareholders have chosen to redeem.

Allison Nathan: So are listed SPACs good investments?

Jay Ritter: To answer this, it's important to recognize that the lifecycle of a SPAC has two distinct periods: pre- and post-merger. In the period between the IPO and the completion of a merger, or, if no merger occurs, the liquidation of the SPAC, the average return for the SPAC IPO investor since 2010 has been 9.3% pa. This high return has also been very low risk given that SPAC IPOs are essentially analogous to default-free convertible bonds. They're default-free because the money is put into an escrow account, and investors can always opt to redeem, and convertible because there's upside if an attractive merger is executed. With these sort of returns and attributes, it's no wonder that a core group of hedge fund investors—the so-called "SPAC mafia"—have been happy to buy them.

More recently, a much broader range of investors has caught on and has started to pile into the SPAC market. One of those investors is me! Until two months ago, I had never bought a SPAC IPO. Now, I own eight or nine. Such increased investor demand is apparent in the price of listed SPACs. Historically, SPACs went public at $10 a share and traded at that price or maybe 5 to 8 cents higher—about 0.6% above the listing price on average. But, in 2020, SPAC prices typically jumped immediately after the listing and averaged 1.6% higher than the $10 listing price. And in the first two weeks of 2021, 53 SPAC IPOs launched—more than in all but three years ever—and their listing prices jumped more than 6% on average.

In contrast to the compelling pre-merger performance of SPACs, their post-merger performance has been disappointing on average—underperforming the broader market by 24% in the year following the IPO, on my calculations. But as with IPOs more broadly, past patterns can't be relied on to predict the future. As companies, investors and the market more generally have gained experience with SPACs, the post-merger return patterns have begun to shift a bit. For example, returns for some recent SPAC mergers—like Virgin Galactic, Luminar, and DraftKings—have been very good. Investors have been assessing each deal independently, and that will likely remain the case.

Allison Nathan: Is the SPAC frenzy likely to persist in 2021?

Jay Ritter: The number of SPAC IPOs in 2020 was more than three times any previous year, and SPAC proceeds last year were more than all previous years combined. I expected that after such a big boom things might moderate. But, as I mentioned, the first week of this year alone had a record-high number of SPAC IPOs. So while there's eventually likely to be some moderation, it doesn't look like it's coming anytime soon.

Allison Nathan: That said, are some issues that have contributed to the shift towards alternative IPOs, like the "pop" in first day pricing of recent IPOs, likely to diminish?

Jay Ritter: The traditional IPO process has started to evolve in ways to counteract that issue. For example, in the DoorDash and Airbnb IPOs investors were asked to submit indications of interest that included numbers for both price and quantity, rather than just the latter. This allowed the investment bank to construct a demand curve, providing much more transparency in price. The price on the first day of trading still jumped significantly for both companies, partly because the strength of retail demand caught everybody by surprise. But I don't expect that will be the norm. And so it wouldn't surprise me if providing this type of transparency becomes more common—and maybe even standard practice—for the traditional IPO process in the future.

Interview with David Ludwig

David Ludwig heads the Global Equity Capital Markets business at Goldman Sachs. Below, he discusses current trends in the IPO market and its ongoing evolution.

The interviewee is an employee of the Goldman Sachs Investment Banking Division (IBD), not Goldman Sachs Research, and the views stated herein reflect those of the interviewee, not Goldman Sachs Research.

Allison Nathan: How large was the surge in equity capital market activity in 2020?

David Ludwig: 2020 was extraordinary on many levels. Global equity issuance volumes broke $1tn for the first time ever, reaching levels 25% above the previous record in 2007 and over 50% above 2019 levels. IPO activity was also record breaking. Global IPO volumes in 2020 amounted to more than $300bn—an increase of 60% from 2019—with 75% of that concentrated in the second half of the year. US-listed IPOs comprised around $170bn of that total, and slightly more than 50% of those listings were Special Purpose Acquisition Company (SPAC) IPOs. But even putting SPACs aside, US corporate IPO activity levels were higher in 2020 than in 16 of the last 20 years and at the highest levels of the last six years.

From a sector perspective, technology outpaced all other industries last year—comprising around a quarter of global IPO volumes—as the pandemic accelerated technology-driven changes in how we live and work that were already underway. Technology has no doubt been a very attractive sector for both investors and issuers; we've been saying for a while that we're in the middle of a technology IPO super cycle, and 2020 did not disappoint. Given the focus on vaccine development and improvements to drug discovery in general, IPO activity in the biotech and pharma sectors was also high, representing about 15% of global IPO volumes last year, and we expect strong new issuance in these sectors over the longer term.

Allison Nathan: It seems like not that long ago everyone was focused on the shift toward private markets and the death of the IPO market. What's changed?

David Ludwig: It's true that five years ago everyone was talking about companies "staying private longer", and we were saying it would be worth the wait. Choppier markets in '15 and '16 made the public markets a less exciting place for some companies, but now that we've seen several years of constructive market conditions and increasing valuation multiples, companies have been more excited to move forward. And as companies saw markets close briefly and then reopen again in a very robust manner last year, many decided it was a good time to move forward with their public market plans. Looking to the year ahead, if the prospects for vaccine efficacy remain positive and the economic recovery continues, we expect to come close to the volumes we saw last year.

Allison Nathan: Who's buying all of this new IPO issuance?

David Ludwig: It's difficult to recall another period in my career when the IPO investor base has been as deep or as broad as it is today. The institutional investor community, including mutual funds and hedge funds, has been very active in a number of our deals. The sovereign wealth fund community has also begun to more actively manage a substantial amount of its capital. The retail community has been increasingly active in our transactions and in the aftermarket, and other pockets of investors have been participating, including traditionally private market investors who have been rolling out public market strategies.

Allison Nathan: How else does the current IPO boom compare to past cycles in your career?

David Ludwig: Similar to past cycles, capital is readily available and equity investors are expressing an optimistic point of view. What's unique about this cycle is that this optimism exists alongside a relatively weak economy amid a global pandemic. Investors' confidence in successful vaccination rollouts, a continued low interest rate environment, and significant fiscal stimulus have all enabled financial markets to be in much better shape than the overall economy.

Allison Nathan: Does this disconnect between markets and the economy suggest this IPO cycle is fragile?

David Ludwig: I don't think so; the market is inherently forward-looking. The rapid approval of vaccines and subsequent start of vaccination programs provides credibility to the market's expectation that the economy will continue to recover. So, despite some near-term economic headwinds, it seems reasonable for investors to look ahead and value companies based on expectations for 2022 and beyond.

Allison Nathan: Today's high valuations have led to comparisons between the current cycle and the 2000 internet bubble. Do you see worrying similarities?

David Ludwig: That's a reasonable question given the obvious common elements between the two periods, but there are also some critical differences. The innovation we're seeing in the technology sector around the world today is truly staggering. The digitization of the economy and how we use technology in our everyday lives is only continuing to expand, and the group of companies driving this massive change is creating substantial value. Some of these disruptive companies are achieving larger scale and growing faster for longer than what we might have expected three, five, or even ten years ago. So it's not surprising that investors want to own similarly fast-growing and disruptive companies that could be as successful, even at relatively high valuations.

It's also important to note that the tech companies pursuing IPOs today are generally backed by solid fundamentals. Twenty years ago many of the businesses going public were much smaller and less developed. Some great companies certainly emerged from that period, but they were substantially less established on average.

Allison Nathan: What risks to your positive IPO outlook worry you the most?

David Ludwig: There are a few I worry about. First, the potential for rates to rise materially faster than investors expect, which would dampen investor sentiment, is clearly a risk in the current environment. Second, anything that shakes investor confidence in the ability for vaccinations to facilitate an economic recovery—whether that be new virus strains, questions about vaccine efficacy, etc.—is a concern. And third, strong IPO cycles like the current one always increase the likelihood that companies that aren't ready to go public still do so. If IPO returns become more inconsistent as a result, investors' receptivity to buying IPOs may decline. And if companies can no longer go public at the valuations and with the shareholders that they want, they may decide to hold off on entering the public market until the market normalizes.

Allison Nathan: Amid the current IPO boom, why are some companies choosing alternative paths to going public—like SPACs and direct listings—rather than traditional IPOs?

David Ludwig: Different listing vehicles solve different company objectives. For example, SPACs can provide companies earlier access to the market, given the ability to include incremental disclosures like projections in the process, as well as potential access to more capital through both the public listing and the private investment in public equity (PIPE) raise. Importantly, SPACs also enable companies to de-risk the IPO process by allowing them to negotiate the acquisition price with the SPAC sponsor as well as the PIPE investors; many companies find this price certainty compelling. On the other hand, a SPAC can be more dilutive than a traditional IPO at a similar valuation once SPAC warrants and the sponsor promote are factored in. Companies also have somewhat less ability to select their shareholder base since a PIPE process is not as broad as IPO marketing.

Direct listings are well suited to the needs of companies who want to achieve maximum market pricing efficiency and equal access for all market participants to buy or sell when they want. The biggest tradeoff in a direct listing is that companies forego the ability to select their shareholder base. And notably, until December 2020, companies weren't able to raise primary capital through a direct listing, which prohibited many companies from considering this option. New rules that the SEC recently approved have since changed this, and we expect more clients to pursue direct listings as a result.

All that said, many aspects of the traditional IPO process still appeal to a broad set of companies. It's a tried-and-true process, and many companies feel that they have more control over the outcome. I expect that the majority of new listings will take place via the traditional IPO route, but I also think that SPACs and direct listings will comprise a materially larger share of public listings over time.

Allison Nathan: There's a market narrative that the traditional IPO process leads to systematic underpricing, and that's one major reason why companies are increasingly looking at alternative ways of going public. Is there a structural flaw in the traditional IPO process?

David Ludwig: I don't think so. There are some great companies that are changing how we live and work, and investors want to own them. Mix in lofty expectations, business models that have not come to market before, scarcity value, and a limited supply of shares—given that most companies float only 10% or less of their company at the time of their IPO, with only a fraction of that actually trading—the possibility of elevated valuations for some period of time becomes more likely.

