Note: The following is a redacted version of the original report published February 25, 2020 [23 pgs].

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TOP of MIND

THE SHORT AND LONG OF RECENT VOLATILITY

The volatile start to 2021—with some heavily-shorted stocks unexpectedly skyrocketing in late January—seemed to have subsided. But with some of these stocks again on the rise, we ask what factors caused this volatility, how likely it is to repeat, what could prevent this, and what it signals about or for markets. We turn to former SEC Chair Arthur Levitt, Wellington's Owen Lamont, GS' co-head of Global Prime Services, Kevin Kelly, and GS GIR strategists for answers. We conclude that many factors led to the volatility, with a sharp and unusual underperformance of short positions—in part driven by retail investors—a key catalyst. While Kelly believes that shifts in positioning have reduced risks around a repeat episode, Lamont worries that prices look less and less rational, and sees more volatile episodes ahead. Levitt agrees that future bouts of volatility are likely, but struggles to define regulations that would protect investors against them. And he concurs with Lamont that despite a perception that short-sellers create volatility, they actually play a vital role in price discovery.

"I couldn't define any new regulations that should be called upon to protect investors against this type of market volatility... we've seen similar periods of volatility before, and we'll see them again.

- Arthur Levitt

Short-sellers are an important part of a well-functioning, liquid market. In places where short selling is banned or restricted, market quality typically deteriorates and prices are farther from fundamental value.

- Owen Lamont

It's difficult to say that we've moved completely beyond these dynamics…. [But] the risk of a repeat episode is much lower today as positioning in the most-shorted US names has dramatically declined.

- Kevin Kelly"

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...AND MORE

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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

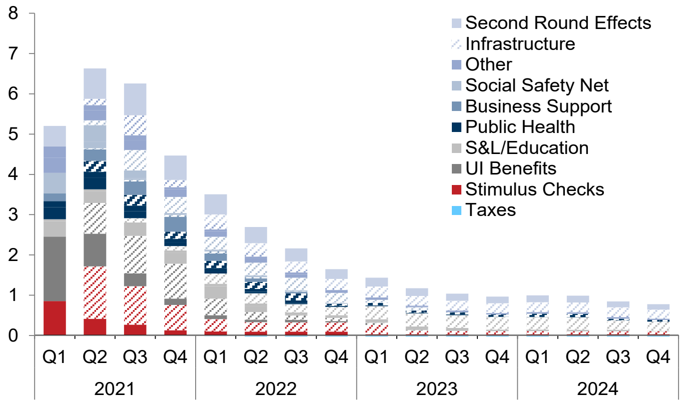
- We now expect $1.5tn in additional fiscal stimulus to pass in March, and raised our 2021 GDP forecast to 7% to reflect this fiscal boost and stronger consumption in Q1.
- We now expect Fed liftoff will be brought forward to 1H24 in light of a firmer outlook for unemployment and inflation.
- We see core PCE inflation peaking at 2.5% in April before falling to 2.05% and 1.85% by year-end 2021/22, respectively.

Datapoints/trends we're focused on

- Vaccination pace; despite a slight dip in daily new vaccinations amid winter weather, we still see 50% vaccination by May.
- Overheating risk; we're less worried about sharply higher inflation given a likely fading fiscal impulse and ample slack.

US fiscal boost to peak in 2Q21

Effect of fiscal spending on level of GDP, percent



Note: Solid bars reflect enacted spending; striped bars reflect expected spending.
Source: Goldman Sachs GIR.

Japan

Latest GS proprietary datapoints/major changes in views

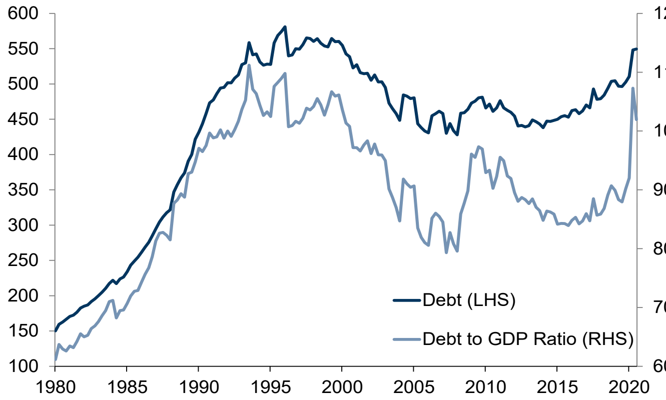
- We lowered our 1Q21 GDP forecast to -4.4% due to the extension of the state of emergency by one month to March.

Datapoints/trends we're focused on

- Virus resurgence; after a sharp rise in new cases in early January, case growth has since declined substantially.
- Corporate debt overhang; despite a sizable debt increase during the pandemic, we don't believe the aggregate level of debt at non-fin. corporations poses large downside risk.
- BoJ March policy review, which could consider tweaks to the YCC framework and the maturity of asset purchases.

A COVID-driven corporate debt surge

Corporate debt (borrowing and bonds), JPY tn (lhs), % of GDP (rhs)



Source: BOJ, Ministry of Finance, Goldman Sachs GIR.

Europe

Latest GS proprietary datapoints/major changes in views

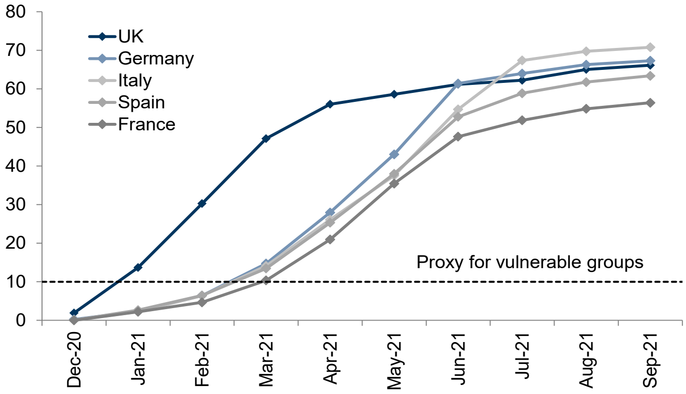
- We shaved our 1H21 GDP forecast on a slower expected pace of reopening, but continue to see a strong spring rebound and above-consensus growth of 5.1% in 2021.

Datapoints/trends we're focused on

- Vaccination acceleration; we expect the vaccination pace to rise in Q2 and 50% vaccination of the EU pop. by June.
- Inflation; after a sharp rise in January, we see core HICP inflation falling to 0.1% yoy in July, and climbing to 1.4% yoy in November.
- Rising yields, which we expect to lead to an acceleration in the pace of the ECB's PEPP purchases.

Vaccination acceleration ahead

Baseline vaccination timeline for first dose, % of pop.



Source: Goldman Sachs GIR.

Emerging Markets (EM)

Latest GS proprietary datapoints/major changes in views

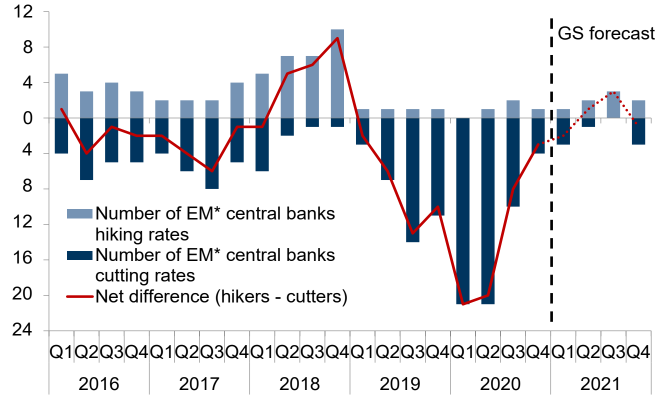
- We raised our GDP forecasts for Turkey and Israel, and now expect above-consensus 4.7% growth for CEEMEA in 2021.
- We expect a faster pace of sequential growth in India driven by a larger FY22 budget, bringing CY21 growth up to 11.4%.

Datapoints/trends we're focused on

- Virus/vaccines; case growth has declined in much of EM; we don't see 50% vaccination in most EMs before late 2021.
- US-China trade; we think an easing of US tariffs is unlikely before late 2021 and would likely be only partial even then.
- End of EM easing; we think the large EM rate-cutting cycle of 2019-20 is over and see most EM CBs on hold in 2021.

The end of EM monetary easing

Net number of EM central banks hiking vs. cutting rates, total



Note: Excludes Argentina, Venezuela, and Nigeria.
Source: Haver Analytics, Goldman Sachs GIR.

The short and long of recent volatility

The volatile start to markets in 2021—with a number of heavily-shorted stocks unexpectedly skyrocketing in late January amidst a boom in retail trading— seemed to have subsided. But with some of these stocks again on the rise, many questions remain: What confluence of factors led to this volatility? Is it likely to repeat, especially given the increased activity of retail investors? What could/should be done to prevent such volatile episodes in the future? And what—if anything---does this episode signal about the broader market, or mean for it? Exploring these questions is Top of Mind.

We first turn to Kevin Kelly, GS co-head of Global Prime Services, to break down the factors that led to the equity market volatility in late January. He explains that the positioning of long-short hedge funds looked stretched to the long side heading into the new year as investors expressed growth optimism around the US election. But as January progressed, increasing underperformance on the short side of their portfolios—which was quite unusual against the backdrop of a mostly flat market—ultimately forced these funds to substantially de-risk by liquidating their long positions—culminating in the largest amount of daily notional selling by hedge funds since the Global Financial Crisis.

David Kostin, GS Chief US Equity Strategist, details the magnitude of this short underperformance, noting that in the three months leading up to the late January volatility, a basket of the 50 most heavily-shorted stocks with market caps above $1bn in the Russell 3000 rose by 98%—far surpassing any historical rally of the basket. And he notes that this rally was unusually driven by concentrated short positions in a handful of smaller companies, against a backdrop of very low levels of aggregate short interest in the US equity market.

Given the importance of short-selling to these market moves, we then speak to Wellington Management's Owen Lamont, who published extensively on the topic during his prior academic career, to drill down into short-selling dynamics and the role they played during the recent volatility (see also pg. 9 for a short-selling explainer.) In his view, the recent volatility was a short squeeze in the sense that there was a deliberate attempt to push the prices of a small number of heavily-shorted equities higher without any new information about their fundamental value. But unlike historical examples of short squeezes, which were mostly orchestrated by a few deep-pocketed players operating in secrecy, the January event was more of a "flash mob" short squeeze conducted by a large number of small—aka "retail"—players who were coordinating on social media.

So just how powerful a force are retail investors today? John Marshall, GS Head of Derivatives Research, assesses the size of US retail trading—a hotly debated topic in itself given limited public data—by analyzing the size of every trade in every stock on every day. Through this proprietary "big data" approach, he finds that the dollar value of small-lot trades—a proxy for retail trades—has risen by 85% over the past year, leaving small traders a much more powerful market force. And his analysis reveals that retail trading activity has become a valuable signal for stock differentiation, with stocks that see an increase in small-lot shares and options trading activity outperforming in the subsequent 5-10 days.

