WealthShield

2021

MARKET OUTLOOK

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APPENDIX

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THE MIKE TYSON PORTFOLIO

"Everyone has a plan till they get punched in the mouth"

- Mike Tyson

Source: Focus on Sport/Getty Images

In a 2012 Sun-Sentinel article by Mike Berardino, the author talks with Mike Tyson about the famous quote above.

"People were asking me [before a fight], 'What's going to happen?,' " Tyson said. "They were talking about his style. 'He's going to give you a lot of lateral movement. He's going to move, he's going to dance. He's going to do this, do that.' I said, "Everybody has a plan until they get hit. Then, like a rat, they stop in fear and freeze.'"

What is interesting about this quote is that it applies to all of life. It is not about getting punched in the mouth. It is instead about the truth that things happen, and you have to be resilient enough to roll with the punches. Sometimes things do not go as planned. What defines us is how we react when we are punched in the mouth. Do we pick ourselves up and move on or do we quit?

2020 was a year of punches. 2021 is hopefully the year where humanity demonstrates its incredible resilience. My hope is that our partner firms will guide their investors to take advantage of the opportunities that have presented themselves in the aftermath of the COVID 19 pandemic and subsequent response. The response which saw record amounts of money supply flood the market to keep asset prices elevated. A response which resulted in rampant speculation in global stocks. A response which accelerated the largest asset price bubble in the history of the US economy.

The opportunities are plentiful, but we believe they are not where most are looking. What has worked over the last 10 years has been investing in primarily large US publicly traded equities. The best performing index was the Nasdaq 100, as the Fed's continued rolling QE program and global central bank asset purchases created a massive incentive to buy duration. Therefore, growth assets (i.e., the Nasdaq 100) were direct beneficiaries. The Swiss National Bank's top five holdings are all US technology stocks, with the largest market capitalizations in the world.

Now, growth stocks are trading at such elevated multiples that returns could be lower than desired over the long-term. The S&P 500 (which is dominated by the mega cap technology names) is the most expensive it has ever been, according to several valuation metrics. The justification for these elevated valuations has been low interest rates, however that logic is flawed. Low interest rates just mean that both stocks and bonds are highly valued and priced for low returns.

S&P 500 VALUATIONS

S&P 500 Valuations

Model Factors	Most Recent Value	Historical Percentile
Median EV to Sales (Ex-Financials)	4.0	100%
US Total Market Cap to GDP	170%	100%
EV to Free Cash Flow Margin-Adjusted (Ex-Financials)	48.8	100%
Median Price to Sales	2.8	100%
Median Price to Book	3.9	100%
Median EV to EBITDA (Ex-Financials)	15.0	100%
Aggregate EV To Sales	3.0	100%
Aggregate EV to Trailing 12M EBITDA	17.5	100%
Aggregate EV to 2021 EBITDA Estimate	15.9	100%
Aggregate Price to 2021 Book Value Estimate	3.8	100%
Aggregate Price to Tangible Book Value	12.8	100%
Aggregate Price to Earnings	27.9	98%
Cyclically Adjusted P/E (CAPE)	32.9	97%
Aggregate Price to 2021 Earnings Estimate	25.6	97%
Aggregate Price to Book	3.9	91%

Source: Bloomberg, Yale/Robert Shiller, John Hussman *Numbers as of November of 2020 ©2020 Crescat Capital LLC

Figure 1: S&P 500 Valuations; Source: Bloomberg, Yale/Robert Shiller, John Hussman; As of November 2020

Figure 2: S&P 500 vs. Exponential Regression; Source: Bloomberg

That brings us to the first major long-term theme for 2021 (and beyond); invest in real assets over financial assets. By real assets, I mean things like commodities, bitcoin, and real estate. Financial assets, like stocks and bonds (with with a few exceptions) are priced for perfection. Commodities are at a historic low relative to stocks. Real estate is at the same level relative to the S&P 500 that it was in 2005. Bitcoin has gained a ton of institutional interest as a store of value on the back of rampant money supply creation. According to the Plan B Stock to Flow model, Bitcoin is significantly undervalued. Scott Minerd of Guggenheim believes Bitcoin is worth $400,000 due to its scarcity and rising demand. The S&P 500, for comparison purposes, is priced for negative returns over the next 12 years according to the market capitalization to GDP ratio (Buffett Indicator).

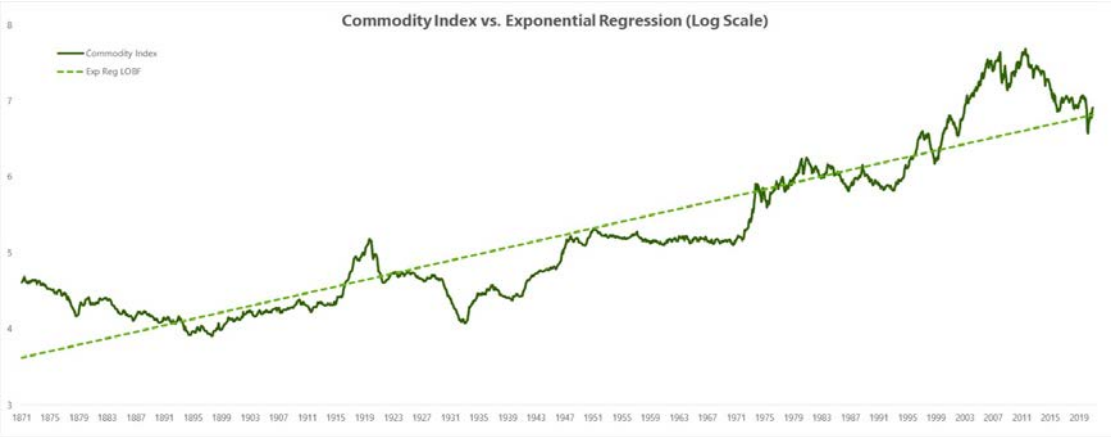

Figure 3: Commodity Index vs. Exponential Regression; Source: Bloomberg

The second long-term WealthShield theme is private over public. Public assets, for the most part, are overbought, overvalued, and sentiment is over bullish. This is partially because of ease of access and the proliferation of "passive" or ETF investments.

Private assets, especially those that generate sustainable and growing cash flows, are attractive on an absolute and relative basis. In our opinion, the key here is to allocate to managers with definable competitive edges. Private assets remain to be an area where active management can make a positive impact on returns. Private equity and private real estate are positioned well for managers who are prudent and value oriented.

Figure 4: Developed Markets vs. Exponential Regression; Source: Bloomberg

The next major WealthShield theme is global assets over US assets. This is across public and private investments. The US stock market has dominated the global stock market since the global financial crisis. Now, international stocks (especially emerging markets) are cheap relative to their US counterparts. Furthermore, US investors are under allocated to global equities. Valuation differences are also present in private assets. Global private investments, in our opinion, offer a better return opportunity than domestic assets presently.

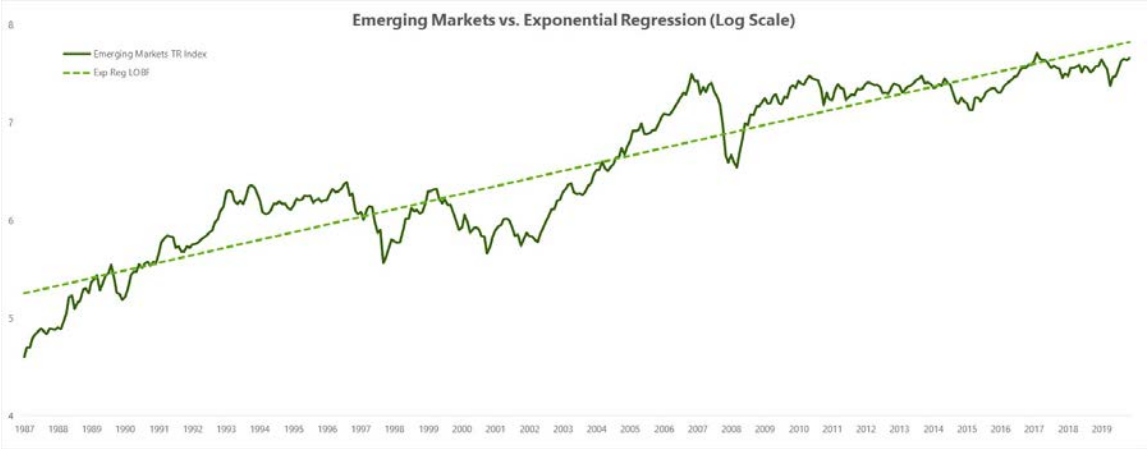

Figure 5: Emerging Markets vs. Exponential Regression; Source: Bloomberg

Small companies could also offer a compelling opportunity from a valuation perspective relative to large caps. If you look at large cap US stocks versus small cap US stocks, it is clear that large cap has dominated, especially when comparing small cap value to the Nasdaq 100. This underperformance accelerated over the last couple of years as the global economy entered a slowdown in 2018. Small caps are not only attractive in the US, they are also interesting globally. It is not just public stocks either. Small companies are interesting from a debt perspective and as private investments.