Companies that pursue traditional IPOs make conscious decisions about their IPO price and their investors. In many cases, they do that based on fundamental valuation work and investor relationships that have been built over many years. But when a small fraction of the IPO—and an even a smaller percentage of the overall company—starts trading the next day, temporary supply-demand dynamics can overwhelm fundamental valuation. In particular, retail buying has significantly impacted the equity and IPO markets in the recent period, and has been a key driver of recent strong IPO outcomes. Some of these companies that experience a large "pop" during initial trading have and will grow into and beyond these valuations over time, while others will normalize as the number of shares available for sale increases, or those lofty expectations and actual company results converge. The goal is for companies to use the listing structure that meets their objectives and creates outcomes that they're ultimately happy with—there isn't a one size fits all answer.

Allison Nathan: How is the traditional IPO process evolving to take advantage of some of the features of alternative listing models?

David Ludwig: Substantial evolution and innovation is occurring around the listing process, and these changes are not just isolated to traditional IPOs. Each model is shifting—and converging in some respects—to include advantageous elements of other models. For example, the direct listing model is changing to include some aspects of the traditional IPO model that companies find compelling, such as controlling supply through lock-ups, and the traditional IPO model is shifting to make it easier to add liquidity into the market within a shorter period of time.

To that end, we and others have created mechanisms to combine the best features of the different listing models. For our part, we recently launched a system called the Transparent Order Platform through which prospective investors submit indications directly, including both quantity and price limits. The technology provides greater transparency around investor demand and valuation in the traditional IPO process, while still allowing companies to curate their shareholder base. The platform was designed for Unity Technologies for their September 2020 IPO, and DoorDash subsequently used it for their December IPO. Both companies still faced what we call a "conscious pop", as they balanced the tradeoff between achieving a fair price and selecting their shareholder base. Every company going public will make different decisions about how to strike this balance based on their individual objectives, but there is no doubt that tools like these are increasingly helping companies meet their goals—and minimizing any friction they encounter in the listing process—and I would expect this type of innovation to continue.

Going public: the basics

How can a company enter the public market? A company can go public in a number of different ways, including: a traditional IPO, a direct listing, or through a Special Purpose Acquisition Company (SPAC).

What is the process behind a traditional IPO? In a traditional IPO, a company hires an investment bank to advise on the IPO and provide underwriting services. The investment bank helps the company establish an initial price range for the offering, and then a roadshow takes place to generate and gauge investor interest in the company and set the IPO price. Once the IPO is priced, the investment bank allocates shares to investors and the stock begins trading in the public market. The traditional IPO allows companies to curate their shareholder base and control the transition of their pre-IPO shareholders to public shareholders.

How does a direct listing differ from that? Historically, in a direct listing, a company would go public through the sale of existing stock owned by employees/investors rather than through the issuance of new shares. Until recently, raising capital via direct listings was not permitted, so a primary goal of companies going public through direct listings was to reap the benefits of being a public company, not raise funds. However, on December 22, 2020, the SEC approved the NYSE's proposal to allow companies to raise capital through a direct listing. Companies may now issue new shares, which will be priced in an opening auction, and the proceeds from the auction will represent the total capital raise. A key distinguishing feature of a direct listing from a traditional IPO is the timing of share pricing—in a direct listing, pricing occurs during the opening auction, whereas in a traditional IPO, pricing is determined beforehand. Other differences typically include the lack of an underwriter and lock-up period, as well as no built-up investor base. As a result, direct listings have historically been employed by companies that were more consumer-facing, with strong brand identities and easy-to-understand business models.

What is a SPAC? A SPAC—also known as a 'blank check company'— is a publicly held investment vehicle created to merge with a company, thereby bringing the company public. A SPAC begins with a sponsor forming a corporation and working with underwriters to list the SPAC on a public exchange. In the IPO, a SPAC sells units consisting of a share and a fractional warrant. The proceeds of a SPAC's IPO are placed in a trust and invested in Treasury notes. The SPAC typically has two years to identify a merger target and complete the merger, otherwise the SPAC liquidates and distributes the funds in the trust back to the public shareholders (see pg. 17 for more details.) Historically, the types of companies that have gone public through a SPAC have tended to be high-growth companies with long-term or more complex stories that wanted a longer marketing period, and/or the ability to issue projections, or those who wanted to raise more proceeds than would have been available to them through a traditional IPO.

What notable companies have recently gone public using each avenue? In December 2020, Airbnb and DoorDash went public through traditional IPOs. Notably, however, both companies used a hybrid auction mechanism for pricing. Under such a mechanism, institutional investors were required to electronically submit the amount of shares they were willing to buy, and the price they were prepared to pay. Meanwhile, Palantir Technologies and Asana went public in September 2020 through direct listings. Before that, only two other notable companies—Spotify and Slack—had ever gone public through direct listings. And Fisker and DraftKings were two of a number of high-profile companies to go public via SPACs in 2020.

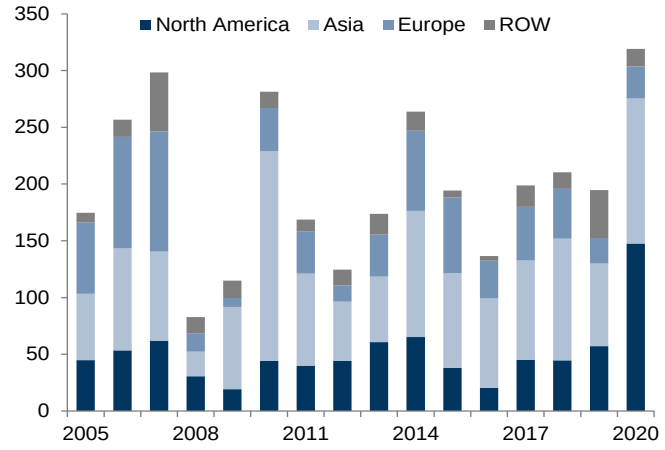
Note: Intended to provide an overview of the different ways for companies to go public rather than an exhaustive explanation of each process.

Source: Klausner, Michael D. and Ohlrogge, Michael, "A Sober Look at SPACs" (October 2020), Corporate Finance Institute, NYSE, SEC, NY Times, WSJ, various news sources, internal interviews, Goldman Sachs Global Investment Research.

IPOs: sizing up the surge

Global IPO proceeds rose to more than $300bn in 2020

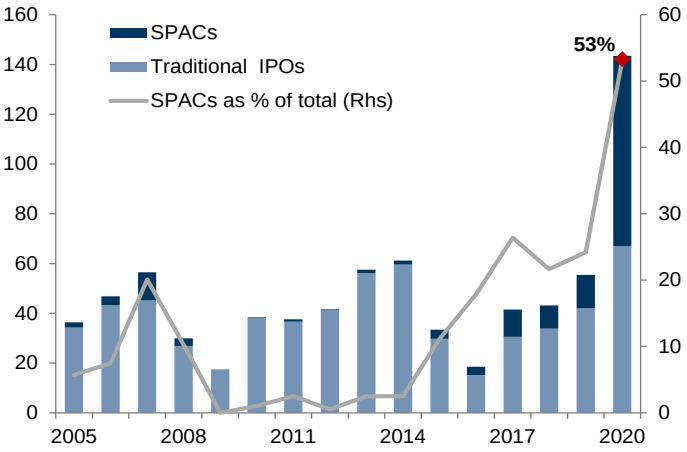
Total deal value of IPOs by region, $bn



Note: Includes proceeds from SPACs.
Source: Dealogic, Goldman Sachs Global Investment Research.

US IPO revenues reached record levels driven by SPACs

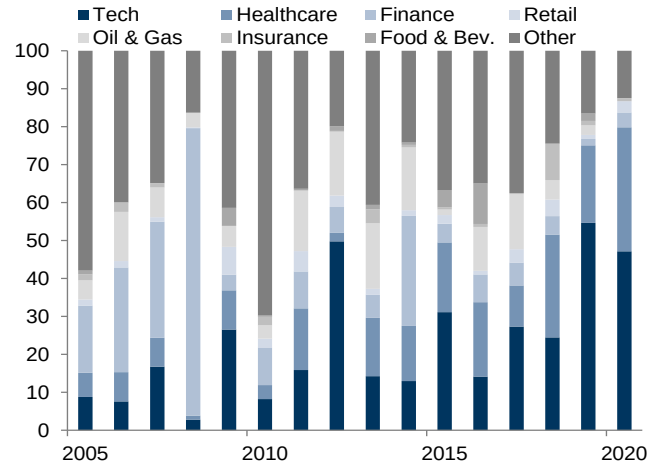
Total US deal value, $bn; SPACs as % of total yearly total (rhs)



Source: Dealogic, Goldman Sachs Global Investment Research.

Tech and healthcare made up ~80% of 2020 US IPOs

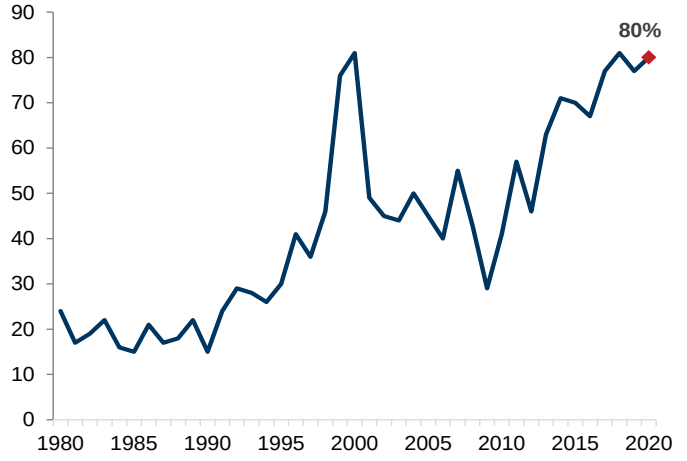
Industry composition of US IPO proceeds by year, % of total



Note: Excludes SPACs; "other" includes all remaining industries with IPOs.
Source: Dealogic, Goldman Sachs Global Investment Research.

