Clients & Friends –

In this commentary, I will provide some high-level updates, insight into strategy evolutions, highlight some research that is influencing our thinking, a brief market outlook, and a review of what is on our research agenda for Q1.

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**General Updates**

Our team spent Q4 transitioning the Newfound Risk-Managed U.S. Growth Fund (NFDIX) to better align with our core thesis that equity market extremes are becoming more frequent and more severe. The Fund’s stated Investment Objective – to focus on long-term capital appreciation with an emphasis on the preservation of capital – remains the same; it is the process by which we pursue this objective that we have transitioned to be more in line with our views.

As quantitative evidence of our market thesis, we can seek to measure how “fat tailed” equity market returns are and how this estimate has evolved over time. Increasing fat tails imply a higher probability of seeing more extreme returns (both positive and negative). Figure 1 demonstrates that as new return data is collected, robust estimates of how fat tailed the market is continues to go up.

**Figure 1. Excess Tail Weight of the S&P 500**

![Excess Tail Weight of the S&P 500](image)

*Source: Bloomberg. Calculations by Newfound Research. Excess Tail Weight seeks to capture a robust estimate of kurtosis, a statistical measure used to describe the degree to which values cluster in the tails or peak of a distribution. Higher kurtosis implies a larger probability of seeing larger values. Excess Tail Weight is the average of KR2, KR3, and KR4 measures in On More Robust Estimation of Skewness and Kurtosis: Simulation and Application to the S&P 500 Index (Kim & White, 2003). Measures are calculated using an expanding window of non-overlapping, weekly returns of the S&P 500 Total Return index (SPXT).*
We outlined our qualitative thesis for why this is occurring in our whitepaper *Liquidity Cascades: The Coordinated Risk of Uncoordinated Market Participants*. The paper reviews existing narratives as to what may be destabilizing markets and ultimately concludes that it is a confluence of pro-cyclical pressures acting in a loop that may be leading to the widening gyre. While the loop has no definitive beginning or end, we can outline it in a few steps:

1. **Central Bank Intervention:** Central banks have moved from referee to player in markets, stepping in to create stability and provide liquidity. Suppressed interest rates force investors to increasingly use markets as a savings vehicle, tightening the link between markets and the economy.

2. **“There is no Alternative” Effect:** With suppressed interest rates, investors are forced to pursue higher risk assets and strategies to meet return targets. Demand for riskier assets creates a perpetual bid and suppresses both realized and implied volatility.

3. **Volatility-Contingent Strategies:** To manage risk, investors adopt strategies that vary exposure based upon market volatility (including target risk variable annuities, risk parity, CTAs, multi-asset momentum strategies, etc). As volatility drops, leverage in these strategies goes up, leading to an increasingly crowded equity position. This also includes the growing scope of strategies that sell volatility (such as covered calls or many structured products) from yield-seeking investors. These strategies are enabled by banks and option dealers who take the other side of the trade and hedge their exposure in the underlying markets.

4. **An Exogenous Shock:** A sudden, exogenous shock, such as the COVID-19 pandemic, causes a sudden and rapid repricing of risk within markets, driving prices down and volatility up.

5. **The Cascade:** High frequency traders hit capacity constraints and reduce liquidity. Banks, option dealers and other institutions hit risk limits and are forced to hedge, or outright sell, positions. Target-risk mandates, and other similarly correlated strategies, are forced to sell simultaneously.

Central banks step in to stabilize markets, and the loop begins anew.

While the loop ultimately ends in the cascade, it is important to recognize that the time horizon of the interim steps can be years. The abnormally low volatility of 2017, for example, is arguably a symptom of the same underlying effects that lead to an environment like March 2020.

At Newfound, we believe that addressing this widening gyre of outcomes requires us to *diversify our diversifiers*. While our prior approach focused predominately on utilizing trend-following as a means of managing equity risk, we have taken steps in Q4 to further expand the diversifiers we incorporate to attempt to create an equity position that is more resilient to these evolving market dynamics. We think of the current positioning as a composition of approaches designed for different markets. At the core is a strategic equity position comprised of a barbell approach between momentum and defensive style tilts (approximately 30% in both sleeves; 60% total). We complement the core equity position with a trend-following strategy (approximately 30%) which has the flexibility to tilt from fully invested to fully divested into short-term U.S. Treasuries. We implement a ladder of out-of-the-money put and call options (approximately 2.5% each) in an effort to maximize protection in extreme down markets and participation in extreme up markets. Finally, we use the remaining capital (approximately

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5%) as collateral for an active U.S. Treasury futures strategy, which seeks to provide a second, diversifying source of returns to the portfolio.

There are pros and cons to each of the approaches we have incorporated. As we have said many times in the past: "risk cannot be destroyed, only transformed." At the risk of stating the obvious: if we were able to eliminate all risk, we’d either have discovered an arbitrage, or diluted our return to a very expensive U.S. Treasury bill position. Nevertheless, we believe that in an environment where greater extremes occur with greater frequency, relying less on one approach to managing risk and more on an ensemble of techniques is warranted.