The million-dollar question, then, is whether heightened retail trading activity—as well as the other factors that contributed to the late January events—are likely to repeat, and what that means for markets. Kostin argues that the retail investor boom has legs given the abundance of US household cash, as savings have increased and some forms of debt have declined over the past year amidst the pandemic (see page 11 for a snapshot of the retail investor base).

Kelly agrees that it's difficult to say that the market has moved completely beyond these dynamics. But he believes that shifts in positioning and more awareness of these risk factors have left hedge funds nimbler and better prepared to anticipate and manage them. And he emphasizes that even with record-breaking trading volumes during this period, the market functioned well from an execution, financing and clearing standpoint. But Lamont stresses that short squeezes rarely happen in well-functioning markets, and is concerned that market prices look less and less like the outcome of an orderly process. So he believes that more volatile episodes are likely ahead, either in illiquid corners of the market, or via a broader market flash crash.

We then sit down with Arthur Levitt, former chair of the SEC, to explore whether regulation or other measures could help prevent similar episodes in the future. He struggles to define new regulations that could protect investors against this type of market volatility. And he believes that short-selling—historically a target for regulation—plays an important role in price discovery. Lamont concurs, emphasizing that despite a common perception that short-selling generates market volatility, it is actually a stabilizing force in the market that helps push asset prices toward their fundamental value. But Levitt does believe the new administration and the incoming SEC Chair Gary Gensler will be focused on assessing if existing rules and regulations that were appropriate in the past remain appropriate in the present, given the constantly changing market environment.

Finally, we ask two other important questions about the recent episode: What might it signal about the broader equity market, and what spillover effects did/might it have? Peter Oppenheimer, GS Chief Equity Strategist, argues that while the recent volatility is indicative of heightened risk tolerance among equity investors and may point to select pockets of speculation, valuations are not consistent with a bubble across equities, and other equity risk factors are not flashing red (Lamont, for his part, seems more worried about an equity bubble).

As for spillovers beyond equities, Lotfi Karoui, GS Chief Credit Strategist and Frank Jarman, GS Director of High Yield Research, argue that the recent period of equity volatility actually provided a tailwind to distressed corporate borrowers. And Jeff Currie, GS Head of Global Commodities Research, sees populist motivations behind the recent bouts of volatility in equities as well as in silver as supportive of the commodity complex, as policymakers raise spending to meet social needs.

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Interview with Kevin Kelly

Kevin Kelly is co-head of the Global Prime Services business at Goldman Sachs. Below, he discusses the factors that led to the recent bout of equity market volatility, whether such volatility is likely to repeat, and the longer-term implications for hedge fund strategies.

The interviewee is an employee of the Goldman Sachs Global Markets Division (GMD), not Goldman Sachs Research, and the views stated herein reflect those of the interviewee, not Goldman Sachs Research.

Allison Nathan: What factors led to the bout of equity market volatility in late January?

Kevin Kelly: The seeds of this volatility were actually planted as far back as October of last year, with a large increase in net exposure—the difference between long and short positions—among our prime brokerage clients ahead of the US election. In particular, long-short hedge funds added to their long exposures at a much faster pace than their short exposures amid greater optimism about the outlook for earnings and additional fiscal stimulus. This drove the long-short ratio of these funds—long market value divided by short market value—to an all-time high by year-end. In early January, aggregate short exposure began to decline as funds reduced their short positions, including covering about 5% of our US short book, but without much of the long selling typically observed during periods of de-risking. The net effect of funds covering their shorts while not selling their longs actually increased long exposure in an environment where the market was already quite stretched.

Against this backdrop, the positions held by long-short hedge funds began to underperform the market. By the end of the third week of January, our prime brokerage data on client performance showed that these funds had, on average, generated 250bp of negative alpha—a negative excess return versus the market—which was offset by 300bp of positive beta, reflecting clients' higher net exposure to the broader rising market, leaving overall fund performance up 50bp.

But during the week of January 25, the poor performance of both the long and short sides of these portfolios accelerated rapidly. We estimate that long-short funds were down around 5.9% on an asset-weighted basis in January, although this underperformance was extremely concentrated on the short side, with shorts accounting for 5.5% of this loss. The pain reached a crescendo on January 27—with the average losses of the funds we track peaking at 7%—leading hedge funds to de-risk by liquidating long positions in addition to covering remaining shorts, which led to a self-fulfilling cycle of underperformance. Notional selling by hedge funds that day was the largest since the Global Financial Crisis. While this was mostly a US story, some de-risking occurred in Europe and Asia as well.

Allison Nathan: How common is it to see that degree of underperformance on the short side of long-short portfolios?

Kevin Kelly: Over my 20 years in the business, I've never seen such a significant underperformance of shorts without an accompanying selloff in longs. Most historical periods of stress and hedge fund de-risking have occurred alongside a broad market selloff, and almost all of them resulted in de-grossing on both sides of funds' portfolios—longs and shorts. During the latest episode, markets were basically flat with longs only slightly down in January despite shorts underperforming and the most shorted names in particular rocketing higher. Specifically, a GS basket of the most shorted names (GSCBMSAL), which reflects the 50 stocks with the highest short interest in the Russell 3000 with a market capitalization greater than $1bn, rose by more than 40% In January. At the same time, GS GIR's Hedge Fund VIP basket of the most popular hedge fund long positions (GSTHHVIP) was essentially unchanged.

Allison Nathan: To what extent did this underperformance of shorts—and the market volatility it helped precipitate—owe to retail investor activity?

Kevin Kelly: There's no doubt that the new dynamic of retail investors comprising a larger share of daily trading volumes was one of the factors that helped accelerate the rise in prices of some of the most heavily-shorted equities. But what's been lost in the popular conversation that has focused on only a handful of heavily-shorted stocks has been the breadth of the underperformance of equity names with substantial short interest, as reflected in the outperformance of the GS most-short basket (GSCBMSAL) that I mentioned. Given that traded equity volumes peaked at approximately 24 billion shares on January 27 —versus an average of11 billion a day last year—other market participants beyond retail investors were also driving equities during this period. Greater options trading by retail and other investors, especially the trading of short-dated options that have a lot of convexity, also caused an uptick in trading volumes by participants other than retail investors, as market participants had to hedge this exposure. In the end, it was the sharp spike in trading volumes—driven by both retail and other investors—and a run-up in the prices of highly-shorted names that contributed to a degradation of short positions, and caused hedge fund underperformance and subsequent de-risking.

"It was the sharp spike in trading volumes—driven by both retail and other investors—and a run-up in the prices of highly-shorted names that contributed to a degradation of short positions, and caused hedge fund underperformance and subsequent de-risking."

Allison Nathan: How significant of a role did leverage play in this episode?

Kevin Kelly: I don't believe that leverage played a material role in this bout of volatility. Most of the recent pressure was concentrated among US long-short funds. Generally, these funds have gross exposure—defined as their long market value plus short market value as a percent of equity or net asset value (NAV)—of less than 200%. So they actually have fairly modest leverage strategies; they weren't levered up four, five, or six times. The pain point was really on the short side of their books and specifically among highly concentrated shorts where the short market value of funds' holdings as a percentage of their total NAV or equity was very high. So this event wasn't a forced unwinding owing to leverage, but rather a deliberate effort to reduce risk given poor short performance that eventually also led to the underperformance of longs.

Allison Nathan: At any point during this episode did the proper market functioning break down in any way?

Kevin Kelly: No, the market functioned incredibly well. Despite an all-time record trading volume on January 27, everything went smoothly from an execution, financing and clearing standpoint. The market again demonstrated its stability and fortitude in the face of a sharp uptick in volatility and a deluge of trading activity.

> "The market functioned incredibly well… and again demonstrated its stability and fortitude in the face of a sharp uptick in volatility and a deluge of trading activity."

Allison Nathan: So how significant of an event was this for hedge funds?

Kevin Kelly: Based on our conversations with clients at the time, which have since been supported by subsequent returns data, the challenges were most acute among US equity long-short hedge funds. Looking across other hedge fund strategies—such as macro, CTA, credit, and systematic—many posted positive average returns in the month of January. But even within the long-short community in the US, the dispersion of performance was very high, with several managers actually posting positive returns for the month. And while long-short funds were down around 6% on average for the month, they have made back over 8% from the ytd low by February 24.

Allison Nathan: Where does the market stand today? Have these dynamics largely unwound?

Kevin Kelly: Although the pace of de-risking was ferocious in the final week of January, it was ultimately short-lived as the fairly rapid stabilization of the prices of highly-shorted names settled the market. Since then, a very large and broad-based dollar re-risking has taken place across regions and sectors. The pace of re-risking hasn't outweighed the de-risking last month, but investors are certainly beginning to increase both long and short exposure. For perspective, since the end of January our data show that long-short hedge funds have increased their gross and net exposures by 4.3 and 2.4 percentage points, respectively.

Allison Nathan: Are the underlying dynamics that drove this episode still intact, though, or is it unlikely that we're going to see the same confluence of events again?

Kevin Kelly: It's difficult to say that the market has moved completely beyond these dynamics. But hedge funds have adjusted their position sizing to remain nimble. The risk of a repeat episode is much lower today as positioning in the most-shorted US names has dramatically declined. For example, the constituents of the GS most-short basket (GSCBMSAL) that I mentioned collectively have seen short covering of as much as 65% ytd on a unit basis excluding mark-to-market in January. In particular, long-short managers on average have much less exposure to these heavily-shorted names and are therefore less exposed to another sharp rally. And managers have significantly increased shorts on index futures, ETFs and custom baskets as a way to replace single name short exposures. While these actions have reduced the risk of a repeat of the events of January, they also underscore that hedge funds have repositioned their portfolios to anticipate the prospect that similar volatility can show up again in different names or a different region.

Allison Nathan: What longer-term implications, if any, will this episode likely have for hedge fund strategies?

Kevin Kelly: Hedge funds will continue to improve their risk management processes, as they have typically done when new risk factors arise in the market. During the so-called "Factormaggedon" episode in March 2016, the crowdedness of particular factors wasn't a well-known risk factor for the long-short community. But after that episode weighed on performance, clients began adding it to their risk models. This time around, fund managers will likely attempt to adapt their risk models, and, again, remain nimble and aware of new risks.

Interview with Owen Lamont

Owen Lamont is the Associate Director of Multi-Asset Research for Wellington Management's Quantitative Investment Group. In his previous academic career, he taught at Harvard and Yale University, among other schools, and published extensively on the role of short-selling and its market implications. Drawing on that work, he discusses the recent volatility in equity markets and why such episodes are likely to repeat in the future.

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

Allison Nathan: What are short squeezes, and how common are they?

