

Policy in a World of Pandemics, Social Media and Passive Investing

The world is in the midst of an unprecedented shutdown ordered by politicians moving swiftly to “flatten the curve” of virus spread and avoid the unnecessary risks associated with overwhelmed medical systems. Watching global markets crash, particularly with over a decade of headlines about unsustainable debt buildup, it is easy to assume that we are headed towards a “hard reset” as recompense for the bad behavior and that the markets are reinforcing the severity of the situation. Political pressure has exploded to “Do something!” and debates are no longer about “if”, but rather “how large” should mitigation efforts and supplemental government stimulus become. The information we are receiving is no longer filtered through traditional news sources; a high fraction of the information we receive daily is being distributed on a continuous basis over platforms like Facebook, Twitter and TikTok. Having positioned our client portfolios for these events not because of insights on the virus but with an acute awareness of the underlying fragilities of modern markets, we have been somewhat uniquely positioned to filter the incoming information without the need to protect positions. After many requests, it feels valuable to share some perspective on how we are interpreting the information available to us at this point.

The most important message is that the behavior in markets is not an indication of the severity of the current crisis (although many governments seem intent on solving all problems except the ones currently at hand), but rather a foreseeable byproduct of market structure that has been previously identified, publicly discussed and which we positioned our investors to benefit from in advance of this crisis.

Second, without the requisite data and long-term studies, the severity of government response is quite possibly an over-reaction. An approach that quarantined the vulnerable populations, supported self-quarantine amongst the working vulnerable (e.g. government supported sick days for those working and at risk) and encouraged increased sanitation and reasonable public health precautions (e.g. cancellation of large public gatherings) would likely be equally effective in reducing the R0 dynamics while actually encouraging the development of herd immunity among those less at risk while preserving economic activity. We are seeing examples of this in Japan and Sweden.

None of this message is meant to minimize the tragedy of personal and societal loss and it is almost certain that we will experience renewed outbreaks of COVID-19 until we broadly develop a herd immunity. Over time, the general development of immunity will result in a collapse in mortality rates for COVID-19 until it really does look very much like the common cold as many have unsuccessfully (and somewhat inaccurately) argued to this point. This pattern of high initial mortality is the path of most novel viruses until either immunity emerges or we develop a vaccine. We just happen to be unlucky enough to live in interesting times.

Unfortunately, there is the further tragedy of the investors, employees and small businesses that are being adversely affected. Many investors nearing or in retirement have seen their portfolios obliterated. A discussion of the appropriateness of the portfolio structures we have developed over the last decade is sorely needed; institutions that promoted these structures need to be identified and penalized. Employees face the uncertainty created by a loss of income and employment. While many will benefit from lower interest rates (facilitating refinancing of mortgages, etc), those who lose their jobs are typically ineligible and many of those who will face unemployment are already at the lower rung of the economic ladder. Finally, small businesses face the expiry of real options, e.g. do they release employees and exit currently negative cash flow businesses to preserve their liquidity at the expense of long-term income and opportunity? The ambiguity created by overly aggressive political responses (due to both political opportunism and poor information) is forcing these choices to be made in an unreasonably short period of time. When a business closes, entrepreneurs are often unable to obtain the significant financing required for a restart and the economy faces real losses associated with this destruction of human capital.

Following the 2008 Global Financial Crisis, there were outcries for accountability for those involved in the various poor choices and outright fraud that were exposed. Little was done and apparently few lessons were learned. Instead, we chose to place our faith in politicians, regulators and algorithms. As we move forward through this crisis, I can only hope that we do a better job of tracking and identifying those who contributed to the underlying fragilities and those who exploited this crisis for personal and political gain. Unless we hold them accountable we will be unable to rebuild on more structurally sound foundations.

Markets Do Not Represent Information, They Represent Transactions

The behavior we are seeing in public markets is not a signal of collective decision making, “the wisdom of crowds” or the Efficient Market Hypothesis at work. Instead, it’s an indication of a market that has been twisted into a shadow of its former self by two forces – passive investing and synthetic attempts to generate yield by systematically selling volatility. This should not be a surprise. Using the words of John Bogle himself:

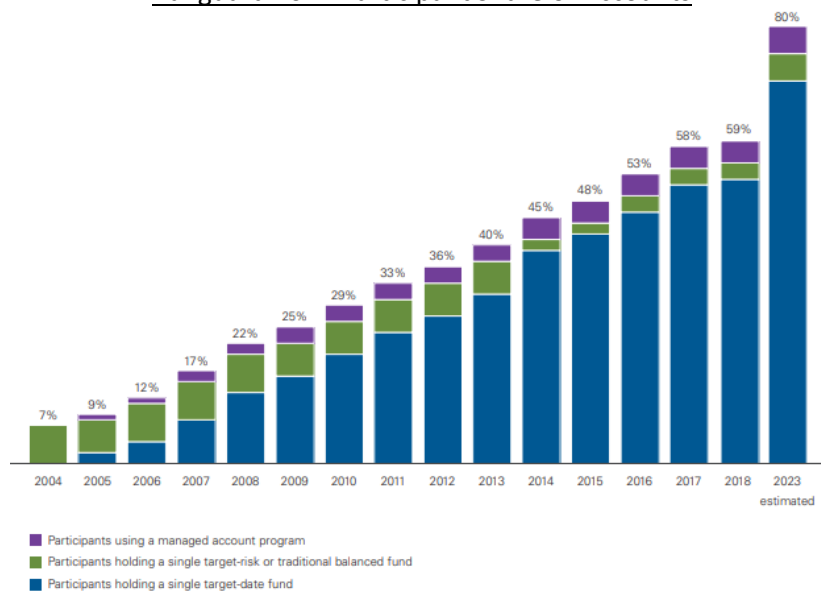
“If everybody indexed, the only word you could use is chaos, catastrophe...The markets would fail.”

– John Bogle, May 2017

And yet this is what we have allowed to happen through a combination of regulatory capture and poor model construction. For those of us who lived through the United States mortgage crisis, either directly or through the vivid descriptions of Michael Lewis’ *The Big Short*, this should not be a surprise. It’s the same story all over again.

Over the past 25 years, we have experienced unprecedented growth in passive investing. Most Americans and market participants are unaware that this has become the primary mechanism by which investments occur. Regulatory changes, heavily influenced by the lobbying activities of Vanguard and Blackrock, have led to an inexorable flow of capital towards passive investing. Today, more than 100% of gross flows into the stock market are passive (meaning discretionary managers are facing gross redemptions) and nearly 85 cents of every incremental retirement dollar now flow into a target date fund. Roughly half of all 401Ks hold a target date fund as their sole security.