But what if we’re wrong? What if our thesis is merely a well-crafted narrative of circumstantial evidence? While we believe the portfolio should excel if our thesis is correct, the core design does not rely upon it. Rather, we find this approach appealing because the key design focus is diversification; even without the liquidity cascades narrative, we believe the building blocks of this portfolio still lay the foundation for a resilient equity solution.

**Figure 2. Diversifying our Diversifiers for Different Market Regimes**

Momentum equity typically over-weights stocks that have recently out-performed their peers and under-weights stocks that have under-performed their peers. Call options give the purchaser the right to buy the underlying asset at a specific time. Trend-following is the systematic process of buying securities that are increasing in price and selling securities that are decreasing in price. Defensive equity is typically characterized as securities of companies with stronger balance sheets, higher quality earnings, or lower volatility stock prices than peers. Put options give the purchaser the right to sell the underlying asset at a specific time. U.S. Treasury futures contracts are an agreement to buy (or sell) a U.S. Treasury bond at a predetermined price at a specified time in the future.

In practice, transitioning to this approach was not as simple as flipping a switch. For example, there were the practical realities of having to open new accounts to enable the options positions, which required a significant amount of paperwork to be shuffled between us, the Fund administrator, the Fund custodian, and the options broker. We also had to update our
research and trading pipeline to acknowledge the differences between running a hypothetical backtest on paper and actually implementing trades on a daily basis within a portfolio.

The full transition was completed in late November.

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**Strategy Evolutions**

Momentum is not really a *fundamental* investment factor. Rather, it is more of a discipline that seeks to exploit the under- and over-reaction of other investors. Which also means that it is chaotic in nature: left unconstrained, it can surf across sectors, themes, and factors, often giving rise to a wake of “meta-momentum.”

In portfolio design, however, this can lead to the potential of unintended crowding. Such has been the case in the latter half of 2020, where momentum and defensive (including quality and anti-beta) factors have become increasingly correlated as their positions converge. As we have adopted a barbell between momentum and defensive factors as our core equity position, this crash up in correlations leads to the risk of an increasingly volatile position.

**Figure 3. Factor Correlations**

Correlation with Momentum Factor

Source: Bloomberg. Calculations by Newfound Research. Momentum, Value, Size, Quality, and Anti-Beta are the corresponding Dow Jones U.S. Thematic Market Neutral indices. Correlation is measured as the rolling 63-day realized correlation between daily log differences.

To prevent an over-concentration in either factor, we have adopted purification methodologies. While there are a number of ways in which factor purification can be implemented – such as more complex statistical techniques and optimization – we found that a thoughtful set of filtration rules can help distinguish the defensive sleeve from the momentum sleeve.
Specifically, by removing stocks from the investible universe that exhibit the strongest momentum characteristics, we can ensure at least a certain degree of separation.

We can see an example of this impact in Figures 4 and 5. In Figure 4 we plot our investible universe on annualized volatility and balance sheet leverage characteristics. The blue dots reflect those securities that are selected for inclusion based upon our defensive factor methodology. The orange dots reflect those securities that rank highly enough to be included but also find themselves in the top quintile of a naïve 12-1 month momentum factor and are therefore filtered out. The yellow dots reflect the securities that are chosen instead, and the grey dots reflect those that are avoided entirely.

To evaluate the impact of this step, we can measure the realized correlation of excess returns between a momentum equity portfolio (in this case, using the MSCI USA Momentum Index as a simple proxy) and an unfiltered and filtered version of the defensive portfolio (see Figure 5). While some crowding is inevitable, we can see that the filtered portfolio almost always has a lower correlation to the momentum factor than the unfiltered variation. Our research suggests that diversification is further improved if, rather than simply using the traditional academic definition (i.e. 12-1 month returns), we adopt an ensemble definition of momentum rather (e.g. short-term momentum, long-term momentum, risk-adjusted momentum, and idiosyncratic momentum).

To help control for this unintended overlap risk, we implemented similar filtration procedures in December and expect to continue refining them over the coming months.

Figure 4. Filtering Momentum from the Defensive Factor

Source: Sharadar. Calculations by Newfound Research.
Figure 5. Factor Correlations Pre- and Post- Filtration

Rolling 63-Day Correlation of Defensive Style and MSCI USA Momentum Index Excess Returns

Source: MSCI; Sharadar. Calculations by Newfound Research.

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Research on Our Mind

In 1991, Goldman Sachs launched the Goldman Sachs Commodity Index (GSCI). By the early 2000s, commodity futures were a popular emerging asset class for many financial institutions. Institutional investors, in particular, were ravenous for exposure, and grew their allocations in different commodity index-related instruments from just $15 billion in 2003 to $200 billion by mid-2008, raising concerns that “price-insensitive buyers” were disrupting the natural order of markets, leading to unwarranted increases in prices and volatility.