Around 80% of US IPOs in 2020 had negative earnings

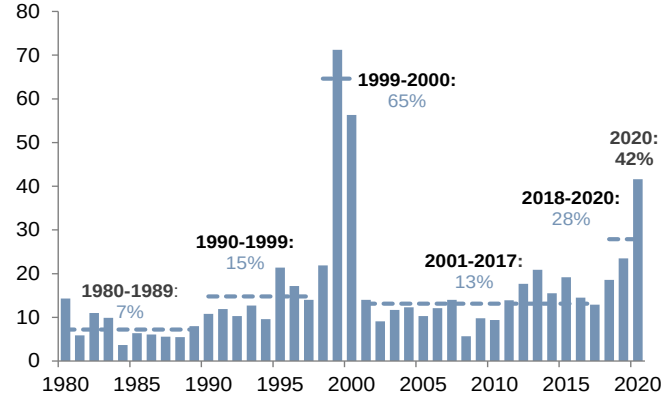
US IPOs with EPS<$0 by year, %



Note: Based on LTM sales prior to going public; excludes SPACs.
Source: Jay Ritter, Warrington College of Business, University of Florida; Goldman Sachs Global Investment Research.

Average US IPOs rose by >40% on first trading day in 2020

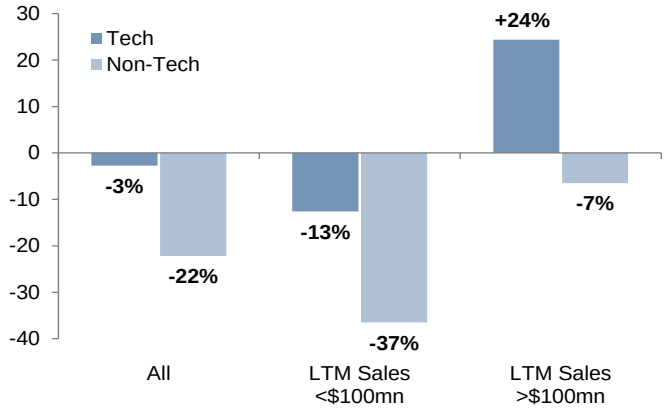
Mean first-day return of US IPOs ("pop") by year, %



Note: Based on equal-weighted mean of all US IPOs with an offer price greater than $5 and excluding SPACs.
Source: Jay Ritter, Warrington College of Business, University of Florida; Goldman Sachs Global Investment Research.

But longer-term outperformance concentrated in large Tech

Avg. 3yr returns for IPOs vs market (1980-2018), %



Note: Based on returns from first day closing price of US IPOs from 1980-2018 excluding the internet bubble (1999-2000) measured against the CRSP-weighted value index.
Source: Jay Ritter, Warrington College of Business, University of Florida; Goldman Sachs Global Investment Research.

Interview with Olympia McNerney

Olympia McNerney leads the US SPAC business at Goldman Sachs. Below, she discusses SPAC mechanics and current market trends.

The interviewee is an employee of the Goldman Sachs Investment Banking Division (IBD), not Goldman Sachs Research, and the views stated herein reflect those of the interviewee, not Goldman Sachs Research.

Allison Nathan: What are SPACs?

Olympia McNerney: In its most basic form, a SPAC—or a Special Purpose Acquisition Company—is a vehicle to take a company public. A SPAC does this through a merger—it first raises cash through an IPO, which is held in a trust, and then looks for a private company to take public with that cash. A SPAC begins with a sponsor forming a corporation and working with underwriters to take the SPAC public. In the process of going public, a SPAC will sell units at a uniform price of $10 consisting of a common share plus a fraction of a warrant. The common share has rights attached to it, including the right to redeem and the right to vote. The right to redeem allows investors to decide whether or not they want to participate in the eventual merger that the SPAC proposes, and if not, they can redeem their share and collect the initial $10 they've put into the deal plus whatever interest has accreted on that. The right to vote allows holders of the share as of the record date to vote on the merger that the SPAC proposes. These rights are transferred with the share.

The warrant allows an investor to purchase some fraction of a common share, with an exercise price set at $11.50 per share. This warrant is a way of compensating investors for parking their money in the SPAC until the merger is executed, which could happen in anywhere from a couple of months to two years—at which point the SPAC must execute the transaction or liquidate the SPAC and return the funds in the trust to the shareholders. Notably, the common share and the warrant can be separated, and some investors who buy a SPAC IPO separate the unit, keeping the warrant and selling the share.

Allison Nathan: What does the lifecycle of a SPAC look like after the IPO?

Olympia McNerney: After the SPAC is listed, the sponsor will meet with any number of target companies to decide which one it could partner with. When a company is found, the sponsor and the company will negotiate the terms of their merger. Once these terms are agreed to, the SPAC sponsor and the company will agree to a letter of intent (LOI) and, in most instances, begin a private investment in public equity (PIPE) raise, which has become an increasingly important element of the SPAC process over the last 18 months.

During this PIPE raise, which can take anywhere from three to six weeks, an additional group of investors provides more capital to the SPAC in exchange for a private placement of the SPAC's public shares. Once the PIPE is raised, an investor subscription agreement and a merger agreement are signed concurrently, and, upon the execution of these documents, the deal will be announced to the market. Then, a two to three-month window ensues before the deal closes, during which time a proxy statement is publicly filed and declared effective by the SEC, the statement is mailed to shareholders, and a vote takes place among the non-redeeming shareholders on the proposed merger. Should shareholders vote in favor of the merger, the deal will typically close and will begin trading publicly as the pro forma operating company.

Allison Nathan: Why has the PIPE raise become an increasingly important feature of the process?

Olympia McNerney: Historically, the PIPE has been a way for the target company to minimize shareholder redemptions and provide it with enough cash to run its business. When a company announces a PIPE with 3rd party investors, it may give validation to the transaction, which in theory should help to minimize redemptions. But in the case that it doesn't, the PIPE can serve to provide cash to a business, allowing the company to retain a minimum threshold of cash that it needs to operate.

Five or ten years ago, redemptions were incredibly high, and, as a result, there was no float vehicle. But redemptions have actually been quite low over the last 12 months as the quality of companies that have gone public via a SPAC has improved and PIPEs have become an integral part of the SPAC merger process. It used to be that the companies going public through a SPAC chose this route because the traditional IPO was closed to them. Today, the narrative has shifted—companies that belong in the public market have multiple options to get there, and a SPAC is one of those options.

All that said, the PIPE raise has been an increasingly important aspect of the process for several reasons. First, it expands the aperture of investors that can participate in the SPAC. Some investors don't participate in SPAC IPOs because they cannot place money in an interest-bearing vehicle for two years, but would still like to participate in the opportunity, and so a PIPE raise can open the door for such investors. Second, the PIPE provides external validation that the target company belongs in the public markets at the value that the SPAC and the company have agreed to. And if that external validation isn't provided, the PIPE gives the sponsor and the company an opportunity to reset the valuation and get it right so that investors are interested. Third, while the need for SPACs to raise additional capital owing to redemptions has diminished on average, as I mentioned, the PIPE still gives the company essentially two bites at the apple in terms of raising capital in contrast with the one bite they would have in a traditional IPO process.

Allison Nathan: What's driven the positive change in the narrative around SPAC IPOs?

Olympia McNerney: Despite the pandemic and related turbulence in the economy, 2020 saw a surge in IPOs and a historically high amount of capital raised. This market openness has allowed companies to be more discerning about the best way to go public—whether through a regular IPO process, new auction platforms, a direct listing, or a SPAC.

Going public through a SPAC won't work for every company, but SPACs have several appealing features. One, SPAC IPOs can potentially raise greater proceeds given the multiple bites of the apple that I discussed. Two, because a SPAC is a merger, companies have the ability to use projections in their conversations with investors, which could be beneficial for those companies trying to tell a high-growth, forward-looking story. Unlike the traditional IPO process, a SPAC allows investors to have multiple meetings with company management and potential access to customers or industry consultants.

Three, SPACs provide more flexibility than traditional IPOs. For example, a SPAC sponsor initially takes a promote—a block of shares—as compensation for the work it does for the SPAC. But sponsors have the flexibility to give any piece of that promote to the company, or build an earn-out that would allow the company to be issued incremental shares from the sponsor's promote if their stock price hits some predetermined level as a way of recouping possible dilution that comes from the presence of the promote. That can be very appealing in a world where some companies are focused on the potential first day "pop" of a traditional IPO, which could arguably be more dilutive than the promote from a SPAC deal. And, four, going public through a SPAC gives companies an opportunity to potentially partner with a sponsor that has credibility, previous public company experience, access to capital, and who could help the company operate and drive synergies in a differentiated manner.

Allison Nathan: So is it generally more or less expensive for companies to go public via a SPAC than through a traditional IPO in your experience?

Olympia McNerney: It's hard to say. On the one hand, a SPAC typically has a 20% promote attached to it. And even with the dilution to the promote that comes from executing a larger transaction—for example, if a $300mn SPAC executes on a $2-$3bn transaction, that 20% promote is diluted down to single digits—it could still be more expensive than a traditional IPO when dilution from the warrants is considered. On the other hand, if SPAC sponsors build in flexibility to their promotes, which allows companies to recoup value, and that is compared with the first day price "pops" that have recently occurred for traditional IPOs, the SPAC may actually look on par or less expensive than the traditional IPO. So the answer to this question really depends on where the company trades and whether it can recoup any significant moves in its share price through some level of earn-out.

Allison Nathan: Are you seeing a difference in the types of industries that are using SPACs to go public as opposed to traditional IPOs?