Owen Lamont: A short squeeze is usually defined as an increase in an asset's price that causes existing short-sellers to buy the asset in order to cover their short positions. The short-sellers close out their short positions either because they're trying to limit their losses, they've run out of collateral to post against their short position, or something has disrupted their ability to borrow the asset. This buying by short-sellers pushes up the price of the underlying asset even more. Some short squeezes occur naturally, and some are the result of deliberate market manipulation. An extreme version of a short squeeze is called a corner, which occurs when somebody gets control of the entire supply of an asset and forces the short-sellers to buy back the asset from them at a very high price. It's difficult to say how often short squeezes actually occur, but they tend to be rare in well-functioning, liquid markets.

Allison Nathan: Was the volatility that occurred in the US equity market in January 2021 likely the product of a short squeeze? What are the similarities/differences between the recent episode and past short squeezes?

Owen Lamont: Yes. Beginning in January and arguably continuing through today, we've seen a series of short squeezes in a small number of stocks that were targeted because of their high short interest. The recent events were similar to plenty of past short squeezes, like the Volkswagen short squeeze of 2008—one of the largest in history that briefly left the company with the highest market capitalization in the world—the Piggly Wiggly short squeeze of 1922 and the Stutz Motor Company corner of 1920, in the sense that there was a deliberate attempt to push prices higher without any new information about the fundamental value of these assets.

But what happened in January was also different from previous short squeezes in two important ways. First, short squeezes have historically been orchestrated by a few deep-pocketed players operating in secrecy. In January, the short squeezes were instead conducted by a large number of small players who were coordinating on social media, which could be described as a "flash mob" short squeeze. Second, some past notable short squeezes like the Volkswagen one have involved an unexpected change in the supply of shares in the market. The Volkswagen case was relatively complicated—involving derivatives and a corporate takeover—but investors ultimately had to deliver Volkswagen stock that they weren't able to get their hands on because of disruptions in their ability to borrow the shares. Such a disruption of the securities lending market wasn't an obvious issue in January.

Allison Nathan: Some of the recent activity seemed to spill over into other asset classes, such as silver. How common are these dynamics outside of equity markets?

Owen Lamont: Actually, silver and other commodities in the futures markets provide the classic historical examples of short squeezes, such as the Hunt brothers' attempt to corner the silver market in 1980. Many commodities have special delivery or storage situations that leave them particularly vulnerable to short squeezes, which is one reason why the futures market is regulated. But short squeezes have occurred in other asset classes as well, such as the Salomon Brothers squeeze of 1991 that involved Treasury notes. Different markets have different institutions, but the basic mechanism is the same.

Allison Nathan: Given the market volatility that results from short squeezes, is short-selling bad for markets and incompatible with orderly market functioning?

Owen Lamont: I would actually say the opposite, that shorting is good for markets, for several reasons. One, short-selling is a way to get negative information into a market. For example, historically short-sellers have played an important role in exposing corporate frauds such as Enron. The market has optimists and pessimists, and you want them to come together to find the right price for an asset based on the asset's fundamental value. An important part of that process is allowing pessimists to trade on their views. Two, short-sellers provide liquidity because they have to buy the asset when they close out of their position, and so without short-sellers, market liquidity would be lower.

And three, short-sellers are a stabilizing force in the market. Milton Friedman argued more than 50 years ago that speculation is inherently stabilizing because profit-seeking speculators buy low and sell high, which helps drive prices towards their fundamental value. Short-sellers do the same thing, but in the reverse order—aiming to profit by selling high and buying low. So, in a similar way, short-sellers also help the market find a stable equilibrium. Short-sellers are therefore an important part of a well-functioning, liquid market. In places where short-selling is banned or restricted, market quality typically deteriorates and prices are farther from fundamental value. All that said, our system is not set up to make short-selling easy, which leads to an optimistic bias in prices.

Allison Nathan: Beyond short-selling, what other ways can price jumps like those we saw in January be addressed?

Owen Lamont: Another way to satisfy optimists in the market beyond short-selling—which creates shares but comes with its own risks and problems—is for a company itself to issue more shares when prices are high. That's probably not feasible on a very short-term basis due to the various regulations around issuance by companies. But if I were the management of a small/midcap firm, I'd look for ways to set up a system to sell shares when the price gets too high. And one way to do that would be through an at-the-money offering. Over the long term, the aim is for prices to reflect fundamental value. Issuance is a way to do that and, in particular, plays an important role when stocks become overvalued; it is both a symptom of overvaluation and also the cure for overvaluation.

Allison Nathan: Has the role that retail traders played in the recent market volatility been overhyped?

Owen Lamont: I don't think so. Substantial evidence suggests that the volume and impact of retail trading has grown significantly since the advent of widespread commission-free trading in late 2019, with retail sentiment especially visible in small, illiquid names and more recently in the options market. By some estimates, retail trading volume as a fraction of total equity market volume has doubled, and it has exploded in the options market. Indeed, the January period of volatility in part reflected a relatively new ability and willingness of retail traders to use equity options on individual stocks as a way of magnifying their impact on underlying stock prices. This event could be described as a "crowdsourced gamma squeeze"—retail activity in the options market created a gamma squeeze as options dealers sought to hedge their exposures by buying more shares.

Allison Nathan: Were there signs that the market didn't function well in this episode?

Owen Lamont: I would argue that huge volatility in the absence of new information is one sign that the market is not functioning well. On the other hand, compared to the Global Financial Crisis (GFC) of 2008, this episode was a minor issue. During the GFC, trading broke down altogether in certain markets partly due to counterparty risk and lack of collateral; that didn't happen in January 2021. Whenever you trade with someone else, you have counterparty risk. So if I buy a share from you, I have to trust that you'll deliver it to me, and if I don't trust you to deliver it, I force you to give me some collateral. The more price risk there is, the more collateral I'll need. So, in January, certain stocks became incredibly volatile, and in order to trade those stocks, the institutions involved in the trading demanded more collateral. Some institutions didn't have sufficient collateral to ensure that their counterparty risk was minimized, and therefore were forced to limit their—or their client's—trading. While it's never great to have market players scrambling to provide collateral, it is a necessary and desirable feature of any trading system that when risk goes up, collateral requirements should go up as well.

Allison Nathan: Is the recent volatility of stocks popular among retail investors a sign of a market bubble?

Owen Lamont: The entire stock market may not be in a bubble, but I do think we may be in a bubble in certain overvalued stocks, and, like in the tech bubble of 1999, retail investors are a central part of the story. Also similar to the 1999-2000 period, unprofitable, risky, and expensive stocks have risen dramatically in price relative to safe, profitable, and cheap stocks in recent years. And stocks that have historically underperformed have instead outperformed. This is particularly true of heavily shorted stocks, which have typically performed poorly in the past, but have substantially outperformed over the last year or two.

Allison Nathan: Do you expect similar episodes of volatility in the future?

Owen Lamont: The internet has allowed decentralized bands of activists to coordinate their actions in both politics and finance, and it's difficult to say if social media-induced trading will end up being a fad like hula hoops or is here to stay. But my sense is that this trend so far has decreased liquidity and increased volatility in financial markets. It's not clear whether the lack of liquidity is causing the volatility, or if the volatility is causing the lack of liquidity, but in either case, prices look less and less like the outcome of an orderly process. My concern is that this may create what academics have called "noise trader risk," in which rational traders exit asset classes that are dominated by irrational traders because the risk is too high. As a result, volatility would beget volatility in certain markets, leading to wildly mispriced assets. The more that traders are motivated by something other than profit, such as excitement, group loyalty or an anti-establishment sentiment, the more likely this is to occur. I see a good chance of rolling disruptions, especially in illiquid names or in obscure corners of the market, as well as broader market flash crashes like the one we saw in 2010.

Allison Nathan: What is your key takeaway from this episode?

Owen Lamont: As an economist, I am concerned with prices. It is important that we get the prices right. When security prices are wrong, resources are wasted and investors are hurt. In order to get prices right, we need to allow all information, both positive and negative, to get into the market. Now, when I look back at the tech bubble of 1999-2000, I think one problem was that there were too few short-sellers and consequently technology stock prices were too high. I worry that today we are in the same situation, with the stock prices of some firms seemingly untethered from rational assessments of their future earnings. In January 2021, we saw prices gyrate in the absence of new information. It doesn't seem as if the market is getting more efficient over time.

Allison Nathan: Will the recent volatility likely shift the behavior of institutional investors?

Owen Lamont: Yes. While institutional investors are always focused on price risk and volatility, the recent events have added another possible source of volatility that must be managed and addressed, especially for investors with concentrated portfolios. That is perhaps easier said than done since predicting the precise source of this risk and whether it will get bigger or smaller is likely to prove challenging. But that's why it must be managed prudently. Going forward, I'd advise all market participants to be ready for greater volatility: stress-test your portfolio and make sure you have plenty of capital on hand to survive an unexpected change in market prices.

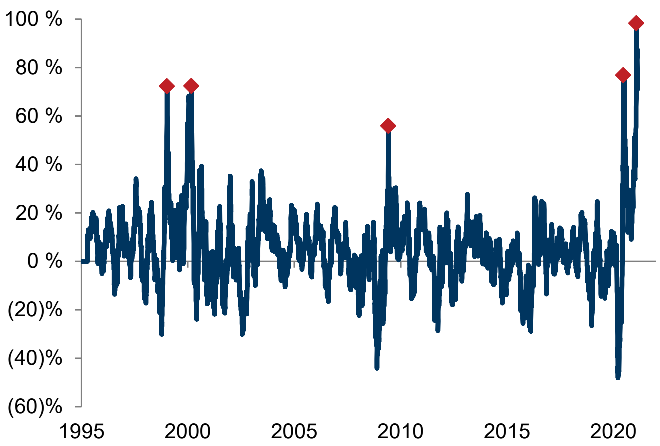
An unusual short squeeze

David Kostin details the unusual aspects of the recent equity market short squeeze, and argues that one of these aspects—the role of retail traders—is set to continue

The past 25 years have witnessed a number of sharp short squeezes in the US equity market, but none as extreme as the episode in late January. Over the prior three months, a basket containing the 50 Russell 3000 stocks with market caps above $1bn and the largest short interest as a share of float (GSCBMSAL) rallied by 98%. This surge exceeded the 77% return of highly-shorted stocks during 2Q20, the 56% rally in mid-2009, and two distinct 72% rallies during the tech bubble in 1999 and 2000. At the end of January, the basket had posted its largest return on record during the prior 5-, 10-, and 21-days.