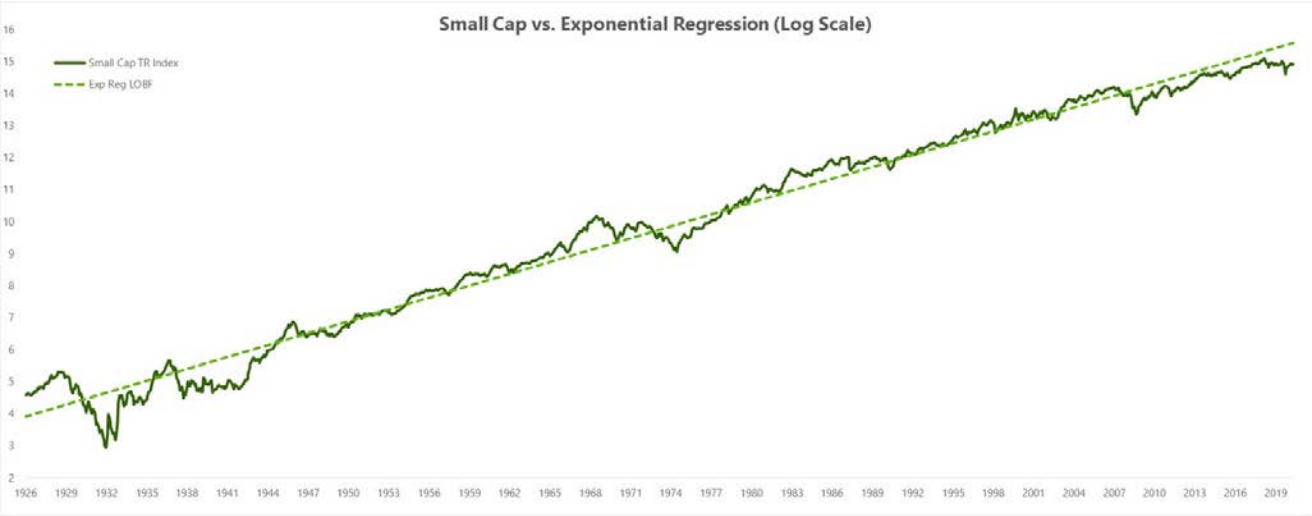

Figure 6: Small Cap vs. Exponential Regression; Source: Bloomberg

Lastly, we don't think value is dead. The conditions have simply been optimal for growth assets. However, now value has underperformed growth on a rolling 10-year basis more than any time in history. Heading into an economic recovery, value tends to outperform and could be an interesting play. Getting back to buying companies below intrinsic value and having a margin of safety is probably a prudent idea given the speculative euphoria we are witnessing in some assets. Just like the other themes mentioned, the opportunity in value investments is not just reserved for US public equities. It can apply across asset classes, geographies, and also apply to private assets. Value investing is a discipline that has been out of favor for some time.

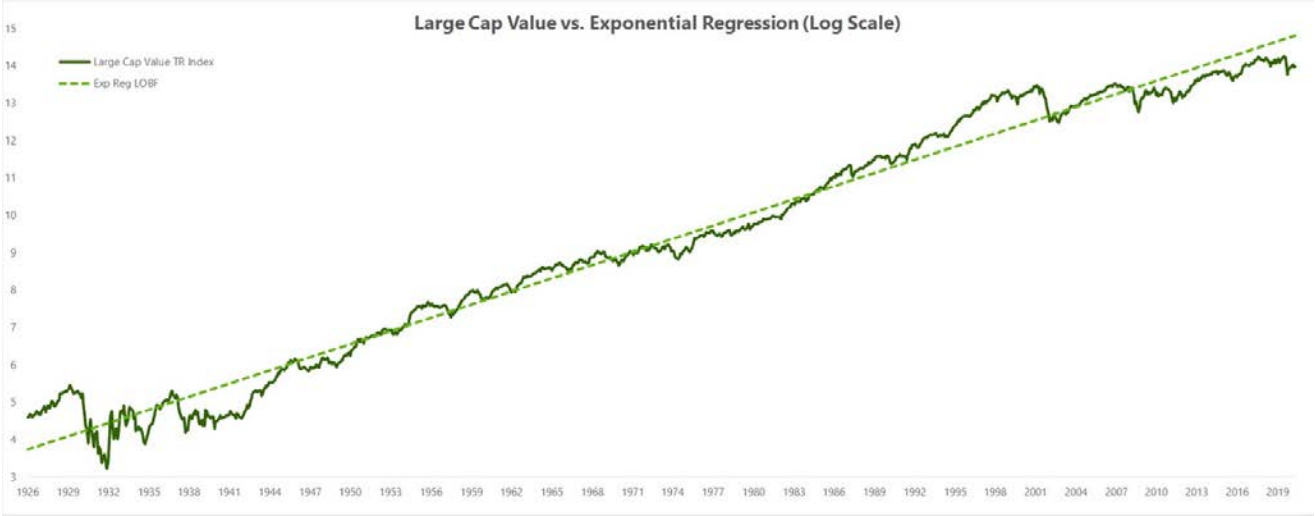

Figure 7: Large Cap Value vs. Exponential Regression; Source: Bloomberg

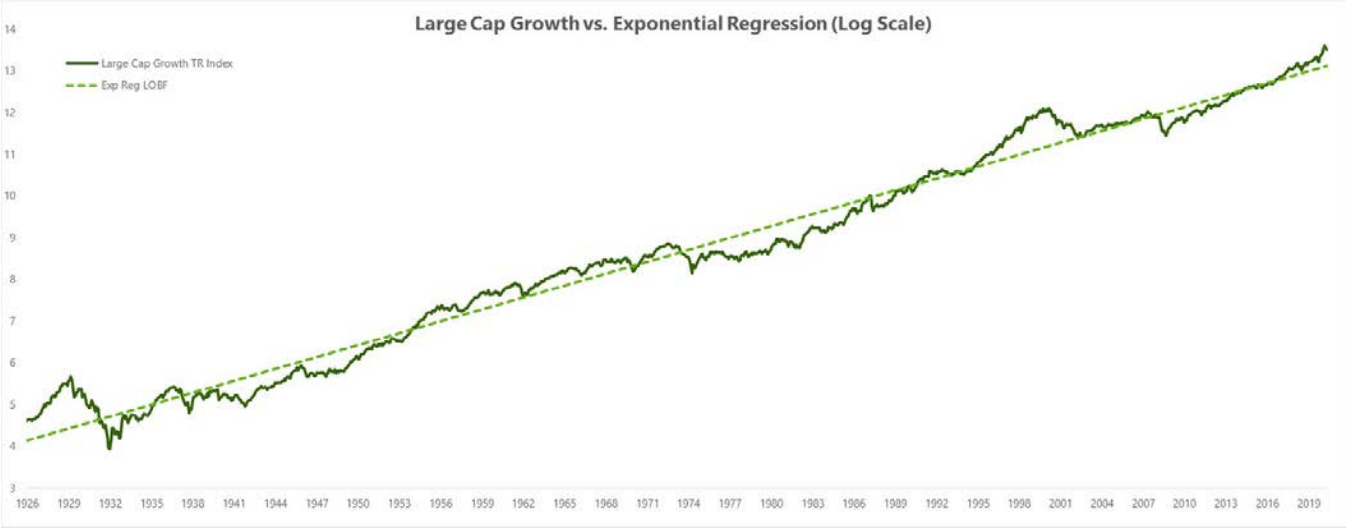

Figure 8: Large Cap Growth vs. Exponential Regression; Source: Bloomberg

We ultimately encourage our partner advisors to build a Mike Tyson portfolio. That means that even though we expect the above opportunities to manifest in the global markets over the years to come, we have to be prepared to be wrong. Anything can happen. Unexpected punches will come our way. We commit to focusing on building a resilient portfolio that can roll with the punches. The way to do that is to diversify.

Diversification doesn't just apply to spreading an investment across different asset classes and sub asset classes. We think it is also important to invest across systems as well. One of the best ways to do that is to add trend following to a portfolio. That is where our tactical playbook comes in. Tactically, we want to be in the exposures that are the strongest. Trend following is essentially betting on the strong getting stronger. An object in motion stays in motion.