Olympia McNerney: SPAC trends have really been following broader IPO market trends, with activity concentrated in the TMT and healthcare sectors. One area of differentiation has been in the ESG space—we've seen many SPAC transactions involving mobility and clean energy companies. These are businesses that are either in their earlier stages of growth or require more marketing to sell in terms of explaining the future of the underlying technology. So it's not surprising that such companies are using the SPAC process, which, again, allows them to share growth projections and have that deeper layer of diligence that has been instrumental in allowing these types of companies to go public.

> "The volume, quality and performance of companies that are going public via SPAC has made the product one that investors can no longer ignore."

Allison Nathan: How has the investor base and investor demand for SPACs evolved?

Olympia McNerney: The investor base for SPACs has evolved significantly over the past few years. Historically, SPACs appealed to a very niche group of investors, mostly merger arbitrage and convert arbitrage funds that bought the product because they valued its optionality in terms of the ability to redeem shares and exercise the warrants. Today, the breadth of SPAC investors is much wider, including an array of hedge funds as well as mutual funds. The volume, quality and performance of companies that are going public via SPAC has made the product one that investors can no longer ignore. So many investors who a year ago didn't want to be called for a SPAC PIPE raise, now ask to be called. And for many investors, the fact that a SPAC has redemption rights is quite valuable, because it gives investors a put right.

Demand from this larger investor base is incredibly strong right now. We did see a period of weakness in late October and November last year because there were just too many deals for the market to digest. But the market is now wide open again. 75+ SPAC IPOs priced so far in January, which is an absolute record.

Allison Nathan: Do you expect this strong demand to continue?

Olympia McNerney: Right now, 1Q21 is on track to have the highest issuance of SPAC IPOs on record, and more SPACs are likely to price this year than in 2020. Just as occurred last autumn, there will likely be periods of weakness in SPAC activity. But as long as SPACs can find good deals that make sense in the markets, the product is an option for companies to consider.

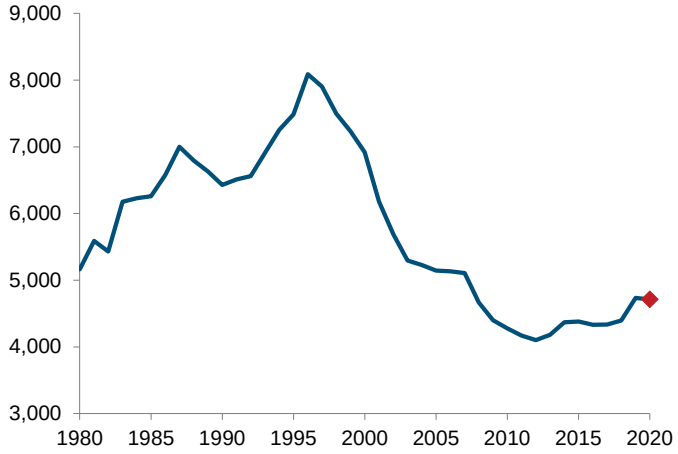
2020: The year of the SPAC

David Kostin and Cormac Conners discuss the recent US IPO boom, why 2020 was the year of the SPAC, and reasons to believe that high SPAC activity can continue in 2021

During the past 25 years, the number of publicly-traded companies in the US has declined from a peak of 8,090 in 1996 to 4,713 today. Several factors contributed to this decline. The passage of the Sarbanes-Oxley Act in 2002 increased reporting and governance standards, making it more burdensome to be a public company. The combination of a secular decline in interest rates and a surge in the availability of venture capital and private equity over the past two decades made accessing private market capital easier, allowing companies to remain private for longer. And the rise of the internet and cloud computing have resulted in many new ventures that are less capital-intensive and have less need to seek a public listing.

The number of US public companies has declined sharply

Number of listed US companies



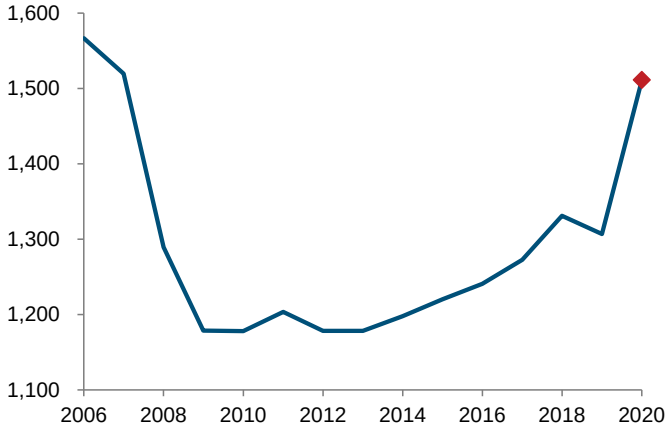
Source: Haver, Goldman Sachs Global Investment Research.

The declining trend in the number of public companies has reversed in recent years, although only modestly. We estimate that the number of publicly listed US companies troughed in 2012 at 4,102 and today is approximately 4,713. More than 1,800 companies have completed IPOs in the US since 2012. In our view, three factors explain this rebound in public companies. First, while many Software and Internet businesses are not particularly capital intensive, they often require relatively highly compensated, high-skilled labor. A public listing allows firms to lessen the cash burden of salaries by utilizing equity-linked compensation in the form of restricted shares and stock options. Second, a publicly traded company also has the flexibility to fund acquisitions using shares as currency, in addition to drawing on cash reserves or using debt financing. And third, an increase in business formations over the past eight years also helps explain the modest rebound in the number of publicly traded companies.

The disruption caused by COVID-19 and the ensuing lockdowns brought to light one key benefit of being publicly listed: access to capital essential to maintaining solvency and liquidity. As the specter of a prolonged battle with COVID-19 shrouded the globe in 1H20, many firms faced the dire predicament of a collapse in cash flow. Companies rushed to raise capital to get them through the pandemic. Publicly traded corporations accessed public debt and equity markets that were generally not available to private businesses. More than $86 billion of follow-on equity issuance occurred during 1H20 while public debt offerings totaled $1.2 trillion during the same period. Cruise lines represent a good case study: they were among the hardest hit industries and yet these businesses survived, largely due to their ability to raise $13.7 billion in various forms of public capital—common shares, convertible preferred, and debt. The much-needed cash allowed companies to avoid bankruptcy and the investors providing the life-saving capital benefitted from the rebound in shares prices from pandemic lows.

US business formations have increased since 2012

High-propensity new business applications by year, thousands



Source: US Census Bureau, Goldman Sachs Global Investment Research.

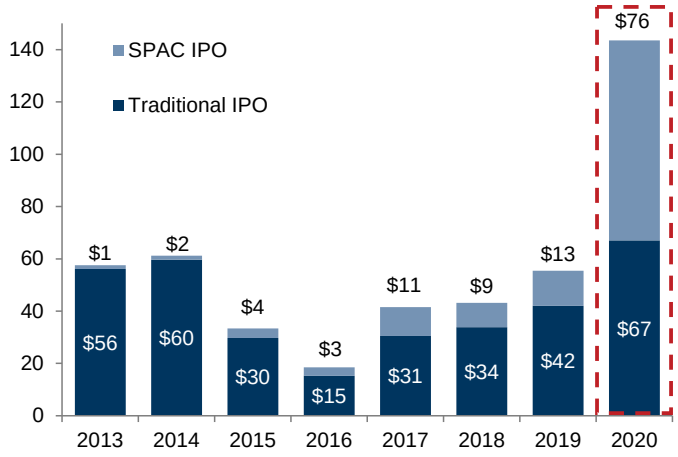
While 2020 was a strong year for traditional IPOs, SPAC IPOs shone even brighter. A Special Purpose Acquisition Company (SPAC) is a "blank check" company formed with the intention of merging with another company. Last year, by our count, 161 traditional IPOs raised $67 billion in capital. During the same period, 229 US SPACs completed IPOs, raising $76 billion—a five-fold increase from the previous year's record high—and accounting for 53% of total IPO capital raised. SPAC acquisition announcements and deal closures also hit record highs in 2020. In 2020, 99 SPACs representing $30 billion in IPO capital announced M&A targets while 55 SPACs closed de-SPAC acquisitions totaling $79 billion in enterprise value.

Three reasons explain why 2020 was the year of the SPAC:

(1) SPAC sponsors shifted their focus from Value to Growth, both in terms of completed acquisitions and new capital raising. Between 2010 and 2019, more than half of SPAC acquisitions were in the Industrials, Financials and Energy sectors while one-third were in Info Tech and Healthcare. In contrast, 60% of the de-SPACs completed in 2020 were in the fast-growing Info Tech, Consumer Discretionary and Healthcare (mostly BioPharma) sectors while just 24% were in Industrials, Financials and Energy. Investors are firmly in a growth mindset and SPAC sponsors targeting purchases in growth industries have had success raising

capital. More than 50% of 2020 SPAC IPOs are seeking mergers in Tech, Consumer Discretionary, or Healthcare.

2020: A strong year for traditional IPOs, stronger for SPACs
IPO capital raised by IPO type, $ billions



Source: Dealogic, Goldman Sachs Global Investment Research.

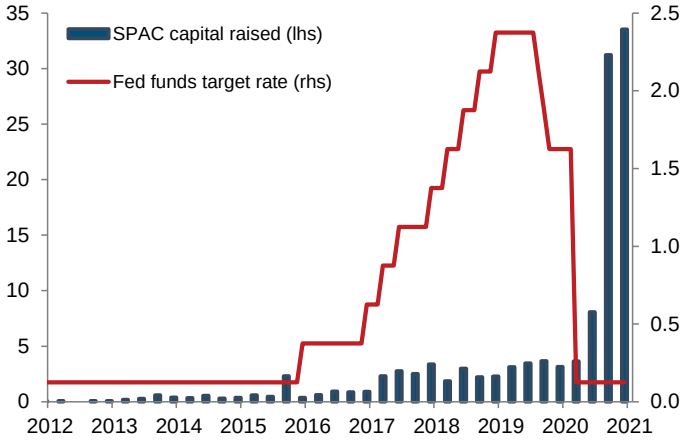
(2) Acceleration in retail trading activity increased investor appetite for non-traditional and early-stage businesses. SPACs offer an alternative route to the public market for firms, including those that are early-stage or in businesses that lack many publicly-traded comparables, such as green tech, sports betting or cannabis. Lockdowns associated with the pandemic have prompted a surge in retail trading and demand for the highly-volatile shares of firms with perceived hyper-growth prospects. Anecdotal evidence of heavy retail trading coincided with the de-SPAC purchases of electric vehicle and sports betting firms (e.g. FSR, DKNG).