Vanguard 401K Participant Share of Accounts



The theory behind passive investing relies on a very simple concept, the Efficient Market Hypothesis, which posits that current prices reflect all available information. As a result, trying to “beat the market” is a fool’s errand and investors should simply try to passively participate. Unfortunately, the assumptions behind passive

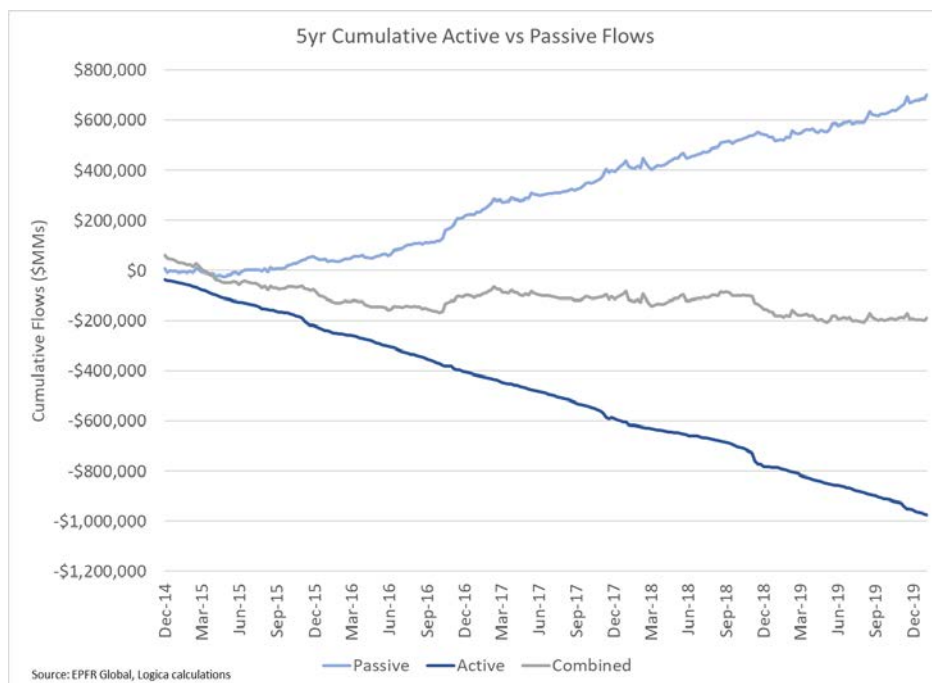
investing are critical -- no transactions costs, costless information, homogenous expectations, and perfectly rational investors. These do not hold in the real world.

The arguments for passive index investing over active investing received a further shot in the arm from a simple thought exercise by William Sharpe in 1991, "The Arithmetic of Active Management". Again, Sharpe's work is seductive in its simplicity:

If "active" and "passive" management styles are defined in sensible ways, it must be the case that
(1) before costs, the return on the average actively managed dollar will equal the return on the average passively managed dollar and
(2) after costs, the return on the average actively managed dollar will be less than the return on the average passively managed dollar

This observation set the stage for a revolution in investing with fees for managing assets collapsing over the last three decades. These declines have taken the form of reduced annual fees, reduced sales load fees and reduced commissions. This appears to be the ultimate free lunch for investors; but what if the assumptions are wrong? Looking closely at Sharpe's work, it is clear where an error lies:

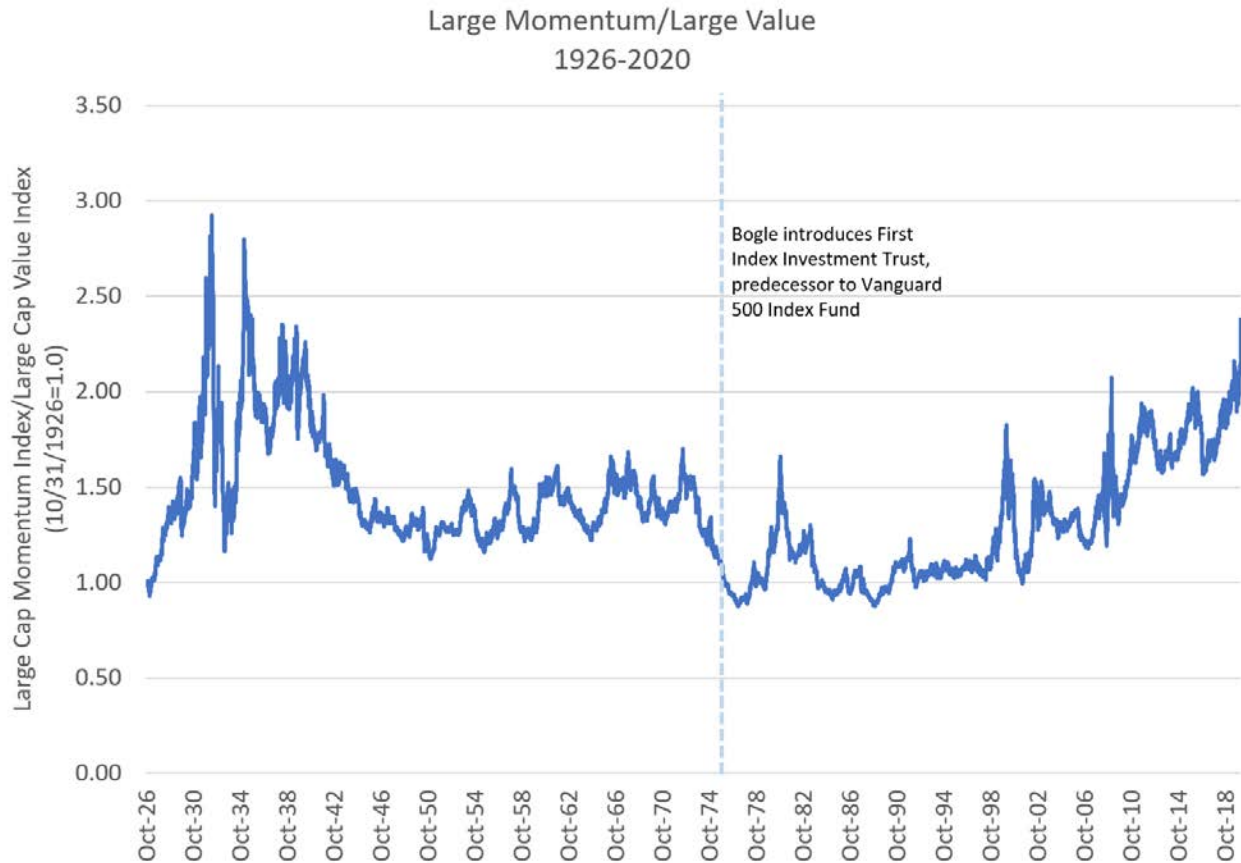
A passive investor always holds every security from the market, with each represented in the same manner as in the market. – Sharpe, 1991



There is a key assumption within the articulation that the investor holds the market portfolio. How does the investor get in? Apparently magic. How does the investor get out? This would also be magic. These assumptions were successfully challenged in a 2016 paper by Lasse Pedersen, "Sharpening the Arithmetic of Active Management" where the author noted that changing index construction requires passive participants to trade.¹ Pedersen's work, however, did not go far enough. As the above flows charts highlights, "passive" investors are forced to trade every single day due to incoming flows. Each new dollar invested into passive index funds must purchase the securities in the benchmark index. These purchases exert an inexorable influence on the underlying securities. Per Sharpe's own work, these are not passive investors – they are mindless systematic active investors with zero interest in the fundamentals of the securities they purchase.