The most heavily shorted stocks rallied sharply in January

Most short basket (GSCBMSAL) rolling 3-month return, %



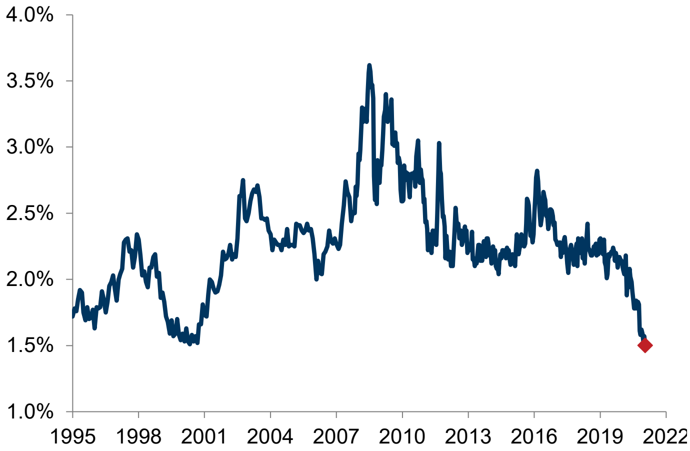
Source: Goldman Sachs GIR.

Unusually, the rally of the most heavily-shorted stocks occurred during a backdrop of very low levels of aggregate short interest. At the start of this year, the median S&P 500 stock had short interest equating to just 1.5% of market cap, matching mid-2000 as the lowest share in at least the last 25 years. In the past, major short squeezes have typically taken place as aggregate short interest declined from elevated levels. In contrast, the recent short squeeze was driven by concentrated short positions in smaller companies, many of which had lagged dramatically and were perceived by most investors to be in secular decline.

One key difference between the typical short squeeze and the recent rally in heavily-shorted stocks is the degree of involvement of retail traders, who also catalyzed sharp moves in other parts of the market such as low-priced stocks. The increased importance of online trading is evidenced by the dramatic performance of a basket of stocks favored by retail investors (GSXURFAV) which has returned +20% ytd and +198% since the March 2020 low, outperforming both the S&P 500 (+5% and +75%) and our Hedge Fund VIP list (GSTHHVIP) of the most popular hedge fund long positions (+8% and +122%).

Aggregate short interest is at very low levels

Median S&P 500 stock short interest as % of market cap



Source: FactSet, Goldman Sachs GIR.

The magnitude of the short positions of certain "meme" stocks was another differentiating aspect of the recent short squeeze. Many of the shorted names that dominated headlines in January were small-cap stocks, and a few of these firms had short interest outstanding that totaled more than 100% of the float of the company. That situation is highly unusual. During the last 10 years, we find only 15 instances when the short interest outstanding exceeded 100% of a company's float. Extremely elevated short interest is a pre-condition for a major short squeeze to occur.

The large short squeezes led investors who were short these stocks to cover their positions and also reduce long positions, leading other holders of common positions to cut exposures in turn. According to Goldman Sachs Global Prime Services, late January 2021 witnessed the largest active hedge fund de-grossing since February 2009. Funds sold long positions and covered shorts in every sector. As we noted in our recent *Hedge Fund Trend Monitor: YOLO, FOMO, and SPACs*, despite this active deleveraging, both hedge fund net and gross exposures on a mark-to-market basis remain close to the highest levels on record, indicating ongoing risk of positioning-driven selloffs.

An abundance of US household cash should continue to fuel the retail trading boom. The equity market peak in 2000 occurred following a year in which household credit card debt rose by 5% and checking deposits declined. In contrast, during 2020 credit card debt declined by more than 10% and checking deposits grew by $4tn. Our economists estimate that households have accumulated about $1.5tnin "excess" savings that will rise to about $2.4tn, or 11% of GDP, by the time that normal economic life is restored around mid-year. More than 50% of the $5tn in money market mutual funds is owned by households and is $1tn greater than before the pandemic. With short-dated interest rates likely to remain near zero for several more years, retail investors are likely to continue to re-allocate funds to asset markets such as equities that have greater return potential.

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Short-selling: an overview

Anatomy of a short sale

- Short-selling is a strategy designed to profit from a drop in the price of a security; in addition, short-selling can be used to hedge downside risk to a long position
- Short-sellers borrow and then sell a security on the open market with the intention of buying it back at a lower price later for a profit

The process of a short sale:

1.
- A short-seller identifies a security they believe will fall in price and therefore that they would like to short
- They open a margin account with a broker through which they can borrow securities that they plan to return in the future
- In return for these borrowed shares, the short-seller is required to post collateral, or assets to protect against a sharp rise in the price of the borrowed security, and typically makes regular interest payments on the value of the borrowed security

2. The short-seller borrows 10 shares of stock from another investor or their broker. The lender of the shares can ask for them back with limited notice.

3. The short-seller then sells those 10 shares for $1,000 ($100 per share)

4. The total price of the 10 shares falls to $800 ($80 per share)

5. The short-seller buys 10 shares of stock for $800 ($80 per share)

6. The short-seller then returns the 10 shares of borrowed stock to their broker and makes a total gain of $200

Anatomy of a short squeeze

- A short squeeze occurs when the price of a heavily-shorted security moves sharply higher, forcing the short-seller to buy it back, or "cover their position," in order to limit losses; increased short covering can lead to a further surge in a security's price as investors are forced to buy it
- A short squeeze can be driven by a sharp rise in the price of the security or reduced liquidity in the lending market for the security, causing the broker to recall the borrowed shares

The process of a short squeeze:

1. A short-seller borrows 10 shares of stock from another investor or their broker

2. The short-seller then sells those 10 shares of stock for $1,000 ($100 per share)

3. The total price of the 10 shares rises sharply, doubling to $2000 ($200 per share)

4. In order to prevent further losses or because of broker requirements, such as a demand for additional collateral that the short-seller can't or doesn't want to meet, the short-seller buys 10 shares of the stock for $2000 ($200 per share)

5. The short-seller returns the 10 borrowed shares of stock to their broker and suffers a total loss of $1000

Note: The example of a 10 share short sale is used for demonstration purposes.
Source: Interactive Brokers, various news sources, Goldman Sachs GIR.

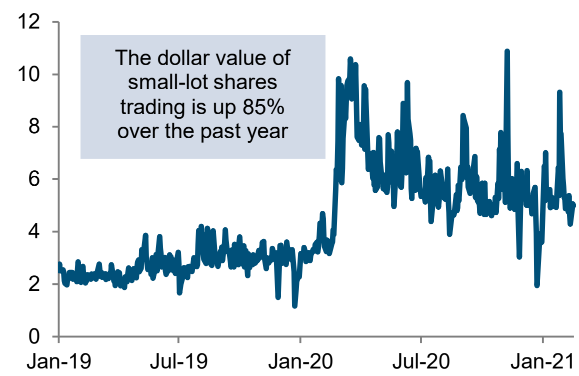
Sizing up retail trading

John Marshall, Head of Derivatives Research in GS Global Investment Research, takes a proprietary "big data" approach of analyzing the size of every trade in every stock on every day to track trends in retail trading activity. His key takeaways are below.

Retail activity: Up, but still a modest share of the market

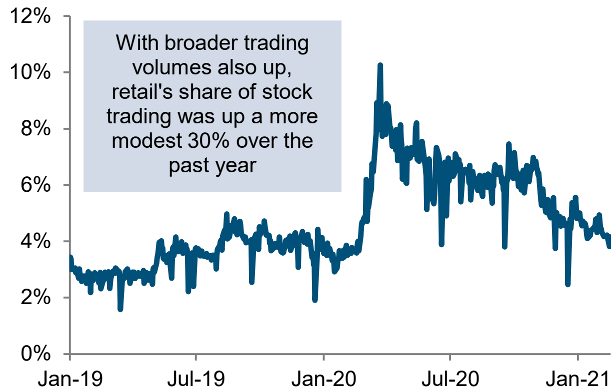
While the dollar value of retail trades has risen…

Shares volume from small trades, $bn



…retail activity still accounts for a small share of the market

% of shares volume from small trades

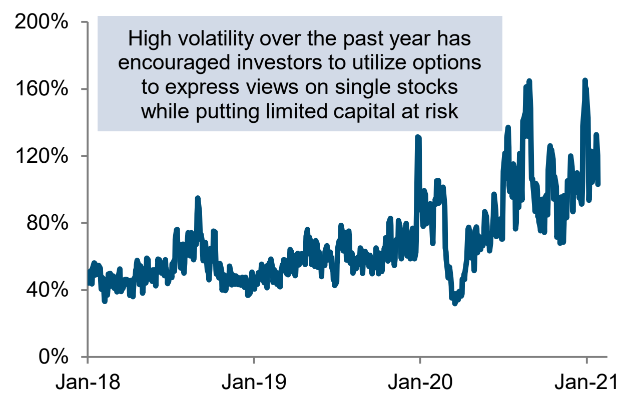


Note: We define a small-lot share trade as trades of less than $2,000 and use as a proxy for retail trading.

While all trading volumes are up, single stock options have seen exceptional growth

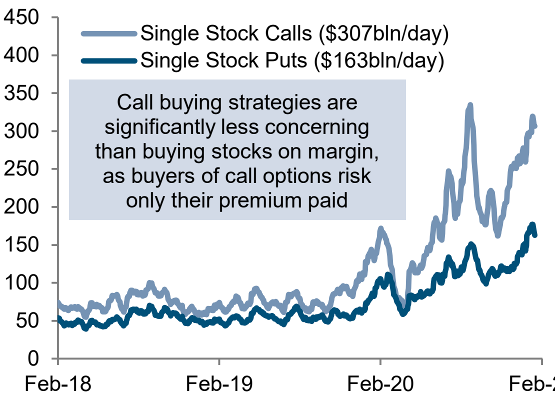
Total options volumes are +120% of total share volumes…

Single stock options volumes as % of share volumes



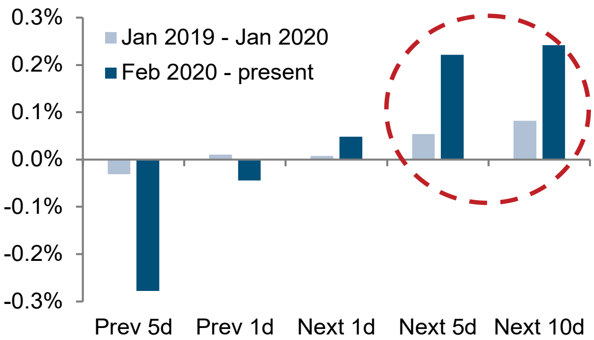
…and single stock call volumes are up +400% from 2018

Daily notional options volume, $bn

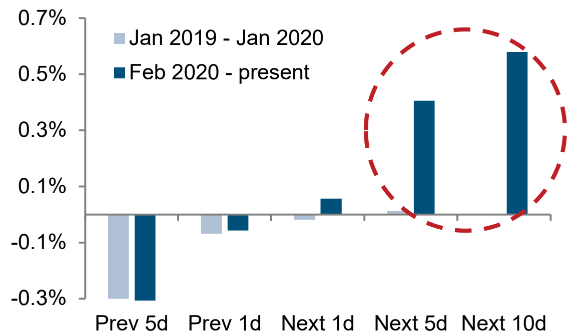


Retail trading activity has become a valuable signal for differentiating between stocks

Stocks have outperformed for 5-10 trading days following an increase in small-lot options trading…



…and stocks with a high proportion of small-lot shares have exhibited the same pattern, but this is a new trend

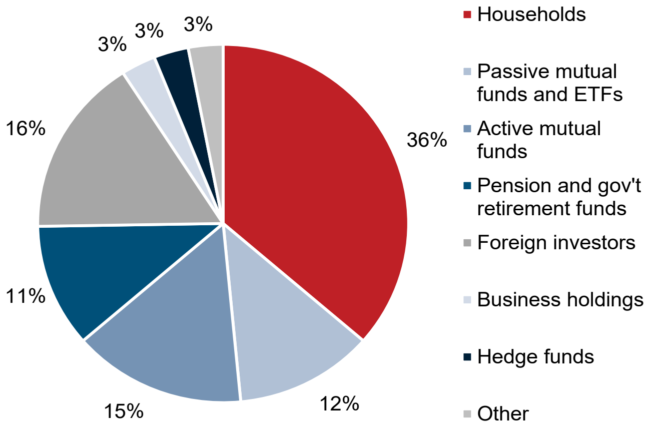


*Note: We define a small-lot options trade as any trade where the number of contracts*stock price is less than 5,000.*
Sources for all exhibits: Bloomberg, Goldman Sachs GIR.