(3) SPACs have a low opportunity cost for investors when policy rates are near zero. Cash yields next to nothing and under the Fed's average inflation targeting (AIT) regime, a hike in the fed funds rate is unlikely during the next three years. Our economists forecast the Fed will be on hold until 2024. Investors in a SPAC receive a de minimis yield while waiting for the sponsor to identify a potential target and then have a put option to redeem their shares if they do not like the potential acquisition. Of course, there is the opportunity cost of not owning equities given the 18% return of the S&P 500 during 2020 and our forecast of a roughly 16% return this year. SPACs can be a cash substitute when fed funds are at the lower bound. The focus on growth industries also means that SPACs are long duration assets that benefit from low long-term interest rates.

We expect a high level of SPAC activity will continue in 2021. In fact, 56 SPACs have completed $16 billion in IPOs during the first three weeks of 2021 alone. Simply put, the state of play outlined above is likely to remain in place. Additionally, the most recent wave of issuance has broadened the universe of SPAC sponsors and lent institutional credibility to the SPAC process.

However, weak returns represent one headwind to future SPAC issuance. Of the de-SPACs completed in 2020, the post-acquisition median 1-month, 3-month, and 6-month excess returns relative to the S&P 500 index have been -13 pp, -6 pp and -27 pp, respectively. The samples are small and the range of outcomes is wide. The highest and lowest 6-month relative return vs. the S&P 500 following deal closing was +135 pp and -108 pp, respectively. Returns are also volatile around acquisition completion as the standard deviation of 1-month excess return is 40 pp. If weak returns persist, investor appetite for new SPACs may wane. A distribution with poor median returns and a long right tail is consistent with the SPAC return profile we discussed in July and in our 2019 report *What Matters for IPOs* that analyzed all 4,481 IPOs completed in the US during the last 25 years.

SPACs can be a cash substitute when policy rates are low
$ billions (lhs), % (rhs)



Source: Dealogic, FRB, Goldman Sachs Global Investment Research.

Most SPAC acquisitions completed during 2020 have utilized supplemental equity financings through private investments in public equity (PIPEs) or private placements. Our review of company filings for 36 2020 de-SPACs found that 30 of them completed during 2020 raised PIPEs or private placements totaling $8.4 billion concurrent with the deal closure. These 30 SPACs had original IPO proceeds totaling $9.7 billion. The use of PIPEs or private placements allowed SPAC sponsors to raise $8.4 billion, nearly doubling their cash buying power before issuing any debt. The ability of a SPAC at the time of deal closing to raise additional capital through a PIPE or private placement to prominent mutual funds and hedge funds sends an important signal to outside investors and validates the transaction. In contrast, the six SPACs without PIPEs or private placements underperformed in 2020.

We estimate that $82 billion in equity IPO proceeds raised by 265 SPACs are currently searching for acquisition targets. Based on their two-year post-IPO expiration dates, these SPACs will need to acquire a target in 2021 or 2022 nearly equal to the total enterprise value of SPAC deal closures during the last decade. If this year's 5x ratio of SPAC equity capital to target M&A enterprise value persists, the aggregate enterprise value of these future takeover targets would be $410 billion.

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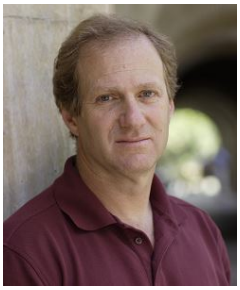
Interview with Michael Klausner

Michael Klausner is Nancy and Charles Munger Professor of Business and Professor of Law at Stanford Law School. Below, he argues that the shareholder dilution inherent in the structure of SPACs has made them a bad deal for post-merger investors, and questions whether the current enthusiasm around SPAC mergers is sustainable.

The views stated herein are those of the interviewee and do not necessarily reflect those of Goldman Sachs.



Allison Nathan: You have recently called the SPAC market a bubble that's likely to burst. Why?

Michael Klausner: In my research with Michael Ohlrogge and Emily Ruan on Special Purpose Acquisition Companies (SPACs) that merged in 2019 and 1H20—47 in total—we found that when a SPAC begins a merger, there's a big hole to fill in terms of the SPAC's cash holdings. Although SPACs issue shares at a uniform price of $10, the median SPAC holds cash of only $6.67 per share when it merges with the target company. And our work shows that the post-merger performance of a SPAC is closely correlated with the size of that cash shortfall. So there's a dilution hole, and the underperformance of SPACs post-merger directly reflects that hole. With only a couple of exceptions, the structure of SPACs and the terms of SPAC mergers have not changed since we completed our study, and yet SPAC creation is now skyrocketing, SPAC share prices are jumping on mere rumors of a deal, and huge price "pops" are occurring on some deal announcements. This shift in behavior doesn't seem based on fundamentals. That's why I think SPACs may well be in a bubble.

Allison Nathan: What is it about the structure of a SPAC that creates that hole?

Michael Klausner: The hole results from four sources of dilution. One, the SPAC sponsor initially takes 20% of post-IPO equity for a nominal price as its promote. That's sometimes negotiated down during the merger, but for the SPACs we studied, not all that much. Two, the SPAC issues a fractional warrant—varying from a quarter to full for the SPACs we studied—to IPO investors for free as an inducement to get the SPAC up and running. Three, underwriters are paid a fee to sell shares that are going to be redeemed on average. And four, SPAC IPO investors have the right to redeem their shares upon the announcement of a merger. When shares are redeemed, the SPAC has to return cash to the redeeming shareholders, leaving empty shares still sitting in the SPAC. Each of these four features of a SPAC creates a situation where there is equity with no cash behind it, and that's what creates the hole.

Allison Nathan: Does the extent of dilution vary?

Michael Klausner: Yes. Although the median SPAC has cash of only $6.67 per share, there is variation between SPACs. That variation depends on the extent to which the sponsor gives back some of its promote, the size of the fractional warrant, and the amount of redemptions. Variability in redemptions is probably the largest source of variability in total dilution. For the SPACs that we studied, the median level of redemptions was 73%, but the variation was huge, ranging from zero to upwards of 95%.

Allison Nathan: Does this dilution make going public through a SPAC costlier than going public through a traditional IPO?

Michael Klausner: In one sense yes, but in another sense, not necessarily. The transaction costs of a SPAC, including the items I've described—the promote, the warrants, the underwriting fee—as well as the initial costs to set up the SPAC, are far higher than the costs of a traditional IPO. Some people might consider the underpricing of a company's initial offer price in a traditional IPO, or the first day "pop," as a cost as well. But even if you factored that in, the total transaction costs of a SPAC were much higher than the transaction costs of a traditional IPO. So, from the perspective of total costs, yes, SPACs are far more expensive.

We found, however, that in general the company going public by merging with a SPAC doesn't bear these costs—the SPAC shareholders at the time of the merger do. That's because SPAC merger targets tend to negotiate mergers with SPACs based on the cash they expect to receive—so the $6.67 per share—rather than the $10 per share for which the SPAC shares are initially sold and at which they are valued at the time of the merger. This means that the cost of dilution is left with the SPAC shareholders. We find a very close correlation between a SPAC's cash per share and post-merger share prices. So, for now, you could say that a company that merges with a SPAC often goes public more cheaply than it would through a traditional IPO. But that will last only as long as the SPAC shareholders are willing to bear those costs.

Allison Nathan: So what does that mean for shareholder returns?

Michael Klausner: It all depends on which shareholders you're referring to. There are essentially two non-overlapping sets of shareholders in a SPAC. First, there are the IPO shareholders that hold their shares for some period of time until a merger is announced. Those shareholders either redeem their shares at the time of the merger, or they sell their shares for at least the merger price. Either way, they get the warrants for free, and as a result, they do very well. We found that the mean annualized return for these shareholders in the period we studied was 11.6% with no risk to their principal. On the other hand, the shareholders that hold shares at the time of the merger do very poorly. For our cohort of SPACs, the median three-, six-, and twelve-month post-merger returns were -14.5%, -23.8%, and -65.3%, respectively, as of October 2020. And median returns in excess of the Russell 2000 and the Renaissance Capital IPO index were even lower.

Allison Nathan: But wouldn't you expect these post-merger returns to improve given the recent bullish price action around SPACs?

Michael Klausner: Possibly. As long as the market enthusiasm continues, then shareholders should do better—based on the logic of a bubble. But it's hard to believe that this enthusiasm will last, because, as I mentioned, nothing about the SPAC structure has changed. That said, the recent price "pops" on merger announcements have the fundamental effect of reducing redemptions, and, in turn, dilution. So even if these pops are caused by irrational exuberance, the result is fewer redemptions, less dilution, smaller holes, and, ultimately, better returns. Now, will returns be positive in the longer run? We'll see. I doubt it, because dilution is still sizable. But the recent experience of lower redemptions suggests that dilution holes today are smaller than they were during the period we studied.

Allison Nathan: Some of the recent enthusiasm about SPACs seems to relate to an improving quality of SPAC sponsors. So could we just be seeing evolution rather than irrational exuberance playing out in this market?

Michael Klausner: Possibly. When we separated out high-quality sponsors—defined as private equity funds with $1bn+ in assets under management or a Fortune 500 senior officer—in our study, we found that they had lower dilution and higher post-merger returns. But they still had dilution holes, and their post-merger returns weren't great; their median three-, six-, and twelve-month post-merger returns were -4.6%, -15.9%, and -34.6%, respectively, as of October 2020. A few, of course, did very well. And the market exuberance since October has presumably increased those returns.