Despite popular belief, trend following is not some sort of crisis alpha. It is a way to diversify exposures and historically has a low correlation to long-only equity strategies. Behaviorally, adding trend following is tricky. Clients often anchor to long only equity indices when comparing how trend following strategies are performing. Therefore, too heavy of an allocation in a client portfolio, although optimal mathematically (if you are searching for the best historical return to risk ratio) is not compatible with investor psychology. Our recommendation is making it enough of an allocation to matter to the portfolio but not enough for a client to focus on. That is probably around 10-30%.

Performance characteristics of the 60/40 portfolio and a portfolio with 80% invested in the 60/40 portfolio and 20% invested in the time series momentum strategy, from January 1880 to December 2013				
	Annualized Net of Fee Return	Annualized Realized Vol	Max Drawdown	Net of Fee Sharpe Ratio
60/40 Portfolio	7.8%	10.8%	-62.3%	0.38
80% 60/40 Portfolio, 20% Time Series Momentum Strategy	8.5%	8.8%	-50.2%	0.54

Source: AQR. Time Series performance is hypothetical as described above. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix. The 60/40 portfolio has 60% of the portfolio invested in the U.S. Equity Market and 40% invested in U.S. 10-year bonds. Past performance is not a guarantee of future performance

Figure 9: Performance Characteristics; Source: AQR

Scientifically, when something gets too far away from equilibrium, it becomes susceptible to shocks. The S&P 500 and Nasdaq 100 are now at valuation extremes that would suggest a far departure from fundamental fair value (equilibrium). Thus, another way to diversify a portfolio would be to add an active volatility strategy to protect against sudden and violent market reactions. These strategies are built to do one thing and one thing well, capitalize on the observation that volatility clusters. Having a portion of the portfolio in this type of investment could serve as a sleep aid.

When surveying our long-term investment themes, they can be summed up as allocating to exposures that have been out of favor. What has worked so well over the last 10 years will most likely not be what works over the next 10 years (in our opinion). Long-term it pays to be a contrarian. It is hard to do though and so diversifying across trend following and active volatility strategies (as satellites) could serve to build a portfolio that can take a punch. A resilient portfolio. A Mike Tyson portfolio.

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INCREASED VOLATILITY IS A PROBABLE OPTION

DAVID STEFANICK, CFA® - Director of Research

If you read a market related headline or checked your account value through 2020, you know that it was a year filled with volatility. Prices of assets swung wildly throughout the year as COVID uncertainty and massive stimulus created headwinds and tailwinds like few we've experienced in market history. This volatility brought some indicators and metrics that often aren't as widely understood, such as options and VIX data, to the forefront of financial news for the general investing public. Our team has received far more questions on options and volatility this year than in years past, so we wanted to share a snippet of some of the interesting trends we're seeing in that space.

To start, an option is the option to purchase or sell an asset at an agreed upon price. There are a few reasons for an investor to want to trade options. First, an investor may want to hedge performance of an asset. Say for instance I own a substantial amount of Apple stock, but I'm worried about the upcoming news event or their next two quarters of performance, I can purchase a put option to mitigate my downside risk in Apple over the defined period. A second reason to use options is for income generation. For example, if I still own my Apple stock, I can sell call options against my shares to generate income. While it'll mitigate my upside potential in Apple, it generates income to my portfolio. A third reason to use options is for leverage. Equity options contracts are typically structured as 100 shares of the underlying asset. That means that for a mere fraction of the price, investors can gain significant exposure to an asset. This leverage couples with a fourth reason to use options; speculation. Speculative trading in options is when an investor trades options based off their discretion or a system, in an attempt to make money off of the transaction. While speculative trading is sometimes done by larger professional money managers, it is most frequently associated with retail investors trading small numbers of contracts looking for a lottery ticket.

Options activity overall spiked dramatically last year. The below chart shows the approximately 50% increase we saw in option volume in 2020.

Figure 1: US Option Volume (100d Moving Average, Millions of $) Source: Bloomberg

So, what do options have to do with volatility? We've seen articles this year highlighting retail options trading as never before, and Reddit and Finmeme accounts have brought option trading to the younger retail masses. Options are a two-party agreement; where there is a buyer of an option, another party must sell that option. While speculative traders may be purchasing call options on a stock without hedging their risk at all, the other side of that option is typically a dealer or market maker with multitudes of analysts and computers generating risk assessments to mathematically win over the long term. As such, their team isn't selling a retail investor an option and sitting around hoping for the price to go in their favor. Their team is hedging that risk.

There are two primary "Greek" variables that would help an investor hedge the risk of their options position: Delta and Gamma. Delta is the amount that an option's price should move given a $1 change in the underlying asset. Gamma is the rate of change of that Delta. To effectively hedge their options position, an investor must hedge for both variables. While we could spend pages describing the research and calculations that go into hedging for these variables (which can be dense for even our team) the most important thing to note is the relationship. As more options are purchased, the dealer on the other end of that option has to hedge by buying or selling the underlying asset (or exposure to that asset through derivates). So, when a trader purchases a call option, the dealer who sold that call option hedges their risk of the asset rising by purchasing that same asset. The Gamma Exposure (GEX) tracks this data, monitoring the number of shares that will come to market per a +/-1% move. If GEX is positive, shares will push against the prevailing direction, acting like a brake on volatility. If GEX is negative, shares will push with the prevailing direction, acting like an accelerator.

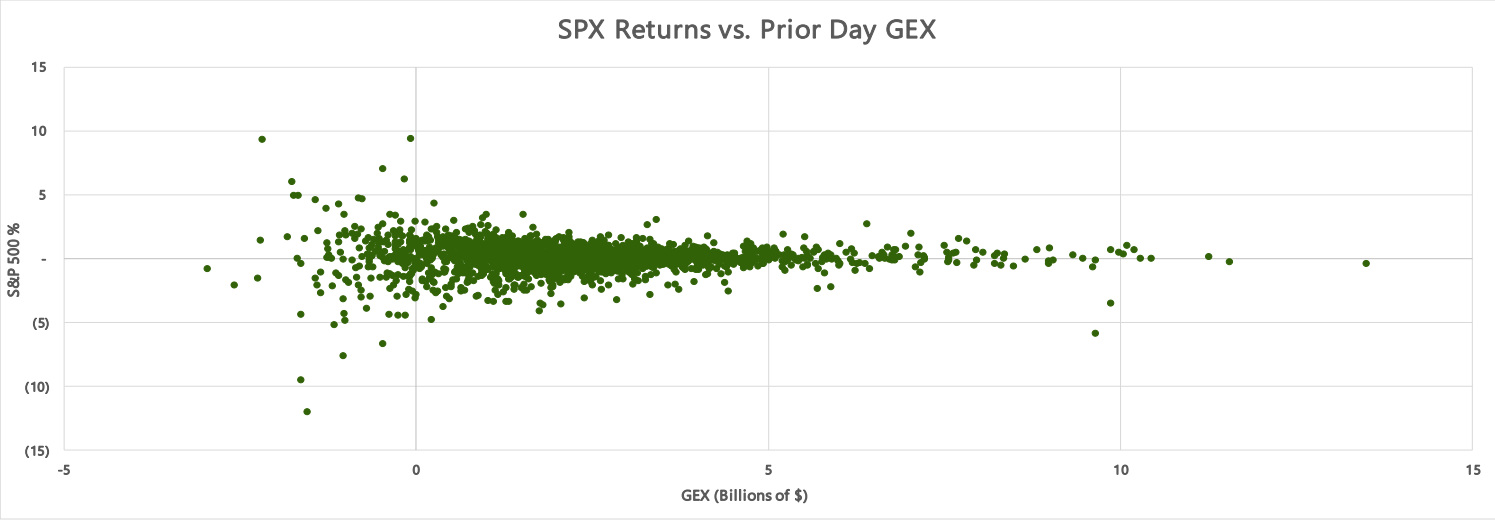

Figure 2: SPX Returns vs. Prior Day GEX; Source: Squeezemetrics.com

This chart shows the dispersion of S&P returns since GEX was first recorded in 2011. Clearly, when a day's GEX is high, the following day's S&P price action tends to be around that 0% mark. However, when GEX is negative, particularly as it moves further away from zero, we see the following day's S&P price action is substantially more volatile. This shows that the Gamma is acting in that accelerator fashion, creating wild days in the market.

Looking at GEX trends through the years, we see increases in the average and standard deviation of GEX. The increase in average would seem favorable. As we saw above, that generally means lower volatility in markets. However, the increase in standard deviation of GEX means we may experience increasingly negative GEX days, which we've seen can increase volatility of S&P price action.