A retail investor base with legs

Households own a third of the $57tn US equity market…

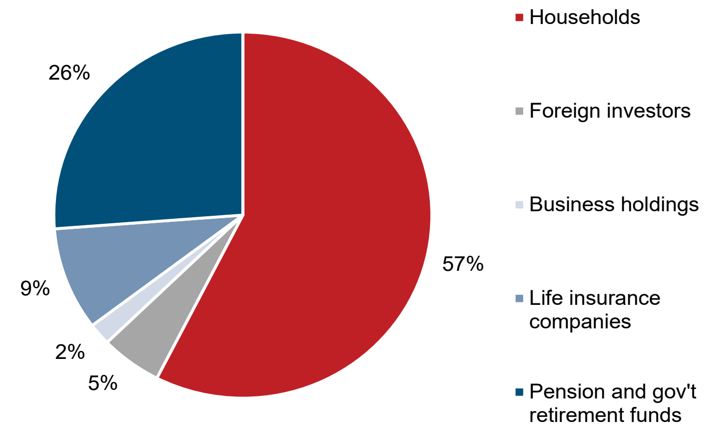
Ownership of corporate equities by group, % of total



Note: Data as of 3Q20 (latest data available).
Source: Haver Analytics, Federal Reserve Board, Goldman Sachs GIR.

…as well as over half of the $18tn in mutual fund shares

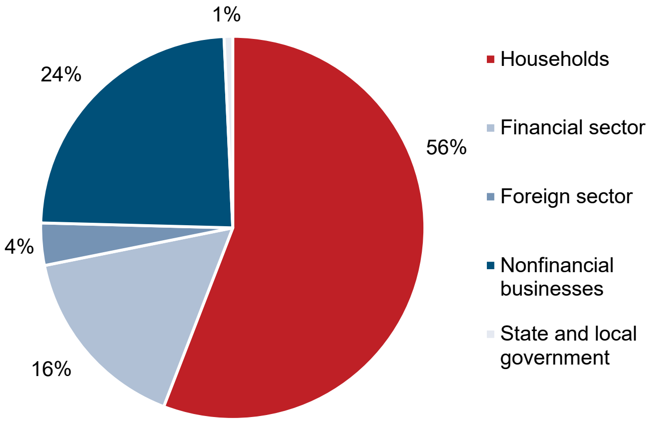
Ownership of mutual fund shares by group, % of total



Note: Data as of 3Q20 (latest data available); excludes money market funds/ETFs.
Source: Haver Analytics, Federal Reserve Board, Goldman Sachs GIR.

Households also own more than half of the $5tn in money market mutual funds…

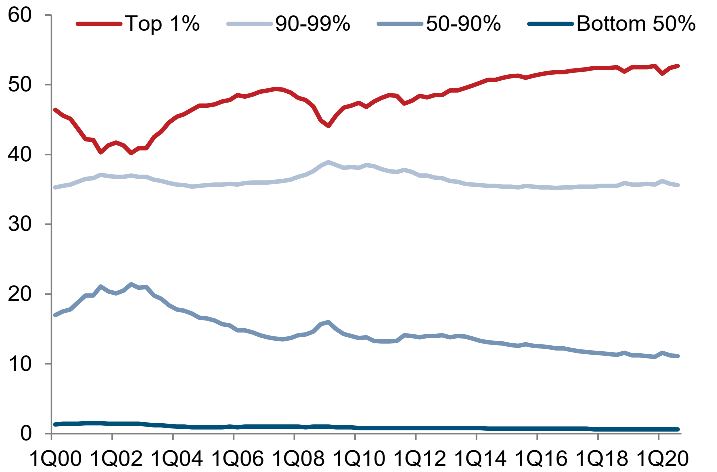
Ownership of money market mutual funds by group, %



Note: Data as of 3Q20 (latest data available).
Source: Haver Analytics, Federal Reserve Board, Goldman Sachs GIR.

…but asset ownership is concentrated among the wealthy

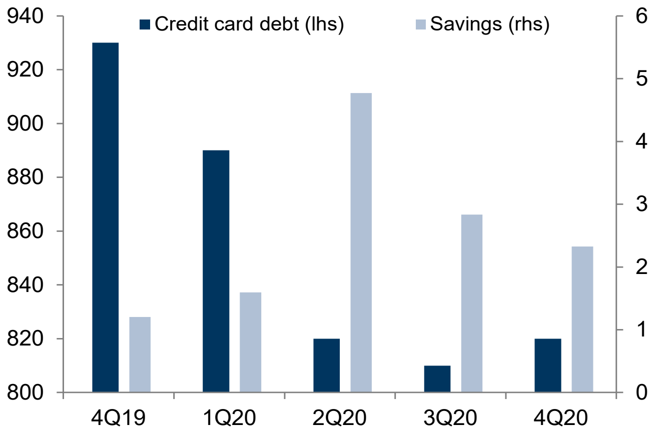
Ownership of corporate equities and mutual fund shares by household wealth group, % of total



Note: Data as of 3Q20 (latest data available).
Source: Federal Reserve Board, Goldman Sachs GIR.

The state of consumers has improved over the last year…

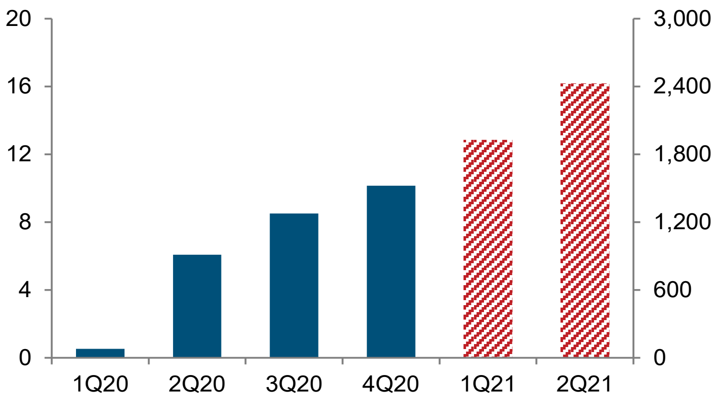
Household debt and savings, $ billions (lhs), $ trillions (rhs)



Source: New York Fed Consumer Credit Panel/Equifax, BEA, Goldman Sachs GIR.

…and is likely to improve further given an expected additional rise in excess savings

Excess savings, % of 2019 PCE (lhs), $ billions (rhs)

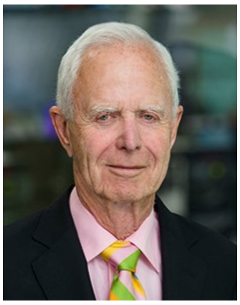


Note: Excess savings defined as savings above normal levels; striped bars reflect forecasts; see US Economics Analyst, 15 February 2021 for more details.
Source: Bureau of Economic Analysis, Goldman Sachs GIR.

Interview with Arthur Levitt

Arthur Levitt was chair of the Securities and Exchange Commission from 1993 to 2001. Below, he argues that episodes of equity market volatility have happened before and will likely happen again, but he struggles to define regulations that could protect investors against them. Rather, he sees a need for more transparency around market plumbing and better investor education of investing risks, which he believes the SEC should play a leading role in.

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



Allison Nathan: You were chair of the SEC during the internet bubble. What similarities or differences do you see between the recent equity market volatility and that period, or other periods in your career?

Arthur Levitt: I see considerable similarities between the recent period and the internet bubble. In both instances, investors were seeking high returns based on the upward momentum of the market rather than on fundamental analysis. The use of the internet to hype stocks in chat rooms or on social media, and the perception of stock trading as a form of entertainment, were present in both instances. And in both periods, pricing was totally divorced from fundamental research. Beyond these specific episodes, many periods in the past have been characterized by a feeling that the markets had no place to go but up, which led to investor hubris that eventually caused markets to fall. So, these periods of volatility have occurred repeatedly in the past, and will very likely occur again in the future, probably more frequently during periods of high optimism than during periods of reflection and caution.

Allison Nathan: Are such periods of volatility problematic, and, if so, where does the problem stem from?

Arthur Levitt: The volatility in individual stocks driven by casino-like trading is a by-product of a culture of extreme risk-taking, in which people seek higher returns than they can typically earn. If record-low interest rates are a by-product of too much liquidity in the system, then liquidity is a problem. When savers can't get any return on bank deposits, they're going to chase yield elsewhere, and chasing yield is always risky. But today's investors also don't necessarily understand the amount of risk that they're taking. We haven't had a sustained period of market weakness since the Global Financial Crisis, when most of today's day traders weren't even in college yet; they've never bought high and been forced to hold through a trough. I also think we need greater focus on trading platforms and whether they're using the same tools that make social networking platforms addictive.

> "The volatility in individual stocks driven by casino-like trading is a by-product of a culture of extreme risk-taking… But today's investors also don't necessarily understand the amount of risk that they're taking."

Allison Nathan: Online trading platforms have certainly come under substantial scrutiny in light of recent events. More broadly, what's your take on their business model and their role in markets today?

Arthur Levitt: These platforms are baked into the fabric of markets today. But investors must recognize that the transaction costs of online trading platforms are built into the price of the assets they are trading. Investors using online brokers have been told that they're getting their trades for free, but that's actually misleading. The reality is that investors get nothing for free. Through the payment for order flow (PFOF) business model, online brokers give away a percentage of the difference in the bid-ask spread of the trade to platforms that actually execute the trades, affecting the returns that investors receive. As the old saying goes, "if something's free, you are the product." And, unfortunately, the trading platforms that online brokers route stock trades to may not always be giving investors the best deal, and are not necessarily acting in investors' best interests. So we need to consider how to make the plumbing of the markets more transparent and how to require those operating the market to act in the best interests of their customers, the investing public.

> "Investors using online brokers have been told that they're getting their trades for free, but that's actually misleading… As the old saying goes, 'if something's free, you are the product."