If incremental investor dollars were increasingly flowing into market capitalization indices, we would expect to see two clear phenomena. First, we would expect to see momentum rewarded as securities that rose in price would capture an increasing fraction of each incremental investment dollar. Second, we would expect to see a rise in correlation as securities become increasingly traded as a group.

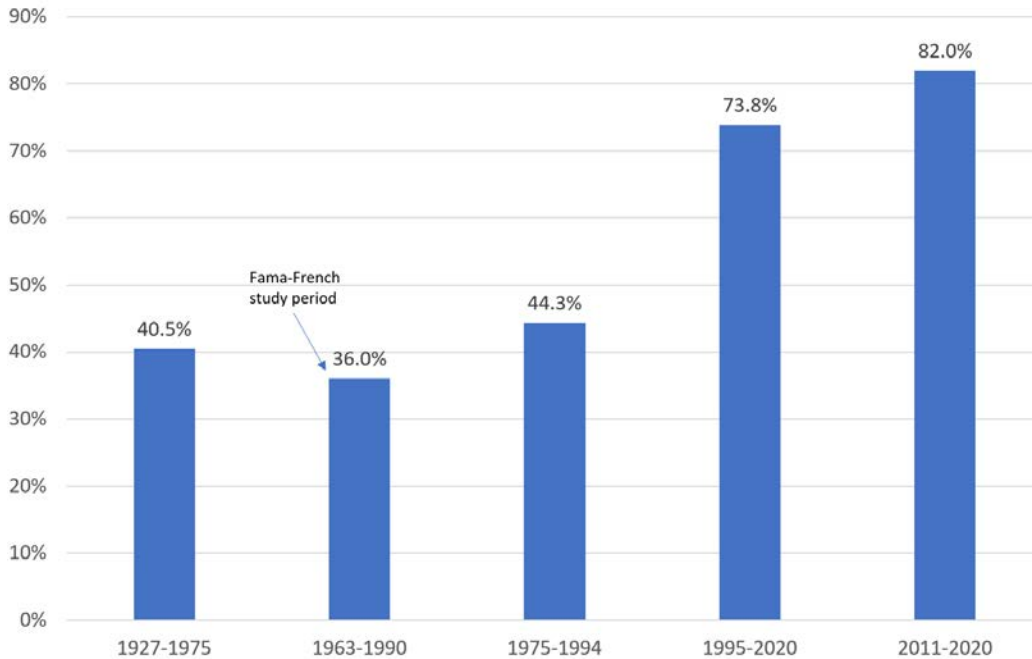
The rise of momentum has been well documented, although the focus has more often been placed on the underperformance of “value”. While I believe it is a bit of coincidence, it is somewhat notable that the introduction of passive index vehicles by John Bogle on December 31, 1975 represented nearly the last sustained period of value over momentum.



Source: Kenneth L. French data library

If we compile the data periods, we see this even more clearly. Since 1995, momentum has outperformed value an astonishing 73% percent of all three-year periods. Since 2011 (which includes the GFC), the outperformance has occurred 85% of the time. The work of Eugene Fama and Ken French^{2,3}, which led to the development of the modern “factor” portfolios (including Smart Beta-type products), highlighted the outperformance of the value factor in the period 1963-1990. As can be seen, this study period appears quite anomalous versus the experience since the Fama-French results were published.

% of 3 Year Periods Momentum Outperforms Value

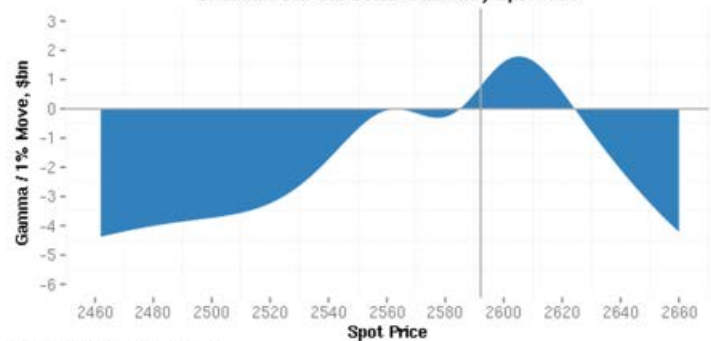


Source: Kenneth L. French data library

The second impact from a rise in passive index investing would be an expected increase in correlation. Most market participants have been unable to identify this dynamic because they have failed to consider other factors that interfere with the observation. In particular, the simultaneous rise in “yield enhancement strategies” which sell volatility across asset classes, especially equities, in order to generate additional income. These strategies have exploded in popularity since the Global Financial Crisis and the associated collapse in traditional fixed income yields to historical lows. The provision of this volatility by market participants to broker dealers creates conditions under which localized volatility is minimized. As long as dealers remain net

Why weren't Stock Indices Moving? Systematic Volatility Selling

Estimated S&P 500 Dealer Gamma by Spot Price



Source: Morgan Stanley QDS

Dealer trading creates a boundary around S&P prices within which price is more likely to mean revert.

When the boundary is broken, however, dealer trading *exacerbates* volatility instead of cushioning it.

- Yield Enhancement Strategies
- Call Overwriting
- Asian retail
- Public pensions

- Retail VIX ETFs (like XIV)
- Corporate share buybacks
- Systematic investment programs (401ks)
- Systematic rebalancing