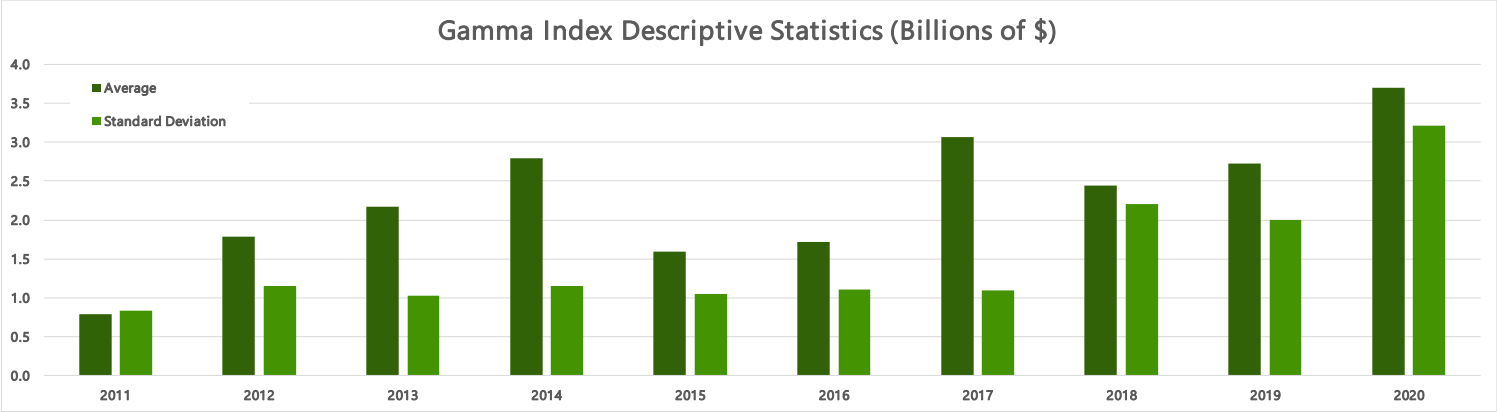

Figure 3: Gamma Index Descriptive Statistics; Source: Squeezemetrics.com

Finally, our team specifically examined the negative GEX days. We can see from this data that the median and minimum have been lower (more negative) over the most recent few years than in years past. This tells us that those substantial swing days may continue or increase.

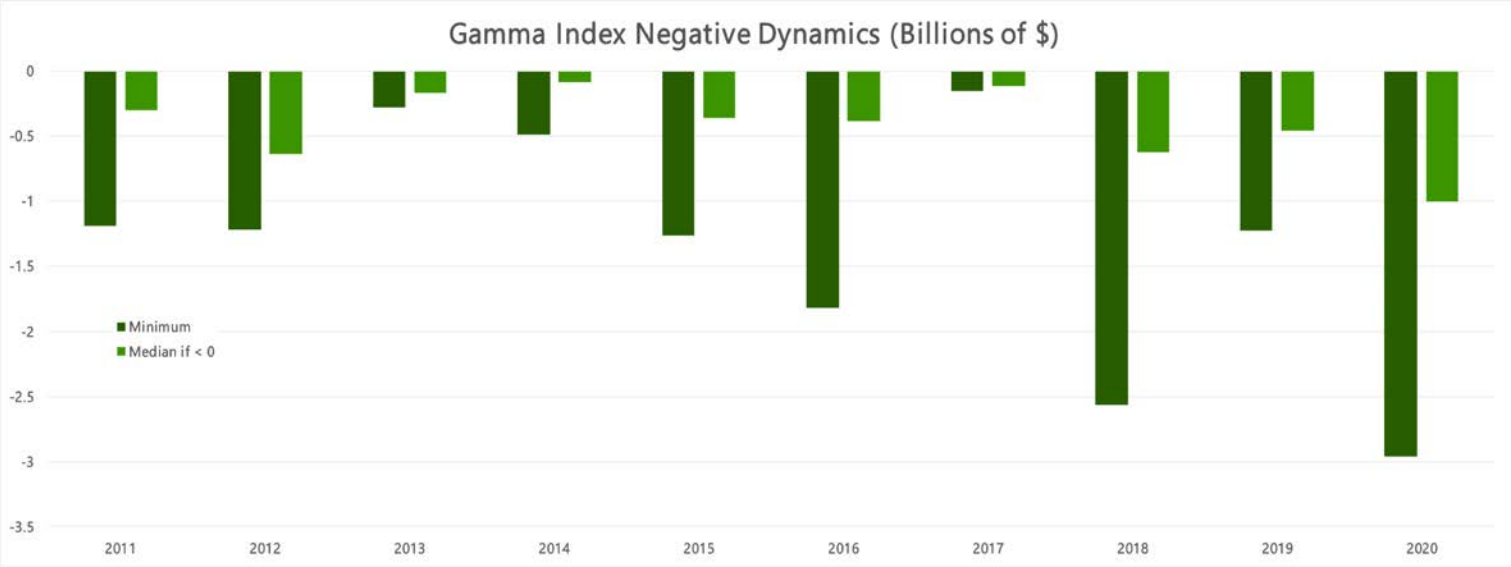

Figure 4: Gamma Index Negative Dynamics; Source: Squeezemetrics.com

So where does this leave us? Well, we know that GEX's formula is (GEX = sum(gamma*open interest)) for all options on the S&P, which we also know have been increasing. Given that we have this formula, we can generally say that as there are more options, we should expect a higher absolute value of GEX. We've evaluated the results of higher values of GEX both positively and negatively, so it's safe to assume that if options activity continues as it did in 2020, we should expect volatility and extreme highs and lows to continue.

WEALTHSHIELD

INITIAL PUBLIC OBSESSION & EXTREME SPAC-ULATION:

WHAT TO MAKE OF INVESTOR EUPHORIA FOR IPOS & SPACS

MAX ROCKWELL - Senior Investment Consultant

According to the Chinese Zodiac, the year 2020 was the year of the Rat. However, we think one could argue that 2020 was in fact the year of liquidity. With record amounts of central bank intervention in response to devastating circumstances, it is hard to argue that it shouldn't be recognized as such (Sorry, Mr. Rat!). Alongside that liquidity has come an incredible increase in the amount of capital raising for companies. Investors appeared quick to forget the WeWork IPO debacle of 2019 and rushed at the chance to own a piece of some of the hottest companies. The fervor of investors to own these companies led 2020 to see record numbers of initial public offerings (IPOs) and brought about the return of the special purpose acquisition company (SPAC).

IPOs took place in 2020 at an astonishing pace. As evidenced below, the year was a banner year for both number of companies brought public and money raised. All the money that was injected into financial markets had to go somewhere right? It certainly looks like it found its way to these new companies, undoubtedly fueling the TINA ("There Is No Alternative") equity narrative at the same time.

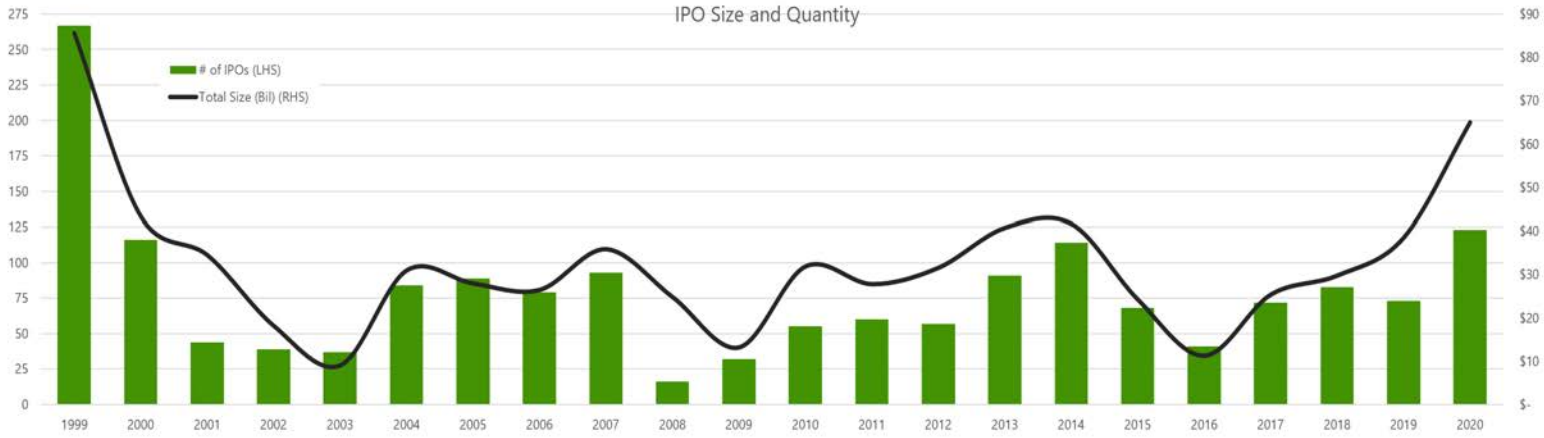

Figure 1: IPO Size and Quantity; Source: Bloomberg as of 12/31/2020. Initial Public Offerings greater than $100mm USD.