That said, at least historically, sponsors haven't been that influential in the post-merger companies—typically just sitting on the company board and providing some input, but not in the way that a private equity firm controls a portfolio company. Going forward, if skilled sponsors are increasingly committed to staying engaged in the company, they may be able to create enough surplus value in the deal to fill even more of the hole created by dilution, and ultimately help generate positive returns. So if we saw something approaching that model, I could start to believe that SPACs may not be so bad. But we haven't seen that yet. And more importantly, I think the benefits of a SPAC, including sponsor engagement, can be achieved without the costly SPAC structure.

Allison Nathan: Why haven't investors demanded different SPAC structures, like that of the Pershing Square Tontine Holdings (PSTH) SPAC—which went public last July with no sponsor promote and smaller fractional warrants?

Michael Klausner: That goes back to the fact that there are two sets of non-overlapping investors. The investors buying into the SPAC at the IPO—primarily a group of hedge funds who have been doing this for a long time known as the "SPAC mafia"—want a lot of warrants because that's how they get their high returns. PSTH offered far fewer warrants than other SPACs offer, and so it likely had fewer of those types of investors, and more fundamental investors. So if a SPAC is going that route, it has to attract a different type of investor that is more focused on the fundamentals of the merger.

Market demand for a better structure would have to begin with traditionally structured SPACs failing to merge in large numbers. This would happen when the second set of investors—those that buy shares and hold them through the merger—are no longer interested. At that point, mergers would fail and SPACs would have to liquidate. That scenario would create demand for new structures.

Allison Nathan: Are there regulatory differences for a company going public via a merger with a SPAC vs. going the traditional IPO route, and if so, do they matter?

Michael Klausner: Yes, a SPAC is regulated under merger rules, while a traditional IPO is regulated under public offering rules. This results in two differences. First, in a merger, there's a legal safe harbor that protects companies from lawsuits for alleged misstatements in projections. No such safe harbor exists for IPOs. As a result, SPAC mergers essentially always provide the market with projections and other forward-looking statements, while IPOs never do. Second, underwriters have liability under Section 11 of the Securities Act in an IPO for a misstatement, but they don't have that risk in a SPAC merger.

Do either of these differences matter? With respect to projections, it could very well be that projections are terrific for conveying information about the value of the company and that they should be permissible in an IPO. But it could also be that the projections are part of the story that's leading SPAC shareholders to stay with deals that aren't good for them. We just don't know. And with respect to the underwriter's liability, would underwriters police projections more closely if they faced liability for misstatements as is the case in an IPO process? It's unclear. But one thing that does seem clear is that these are simply two ways of going public—a SPAC and an IPO—and there's no reason for them to be treated differently. The regulatory differences between SPACs and traditional IPOs should be evened up one way or the other. If I had to choose without more research, I would subject SPACs to IPO rules.

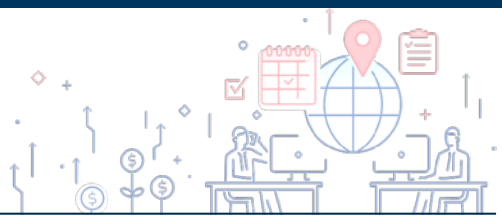
Allison Nathan: More broadly, how should the SPAC market evolve from here?

Michael Klausner: When thinking about SPACs, I've always started with a simple question: why would you set up a structure that collects cash, looks for a company to take public, and then allows the people who invested the cash to exit, and new ones to come in? It's a truly bizarre structure, and I've never heard a good answer to my question.

That said, some aspects of a SPAC—like the role of the sponsor and/or the PIPE—are arguably useful. So, we should keep those aspects. But first find the company that you want to bring public, have the sponsor organize the PIPE investors, and then find an underwriter to do an IPO with those components. That way, everyone now involved in a SPAC can stay involved, but without an expensive structure in which you're paying IPO investors an 11% return to park their cash for a little while. Short of that, then structures like PSTH's, with properly aligned incentives and less dilution, would be a more sustainable model. Without substantial evolution in their terms, I expect SPACs will eventually die out, or at least become much rarer once again.

SPACs: a guide in 10 steps

Special Purpose Acquisition Companies



1 A sponsor decides to launch a SPAC

2 A holding company is created and investor roadshow completed

3 The sponsor covers the SPAC's operating costs and acquires a block of shares typically amounting to 20% of post-IPO equity (the "promote")*

4 The SPAC is listed on an exchange and units costing $10 and consisting of a common share and a fractional warrant are sold to investors**. The proceeds raised from the SPAC IPO are held in a trust account and invested in Treasury notes

5 The units of the SPAC trade on the open market; the common shares and warrants are often separated and traded independently

6 The SPAC sponsor looks for a target company to merge with, and either completes a merger within two years or returns the funds raised to investors and liquidates the SPAC

7 If a target company is identified, terms of a merger are negotiated and a letter of intent (LOI) is signed; additional capital is often raised to fund the transaction through a private investment in public equity (PIPE) raise

8 The shareholders in the SPAC vote on the proposed merger ("de-SPAC" process); if the merger is not approved, the sponsor can continue to look for a target

9 If shareholders approve, the merger is executed; shareholders can choose to keep their shares, redeem them and receive their initial investment back plus interest, or sell them in the market

10 The SPAC merges with the target company and begins trading under a new ticker

*Some recent SPACs have included smaller promotes or seen the sponsor receive warrants rather than a percentage of the common shares. Some SPACs also build an earn-out into the promote to allow the target company to recoup shares if their stock price falls to a predetermined level.

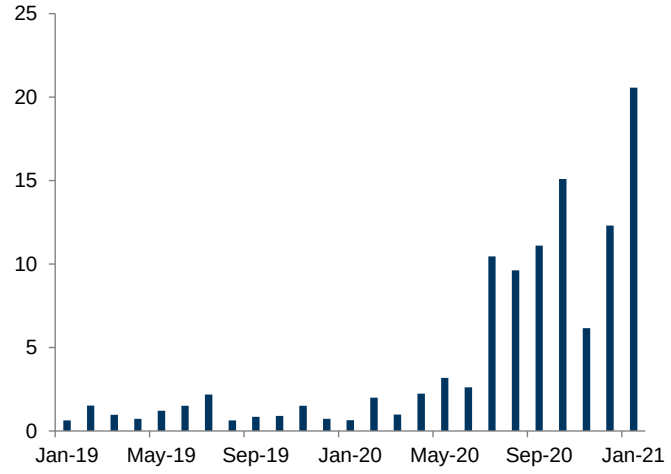
**Each whole warrant entitles the investor to purchase one common share.

Source: CBInsights, Harvard Law School Forum on Corporate Governance, various news sources, Goldman Sachs Global Investment Research.

SPACs: sizing up the surge

SPACs raised $76bn in 2020, and already >$20bn in 2021

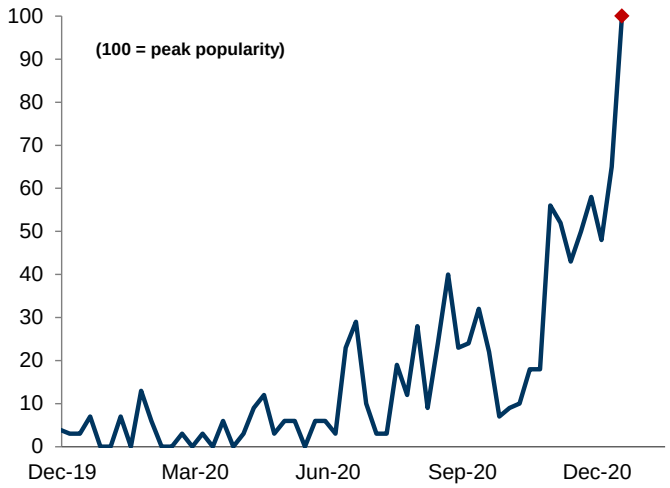
US SPAC IPOs by month, $bn



Note: Data as of January 27, 2021.
Source: Dealogic, Goldman Sachs Global Investment Research.

Popular interest in SPACs has surged to record highs

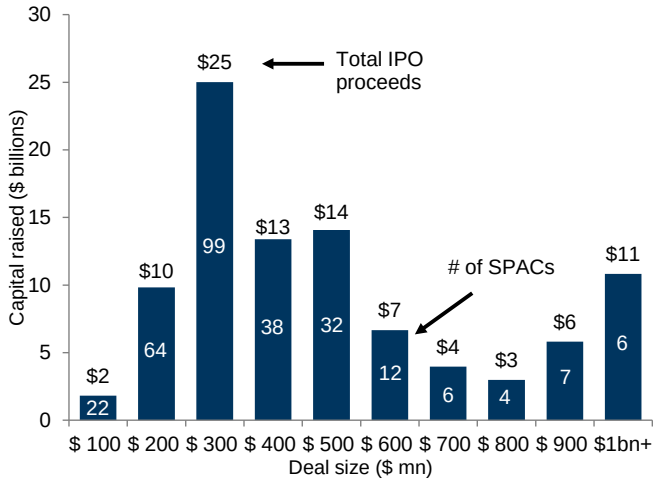
Google search trends for "What's a SPAC?", index



Note: Covers search data for the US.
Source: Google Trends, Goldman Sachs Global Investment Research.