Note: data as of 12/2017 from Morgan Stanley

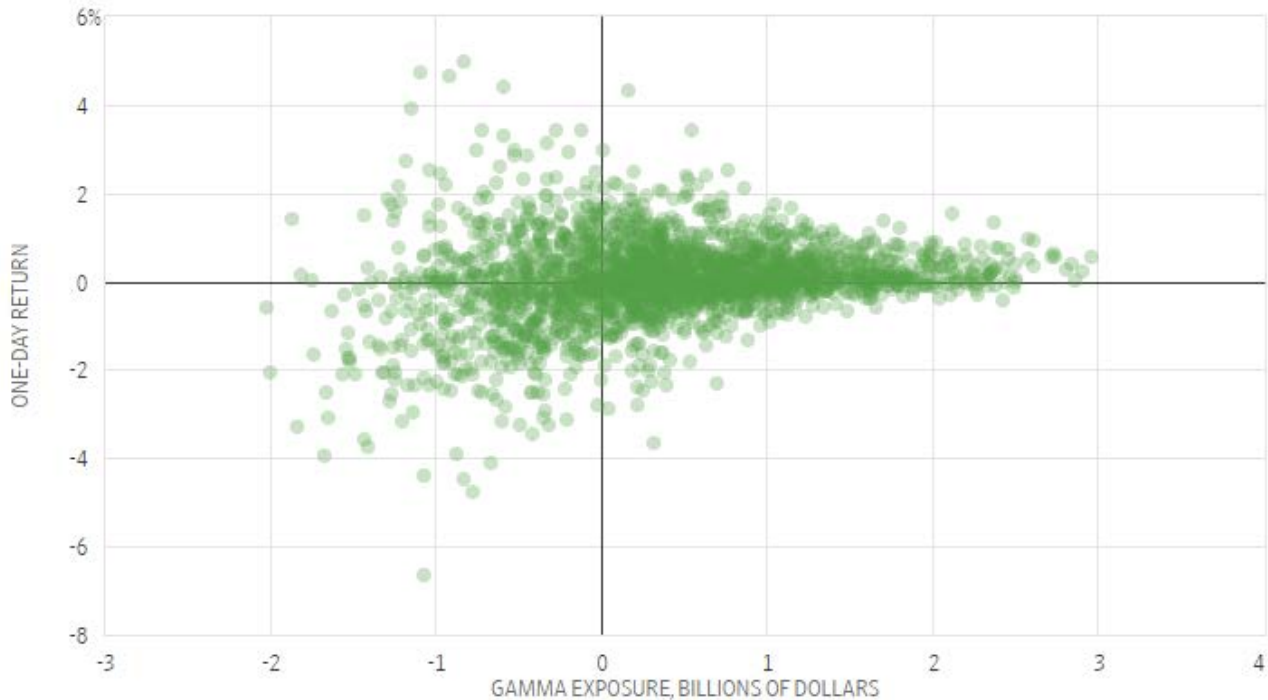
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long volatility, what is referred to as “long gamma”, then dealer hedging activity dampens volatility⁴. When dealers find themselves short gamma, as occurs when markets have been subjected to an outside force like the XIV ETF blowup in February 2018, the US-China trade war escalation in Q4-2018 or the COVID-19 pandemic, then volatility can rise sharply as dealers rush to sell more of the index into the already falling markets in order to hedge their exposure.

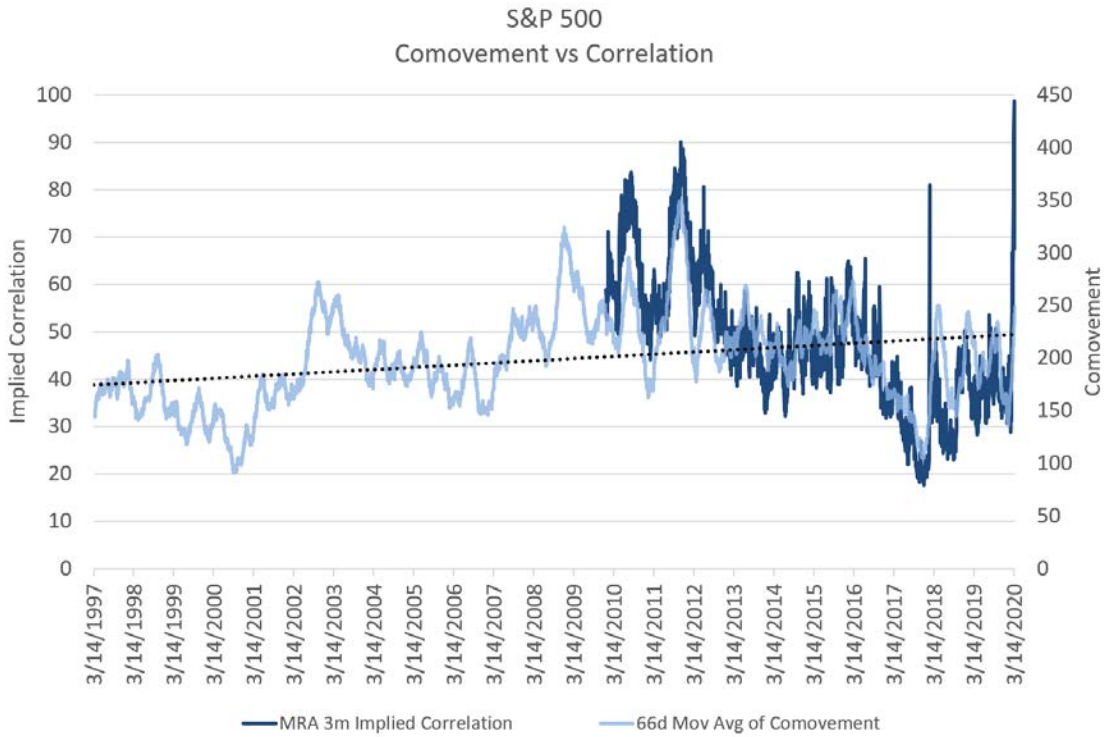
One-day returns on the S&P 500 versus the same day’s estimate of dealers’ gamma exposure^o



^oWhen gamma exposure is strongly positive daily market moves are muted, when gamma exposure is negative, stock markets are more volatile. Note: Results from 2010 to May 14, 2019.
Source: SqueezeMetrics

A second issue in testing for correlation involves the relatively short datasets that exist for S&P 500 correlation. The correlation of the S&P 500 was never a primary focus until the early 2010s as yield enhancement strategies exploded in popularity and broker dealers began to publish correlation statistics. The calculation of correlation is quite data intensive, requiring a roughly 500 by 500 covariance matrix matched to a 500 stock weighting schema and all recalculated daily. In the Bloomberg datasets, for example, correlation for the S&P 500 only exists back to January 2010⁵. Fortunately, there are reasonable substitutes for correlation. At Logica, we extend the data series back significantly using a measure we call comovement. Comovement represents the absolute number of stocks in the S&P 500 which move on the same direction on any day (either up or down). If half the stocks move up and half move down, comovement would equal zero. If 100% of the stocks move up, comovement would slightly exceed 500 (there are currently 505 stocks in the S&P 500). As can be seen in the below chart, where the data series for comovement and correlation overlap they are largely indistinguishable.

The longer data series on comovement reveals what we would expect to see, rising correlation associated with the growth of passive strategies. Even so, the two recent spikes in implied correlation, on February 5th, 2018 and March 9th, 2020 seem anomalous.

