

CIO Strategy Bulletin

May 16, 2021

Does Technology Really Have an Inflation Problem?

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- The US economy has seen record volatility in the collapse and recovery from COVID. Employment and retail sales have seen record swings. In this temporarily distorted economy, should we really expect stable consumer prices? (We've invested to assume otherwise).
- The Nasdaq rose 47% in 2020 partly on extrapolation of COVID's powerful reallocation to technological solutions. The modest rise in interest rates has taken some steam out of the performance of growth shares.
- Making a massive shift into a still highly valued, "cooling" tech sector is not our strategy.
 However, the large dislocation in "unstoppable trends" is beginning to create opportunities for investors.
- The technology correction is underway. The ascent of value versus growth (mean reversion), the impact of higher rates on shares that must grow into their valuations, a glut of new equity including SPACs and retail investor dynamics suggest that further short-term weakness in areas like video gaming, telemedicine, and artificial intelligence is possible.
- With some of our unstoppable trends like health care technology and fintech down sharply from recent highs, we believe that preparing to leg into those areas will be a profitable strategy for long-term investors.
- While investments in video conferencing or home electronics may slow for a period, we expect
 continued spending in cyber security, fintech, and hardware investment as far as the eye can
 see. Meanwhile, we are less concerned about big tech concentration as earnings largely justify
 such a large weight in passive indices.

Does Technology Really Have an Inflation Problem?

Last Wednesday, the Nasdaq fell 2.7%. Many pundits pointed to the nearly 1% jump in April US consumer prices as the reason for the decline. The jump in prices was quadruple the gain expected by economists.

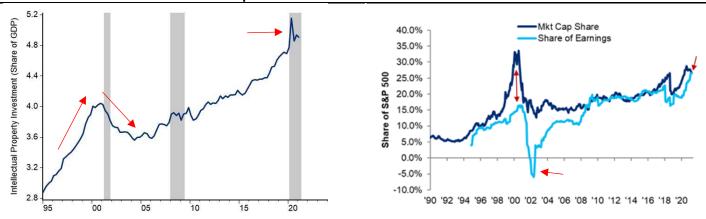
Last week, we highlighted the valuation pressures that have gradually emerged for US growth stocks as markets nolonger assume a zero cash discount rate in perpetuity. And we expressed our view that rates are likely to rise further when the full, new economic recovery gets underway across the world in the near future. But the mere fact that rates will rise does not spell the end of the rise of technology in the economy or doom tech share performance.

Bears like to point to the tech bubble of 2000 as the period most analogous to the one we are in now. The first problem with the comparison is that at that time, we were heading into a recession, not emerging from one. They point to the 78% drop in the Nasdag between early 2000 and late 2002 as a possibility. While that was a period of even higher valuations, at that time, as today, there were many experimental firms with unusual valuations. Looking back, however, we see the collapse in tech spending (Figure 1) as the source of the market implosion. So much of the spending in the run-up to 2000 was unviable telecom investment. And then there was the "Y2K" bug that turned out to be much ado about nothing. With the collapse in tech spending in 2001 and 2002, the sector was unprofitable during the recession (Figure 2).

Much of the meteoric rise of tech shares in 2020 reflected the benefits accruing to companies able to substitute for those most impacted by the pandemic (think food delivery and restaurants, streaming and cinemas). As investors, we have leaned into a cyclical recovery from the COVID collapse. We feared that expectations of endless growth in COVID's tech solutions were rising too far. Looking forward, however, we expect that a good portion of adaptations we've made to digital life will become the new normal (think Zoom versus phone and business travel. Figure 3). Are we really going back to the office five days a week?

Figure 1: Intellectual Property Investment as % of US GDP: 2000-2002 Bust vs "COVID Crimp"

Figure 2: IT Sector Market Cap and Profit Share of S&P 500 - Tech Bubble/Bust and Now



Source: Haver Analytics as of May 14, 2021. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary. "COVID Crimp": March 2020-now. Grey areas represent recessions.

1,000 900 800 Zoom Revenue (Millions) 700 600 500 400 300 200 100 03 '20

Zoom Revenues: Impressive Pre-Pandemic Growth: 92% Compounded pre-1Q 2020 Figure 3:

Source: Blomberg as of May 14, 2021. Past performance is no guarantee of future results. Real results may vary.