A majority of SPAC IPOs have been <$500mn

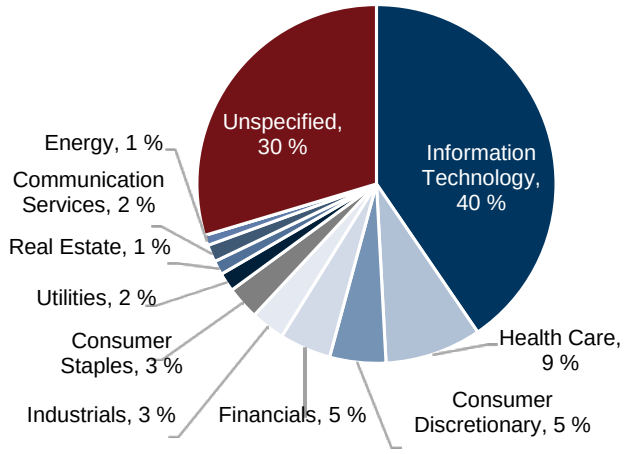
Total US SPAC IPO proceeds and # of SPACs by deal size, $



Note: Includes US SPAC IPOs from start of 2020 through January 22, 2021.
Source: Dealogic, Goldman Sachs Global Investment Research.

SPAC targets have been concentrated in Tech

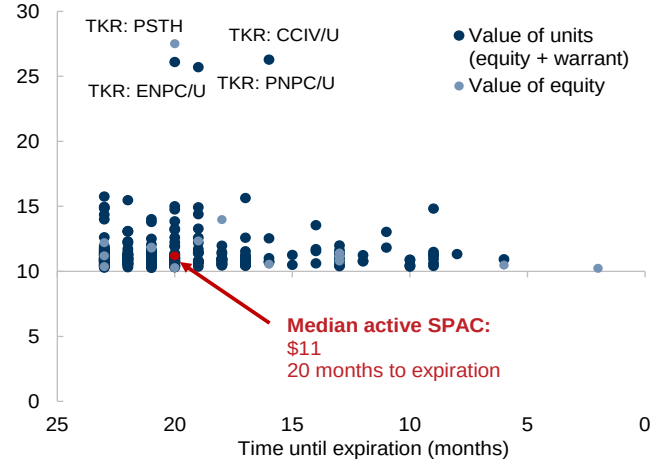
2020 US SPAC IPO targets by industry, % total funds raised



Note: Includes US SPAC IPOs in 2020.
Source: Dealogic, Goldman Sachs Global Investment Research.

The median pre-merger SPAC trades around $11

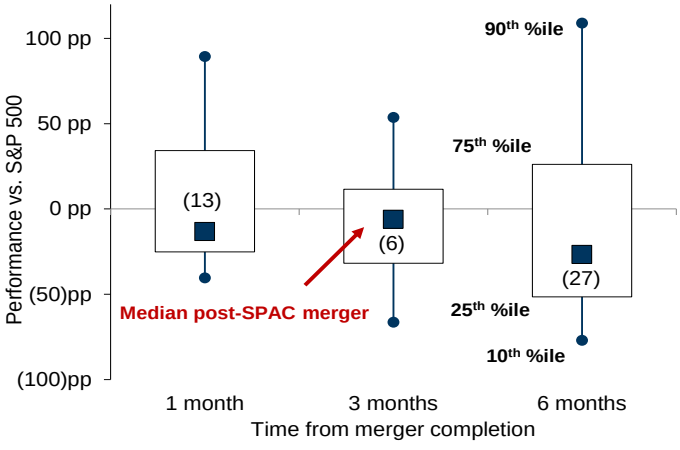
Price of active SPAC units and equity, $; months until expiration



Note: Based on currently active US SPACs as of Jan, 26 2021; equity values cited for SPACs with equity and warrants trading separately.
Source: Dealogic, Bloomberg, Goldman Sachs Global Investment Research.

Median post-merger SPAC returns have lagged the market

Post-merger SPAC performance vs. the S&P 500, pp



Note: Based on US SPAC returns from deal completion of mergers since the start of 2000 until January 22, 2021.
Source: Dealogic, FactSet, Goldman Sachs Global Investment Research.

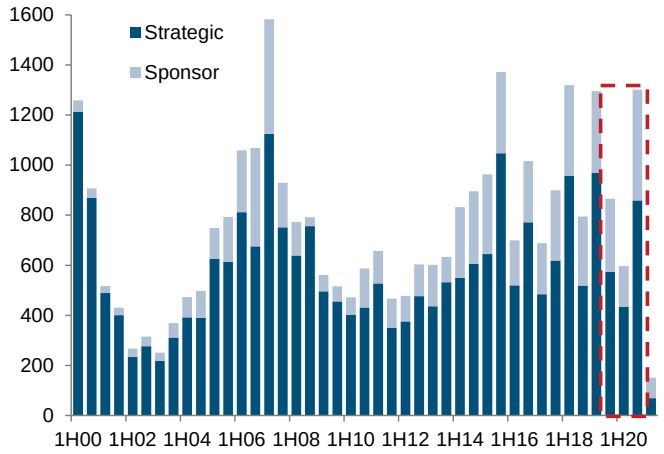
The M&A recovery carries on

Amanda Lynam discusses the recent recovery in M&A volumes, whether it can continue, and the risks to corporate credit quality

2020 was a tale of two halves for announced M&A volumes. Activity in 1H20 was the weakest[1] since 2012, as companies instead focused on shoring up liquidity[2] via the debt market. But firms began signaling a renewed focus on inorganic growth in June, sparking a V-shaped recovery[3] in announced M&A activity that continued through year-end 2020. Indeed, North American and European acquirers announced a combined lofty[4] $260 billion of acquisitions in December 2020—typically a seasonally slow period. Activity in a range of sectors contributed to these high 2H20 volumes, including Technology, Healthcare, Telecom, Financials, and Energy, among others. This M&A surge has so far continued in 2021; more than $150 billion of deals have already been announced, with strategic buyers representing just under half (46%) of the activity.

The V-shaped recovery in M&A has continued

Announced M&A by deal type, for North American and European acquirers, for deals valued at $1bn+ at announcement, $ billions



Note: 1H21 data is as of January 25, 2021.
Source: Dealogic, Goldman Sachs Global Investment Research.

Continued strength in 2021

We expect[5] M&A volumes to remain elevated in 2021 for both strategic and sponsor-related buyers. On the strategic side, the COVID-19 disruption has accelerated management efforts to achieve business diversification (by customer, product, and geography), and we expect firms across a range of industries will use inorganic growth to achieve the desired shifts in their business mix. Indeed, a recent review of capital management commentary from some of the largest IG corporate issuers[6] showed a strong appetite for M&A, with firms in the Food & Beverage/Tobacco, Technology, Energy, Healthcare, Industrials, Insurance, and Aerospace & Defense sectors, among others, noting inorganic growth as a key capital management priority. The largest HY borrowers[7], on the other hand, are still signaling a more defensive approach to capital management, likely reflective of their relatively thinner financial cushions.

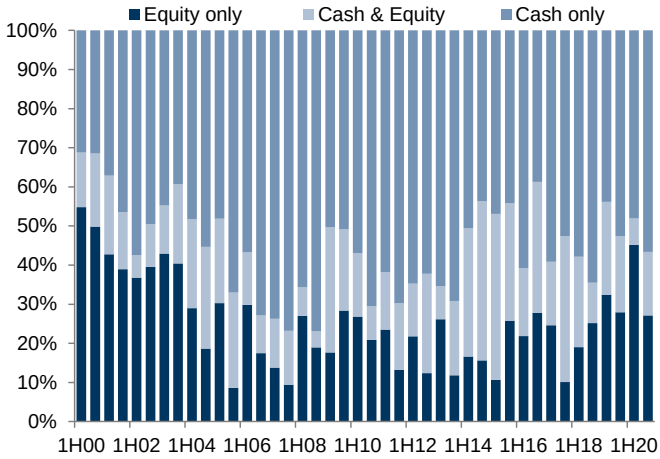
On the sponsor side, dry powder in the private equity universe has reached a record high of ~$1.5 trillion. While rich valuations may present an obstacle to take-private/LBO activity in some sectors, they could nonetheless set the stage for a potential increase in sponsor activity. Additionally, 2H20 saw a large increase in M&A involving Special Purpose Acquisition Companies (SPACs)—or "blank check" companies—which are sometimes backed by private equity sponsors, and this type of activity has remained elevated in 2021.

M&A risks to credit quality

We see[8] a premature return of active re-leveraging as a key risk for corporate credit investors this year. The implications to corporate credit quality from an elevated M&A backdrop will ultimately depend on how such activity is financed. In the context of the post-crisis period, the recent pattern in financing has been fairly neutral for bondholders, but unsurprisingly became more favorable in 1H20 relative to the prior several months. Forty-five percent of the deals announced in 1H20 were funded entirely with equity—the highest all-equity share since 2H00 (50%). However, as M&A activity rebounded in 2H20, the funding mix normalized; 27% of the deals announced in 2H20 were funded entirely with equity, and 57% were funded entirely with cash, vs. an average of 22% and 56%, respectively, since 2010. Should this funding mix shift more significantly towards cash as more M&A deals are announced in 2021, this would likely have negative implications for balance sheet fundamentals, ratings, and potentially risk sentiment.

1H20 funding mix was favorable, but normalized in 2H20

Funding mix for announced M&A, for North American and European acquirers, for deals valued at $1bn+ at announcement



Source: Dealogic, Goldman Sachs Global Investment Research.

Amanda Lynam, Senior Credit Strategist

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Tel: 212-902-9238

[1] See "Defaults: Zooming in on the nuances", Global Credit Trader, 23 July 2020.
[2] See "How IG corporates are planning to spend $1 trillion of new debt", Credit Notes, 27 May 2020.
[3] See "M&A: A V-shaped but friendly recovery", Global Credit Trader, 15 October 2020.
[4] See "New virus strain vs. new policy support", Global Credit Trader, 7 January 2021.
[5] See "Why the M&A rebound is likely to continue in 2021", Global Markets Daily, 8 December 2020.
[6] See "IG capital management: Corporates stay on offense, after playing defense in early 2020", Credit Notes, 8 January 2021.
[7] See "HY capital management: Still on defense", Credit Notes, 14 January 2021.
[8] See "Same direction, different magnitude", 2021 Global Credit Outlook, 18 November 2020.