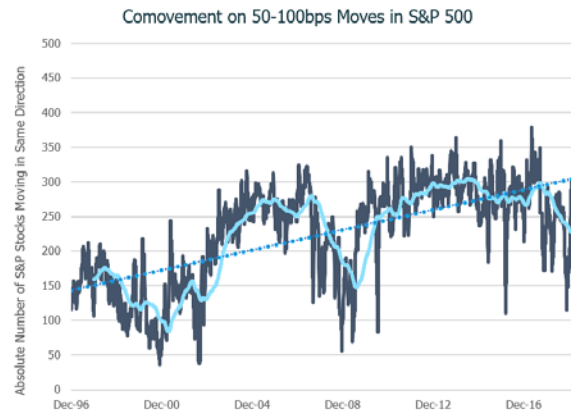
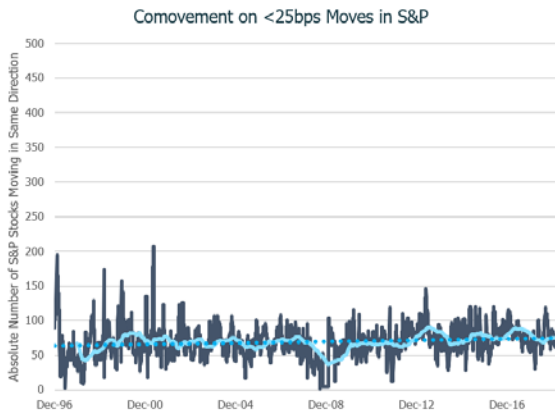


Source: Logica Capital, Bloomberg, Macro Risk Advisors

Yet again, we must dig deeper to understand how the intersection of the yield enhancement volatility selling is obscuring “true” correlation. Remember that during periods of positive gamma, volatility is deeply depressed. If we examine comovement (correlation) during these periods, we see that comovement is also very low. This makes intuitive sense – if the S&P500 is roughly flat then roughly half the stocks will be up and half the stocks will be down generating a low comovement score. However, if we look at comovement during a normal volatility period over 50-100bps per day (0.5-1.0% daily movement roughly equals the historical volatility of the S&P500), a very different pattern of sharply rising comovement over the past 25 years emerges.

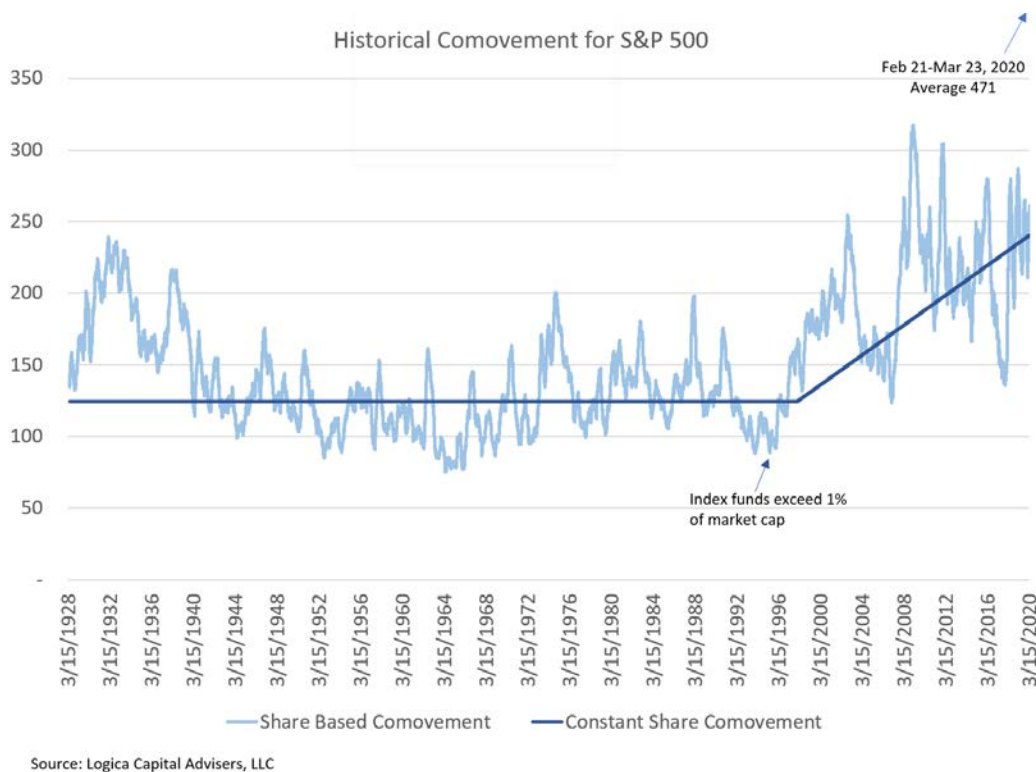
Conditional Correlation – A Measure of Fragility

Holding Volatility constant, over the last 25 years, correlation has increased dramatically - there is nowhere to hide among S&P constituents when volatility increases



Source: Bloomberg, Logica Capital calculations

Due to the simplicity of calculating comovement, we can model the full available history for the S&P 500 since the 1920s. Holding volatility relatively constant, the current experience seems far less surprising.



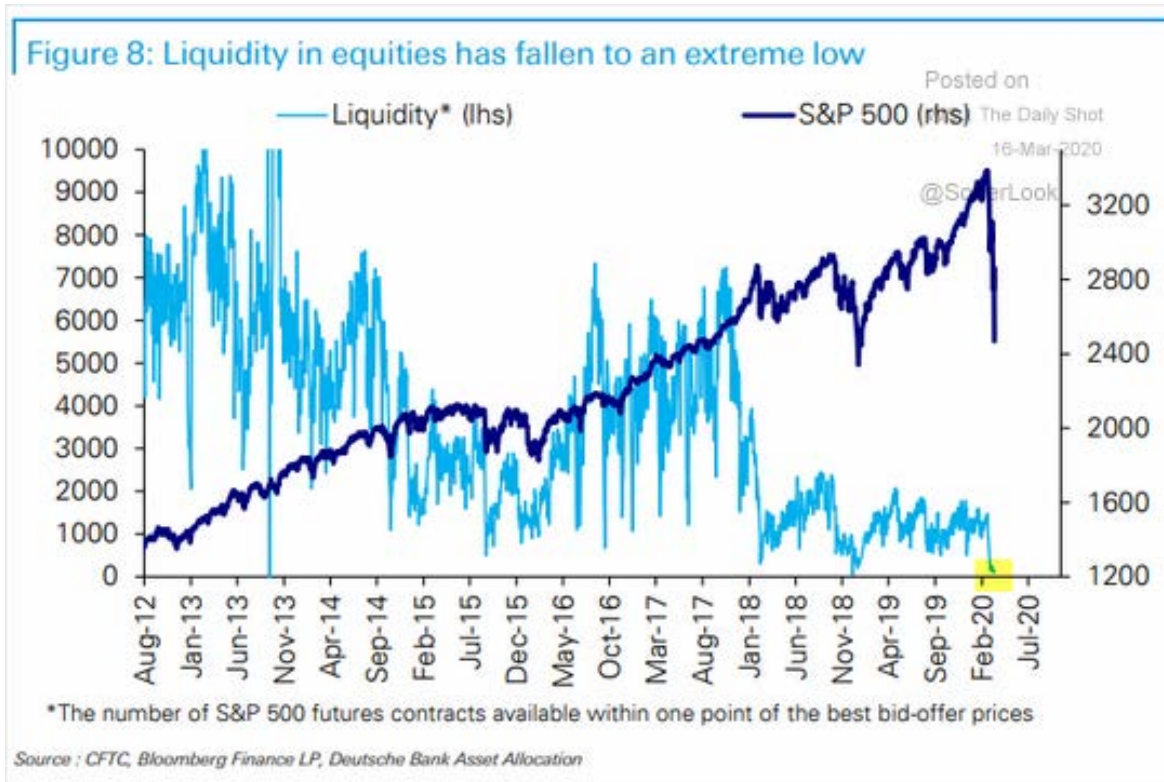
In the ~20 days of this unprecedented market decline, on average 470 of the stocks in the S&P 500 have moved in the same direction. The previous record occurred in the depths of the Global Financial Crisis following the US Congress dithering around the Troubled Asset Relief Program (TARP). Unlike that period, we have seen no significant defaults, unemployment is incredibly low and America has been benefitting from a refinancing wave that has dramatically lowered costs of debt service for the vast majority of households. Unfortunately, there has been almost zero benefit to “diversifying” portfolios by owning the S&P 500. We are seeing equity markets fall as if they were indeed a single stock.