Will Policymakers Really Spur Hyper Inflation?

A year ago, US employment plunged by nearly 21 million, a decline that was equivalent to two decades of ordinary jobs growth. Monthly gains since then have been as large as 5 million, will only one monthly decline. As Figure 4 shows, the plunge and rebound is off the charts from previous experience. In other words, this is hardly a normal recession and recovery.

On the demand side, private wages have already eclipsed their pre-COVID level. Government income subsidies totaling nearly \$2 trillion added further to personal income. Unable to travel and eat out, people consumed every bicycle, dishwasher and 4K TV that could be produced and delivered. Discounts disappeared. This meant massive, unprecedented gains in retail goods sales (Figure 5).

Figure 4: US Employment, YoY % Change

10

5

0

-5

-10

Year-to-Year Percent Change

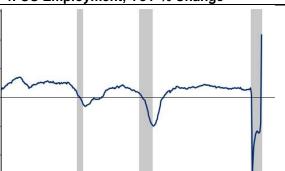
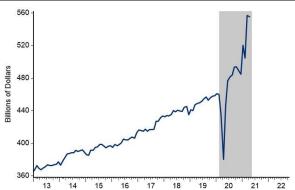


Figure 5: US Retail Sales Level (Nominal \$)



Source: Haver Analytics as of May 14, 2021. Grey areas represent recessions.

In this highly distorted world economy, with supply bottlenecks everywhere, is it reasonable to expect stable consumer prices in line with historical trends? (Figure 6). We do not think so. And when people can fly, drive, eat out and stay overnight at hotels, take summer vacations, ski freely and gather outside to see their families, will demand for electronics remain at these exaggerated levels. We do not think so. US airfares have risen 10% in May alone. If that happened for 6 more months in a row, there would be a lot of middle seats open for sure.

While we added Treasury Inflation Protected securities to global portfolios last year and increased our overweight further in March, we did not do so because we expected an endless acceleration in inflation. We did so precisely because we expected distorted gains in the Consumer Price Index (CPI) (Figure 7). As the services sector opens up, we can reasonably expect bottlenecks and shortages there after the unprecedented strength in goods wanes (Figure 8). Still, the end of COVID will see a boom in "Leave Your Home" activities and then a normalization in economic activity in the period beyond.

Figure 6: US Core Consumer Price Index and Retail Sales Y/Y%

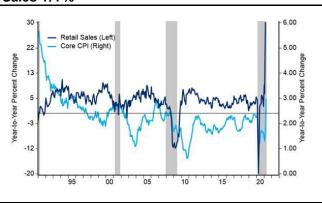
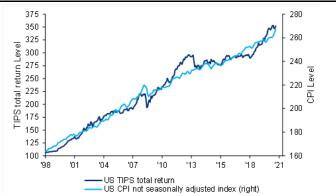
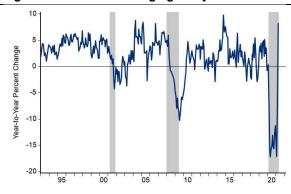


Figure 7: US CPI Index and Treasury Inflation Protected Securities



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Figure 8: US CPI for Lodging Away From Home Y/Y%



Source: Haver Analytics as of May 14, 2021. Grey areas represent recessions.

But US Rates Are Not Likely To Stay At Zero...

As we discussed in our Outlook for 2021, we believe the long period of secular disinflation has ended. This is largely because of a change in the Fed's long-run policy goals. But this does not mean the Fed will simply accommodate double-digit inflation. It does not mean multi-trillion dollar federal income supports in normal years.

If we are right, we should not expect the inflation readings of the COVID-distorted economy to represent the inflation readings of the post-COVID economy. After the 47% return the Nasdaq posted in 2020, there are better reasons than transient inflation to explain the more volatile and negative recent performance of tech.

A Turbulent Tech Tape

The technology correction is underway. In a post-COVID world, the tides that propelled these shares ever higher have ebbed. So, the question of when to buy tech again is on investor's minds. We ultimately believe that cheapening tech names with strong fundamentals are worth holding and potentially adding to core portfolios. This does not include speculative shares in unprofitable 'experimental' firms in industries, like EVs, where it is improbable that they can compete for the long term.