Allison Nathan: Short-selling has also again come under scrutiny given the role it arguably played in the recent volatility. How do you view the role of short-selling in markets?

Arthur Levitt: It's sometimes argued that short-selling is a way to supply shares to a market where more investors want to hold long positions than there are shares available, but I am not convinced by that argument. Short-selling is a way for investors who believe that a stock is overpriced to express this view by borrowing shares from those in long positions. And, in this way, it plays an important role in price discovery and ensuring that stocks are priced appropriately.

Arguments that short-selling should be banned have been around for the last 100 years, but those arguments often come from executives of companies whose stock is overpriced and is being shorted. Enron was a classic example of that; in the fall of 2000, two hedge funds shorted the stock of Enron publicly, alerting investors that they believed the stock was significantly overpriced. Although Enron executives balked at this behavior, a little over a year later, the seventh largest company in America was in bankruptcy and had ceased doing business.

Allison Nathan: Should companies themselves issue more shares when their stock price is high, and should the share issuance process be streamlined to facilitate this?

Arthur Levitt: I don't favor any lowering of standards for the issuance of public shares. When a company meets the current standards for issuance, it's a basic hurdle that the investing public takes for granted. Once that goes away, the risks increase markedly. And there's no evidence that a lack of supply of shares had anything to do with the recent episode of volatility.

Allison Nathan: Last week, the first of what's likely to be many congressional hearings took place to help determine whether the recent episode of volatility signaled a need for more or new regulation. Do these events call for a regulatory response, and is the new administration and incoming SEC Chair Gary Gensler likely to provide one?

Arthur Levitt: I couldn't define any new regulations that should be called upon to protect investors against this type of market volatility. Again, we've seen similar periods of volatility before, and we'll see them again.

In terms of whether such a response is likely, generally speaking, during Democratic administrations, the SEC tends to more aggressively enforce regulations and resist easing them. Whether that continues to be the case remains to be seen, but Gary Gensler will likely be a strong advocate for investors in Washington. That said, Gensler understands as well as anybody in America that markets are sensitive, and that we've been down most of these roads in many past market cycles. But a key responsibility of the SEC chair is to see to it that regulations that were totally appropriate in the past are still appropriate for the present. So rather than seeking out new corners for regulation, I think the incoming SEC chair will focus on improving existing rules to ensure that they remain appropriate for today's markets, and adopt such rules that will allow markets to keep up with the constantly changing market environment. I can think of no one better than Gensler to make those judgments because he's lived through those past markets.

Allison Nathan: Beyond regulation, what else could and should the SEC do in response to the recent events?

Arthur Levitt: The Commission has to stand with the investing public. The SEC chair in particular is really a public symbol, and should always be seen as a familiar and friendly face to the public. It's important that investors know that there is a cop on the beat—a regulator looking out for their best interests. That is especially the case today given the recent growth in retail trading activity. This growth may level off after people return to full-time work or school, but the historical pattern suggests that it will outlast the next market correction.

In many ways, the increase in retail trading is positive. The more people involved in markets, the more people that will be sensitive to issues such as sound corporate governance, efficient investment, etc. But people also need to be conditioned around the responsibilities and risks of long-term investment. Retail trading doesn't encourage that education. Regulators should. I don't think regulators realize that they can and should use the bully pulpit to engage and educate. When I was the chair of the SEC, I focused on engaging and educating the investing public through town halls, the internet, public speeches and the media. A vocal SEC chair can do more with public events than with a handful of rule changes or enforcement actions.

> "A vocal SEC chair can do more with public events than with a handful of rule changes or enforcement actions."

Allison Nathan: What role could/should the Fed play in addressing these bouts of volatility?

Arthur Levitt: Jerome Powell is probably one of the most balanced, experienced chairs of the Fed in the history of that organization. But clearly he and the other Fed board members have a difficult job; they have to bridge the politics in Washington between Democrats and Republicans and the President and Congress while also overseeing the largest banks in the world and trying to keep the economy growing without allowing too much inflation. Powell is well equipped to deal with these challenges, but the more that capital markets grow, the more the Fed will need to interact with the SEC. So, I think it's important that Chair Powell and Gary Gensler communicate and work together to address market volatility.

Allison Nathan: Given all the above, what's your key takeaway from the recent events?

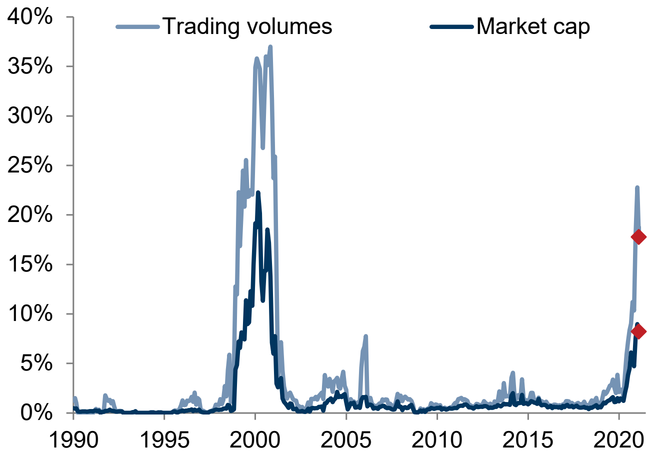
Arthur Levitt: The easy takeaway is that we've entered a period of greater volatility, not only in financial markets, but also in politics and in society more broadly. But given that we've seen so many volatile periods in the past, January's events don't particularly surprise or worry me. And with experienced heads at the two most important entities to protect the public at a time of increased volatility—the SEC and the Federal Reserve—I think that the economy and the markets are in very sound hands. That is not to say that future bouts of volatility won't occur, but if and when they do, at least from a regulatory standpoint, we're in as good a position as we could possibly be.

No broad bubble in equity markets

Peter Oppenheimer argues that despite selected pockets of speculation and higher-than-average valuations in equity markets, there is likely no broad bubble in equities

Many investors worry about the growing signs of exuberance in markets and fear the emergence of a speculative bubble. Certainly, signs of heightened risk tolerance are not hard to find; participation by retail activity in the equity market has been a particular concern as of late. The extraordinary rally of GameStop stock, which increased by 1,600% in January, is an obvious example, as is the spectacular rise in bitcoin in recent months. The number of companies trading at an EV/sales ratio of over 20x has also surged as a share of market capitalization and market trading volumes.

The number of companies with high EV to sales has surged
Stocks with EV/sales ratio of +20x as a share of US equity, %



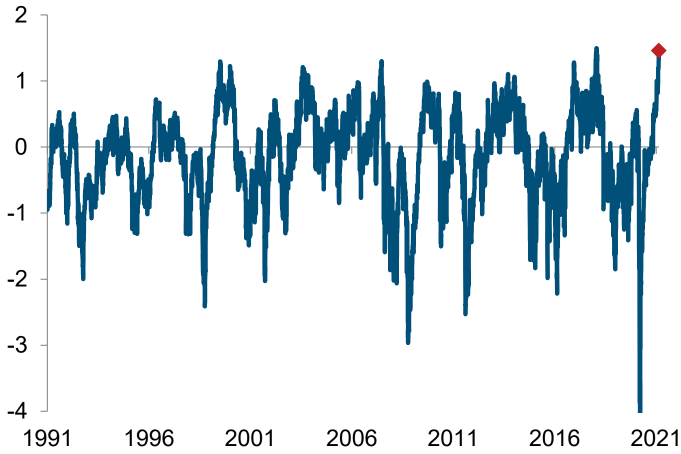
Source: Compustat, Goldman Sachs GIR.

People also point to the boom in IPOs and corporate activity. Year-to-date, US equity and equity-linked issuance (including IPOs, follow-ons, converts and SPACs) in the US alone reached $101bn—a record start to a calendar year, with the previous record of $49bn set back in 2000. While SPACS have comprised an extraordinary $41bn of this total, the remaining $60bn in issuance is still a record start to the year.

Similarly, signs of exuberance in the markets are clearly reflected in price action across a wide array of assets. Our own Risk Appetite Index (RAI), comprising 27 "pairs" of risky versus less risky investments across the major asset classes, stands at levels that have left the market vulnerable to a correction in the past.

Positioning measures also show signs of heightened optimism, such as the skew in put-to-call ratios as well as flows into risky assets like equities. The second week of February saw $58bn flow into global equity funds—the largest inflows on record—and the past 14 weeks have brought $340bn of demand, which is also a record.

RAI is at levels that have historically left markets vulnerable
Risk Appetite Indicator (GSRAII), level



Source: Goldman Sachs GIR.

Valuations don't suggest an equity bubble

But while the current high level of risk tolerance and investor confidence is worrying, valuations are not consistent with a bubble across equities more broadly. For example, despite the surge in performance of many leading technology companies, most of the biggest companies are cheaper today than has been typical in bubble periods in the past. We estimate that the leading five companies during the Nifty Fifty bubble of the early 1970s traded at roughly 35x P/E ratios and the five biggest in the technology bubble of the late 1990s traded at valuations of around 55x on average. The five current dominant US companies (the FAAMG) trade at lower valuations on average than during these earlier periods.

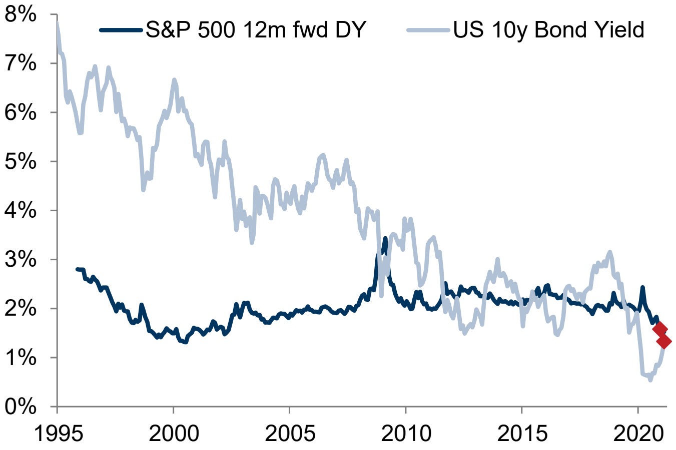
Importantly, all five of these stocks posted positive sales (median +14%) and EPS (+24%) growth during 2020—a year when S&P 500 sales and EPS declined by 3% and 14%, respectively. FAAMG benefited not only from low interest rates that made their high-growth cash flows more valuable, but also from business models that remained in demand during the recession so that their price return was fully driven by rising earnings. In contrast, during past bubble periods, the outperformance of leading companies was typically driven by hopes of future possible high returns. Of course, some of the best-performing and higher-valued smaller growth stocks during the past year have also been driven by future optimism, but these stocks have a much smaller impact on the broader market.