So This is All Passive Selling?

Unfortunately, this story would be easy to tell if this was simply a function of retail investors panicking and selling their passive index funds. Stories are never easy as should be clear by now. What we have seen so far, unfortunately, is a professional investor panic. The events described so far establish conditions of fragility. A giant systematic wave of price agnostic “passive” investors has an interesting feature – they do not respond to external signals. We have seen retail passive flows continue nearly unchanged since the start of this correction. When active fund managers face an uncertain environment they react by reducing risk, i.e. selling. If this selling is not met by enough additional buying, an imbalance is created and prices fall rapidly.

These conditions have been exacerbated by the decrease in “market depth”, a measure of the size of trading that is possible at current prices. A combination of regulations and shifting characteristics of market making from floor traders and specialists to high-frequency traders attempting to exploit bid/ask spreads on ETFs and index products has resulted in a near continuous decline in market depth. In 2013, it was possible to execute nearly 9,000 S&P futures contracts “at the front of the book” (light blue line below). In recent days, that number

has fallen to only 9 contracts. In dollar terms, in 2013 it took a \$750MM order to “move the market”... today it takes a \$1MM order. Not just less liquid, order of magnitude less liquid.



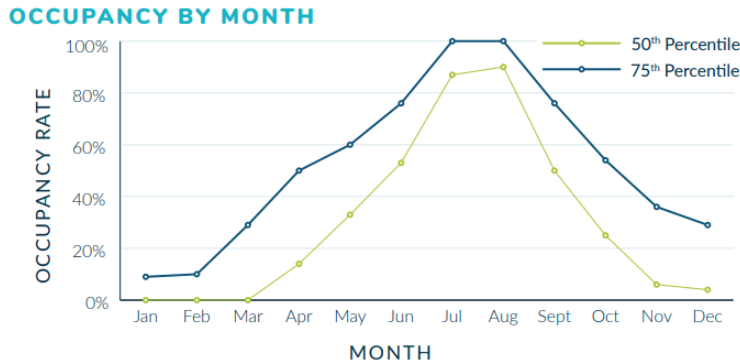
This establishes the greatest of all possible ironies – “What if this is all market structure and not a fundamental signal?” We have precedent for this with the Crash of ’87. Despite prognostications for another Great Depression following that event, nothing of the sort occurred. A contemporary account reveals disturbing similarities:

*“It felt really scary,” said Thomas Thrall, a senior professional at the Federal Reserve Bank of Chicago, who was then a trader at the Chicago Mercantile Exchange. “People started to understand the interconnectedness of markets around the globe.” For the first time, investors could watch on live television as a financial crisis spread market to market – **in much the same way viruses move through human populations and computer networks.** -- FRB Chicago*

Unexpected Shutdown

What we are experiencing in the decline in economic activity is no different than the experience of any seasonal tourist beach town come October (think Cape Cod, MA), with the notable exception that it was unexpected. As a result, many households and small businesses are unprepared for the atypical interruption in cash flow.

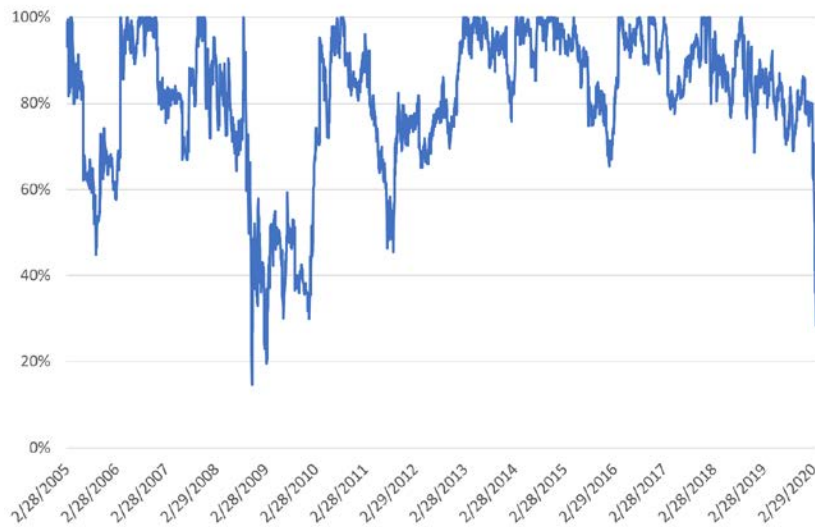
Cape Cod, MA Rental Property Occupancy



Source: Evolve Vacation Rental Performance Report 2020

When the social distancing and self-quarantining measures are eventually lifted, as we are already seeing in countries first to face this pandemic like China and South Korea, this unexpected seasonality will lift and we will be left with a world that very much looks like it did a month ago. This brings us full circle to the model of a seasonal beach town. Despite business activity slowing to a crawl in November, the value of a hotel property in Cape Cod is unchanged from July to November. The easily predictable nature of seasonality ensures that prices fluctuate much less than the level of business activity. Despite the current uncertainty, we should expect to see something very similar in the markets as America (and the rest of the world) goes on an unexpected holiday. The value of your house has not been changed (in fact lower interest rates may have increased its value); nor has the long-term value of many of America's blue chip companies like Microsoft, Apple, Johnson & Johnson and Berkshire Hathaway. However, the price declines experienced in the market are consistent with fantastic revaluations of these premier beachfront locations. For example, cash rich Berkshire Hathaway, shepherded by a superior capital allocator who has been criticized for his patience in deploying his large cash hoard has declined nearly 72% from peak once we adjust for net cash balances. This is consistent with declines experienced in the Global Financial Crisis when the existence of our financial sector was broadly in doubt.