We do expect that there will be further near-term volatility and downside for tech in general. The ascent of value versus growth (mean reversion), the impact of higher rates on shares that must grow into their valuations, a glut of new equity including SPACs and retail investor dynamics suggest that further short-term weakness in areas like fintech, telemedicine, and artificial intelligence is likely. But with some names down 30-50% (or more) from recent highs, we believe that legging into those areas will make sense soon enough. In the interim, strategies that sell volatility in these companies can potentially generate portfolio income and enable better entry points if the selloff persists.

Making Sense of the Growth Technology Selloff

The term "tech" has become an increasingly broad and non-descript way to characterize a large swath of the equity markets in recent years. Once confined to the Information Technology sector, we now find true digital innovators in health care, industrials, communications services, and consumer discretionary. Even mature companies with traditional business models in retail, real estate, and manufacturing have increasingly remodeled their practices to incorporate digital product capabilities for large customer segments, interacting with them online.

To identify where the current stock market has been most punishing, we divided "tech" into the following global segments:

Electronics hardware

Application Software

Semiconductors

- E-commerce

Digital entertainment

Fintech

Cyber security

Health care technology

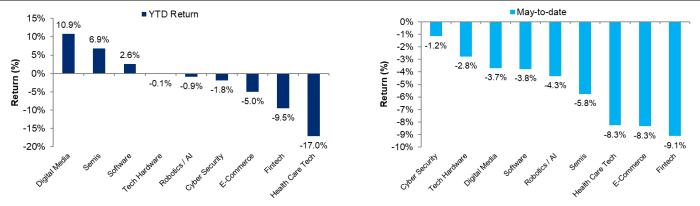
Robotics / AI

Through this simple lens we see significant dispersion. Digital media companies, which include large global names like Facebook, Google, and Tencent, have still delivered positive returns YTD as a group, while areas like health care tech, fintech and e-commerce are down more meaningfully (Figure 9). No tech sector has been spared so far in May (Figure 10).

We attribute the tech weakness to a combination of factors, including unsustainable near term expectations of growth, a rotation into cyclicals that benefit from reopening, concern around inflation and rising rates, potential changes in US tax policies, a surge in equity issuance and the presence of somewhat fickle retail momentum investors.

Figure 9: YTD Return by Tech Segment

Figure 10: Tech Returns So Far in May



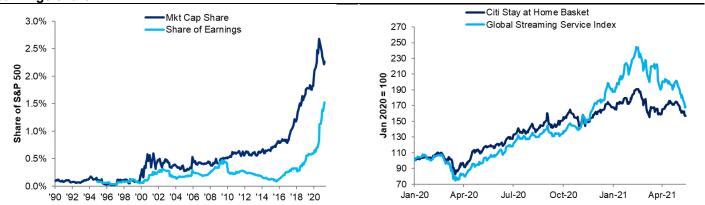
Source: Factset as of May 14, 2021. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary.

Momentum Is Unsustainable

Certain segments of the market had a brilliant run last year, extending well beyond their share of earnings as many investors over-estimated the length of time COVID would be with us (Figures 11-12). Markets are now re-evaluating this view, with valuations coming back to earth in certain secular growth areas that had run too far, too quickly.

Figure 11: Application software market cap and earnings share

Figure 12: Global streaming services return

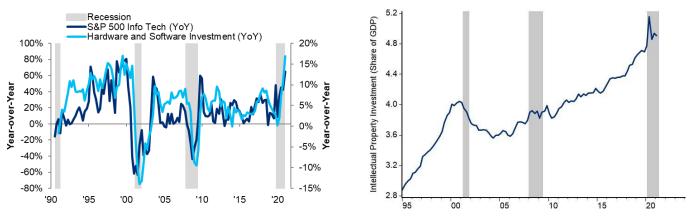


Source: Factset and Bloomberg as of May 14, 2021. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary. Global Streaming Service Index is an equal weighted basket of companies engaged in delivering digital entertainment content. Stay at Home tech basket is a subset of Citi's Stay at Home Index isolating only constituents engaged in delivering technology-related solutions during the pandemic. Constituents include Zoom, Docusign, Teledoc, Shopify, Activision Blizzard, Spotify, and Paypal.