It was not just money raised for these companies, but it was the continued demand in these companies that was also astounding. Investors continued to pour money into these companies driving returns of these stocks quite heavily. IPOs in 2020 had some of the highest median returns ever witnessed, registering the highest one-week median returns in the past 21 years. Pre-market returns and one-day returns for IPOs were also standouts and were bested by only one year in the past. What year was that, might you ask? 2000.

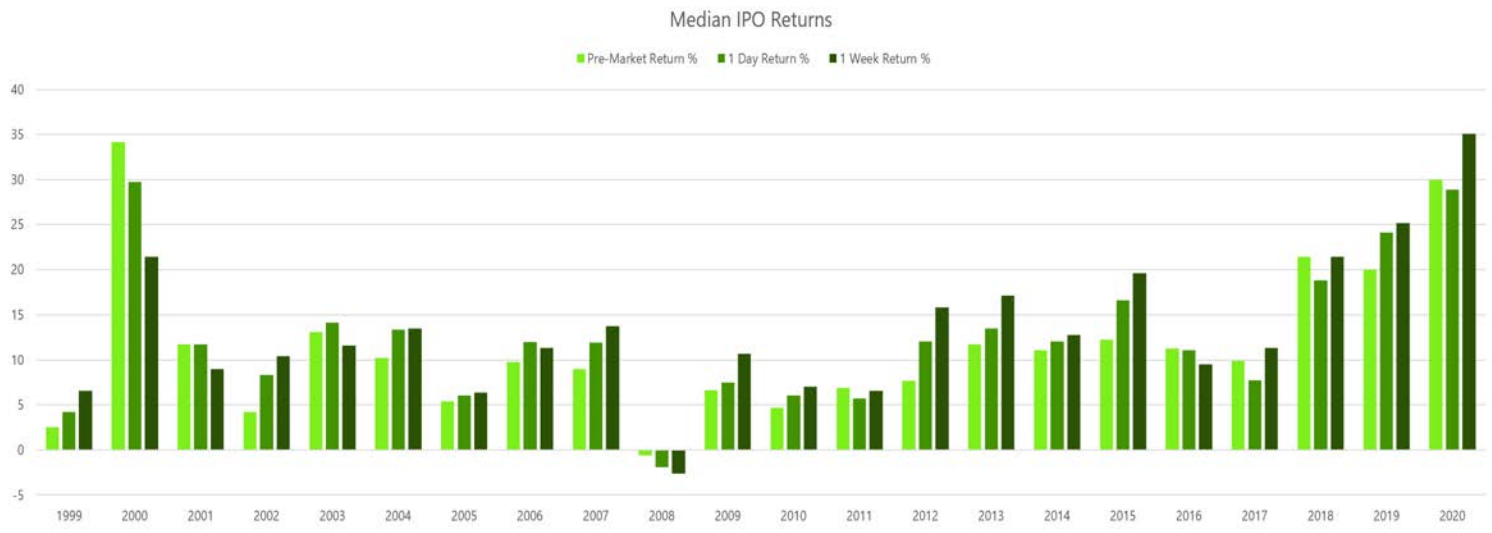

Figure 2: Median IPO Returns; Source: Bloomberg as of 12/31/2020. Offer price to Closing price of Initial Public Offerings greater than $100mm USD.

The traditional IPO was not the only type of capital raising that was in vogue last year. Special purpose acquisition companies (SPACs) made a triumphant return to the spotlight in 2020. For those of you not familiar, SPACs are companies created specifically for the purpose of acquiring another company and have been around for over 20 years. They are commonly referred to as blank check companies because they raise capital with no specific company in mind to purchase. Investors are putting their faith in the SPAC management teams and their ability to identify and purchase a target company, effectively handing them a blank check. After proceeds are raised, they are placed in a trust as the SPAC searches for a company. The SPAC typically has a two-year timeframe to complete the purchase of company, at which point if no company is purchased funds are returned to investors.

2020 was a remarkable year for SPACs, breaking records for the number of SPAC IPOs in a single year, highest amount of SPAC proceeds raised, highest average SPAC IPO size in a year, and largest SPAC IPO on record [2].

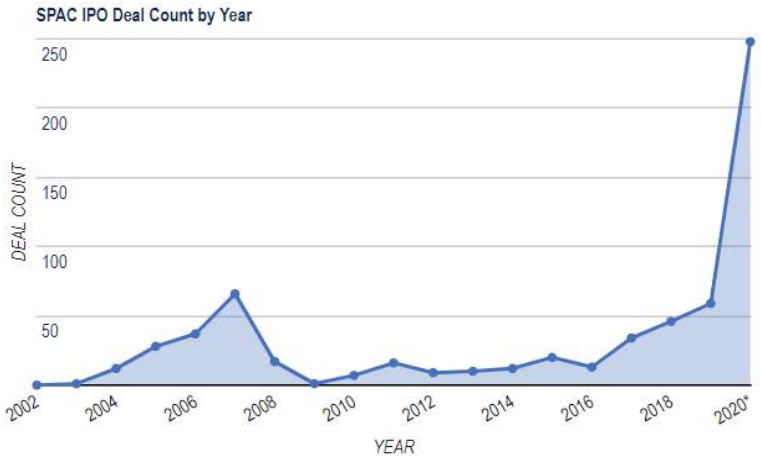

Figure 3: Source: SPACInsider as of 1/4/2021

What is behind the SPAC euphoria? It is difficult to pin it on one single reason. Rather than a single factor contributing to the record-breaking year, we could be living in the perfect storm for SPACs. Record amounts of liquidity, investors obsessed with the hottest private companies, and market volatility might be the ideal combination that has created a SPAC-friendly environment. As liquidity has been pumped into the financial markets, it has needed to go somewhere. While dry powder has continued to mount, investors have become obsessed with private companies promising exponential growth. These investors appear to be very inclined to give their money to SPAC management teams who may be able to land one of these coveted private companies. Market volatility may be the stealth factor playing into SPAC popularity. Volatility tends to postpone a company's plans for a traditional IPO as valuations compress and interest levels wane. SPACs offer another avenue for these private companies to gain access to capital and often at a faster pace than other methods [4].

With all the hype around the latest IPOs and SPACs, should investors be concerned? A crystal ball would certainly come in handy to answer this, but we believe the short answer is that investors should proceed with caution given the risk involved with these types of investments. According to a study by YCharts, only 38% of IPOs have had better performance than the broader market [1]. Further, SPAC common stock returns since 2015, post-acquisition, have averaged roughly a 1.4% loss [3]. Despite the relatively dull outlook for most IPOs and SPACs, it has not dissuaded investors from piling into these names.

Snowflake (Ticker: SNOW) and DraftKings (Ticker: DKNG) are two standout examples for 2020. SNOW, which debuted via an IPO, has garnered a price-to-sales ratio of roughly 172 as of 1/4/2021. DKNG, the product of a SPAC merger, has garnered a price-to-sales ratio of roughly 39 as of 1/4/2021. Compare these with the price-to-sales ratio for the Russell 1000 Growth index of 4.28. Said differently, investors are now willing to pay $172 and $39 respectively for $1 of sales for each of these companies compared to a willingness to pay about $4 for the average company in the Russell 1000 Growth index (Source: Morningstar as of 1/4/2021). Perhaps this time is different and the promised growth stories of these companies will pan out. However, as the saying goes, history doesn't repeat itself, but it rhymes.

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THE FEDERAL RESERVE CREATES A "BUY THE DIP" MENTALITY

LUKE VERNON, CFA® - Research Analyst

This year we found the "check mark" shaped recovery in the S&P 500 to be extremely interesting and indicative of choppier markets and stimulus dependency. In this article we compare this year's market downturn and recovery to previous bear markets and the downturn and recovery in 2018/19 to identify trends in market movements over the past 20 years. Spoiler alert: we make some compelling findings.

The behavior of the market downturns and recoveries are clearly trending toward a quicker and choppier pace. During the tech bubble, the S&P 500 TR index fell 47.4%, taking 768 calendar days to move from peak to trough. Peak to trough took less time during the financial crisis, even less time during the 2018/19 selloff, and significantly less time this year during the 2020 lockdown. This makes sense due to changing market participants and vehicles, information flow and trading technology. Specific to 2020, the lockdown reaction was not limited to just one sector or industry, it appeared to be a halt to nearly all parts of the global economy, impacting virtually everyone. See data below; all data is from the S&P 500 total return index; therefore, numbers appear higher than the standard price index.