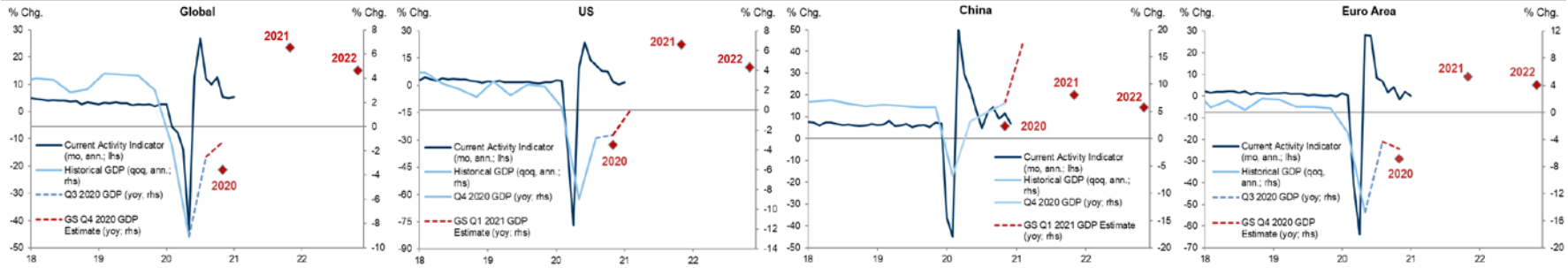
GS GIR: Macro at a glance

Watching

- **Globally,** we expect above-consensus global growth of 6.5% in 2021. Our optimism reflects the view that widespread immunization, accommodative monetary and fiscal policy, and limited scarring effects will support a continued recovery in economic activity, though the still-elevated number of new cases and emergence of new, more infectious strains is likely to trigger a period of softer growth this winter.
- **In the US,** we expect above-consensus full-year growth of 6.6% in 2021 on the back of further fiscal stimulus and widespread immunization—with 50% of the population expected to be vaccinated by May. We expect the unemployment rate to fall to 4.5% and core PCE inflation to rise to 1.8% by year-end 2021.
- **The Fed** has adopted flexible average inflation targeting and outcome-based forward guidance, which we view as consistent with our expectation of liftoff in 2H24. The Fed has also adopted outcome-based forward guidance for asset purchases, and we expect tapering to begin in 2022. On the fiscal policy front, we expect the passage of an additional $1.1tn in support between mid-February and mid-March.
- **In the Euro area,** we expect a 0.1% qoq non ann. decline in real GDP in 1Q21 as countries continue to contend with virus spread and a slow start to vaccinations, but see a sharp pickup to 2.7% qoq non ann. growth in Q2 on the back of a likely reduction in virus restrictions and widespread vaccination. We expect above-consensus full-year growth of 5.2% in 2021.
- **We expect the ECB** will keep rates on hold until 2H25 given a subdued inflation outlook. We also expect the ECB to adopt a symmetric 2% inflation aim but include "soft" elements of Average Inflation Targeting (AIT) by placing some emphasis on persistent inflation misses when the strategy review concludes in September. On the fiscal side, we expect the EUR 750bn Recovery Fund, which will provide fiscal support to the countries most affected by the virus, to be ratified by parliaments in coming months.
- **In China,** we expect 2021 real GDP growth of 8.0% yoy—just below consensus—based on our belief that a policy mix of smaller government fiscal deficits, slower credit growth, and relatively tight housing policies should limit the pace of growth.
- **WATCH CORONAVIRUS.** While the trajectory of the coronavirus remains highly uncertain, our base case assumes that the path of new infections and fatalities will not prevent a continued recovery in global economic activity in 2021. With the recent vaccine approvals and the start of vaccinations, we expect a majority of the population in most DMs to receive their first vaccine dose by midyear.

Goldman Sachs Global Investment Research.

Growth



Source: Haver Analytics and Goldman Sachs Global Investment Research.
Note: GS CAI is a measure of current growth. We have recently revised our methodology for calculating this measure. For more information on the methodology of the CAI please see "Lessons Learned: Re-engineering Our CAIs in Light of the Pandemic Recession," Global Economics Analyst, Sep. 29, 2020.

Forecasts

Economics					Markets								Equities							
GDP growth (%)	2021		2022		Interest rates 10Yr (%)	Last	E2021	E2022	FX	Last	3m	12m	S&P 500	E2021		E2022		Returns (%)	12m	YTD	E2021 P/E
	GS	Cons.	GS	Cons.										GS	Cons.	GS	Cons.				
Global	6.5	5.2	4.6	3.9	US	1.04	1.50	1.85	EUR/$	1.21	1.25	1.28	Price	4,300	--	4,600	--	S&P500	15.0	0.0	22.6x
US	6.6	4.1	4.3	3.5	Germany	-0.58	-0.30	-0.05	GBP/$	1.37	1.42	1.45	EPS	$178	$170	$196	$197	MXAPJ	7.0	7.0	17.9x
China	8.0	8.4	5.7	5.5	Japan	0.04	0.10	0.20	$/JPY	104	103	100	Growth	31%	21%	10%	16%	Topix	4.0	3.0	24.7x
Euro area	5.2	4.3	4.0	3.9	UK	0.26	0.65	0.80	$/CNY	6.47	6.40	6.20						STOXX 600	7.0	1.0	17.5x
Policy rates (%)	**2021**		**2022**		**Commodities**	**Last**	**3m**	**12m**	**Credit (bp)**	**Last**	**2Q21**	**E2021**	**Consumer**	**E2021**		**E2022**		**Wage Tracker 2020 (%)**			
	GS	Mkt.	GS	Mkt.										CPI (%, yoy)	Unemp. Rate	CPI (%, yoy)	Unemp. Rate	Q1	Q2	Q3	Q4
US	0.13	0.11	0.13	0.13	Crude Oil, Brent ($/bbl)	56	60	65	USD IG	98	92	88	US	2.0	4.5	1.9	4.2	3.6	5.9	4.9	--
Euro area	-0.50	-0.54	-0.50	-0.55	Nat Gas ($/mmBtu)	2.8	3.25	2.75	HY	362	330	320	Euro area	0.9	10.3	1.2	9.1	1.7	--	--	--
China	2.25	1.79	2.25	2.00	Copper ($/mt)	7,821	8,500	10,000	EUR IG	102	90	85	China	1.1	--	0.6	--	-2.0	-0.6	3.0	--
Japan	-0.10	-0.07	-0.10	-0.10	Gold ($/troy oz)	1,843	2,300	2,300	HY	346	320	305									

Source: Bloomberg, Goldman Sachs Global Investment Research. For important disclosures, see the Disclosure Appendix or go to www.gs.com/research/hedge.html.

Market pricing as of January 27, 2021.

Glossary of GS proprietary indices

Current Activity Indicator (CAI)

GS CAIs measure the growth signal in a broad range of weekly and monthly indicators, offering an alternative to Gross Domestic Product (GDP). GDP is an imperfect guide to current activity: In most countries, it is only available quarterly and is released with a substantial delay, and its initial estimates are often heavily revised. GDP also ignores important measures of real activity, such as employment and the purchasing managers' indexes (PMIs). All of these problems reduce the effectiveness of GDP for investment and policy decisions. Our CAIs aim to address GDP's shortcomings and provide a timelier read on the pace of growth.

For more, see our CAI page and Global Economics Analyst: Trackin' All Over the World – Our New Global CAI, 25 February 2017.

Dynamic Equilibrium Exchange Rates (DEER)

The GSDEER framework establishes an equilibrium (or "fair") value of the real exchange rate based on relative productivity and terms-of-trade differentials.

For more, see our GSDEER page, Global Economics Paper No. 227: Finding Fair Value in EM FX, 26 January 2016, and Global Markets Analyst: A Look at Valuation Across G10 FX, 29 June 2017.

Financial Conditions Index (FCI)

GS FCIs gauge the "looseness" or "tightness" of financial conditions across the world's major economies, incorporating variables that directly affect spending on domestically produced goods and services. FCIs can provide valuable information about the economic growth outlook and the direct and indirect effects of monetary policy on real economic activity.

FCIs for the G10 economies are calculated as a weighted average of a policy rate, a long-term risk-free bond yield, a corporate credit spread, an equity price variable, and a trade-weighted exchange rate; the Euro area FCI also includes a sovereign credit spread. The weights mirror the effects of the financial variables on real GDP growth in our models over a one-year horizon. FCIs for emerging markets are calculated as a weighted average of a short-term interest rate, a long-term swap rate, a CDS spread, an equity price variable, a trade-weighted exchange rate, and—in economies with large foreign-currency-denominated debt stocks—a debt-weighted exchange rate index.

For more, see our FCI page, Global Economics Analyst: Our New G10 Financial Conditions Indices, 20 April 2017, and Global Economics Analyst: Tracking EM Financial Conditions – Our New FCIs, 6 October 2017.

Goldman Sachs Analyst Index (GSAI)

The US GSAI is based on a monthly survey of GS equity analysts to obtain their assessments of business conditions in the industries they follow. The results provide timely "bottom-up" information about US economic activity to supplement and cross-check our analysis of "top-down" data. Based on analysts' responses, we create a diffusion index for economic activity comparable to the ISM's indexes for activity in the manufacturing and nonmanufacturing sectors.

Macro-Data Assessment Platform (MAP)

GS MAP scores facilitate rapid interpretation of new data releases for economic indicators worldwide. MAP summarizes the importance of a specific data release (i.e., its historical correlation with GDP) and the degree of surprise relative to the consensus forecast. The sign on the degree of surprise characterizes underperformance with a negative number and outperformance with a positive number. Each of these two components is ranked on a scale from 0 to 5, with the MAP score being the product of the two, i.e., from -25 to +25. For example, a MAP score of +20 (5;+4) would indicate that the data has a very high correlation to GDP (5) and that it came out well above consensus expectations (+4), for a total MAP value of +20.

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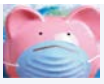

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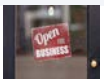

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