While pockets of the tech market have certainly detached from fundamentals, those fundamentals are still positive for the sector long-term. Growth in tech earnings has been underpinned by continued investment in the hardware and software (Figure 13). While the surge in remote work-related spending last year is unlikely to repeat itself, we do not expect tech capital expenditures to decline in the years ahead. Investments in video conferencing or home electronics may slow for a period, but we expect continued positive growth in cyber security, fintech, and hardware investment as far as the eye can see. A return to the office will mean fewer zoom meetings, but video conferencing has likely permanently displaced some pre-pandemic in-person activities. These realities require that we ultimately retain core holdings in secular growth areas across the range of tech segments, as there will be no abatement in spending on Intellectual Property(IP)-based capital improvements (Figures 13 and 14).

Figure 13: IT investment was supportive of prices during the pandemic

Figure 14: IP Investment as share of GDP

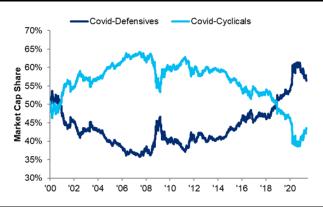


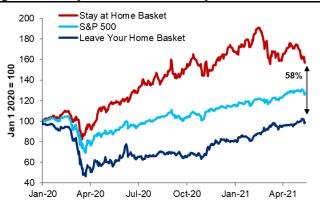
Source: Haver as of May 14, 2021. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary.

Still-elevated broad market indexes as we enter the seasonally weaker summer months could portend further downside for fast-growing tech names in the short-run. But as some companies investing in "unstoppable trends" like telemedicine, fintech, and artificial intelligence approach share price levels not seen since the early pandemic days — with nothing but accelerating sales growth over the past year — they will present attractive entry points for long-term minded investors.

When Mean Reversion Feels Mean

Last September, we highlighted that valuations in the technology space – broadly defined – had likely gotten ahead of fundamentals after a phenomenal rally off their March 2020 lows. Investors were piling into names that directly benefitted from lockdown-related activities, while avoiding services-oriented sectors that saw a deep, but ultimately temporary decline in business (Figures 15-16). Since the November election and the bond market awakening early this year, market consensus has dramatically shifted its attention to the real economy reopening. In fact, we remain a believer that mean reversion has not run its full course yet, but will do so over the coming months. That said, the significant selloffs in tech segments are likely to present an opportunity to add exposures.





60%

-40%

-60%

Source: Factset as of May 14, 2021. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary. Covid defensive sectors are IT+Amazon, Healthcare, Staples, Communications Services, Utilities. Covid Cyclicals are Energy, Materials, Industrials, Discretionary, Financials, Real Estate. "Stay at Home" basket includes names identified to benefit from COVID-related disruptions and a shift to working from home. "Leave Your Home" basket includes Citi Research Buy and Neutral Rated US names in the following sub-industries: Banks, Industrial Conglomerate, Machinery, Oil Gas & Consumable Fuel, Textiles Apparel & Luxury Goods, Energy Equipment & Services, Hotels Restaurants & Leisure, Building Products, Retail REITs, Construction & Engineering, Leisure Products, Airlines, Multiline Retail.

Higher Discount Rates and Negative Cash Flows Do Not Mix Well

Some of the fastest-growing and most innovative emerging companies today operate with limited cash flows available to equity investors. Upstart tech firms often invest their cash into activities that will drive top-line growth, build market share or develop a user base that should, theoretically, drive future earnings and value. It has been a tried and true formula for many companies and market leaders, but it comes at a price. Much like a bond with deferred coupon payments, such "long duration" growth stocks are quite sensitive to interest rates as a result. That's the math: the longer out positive cash flows are, the less value they have today. Valuations fall as rates raise and that's the story in markets, especially recently (Figure 17).

Given our expectation for 10-year US rates to rise to 2% in the coming months, further tech re-valuation may be warranted if the bond market selloff is as swift as it was in February and March of this year. However, we would also note that technology valuations – despite being a "growthier" segment of the market – have historically exhibited a positive correlation to interest rates (Figure 18). Positive rates are a signal for economic growth. Spending on upgraded software and hardware has traditionally moved in line with broader cyclical economic trends. Ultimately, we see this new economic cycle as no different once we exit the COVID-distorted period. A gradual, medium-term rise in rates, which simply reflects a strengthening economic backdrop, should not be a permanent drag on tech valuations or returns.