Observations	Tech Bubble	Financial Crisis	2018 - 2019	2020 Lockdown
Peak Price	$ 2,108.76	$ 2,447.03	$ 5,794.72	$ 6,886.47
Peak Date	9/1/2000	10/9/2007	9/20/2018	2/19/2020
Trough Price	$ 1,108.91	$ 1,095.04	$ 4,868.30	$ 4,559.50
Trough Date	10/9/2002	3/9/2009	1/3/2019	3/23/2020
Recovery Price	$ 2,114.36	$ 2,449.08	$ 5,815.04	$ 6,895.59
Recovery Date	10/24/2006	4/2/2012	4/12/2019	8/10/2020
Peak to Trough TR	-47.41%	-55.25%	-15.99%	-33.79%
Peak to Trough # of Days*	*768*	*517*	*105*	*33*
Peak to Trough Average TR/Day*	*-0.06%*	*-0.11%*	*-0.15%*	*-1.02%*
Trough to Recovery TR	90.67%	123.65%	19.45%	51.24%
Trough to Recovery # of Days*	*1476*	*1120*	*99*	*140*
Trough to Recovery Average TR/Day*	*0.06%*	*0.11%*	*0.20%*	*0.37%*
Total # of Days to Break Even*	*2244*	*1637*	*204*	*173*

****Calendar Days, Not Trading Days***

Figure 1: Source: Bloomberg as of 1/8/2021

Recovery from trough times have accelerated significantly, a further indication of choppier market responses. This may seem obvious for market observers based on memory alone, but the numbers paint a clear and helpful picture. The tech bubble and financial crisis witnessed trough to peak recovery days well over 1,000, whereas the 2020 lockdown recovery only took 140 days to recover 51.2%. The "average total return per day" really says it all. During the tech bubble, financial crisis, 2018/19 downturn and 2020 lockdown the "trough to recovery average total return per day" was 0.06%, 0.11%, 0.20% and 0.37%, respectively. 0.37% is a significantly large average calendar day return. To put this into further perspective, a 365-day year in which the market returns 20% equates to 0.055% per day.

As discussed before, there appears to be many components to the increasingly choppier market. There are greater and faster flows of information, entrance of new investors, increased algo and high frequency traders, an increase in the "markets only go up" mentality, as well as government stimulus as of late. That said, at the very top of the list, you have the federal reserve support driving a significant portion of movements.

Observations	Tech Bubble	Financial Crisis	2018 - 2019	2020 Lockdown
Peak Fed Reserve BS (Trillions)	$ 630,000,000,000	$ 890,000,000,000	$ 4,190,000,000,000	$ 4,172,000,000,000
Recovery Fed Reserve BS (Trillions)	$ 845,000,000,000	$ 2,878,000,000,000.00	$ 3,940,000,000,000	$ 6,930,000,000,000
% Change	*34.13%*	*223.37%*	*-5.97%*	*66.11%*
Absolute Change (Trillions)	$ 215,000,000,000	$ 1,988,000,000,000	$ (250,000,000,000)	$ 2,758,000,000,000
Average Fed Reserve BS Change $ per Calander Day	$ 95,811,052	$ 1,214,416,616	$ (1,225,490,196)	$ 15,942,196,532

Figure 2: Source: Bloomberg as of 1/8/2021

In the above table we look at the Federal Reserve's balance sheet. There was $630B of assets on its balance sheet in September of 2000. In August of 2020 there was nearly $7T of assets on its balance sheet. That is roughly a 13% compounded annual growth rate. Meanwhile, the S&P 500's compounded annual growth rate during that same period was only 6%. Additionally, when looking at the federal reserve's balance sheet from the peak to recovery time frames of each period, there is a salient increase in dollar value to the balance sheet (apart from the 18/19 time period, which wasn't a recession).

The Fed loaded up its balance sheet by $2.8T during the peak to recovery time period during 2020. This compares to only $215B during the tech bubble peak to recovery dates, essentially a steady raise. The evolution of the Fed's involvement is astounding. The $2.8T balance sheet growth versus $215B balance sheet growth is roughly 13x greater. Oddly, the # of days to go from peak to recovery during the tech bubble was 2244 and in 2020, it was 173; that means the peak to recovery time frame during the tech bubble was roughly 13x longer. This is an oddly similar, almost identical, comparison. The math doesn't work out as eloquently during the financial crisis, but the extreme federal reserve balance sheet accumulation during that period shortened the path to recovery versus the tech bubble.

In conclusion, the evolution of market movements and Federal Reserve involvement and dependency is undeniable. Markets have had quicker drawdowns, and for the most part quicker recoveries, especially from a relative perspective. As we look to the future, we are curious to see if the markets get choppier and, additionally, how can the Federal Reserve unwind the balance sheet without unwinding public markets. These concerns give us motivation to continue utilizing risk management within a portfolio.

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BIG TECH VS. ETHEREUM: THE FUTURE OF THE INTERNET

CARTER WILES - Research Analyst

As many Americans shifted their daily social and professional interactions online in 2020, companies occupying this space experienced marked growth relative to other sectors. While the FAAMG (Facebook, Apple, Amazon, Microsoft, Google) stocks have soared, questions regarding their business practices and security have become increasingly relevant. As our lives on the internet become more highly concentrated in a few large corporations, technology offered by a prominent but lesser-understood cryptocurrency could offer an alternative to many issues seen with Big Tech.

As I thought more about this topic, I realized the ubiquity of these five companies goes mostly unnoticed. Apple's phones, tablets, and wearable technology have become the standard, a serious upgrade from the flip phones and Blackberries of the early 2000's. Microsoft's software has become so engrained in the corporate world that using Excel without a mouse is a skill widely sought after in financial analysts. What many call "the internet" is largely based on sites we are directed to by Google's search engine. Amazon is not only the world's largest online marketplace, but also one of the largest cloud computing data providers. As the largest social media platform in the world, Facebook utilizes its extensive user data to generate almost all its revenue from targeted advertisements driven by machine learning. On top of all that, each one of these corporations spend billions of dollars each year trying to find new ways to become indispensable in their users' lives.

Many technology-adjacent stocks saw the spotlight this year; however, these are important because they are amongst the largest companies in the S&P 500, making up 22.7% of the index's $33.2 trillion market capitalization at the end of 2020. The benefits of an increasingly online population have sent these stocks soaring back from March lows while the rest of the index languished in single digit returns. As seen in the chart below, in 2020 FAAMG stocks returned a market weighted 50.57%, the rest of the S&P 500 returned only 2.61%.

Figure 1: 2020 Performance, Source: Bloomberg

While the S&P 500 is regarded as an indicator on the broad market and is often used as a yardstick to evaluate active strategies, in recent years it has turned into a small basket of mega-cap growth stocks, weighed down by a couple hundred tickers from less exciting industries. Investors have been wildly optimistic regarding FAAMG stocks in 2020, but with lawsuits and controversy closing in, there seems to be a disconnect.

Apart from Microsoft, these companies have largely risen to prominence in the 21st century. Each has been able to consistently profit from dominant technology and the commoditization of user data (some more than others). While we have largely reaped the benefits of this as a society, since the Cambridge Analytica scandal in 2018, larger questions have been posed about whether the threats of this technology outweigh the benefits. Additionally, antitrust issues in many of these companies' online marketplaces have fueled additional public and regulatory scrutiny.

Amazon and Apple are currently embroiled in antitrust lawsuits surrounding their respective online marketplaces. Facebook and Google are also dealing with similar antitrust violations, along with allegations of misusing user data. One needs only to look to the antitrust case against Microsoft in the late 1990's to understand what punitive action by the federal government can do to equity returns (after mediation talks

broke down in 2000 Microsoft tanked and didn't recover until 2015). With how top-heavy these five companies have made the S&P 500; the consequences of regulatory intervention could have a debilitating effect on the market. Even if there is no regulatory action and these companies continue to generate staggering growth and returns, do we want a future where our online interactions are concentrated in an effective data oligopoly? One solution to this problem exists in a lesser understood area of innovation: decentralized computing.

Cryptocurrency has become a topic increasingly in vogue, with Bitcoin making new all-time highs in 2020 and smaller coins doubling or tripling their value in mere days. Despite this market's popularity, many in the investing world neglect the fundamental differences between its two largest assets: Bitcoin and Ethereum. Bitcoin and the "blockchain" are familiar ideas to most, but the inner workings of Ethereum are shrouded in esoteric programming jargon. As I've waded through the research, it seems that the moral qualms we face with Big Tech could eventually be answered by the decentralized platform offered on the Ethereum blockchain.

So, what exactly does Ethereum do, and why is it relevant?