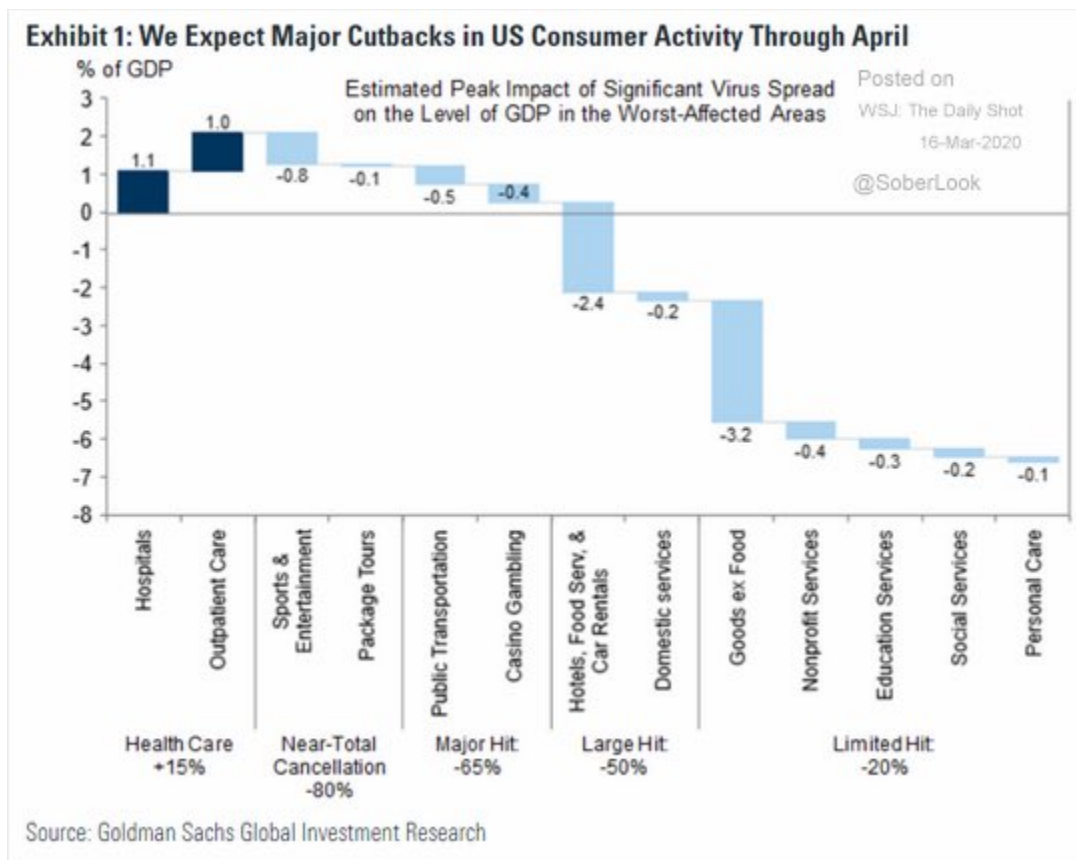
Berkshire Hathaway Decline in Enterprise Value from Peak



The Expectations Revolution

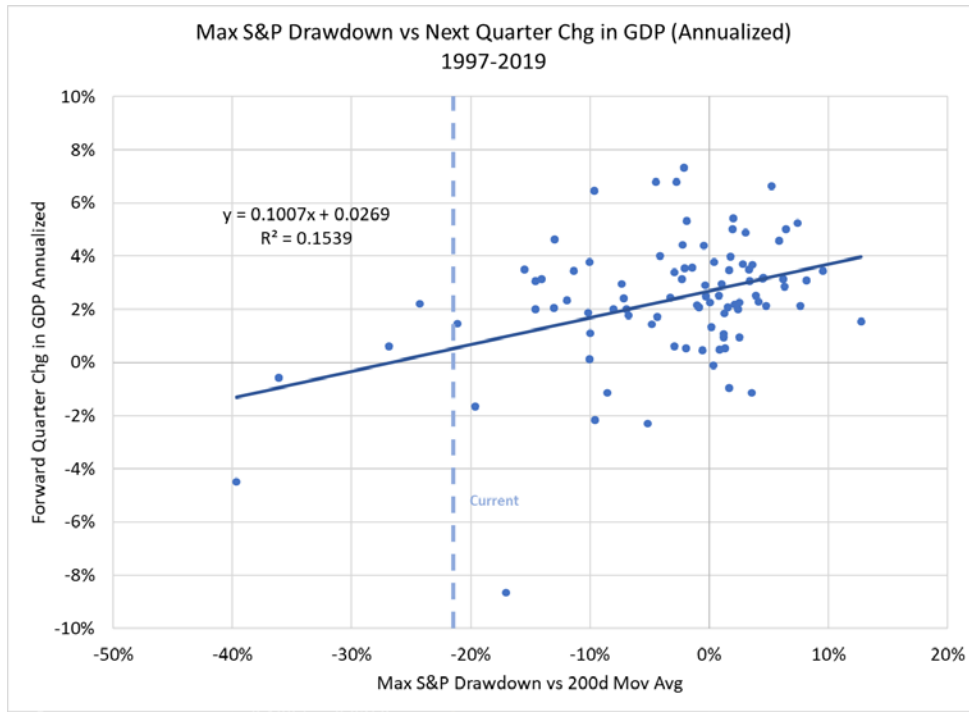
“persistent shifts in financial market conditions can be informative, and signals derived from financial market data—along with surveys of households, firms, and market participants, data, as well as outside forecasts—can be an important complement to estimates obtained from historically estimated and calibrated macroeconomic models” – Richard Clarida, Federal Reserve, May 2019

Our policy makers have broadly ignored the changing nature of financial markets. In fact, they increasingly utilize information from financial markets to inform policy. We have seen this play out in Federal Reserve actions where, despite record low unemployment and inflation measures showing signs of acceleration, we have moved with record speed to provide unprecedented accommodation to financial markets. Fiscal policy is rapidly expanding as well, with a global fiscal response that already exceeds the impulse from 2009. Scary charts from Wall Street investment banks, which also derive their forecasts from the behavior of financial markets, are being shared to illustrate the potential impacts of the virus on the economy. Hidden in the details is a simple caveat – “Estimated peak Impact... in the worst-affected areas”



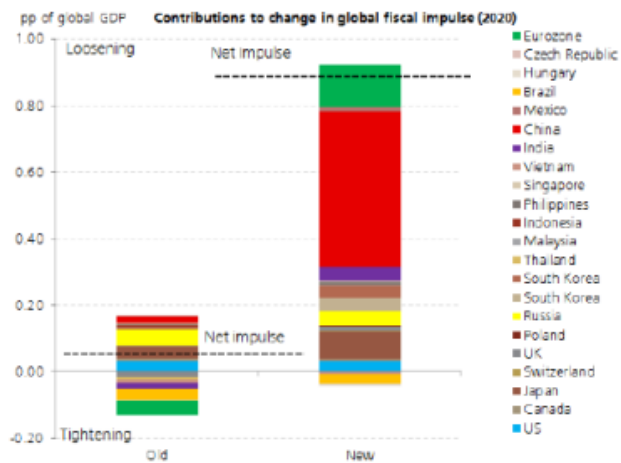
While it’s certainly possible that the peak impact on the worst affected areas approaches a -7% impact on GDP in those areas, a far more rational view would note that the equity markets (and increasingly the credit markets which have their own significant passive index investment problems) are poor predictors of forward GDP, explaining less than 16% of economic variation. While it seems implausible today, the high level of inventory drawdown (check your grocery freezer department) due to household stockpiling and simultaneous production interruptions are creating a significant “bullwhip” effect that, combined with aggressive stimulus and the now obvious need to diversify supply chains, is almost certain to lead to an elevated level of economic activity through the remainder of 2020 and possibly well into 2021.