If there's a bubble, it may be in bonds

Since the financial crisis, bond yields have fallen materially from around 4% in the US and Germany in 2007 to around 1.4% in the US and -0.3% in Germany today. Over this period, however, the dividend yield on the broader equity markets has remained very stable. As result. equities have been significantly de-rated relative to bonds. This de-rating is even more obvious when considering that during the technology bubble in the late 1990s the US 10-year bond yield was over 6% while S&P dividend yields averaged 1.5%.

Equities have been significantly de-rated relative to bonds

%



Source: Datastream, FactSet, Goldman Sachs GIR.

In the late 1990s, investors were so confident about future growth that they were prepared to accept an income that was a fraction of what was available to them in a risk-free asset. Today, it is the reverse. Investors demand a much higher yield on equities—or equity risk premium—relative to a zero or negative real return on a risk-free asset presumably because they are much more cautious about future growth and returns available in the equity market. This is not consistent with a bubble unless, of course, the bubble is in bonds. This may be so, but if bond yields rise because of stronger growth and/or inflation, then the risk premium in real assets like equities would likely decline. This potential dynamic may be consistent with lower future returns, but it is unlikely to trigger a collapse in equities outside of a few highly speculative growth stocks.

Savings are a differentiating factor

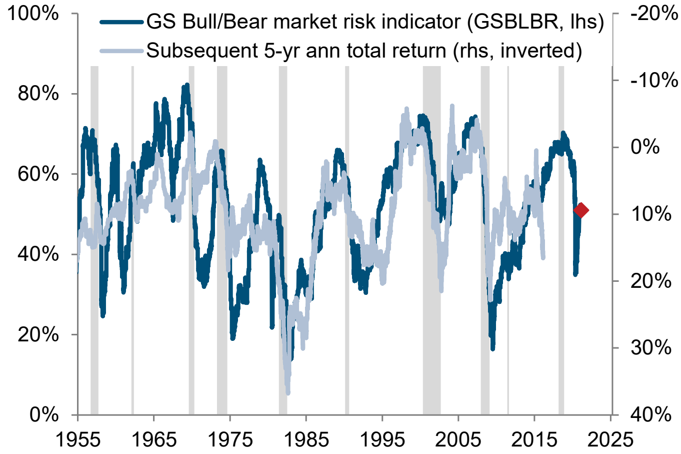
Unlike many other bubble periods, household savings rates are also very healthy. Our economists point out that US households have accumulated about $1.5tn in "excess" savings, and they expect that to rise to about $2.4tn, or 11% of GDP, by the time that normal economic life is restored around mid-year. Rising house prices and asset markets have also pushed household net wealth up to record levels of disposable income. This contrasts sharply with the experience of the late 1990s internet bubble, when high valuations also pushed up household wealth but the savings rate had collapsed to a record low.

Other indicators of equity risk are not flashing red

Other fundamental indicators of equity risk, such as our Global Bull/Bear Market Indicator (GSBLBR), are also not pointing to bubble-like risks. This indicator reached very elevated levels in the late 1990s, 2008 and also in 2019 and has now fallen back to much more moderate levels of around 50%—well below the 70% area that we see as a danger zone for a potential bear market. At current levels, the indicator would point to annualized returns of high single digits over the next five years. It is true that equities have already rebounded more sharply than normal from the trough last year, but so far the rebound has been similar to that experienced after the trough in March 2009.

Other indicators of equity risk are not showing bubble signs

%



Source: Datastream, Haver Analytics, Goldman Sachs GIR.

While equity prices fell around 60% during the financial crisis, compared with around 30% in the bear market in 2020, and valuations fell to much lower levels in 2009 than in 2020, this difference mainly reflects the current aggressive mix of monetary and fiscal policy support. Central bank balance sheets continue to expand and forward guidance suggests that zero policy rates (and negative real rates) are likely to persist for several years. On top of this supportive monetary policy, fiscal support continues to grow. Again, higher asset price valuations and record-low bond yields point to lower returns over the medium term but do not mean that markets are in a bubble.

At the start of the equity cycle, not the end

All of this is consistent with our cycle framework that points to equity markets being closer to the start of a cycle rather than the end. The powerful, valuation-driven, initial rally in the equity markets between March and September last year was very typical of the initial "Hope" phase of a bull market, which generally begins during a recession when earnings are still falling. This phase is typically followed by what we call the "Growth" phase, which is our expectation for this year as global equities generate EPS growth of around 33%. Often, the transition between the two phases is marked by heightened volatility and a market setback as investors wait for, or begin to doubt, the recovery.

So, despite higher-than-average valuations in equity markets and selected pockets of speculation, the overall risk premium in equities is high and household balance sheets are strong; these are characteristics that are not typically consistent with bubbles. For the first time in well over a decade, we are likely to see strong and synchronized global economic growth of 6.6% in 2021 (and 4.7% in 2022), with rising commodity prices, high savings rates in the household sector, nominal policy rates remaining unchanged until 1H24 (and with it, negative real rates) and a significant expansion in fiscal policy. The post financial crisis deflationary narrative is thus shifting to a more reflationary footing, which is likely to make any correction in equities a buying opportunity.

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An unexpected corporate bond tailwind

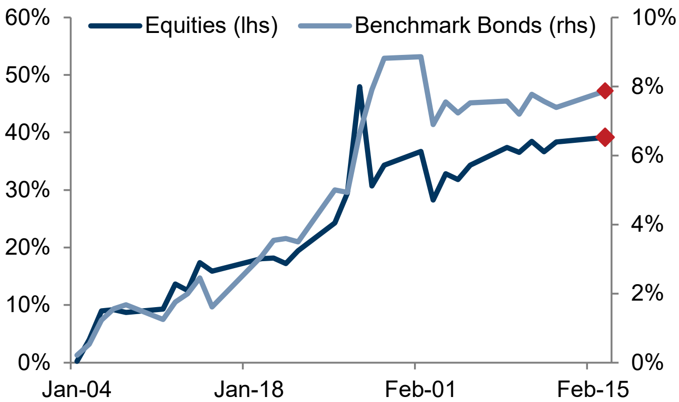
Lotfi Karoui and Frank Jarman argue that the recent equity market short squeeze created tailwinds for distressed corporate borrowers

With the bulk of the short squeeze[1] in the equity market now behind us, the persistence of the spillover to credit markets remains a key question for bondholders. For the broader high yield bond market, we do not expect any material impact, given the small size of issuers within the cohort of high short interest stocks. For context, the top 40 leveraged companies that have seen their equities appreciate the most ytd have a combined face value of bonds outstanding of $103bn, equivalent to 6.5% of the $1.6tn high yield bond market. But for the low end of the rating spectrum, the question is not without merit. Several of the largest equity movers in January also happen to be distressed borrowers with liquid and actively traded bonds.

Bonds and equities have unsurprisingly moved in tandem since the start of the year. But while the equities have on average retraced roughly 10pp of their January peak gains, the performance of their underlying bonds has proven somewhat more resilient. In our view, the bonds will likely remain in a better position to hold onto recent gains than the stocks. Aside from a stronger "institutional skew" in the buyer base, which contrasts to the retail-heavy flows in the equity market, we see two more reasons why the recent gains in the corporate bond market will likely be more sustainable.

The rally in high short interest equities has also boosted the performance of the bonds

Equal-weighted average cumulative returns on stocks and bonds within the cohort of high short interest stocks, %



Source: Bloomberg, Goldman Sachs GIR.

A unique opportunity to raise liquidity…

First, the January equity short squeeze provided the management of many distressed companies with a unique opportunity to improve their balance sheet quality. The most apparent benefit has come from the ability to establish new capital raising avenues to strengthen capital and liquidity positions via at-the-market (ATM) vehicles. These vehicles allow companies with an active shelf registration, also known as SEC Rule 415.1, to issue new common shares at the prevailing market price as part of normal trading volumes (typically within 10% of the stock's average trading volume). Essentially, this process allows companies to swiftly take advantage of favorable market conditions to issue equity capital. One textbook example was AMC Entertainment (AMC), which is rated CCC- with a negative outlook. The company quickly responded to its >500% equity market cap growth by utilizing its ATM equity shelf to raise ~$600mn of additional capital. The ensuing boost to the company's liquidity position has helped it extend its runway from 2021 to 2022 as it continues to navigate the severe disruption inflicted by the COVID-19 pandemic. Another example is American Airlines (AAL), which also leveraged an ATM facility to raise $1.12bn of liquidity in January and currently still has another $118mn remaining under this facility.

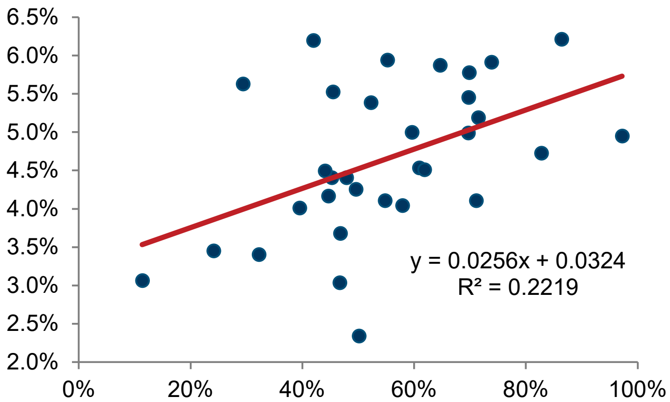
…and to improve bond valuations

A second tailwind from recent developments is the material improvement in enterprise coverage, i.e. lower loan-to-value (LTV)—a key metric for assessing bond valuations. As stock prices rose, so did enterprise value, lowering LTV. We find that among the cohort of firms with high short interest stocks, a one-point reduction in LTV translates, on average, into a 25bp decline in the bond's yield-to-worst (YTW)—the lowest possible yield on the bond prior to defaulting—boosting the bond valuation. A good illustration of this relationship is Transocean (RIG), an over-leveraged company in the Energy sector. RIG's equity has rallied ~44% ytd, and while it has not raised any equity capital, its unsecured bonds have rallied ~6 points as its LTV declined from 83% to 76%.

Coupled with our above-consensus growth forecasts[2], these fundamental tailwinds from the January equity market squeeze increase our conviction that the default environment[3] for high yield-rated issuers will likely remain benign in 2021.

Lower loan-to-value ratios imply lower funding costs

LTV ratio (x-axis) vs. ytw (y-axis) for firms with high short interest stocks



Source: Bloomberg, Goldman Sachs GIR.

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[1] See "The price of everything and the value of nothing: The saga of a short squeeze in the US equity market", US Weekly Kickstart, 5 February 2021.
[2] See "Too much of a good thing?", Global Views, 8 February 2021.
[3] See "Same direction, different magnitude", 2021 Global Credit Outlook, 18 November 2020.

Silver remains the populist metal

Jeff Currie argues that populist motivations behind the recent bouts of volatility will likely drive a commodity bull rally, as policymakers increase spending to meet social needs

When the 7 million WallStreetBets (WSB) subscribers turned their attention to silver last month, markets were focused on a silver squeeze, similar to what took place in the run up to "Silver Thursday" in 1980 when the Hunt brothers cornered the silver market. However, we believe that the better analogue for this episode is William Jennings Bryan's 1896 "Cross of Gold" speech, which criticized the gold standard and the established system it supported, and argued for supplementing it with silver coinage.