Figure 17: Growth factor vs 10-year yield Figure 18: Rates and tech valuations US Pure Growth Factor (Left) 0.0 2.0 10-Year Yield (Right, Reverse Scale 210 0.5 1.5 190 in Yield (%) 1.0 1.0 0.5 170 2010 = 1001.5 🙈 0.0 2.0 150 Change -0.5 130 25 ₹ 110 3.0 -2.0 -2.5 3.5 '05 '07 '17 '03 '09 '11 '13 '15 '19 Jul-18 Jan-19 Jul-19 Jan-20 Jul-20

Source: Bloomberg and Factset as of May 14, 2021. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary.

SPAC Speak: What It Means

Our special SPAC bulletin in early May identified the sectors most favored by SPAC sponsors in their efforts to take new, fast-growing companies public. The largest single business area benefiting from SPAC mergers has been tech, while the fourth most common de-SPAC has been in fintech (Figure 19). We also noted the dispersion in the fundamentals of these newly public firms, showing that a full 40% of recent SPACs have merged with companies have no revenue. These "pre-revenue companies" are labeled like used cars were, "pre-owned", implying that their status will ultimately be a benefit (i.e. "Get in early!" - Figure 20) Shares in these pre-revenue companies are so highly valued that they have become part of broad market indices and therefore have contributed to recent volatility in many technology-focused funds.

Whereas IPOs (both regular and SPAC-fueled) looked like easy money until recently, the Renaissance's IPO index, a popular indicator of recently issued shares, has fallen nearly 29% since its peak in mid-February, while Bloomberg's de-SPAC index is down 45% over the same period. Quality matters, as it turns out, and that is the reason why looking at indices as if they were indicative of "the" trend is a mistake.

Figure 19: Recent De-SPAC Business Models

Figure 20: Sales Figures for the Largest 25 Recent de-SPACs

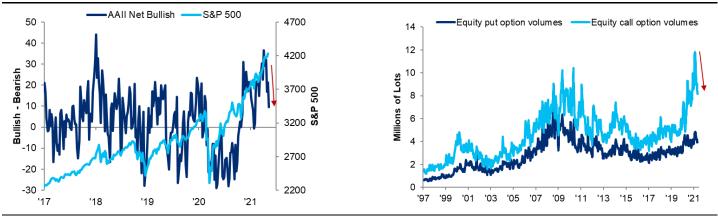
De-SPAC Business Models 25 220	2020 Revenues	Share	Avg Market Cap (\$mil)
<u>s</u> 20 - 0 15 -	>\$1bn	8%	10,998.40
	\$100-1bn	28%	7,452.40
	\$10-100mil	16%	4,209.08
Techtschule Leadiff Cale Vericles Cropic Reberted Eschellantes California Chee Carnadia	<\$10mil	8%	3,417.64
Techt Schwide teeth Cafe Weinder Heider Charles Lidderhad to See Constitute Control Control Controls	Pre-Revenue	40%	6,119.63

Source: Bloomberg as of April 30, 2021. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary.

The GameStop saga earlier this year demonstrated the demand for shares of both strong and weak companies. This has been a story about retail investors in the US, fueled by instant account activation, access to options trading and, of course, Washington's stimulus checks. Some new investors are in the "get rich quick" business, where online data sources and rumors fuel rapid trading and higher volumes in speculative names. Mobile trading platforms and being forced to work from home have exacerbated the retail segment's impact on markets. We noted just a few weeks ago that rising trading volumes in both equities and single name equity call options were evidence of their presence.

In the past month or so, we have seen a decline in this retail bullishness and speculative activity. Losses tend to diminish the capacity and appetite of short-term traders. Thus, the use of single name equity call options to make levered long bets has also declined (Figures 21-22). It turns out that retail investors are not particularly good market timers, either. Their ability to spot when markets go negative is no better than average. One is better off being able to make money in rising and falling markets in order to trade profitably. We see this same phenomenon among retail investors in the booming (and highly speculative) cryptocurrency market.