"Wall Street indices predicted nine out of the last five recessions!"
 --Paul A. Samuelson in Newsweek, "Science and Stocks", 19 Sep. 1966



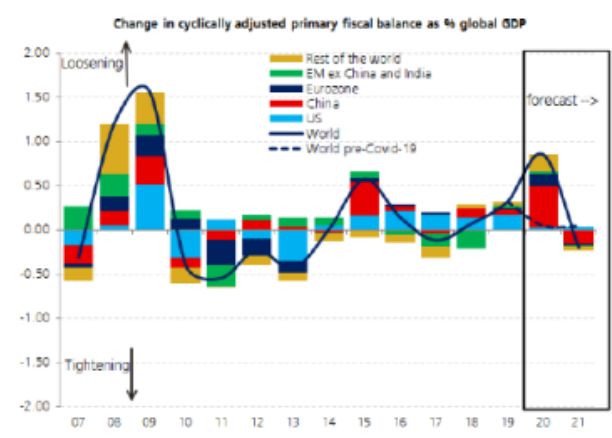
Per UBS, fiscal stimulus in 2020 should rival 2009, before incorporating US fiscal actions which should add nearly 3% of global GDP.

Figure 21: We now project the fiscal impulse to increase by about 0.80% of global GDP relative to pre-Covid19



Source: UBS, Haver

Figure 22: Making this the most expansionary fiscal year since 2009



Source: UBS, Haver

Policy Implications

When summer business in Cape Cod is interrupted by an unexpected hurricane, business interruption insurance covers the loss of income that a business suffers after a disaster. By imposing mandatory curfews and “shelter in place” orders, many governments have made local businesses eligible for insurance reimbursement of lost income. Likewise, supplemental insurance (think of the Aflac duck) offers many of the same benefits to households. However, in the current environment of uncertainty, the validity of these claims is in question and benefits are likely to be delayed. Many of the insurance companies, potentially including Berkshire Hathaway which offers catastrophic reinsurance, are likely to face adverse claims. The actions of the Federal Reserve are likely to offer very modest support under these conditions. As a result, we have been unsurprised at the market’s apparent disregard for the truly sizeable interventions by the Federal Reserve.

What is needed is a Federal program of guaranteed support for immediate cash flow to households and small business. Sri Thiruvadhanthai of the respected Jerome Levy Forecast Center (www.levyforecast.com) has offered a proposal that meets the requirements of a Federal system of business and household insurance in these extraordinary times:

- 1. Give 0% interest loans to small businesses distributed via banks and guaranteed by the government, which will be converted to outright grants (up to a limit) if they can show hardship when they file their taxes for 2020. The loans can be made immediately for any existing business relationship which allows cash to be delivered now, rather than held up by paper work and approval process.*
- 2. \$10,000 for those who filed 1099s instead of W-2s last year, to be adjusted against taxes when filing next year.*
- 3. Mandatory rent and mortgage abatement for small business and their commercial property owners from affected areas*
- 4. Immediate unemployment checks for any employees affected by COVID-19 disruptions*

When proposed, these policies were far off into the future. With the imminent announcement of the anticipated \$2 Trillion stimulus package, we will see how closely policy adheres to these guidelines. No one is being enriched by these policy prescriptions, but importantly these steps preserve existing businesses in the face of unprecedented disruptions. When a restaurant lays off its workers and closes, not only have the workers lost temporary income, the commercial property owner loses rent (income) and many service-oriented contractors (e.g. ventilation hood cleaners) have been harmed. The owner has lost income and society has lost the skills and talents that she has developed over years of work to improve her human capital. The money to cover these expenses will be largely offset by far greater taxable income (and hence recovery) than would be available if we allow these events to escalate.

While the behavior of the public markets carries little information for policy makers, instead reflecting an increasingly technical market structure issue that regulators will eventually have to address, it would be catastrophic to allow this event to result in a cascade of real world events that escalates the current disruption into a far reaching economic event.

Investment Implications

Unfortunately, it does not appear that the combination of systematic volatility selling, passive investing and illiquid markets are going to disappear anytime soon. The currently elevated levels of volatility have made the absolute attractiveness of selling volatility more appealing. Those who avoided overleveraging their short volatility positions will return. Likewise, I am confident that the lobbyists for Vanguard and Blackrock are hard at work tapping into the likely supply of pork from Washington to expand the regulatory advantages of passive

index investing. It is, of course, implausible that the market meltdown will lead to calls for reduced regulation and a reintroduction of contractual market making operations for individual securities (the specialist system). It is likely that ship has sailed permanently.

This highlights the dire need for strategies to express humility about certainty in the underlying direction of markets, and separately, to ensure more exposure to the extremes; whether violent recoveries or further collapses. If we are right and we are unlikely to see substantive changes to the market structure, then the unavoidable conclusion is that markets could aggressively reprice higher as money flows into passive strategies; this becomes particularly true if the United States is engaged in a pattern of aggressive stimulus. Stimulus, in simple terms, is the transfer of public wealth to private sector balance sheets. Likewise, the almost certain restructuring of supply chains to encourage reshoring of production away from China is likely to result in income transfers from the emerging markets to the US corporate and household sector. As always, Logica's portfolios are positioned to exploit the distortions in market structure that have occurred over the last decade to cheaply obtain optionality to capture market moves in either direction. As substantive changes are not likely to be made, we are forced to expect more of the same.

End Notes

- 1) Pedersen, Lasse Heje, Sharpening the Arithmetic of Active Management (2018). Financial Analysts Journal, 2018, 74 (1): 21-36. Available at SSRN: <https://ssrn.com/abstract=2849071> or <http://dx.doi.org/10.2139/ssrn.2849071>
- 2) Fama, Eugene F. and French, Kenneth R. 1992b. "The economic fundamentals of size and book-to-market equity". Working paper (Graduate School of Business, University of Chicago, Chicago, IL).
- 3) Fama, Eugene, and French, Kenneth R., "Common Risk Factors In The Returns On Stocks and Bonds," Journal of Financial Economics 33 (1993), 3-56.
- 4) <https://www.wsj.com/articles/markets-are-calm-then-suddenly-go-crazy-some-investors-think-they-know-why-11562666400>
- 5) MRA S&P Top 50 3M Implied Correlation courtesy of Macro Risk Advisors
- 6) <https://www.wsj.com/articles/bogle-sounds-a-warning-on-index-funds-1543504551>