To put it simply, while Bitcoin acts only as a digital decentralized store of value, Ethereum takes that fundamental technology and uses it to run computer programs. The well-worn idea of the Bitcoin "blockchain" is repurposed in Ethereum to allow software developers to build applications on a decentralized computer server dubbed the "Ethereum Virtual Machine." For example, while the Facebook program runs on a set of private servers owned by the company, an Ethereum program (called a "smart contract") runs using the computing power of every computer on the Ethereum blockchain. Developers pay for computing power using ether (ETH), the cryptocurrency. The price of ETH increases as more applications are added to the Ethereum network. Think of Ethereum as an "App Store" with no owner, where any imaginable application can be run. The realities we face today with monopolies, data misuse, censorship, and user privacy could not exist on the Ethereum blockchain.

This structure opens the door to all sorts of decentralized applications (or "dapps") including music streaming services, real estate listing networks, smart legal contract creation tools, games, banks, and cryptocurrency lending marketplaces. Entire companies can also exist solely on the Ethereum blockchain. Dubbed "Decentralized Autonomous Organizations" (DAOs), they are fully decentralized, guarantee complete transparency, and make

autonomous decisions based only on their core programming. Developers of dapps and DAOs still earn money for their work, these are not free services. A key difference is that user data is completely anonymous and secure, since each one of these applications runs according to the protocols of the Ethereum blockchain where each person's identity is scrambled using cryptographic hash functions. Additionally, monopolistic business practices seen in Amazon and Apple's web stores would not be possible on the Ethereum blockchain due to the decentralization.

While Ethereum's 464% return in 2020 might lead skeptics to say it's already overvalued, with a market cap of $85.1 billion at the end of the year, it represents just 1.13% of the combined market cap of the FAAMG stocks. These represent some of the biggest internet-based companies, but the possibilities presented by Ethereum would allow a new age of computing where the power is redistributed from a small number of mega-corporations to the users themselves. If this technology reaches widespread use, the bull case for Ethereum is best illustrated by the following question:

How much would you pay for a "share" of the internet in the 1990s, and how much would it be worth today?

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THINGS CHANGE, INDEXES ARE NO EXCEPTION

JT RUSINKO, CFA® - Research Analyst

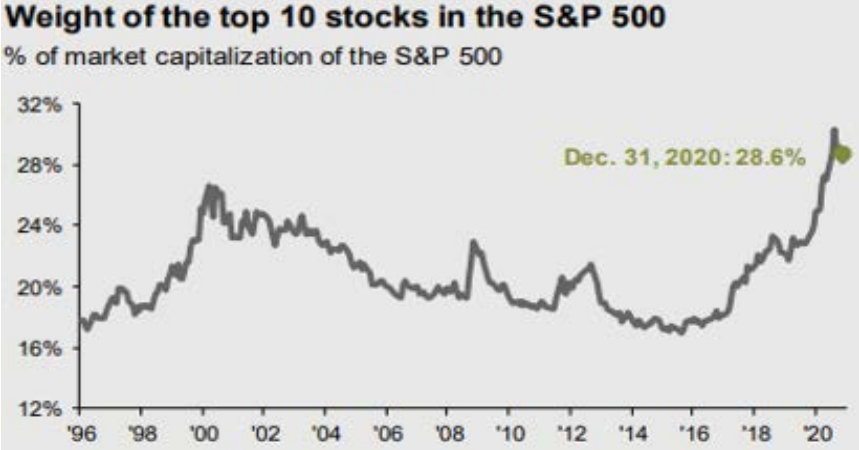
I've always considered the S&P 500 to be one of the most important indexes for gauging the strength of US equity markets, and in turn the US economy. Sorry Dow Jones Industrial Average advocates, but I've never understood the logic behind a price weighted index. Weighting constituents within an index, designed as a proxy for the broader US economy, on share price, an arbitrary number only meaningful when considering outstanding shares, is hard to rationalize.

Not to mention the growth of stock compensation and short-term oriented goals to appease the Street has led to increasingly creative manipulation, i.e., stock splits, only to be spun as an opportunity for retail investors to afford expensive stocks. Alas, I digress, old habits die hard and summarized in short, indexes change over time while presumed objectives typically remain the same.

Since the ETF boom and increasing likelihood of fractional share trading, investing in indexes has become and will continue to be an important component to many portfolios. Like any investment, it is imperative to fully understand what you are buying.

The S&P 500, and market cap weighted indexes, don't come without faults of their own. Mega-cap stocks have an outsized impact and can mask strength or weakness in smaller companies if market cap performances diverge. Within this paper I hope to summarize some of the changes that have taken place within the S&P 500, the index with the most ETF AUM, and consider its composition today relative to its presumed objectives.

Let's review concentration within the S&P 500. There are various ways to assess an index's concentration such as individual constituents, sector/industry exposure, investment style or factor exposure. For today, I'll primarily touch on the first two. The chart below is a great visual from JPM's recent Guide to the Markets illustrating the weight of the top 10 stocks over time.



In recent years, the top ten holdings within the index have grown from 18% in 1996 to 29% in 2020. At the end of 2019, the concentration within the top 10 was not materially above historical norms. Cue 2020, a pandemic, a recession, QE infinity, and an equity market far better than most everyone anticipated. Concentration spiked this year thanks in large part to MSFT, AMZN, and AAPL, the three largest constituents, which returned 42%, 78% and 84%, respectively.

Figure 1: Weight of the Top 10 Stocks in the S&P 500, Source: Source: FactSet, Standard & Poor's, J.P. Morgan Asset Management. Guide to the Markets – U.S. Data are as of December 31, 2020.

Extending this data back to 1985, there is only one time period that feels somewhat similar, albeit has differences. In 2000, concentration in the top 10 holdings spiked above 25%, which ultimately subsided over the coming years. In 2000, no single company accounted for more than 4.2% of the index's weight. As of today, MSFT, APPL, and AMZN have each surpassed that mark. The top three, five and ten holdings in the S&P 500 currently make up 17%, 20%, and 29%, each a historical high. The weight in the top three are equivalent to the weight in the bottom 312 companies. The weight in the top ten are equivalent to the weight in the bottom 397 companies.

A small number of very large companies have proven to thrive during the pandemic, which has resulted in very narrow index leadership. While the general logic of holding an S&P 500 etf is to be exposed and diversified to the 500 largest US stocks, investors today are increasingly making a big bet on just a few technology, discretionary and communication giants.

Next, let's consider how sector weights have changed. The chart below shows the last 20 years of GICS sector weights for the S&P 500.

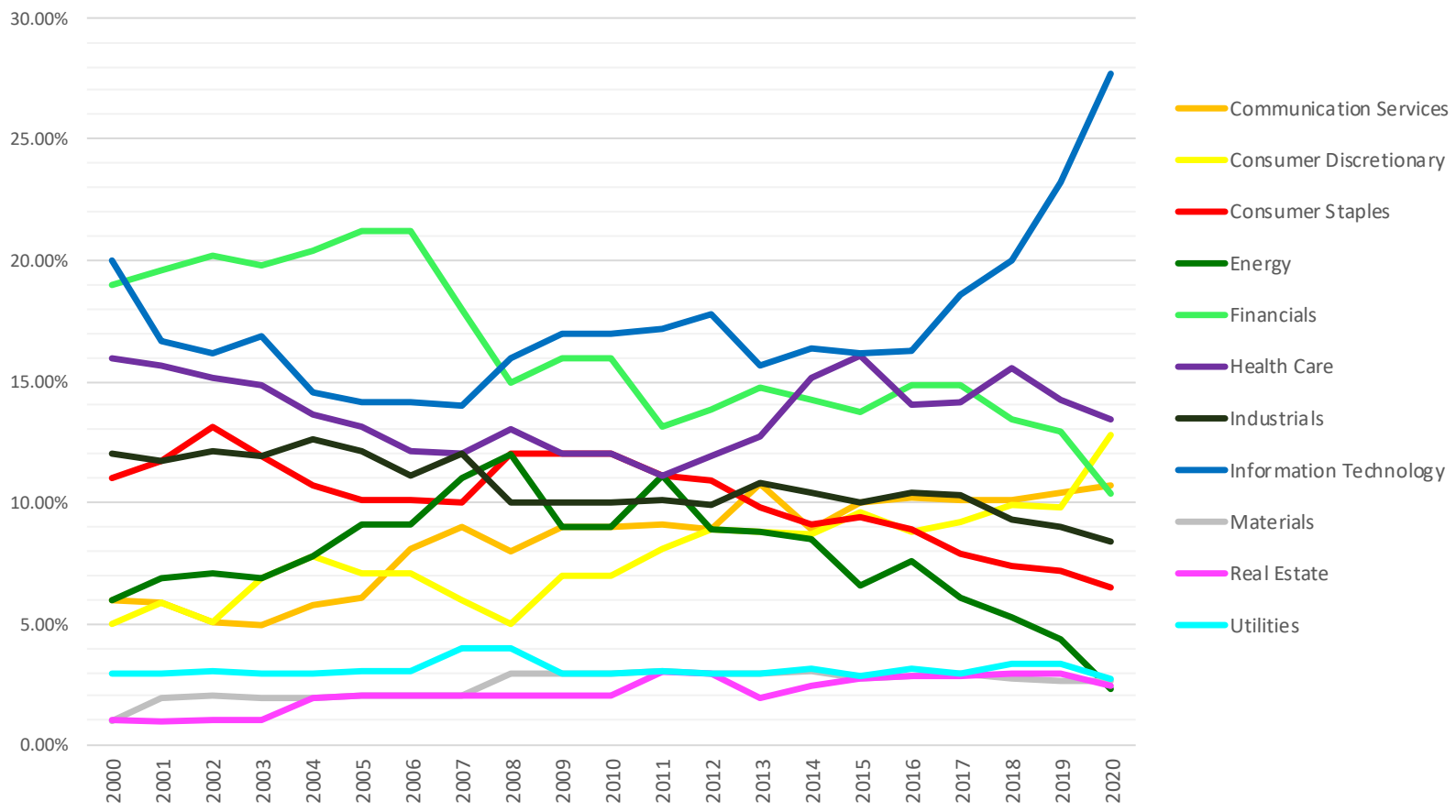


Figure 2: Source: iShares (2020) and Morningstar ('14-'19)