Figure 22: Single Name Equity Call and Put Option Volume

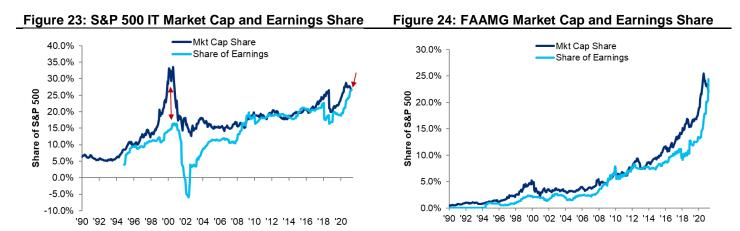


Source: Haver as of May 14, 2021. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary.

Tech Leaders and Tech Concentration

<u>Last fall</u>, we cautioned against having too much exposure to tech in portfolios, as the divergent performance between COVID-cyclicals and defensives -- including Tech -- reached unsustainable levels. While we continue to expect a cyclical recovery over the coming months, we are not worried about the relative value of technology in the indices (i.e. concentration). Unlike the late 1990s bubble period, a full quarter of S&P earnings are generated by software, hardware, and semiconductor firms, largely justifying a similar 25% share of market cap (Figure 23).

The fact that the largest 5 companies in the world (Apple, Microsoft, Alphabet, Amazon, and Facebook) make up 24% of S&P 500 earnings and 23% of market cap would be a concern if their earnings and payouts were not rising proportionately, but they are (Figure 24). And we see no lack of re-investment for future growth in any of these names.



Source: Factset as of May 14, 2021. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary. FAAMG refers to the largest 5 companies globally by market cap: Facebook, Amazon, Apple, Microsoft, and Google

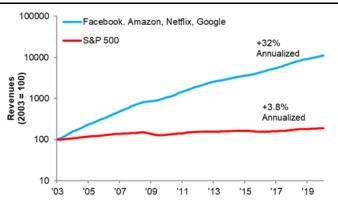
Don't Buy The "Dip in Tech", Buy the Unstoppable Tech Winners

Significant selloffs in secular growers are neither new nor surprising. As we outlined above, evolving macro dynamics, a rush of new supply in the space, and simply buyers' exhaustion can all precipitate sharp selloffs that follow significant rallies. During the last economic cycle, we often saw significant declines among secular growth areas within social media, e-commerce, search, and streaming (Figure 25). All of those dips turned out to be fantastic buying opportunities, as the underlying fundamentals of strong revenue and profits growth continued unabated (Figure 26).

Figure 25: Historic Drawdowns in Secular Growth names

Figure 26: Sales Growth among Last Cycle's Secular Growers





Source: Factset as of May 14, 2021. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. This should not be construed as an offer of, or recommendation of companies discussed Past performance is no guarantee of future results. Real results may vary.

Nothing will stop innovation and growth in new start-ups from Silicon Valley to Shenzhen. Companies with strong products, innovative offerings, and bright talent will continue to emerge and capture market share, much like Zoom and Teledoc have done in the past year as they capitalized on significant business and consumer needs created by the pandemic. Companies that benefitted from lockdowns whose business models will be sustained are excellent prospects for future appreciation. Video conferencing software, grocery delivery, telemedicine services, mobile entertainment and electronic payments are such potential winners. With share prices in some of these names trading at levels not seen since mid-2020, and in some cases trading at pre-pandemic levels, we see opportunities for long-term investors to begin legging into exposure to digital technologies that are most likely to be permanent parts of the economic fabric going forward (Figure 28).

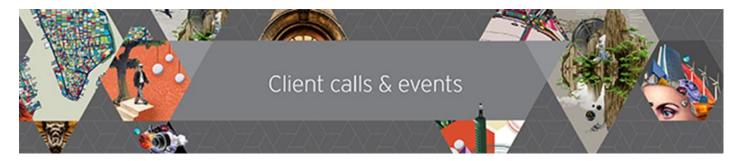
Figure 27: Tech Segment Valuations



Figure 28: Stay at Home Tech Basket



Source: Factset and Bloomberg as of May 14, 2021. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary. Stay at Home tech basket is a subset of Citi's Stay at Home Index isolating only constituents engaged in delivering technology-related solutions during the pandemic. Constituents include Zoom, Docusign, Teledoc, Shopify, Activision Blizzard, Spotify, and Paypal.



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