Changes in futures markets since—and, in part, precipitated by—Silver Thursday, such as the imposition of position limits, suggests similar squeezes in futures markets today are unlikely. But the factors that generated the populist motivations behind Bryan's speech are once again present today, likely spurring expansionary policies that will drive a large and extended commodity bull rally.

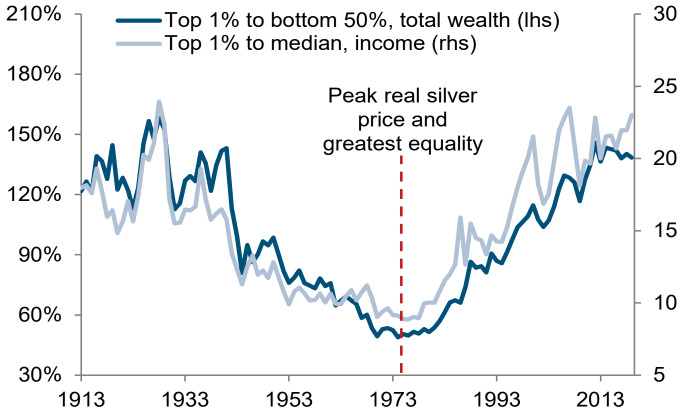
A long history of silver and populism

Silver has long been linked to populism, and recent events underscore that populism remains a growing political force, now with the power to move markets. The focus of today's retail traders on silver as a tool used by governments to suppress inflation and retain economic power chimes closely with Bryan's criticism that the gold standard kept inflation low, making it difficult for cash-poor, debt-burdened farmers to repay loans. He therefore advocated for inflationary policies such as introducing silver to the gold standard to make it easier for farmers and rural westerners to repay loans.

Driving this populist movement was an environment similar to the current one, characterized by extreme wealth and income inequality. Behind this inequality was a lack of inflationary pressures, low interest rates and a sharp rise in asset prices that benefited the few. As anger toward the situation grew, so did the populism that Bryan tapped into. History shows that governments respond to such populism with expansionary policies—especially redistribution policies.

Wealth and income inequality are currently at extreme levels

% (lhs), ratio (rhs)



Source: Distributional National Accounts, Goldman Sachs GIR.

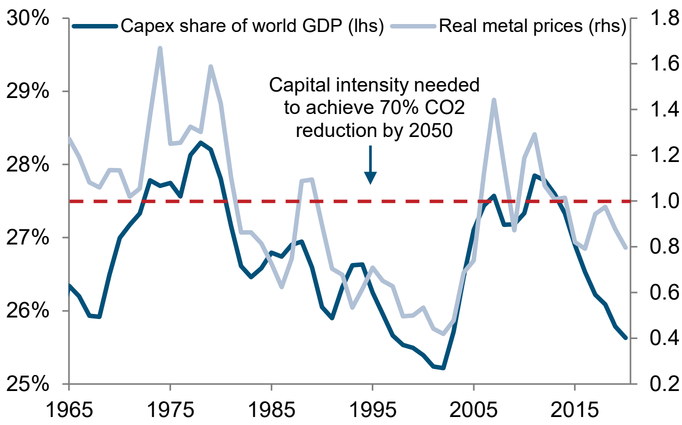
Greater social spending, more commodity consumption

Such spending on social needs lies at the core of our bullish commodity thesis. As we have argued since last year, the pandemic drove a structural shift in policymakers' focus toward social needs. Greater spending on social needs not only raises consumption overall, but also creates more commodity-intensive consumption, as low-income households consume more commodities per dollar of spending.

Such redistributive policies have proven powerful drivers of commodity bull cycles in the past. A key aspect of the China bull market during the 2000s was ultimately the redistribution of wealth from the American and European middle classes to the Chinese rural poor to create a new Chinese middle class. And the commodity bull market of the 1970s was ultimately a product of redistributive and environmentally-focused policies of the late 1960s and 1970s—the War on Poverty and the War on Acid Rain (desulfurization).

Today, wars on income inequality and decarbonization also sit at the top of the policy agenda, with expenditures on green capex, which entails large infrastructure projects, well-positioned to tackle both. We expect global green capex of \$16tn this decade, compared to the \$10tn capex that China spent in the 2000s, which corresponds to \$15tn in today's dollars. Silver sits at the center of this "green levelling" as it is a critical input to solar panels. But this amount of social spending will lead to a substantial increase in commodity demand across the board, which is why we expect a commodity bull market on par with the 2000s.

We expect \$16 trillion of global green capex this decade



Source: Maddison Project, Bloomberg, Goldman Sachs GIR.

Inflation is the great equalizer

A commodity bull market and/or inflationary pressures typically result from declining income and wealth inequality because when all boats rise, so does the demand for goods and services. This, in turn, pushes demand towards capacity, creating upward price pressure. It is not a coincidence that the highest level of income equality in America corresponded to the highest level of real commodity prices and peak inflation in 1980—the year that the Hunt brothers cornered the silver market. So perhaps the real lesson from Silver Thursday is that Bryan had it right: inflation is the great equalizer.

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Summary of our key forecasts

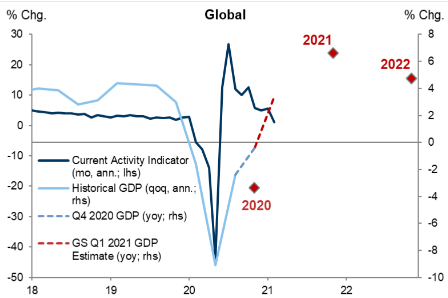
GS GIR: Macro at a glance

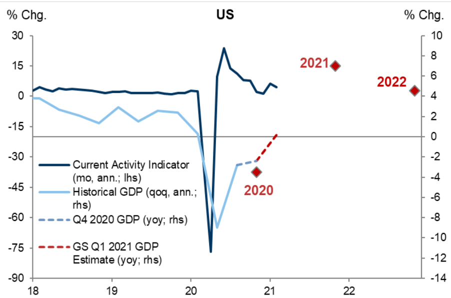
Watching

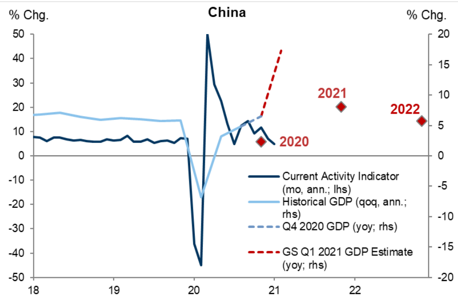
- **Globally,** we expect above-consensus global growth of 6.6% in 2021. Our optimism reflects the view that widespread immunization, accommodative monetary and fiscal policy, and limited scarring effects will support a continued recovery in economic activity, though the emergence of new, more infectious virus strains remains a risk.
- **In the US,** we expect above-consensus full-year growth of 7% 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 4.1% and core PCE inflation to rise to 2.05% 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 1H24. 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 $1.5tn in support in the near term, as well as an infrastructure package later this year.
- **In the Euro area,** we expect a 0.4% 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 pickup to 2% qoq non ann. growth in Q2 on the back of a likely reduction in virus restrictions and widespread vaccination. We expect above-consensus growth of 5.1% in 2021, and subdued sequential inflation given considerable remaining economic slack.
- **We expect the ECB** will step up the pace of PEPP purchases to lean against tightening financial conditions, but believe it will keep rates on hold until 2H25. We 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 in the coming months and disbursement to begin in Q2.
- **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. We expect a majority of the population in most DMs to receive their first vaccine dose by midyear, but don't see 50% vaccination being achieved in most EMs before late 2021.

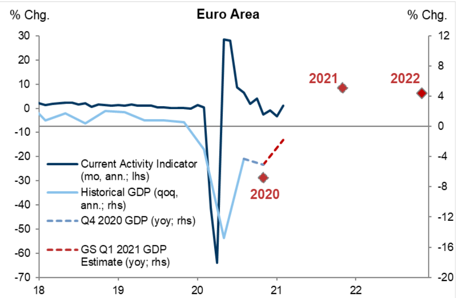
Goldman Sachs Global Investment Research.

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

GDP growth (%)	2021 GS	2021 Cons.	2022 GS	2022 Cons.
Global	6.6	5.4	4.7	4.1
US	7.0	4.9	4.5	3.6
China	8.0	8.4	5.7	5.5
Euro area	5.1	4.2	4.4	4.1
Policy rates (%)	**2021 GS**	**2021 Mkt.**	**2022 GS**	**2022 Mkt.**
US	0.13	0.14	0.13	0.19
Euro area	-0.50	-0.52	-0.50	-0.53
China	2.25	2.72	2.25	2.86
Japan	-0.10	-0.05	-0.10	-0.06

Markets

Interest rates 10Yr (%)	Last	E2021	E2022	FX		Last	3m	12m
US	1.38	1.50	1.85	EUR/$		1.21	1.21	1.28
Germany	-0.33	-0.30	-0.05	GBP/$		1.41	1.41	1.45
Japan	0.12	0.10	0.20	$/JPY		106	106	100
UK	0.75	0.65	0.80	$/CNY		6.44	6.40	6.20
Commodities	**Last**	**3m**	**12m**	**Credit (bp)**		**Last**	**2Q21**	**E2021**
Crude Oil, Brent ($/bbl)	67	70	70	USD	IG	91	92	88
Nat Gas ($/mmBtu)	2.9	3.25	2.75		HY	317	330	320
Copper ($/mt)	9,340	9,200	10,500	EUR	IG	96	90	85
Gold ($/troy oz)	1,788	2,000	2,000		HY	312	320	305

Equities

S&P 500	E2021 GS	E2021 Cons.	E2022 GS	E2022 Cons.	Returns (%)	12m	YTD	E2021 P/E
Price	4,300	--	4,600	--	S&P500	10.0	5.0	28.6x
EPS	$181	$174	$197	$201	MXAPJ	6.0	8.0	22.6x
Growth	27%	22%	9%	15%	Topix	2.0	5.0	22.9x
					STOXX 600	4.0	4.0	24.3x

Consumer	E2021 CPI (%, yoy)	E2021 Unemp. Rate	E2022 CPI (%, yoy)	E2022 Unemp. Rate	Wage Tracker 2020 (%) Q1	Q2	Q3	Q4
US	2.5	4.1	1.9	3.7	3.6	5.9	4.9	5.3
Euro area	0.9	9.9	1.2	8.7	1.7	--	--	--
China	1.1	--	0.6	--	-2.0	-0.6	4.0	5.3

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 February 24, 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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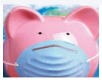

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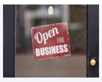

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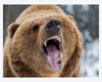

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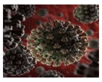

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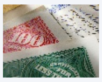

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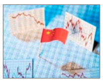

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