The obvious here is the increase in Technology's weight, which insinuates the S&P 500's growing dependence on the sector. The last time the index was this concentrated in a sector was ahead of the tech bubble in 2000 when technology made up over 30%. We may be above that level now when you consider companies such as AMZN, GOOG, FB and TSLA being classified under other sectors but having technology attributes. However, in the modern world technology is present in all industries and sectors, so we'll stick with GICS classifications and call it a moot point.

Within this writing, I don't mean to suggest that today's market landscape is the same as the tech bubble. As I look at the non-common qualities of today's index, there are only certain moments in time where you can draw a parallel and I think that provides some context. There are significant differences between the time periods. In 2000, the valuation gap between growth and value was far larger than it is today, and the top ten holdings only contributed 17% of the S&P 500's earnings versus 24% today.

Due to the pandemic, virtual and essential sectors were thrust into the limelight. Sectors such as Technology, Healthcare, Communications, Staples and Utilities, are generally seen as less cyclical and more resilient. When you look at 2020 sector returns, these are generally the sectors which performed best. The chart below shows the percentage that these sectors have made up over time, relative to the more cyclical and sensitive sectors (Financials, REITs, Energy, Materials, Industrials, Discretionary).

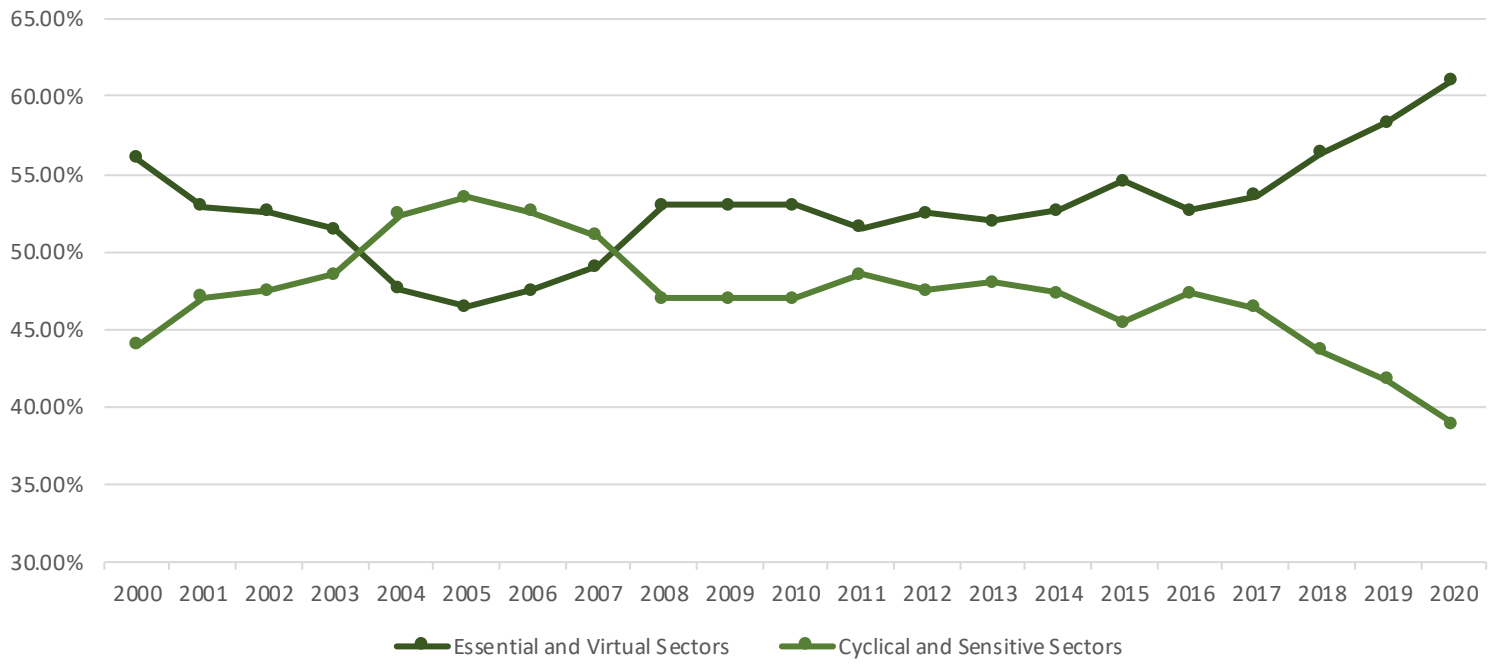


Figure 3: Source: einvestingforbeginners.com; historical-sp-500-industry-weights-20-years; As of: October 2020

Over time, the S&P 500 has shifted towards sectors and stocks that seem likely to weather the pandemic better than most. Over 60% of the S&P 500 now consists of essential and virtual sectors, a quality bias that could dampen the earnings downside in future challenging economic scenarios.

In conclusion, the composition of the S&P 500 has changed materially over the years. The objective of the index to invest in the 500 largest stocks that trade on the NYSE or Nasdaq will be fulfilled, but there is a misconception about being well diversified across 500 stocks. Leadership going forward has never been so reliant on such few individual holdings, or the technology sector. The index is not a perfect gauge of the US economy. In a year like 2020 it's easy to see how far the two can divide, and it supports that the makeup of an index has a material influence on performance.

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Asset Class	Proxy	Asset Class	Proxy
Large Cap Value	Russell 1000 Value TR USD	Large Cap Value Equity	S&P 500 Dividend Aristocrats TR USD
Large Cap Value Equity	Russell 1000 Dividend Select EW TR USD	Large Cap Growth	Pacer US Cash Cows Growth Index TR
Large Cap Growth Equity	Russell 1000 Growth TR USD	Momentum Equity	MSCI USA Momentum NR USD
Small Cap Equity	Russell 2000 TR USD	Managed Futures	SG Trend Index
International Developed Equity	MSCI EAFE NR USD	Dividend Growth Strategies	S&P 500 Dividend Aristocrats TR USD
Small Cap Dividend Growth	Russell 2000 Dividend Growth Select USD	Large Cap Dividend Growth	Russell 1000 Dividend Select EW TR USD
International Emerging Equity	MSCI EM NR USD	Quality	MSCI USA Sector Neutral Quality NR USD
Intermediate/Aggregate Bond	BBgBarc US Agg Bond TR USD	Commodities	Bloomberg Commodity TR USD
Municipal Bonds	S&P Municipal Bond TR USD	Private Equity	Cambridge Associates US Private Equity USD
International Bond	BBgBarc Gbl Agg Ex USD TR Hdg USD	Short Term Bond/Cash	BBgBarc US Aggregate 1-3 Yr TR USD
High Yield Bond	BbgBarc US Corporate High Yield TR USD	Long Term Treasuries	ICE U.S. Treasury 20+ Year Bond TR USD
Intermediate Treasuries	ICE U.S. Treasury 7-10 Year Bond TR USD	Short Term Treasuries	ICE U.S Treasury 1-3 Year Bond TR USD
Mid Cap Equity	Russell Mid Cap TR USD	Real Estate	NCREIF Indexes
International Equity	MSCI ACWI Ex US NR USD	US Equity	Russell 3000 TR USD
Global Equity	MSCI ACWI NR USD	Low Volatility Equity	S&P 500 Low Volatility TR USD
Global Alternatives	Hedge Fund Research HFRX Global Hedge Fund Index	Long Short Alternatives	Bloomberg Long/Short Hedge Fund Index
Merger Arbitrage	Hedge Fund Research Merger Arbitrage Index	Private Credit/Direct Lending	Cliffwater Direct Lending Index