Later research\(^2\) would suggest that the financialization of the commodity market led not only to a dramatic increase in price co-movement between commodities (in particular, non-energy names becoming more highly correlated with oil), but also between commodities and equity markets. It appears that reducing the burden of access allowed commodities to become a mainstay in portfolio allocations, creating an avenue for equity volatility to spill over.

In the same vein, Erb, Harvey, and Viskanta (2020)\textsuperscript{3} suggests that the rise of so-called “massive passives” in the gold market have had similar effects. The financialization of gold ownership via ETFs appears to have de-sensitized gold prices to changes in real yield and increased sensitivity to supply and demand effects.

This research raises important questions about reflexivity in markets and the mechanics of supply and demand.

In October, Parker, Schoar, and Sun (2020)\textsuperscript{4} explored the potential impact of the target date fund (“TDF”) market, which has grown from just $8 billion in 2000 to more than $2.3 trillion in 2019. They find evidence that, “stocks with higher TDF exposure (through the funds held by TDFs) have lower returns after higher market performance, consistent with TDFs altering the return dynamics of individual stocks.” They also identify important cross-asset implications, finding that “the time series momentum in the S&P 500 index declines from the pre-TDF to the post-TDF period.”

TDFs now serve as a large counter-weight to market trends, buying when prices fall and selling when prices rise to keep asset allocations in line with pre-determined glide paths. These forces may not only serve to artificially suppress volatility in the short-run, but create meaningful mispricing in the long run. Equity prices should fluctuate relative to other asset classes based upon changing fundamentals, but TDFs trade against these changes and may therefore suppress fundamentally-driven price responses. They may even affect cross-asset co-movement, as rebalancing requires the sale of one asset to purchase the other.

But can rebalancing really have such a large impact? The recent work of Gabaix and Koijen (2020)\textsuperscript{5} suggests yes, as markets may be surprisingly inelastic. They estimate that every $1 invested in the stock market increases the market’s aggregate value by $5. Since TDFs invest primarily in index-tracking funds (e.g. the S&P 500), Jiang, Vayanos, and Zheng (2020)\textsuperscript{6} then suggests intriguing second-order, cross-sectional impacts. Specifically, they find that flows into index funds, “raise the prices of large stocks in the index disproportionately more than the prices of small stocks.” Positive flows not only lead to a greater concentration in index weights, but they correspond to a negative contemporaneous return for the size premium.

Now, before we are branded as indexing alarmists, we should say that the results of this research should all be taken with a large grain of salt. The underlying premise, though, is intriguing: would we not expect some impact from structural changes to market supply and demand?

This notion goes well beyond passive indexing. For example, what happens when access to equity factor strategies is commoditized with smart-beta ETFs? What happens when access to leverage is commoditized via ETNs or options trading platforms like Robinhood? What happens when volatility-selling becomes a widely adopted yield enhancement strategy among institutions? As it relates to the latter, Barbon and Buraschi (2020)\textsuperscript{7} document that imbalanced hedging pressures from option dealers may be leading to significant intra-day momentum, mean-reversionary pressures, and increasing market instability.


\textsuperscript{4} Parker, Jonathan A. and Schoar, Antoinette and Sun, Yang, Retail Financial Innovation and Stock Market Dynamics: The Case of Target Date Funds (October 2020). NEBR Working Paper No. 28028. Available at: https://www.doi.org/10.3386/w28028.


\textsuperscript{7} Barbon, Andrea and Buraschi, Andrea, Gamma Fragility (November 5, 2020). University of St.Gallen, School of Finance Research Paper No. 2020/05, Available at SSRN: https://ssrn.com/abstract=3725454 or http://dx.doi.org/10.2139/ssrn.3725454
The common thread here is not some admonishment of indexing, but rather an open-ended inquiry into how access changes dynamics. When do dynamics shift from prices reflecting the aggregate, forward looking expectations of the crowd to a simple ledger of transactions reflecting clearing prices driven by supply and demand imbalances? Crowding seems more obvious when it occurs quickly, such as with the rapid rise of speculative, short-dated call option usage in 2020. Less obvious are the financial innovations that grow slowly and are applauded as vehicles of sound financial wisdom along the way, such as target date funds.

As we continue to explore the implications of the Liquidity Cascades theme, we believe these meta-trends of access and adoption may be key drivers for identifying evolving market fault lines.

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Market Outlook

I place little emphasis on market outlooks because I believe strongly in the path dependency created by reflexivity. I once heard someone say that history should be taught backwards to help remove the illusion that what did happen was always what was likely to happen. Even if we could go back to January 2020 and tell forecasters that there would be a global pandemic, I suspect none would chain together the 2nd and 3rd order effects required to lead to a market environment dominated by the presence of speculative, short-term call option volume.

Nevertheless, I do find it instructive to try to map current conditions and how sensitive those conditions are to different potential outcomes.

Central Bank Intervention: Central bank policy (and narrative) supports a “lower for longer” interest rate environment. Barring a faster-than-expected economic recovery, or a higher-than-expected rate of inflation, there is likely little that will shake this policy.

“There is no Alternative” Effect: With rates near the zero bound, many advisors I speak to feel more pressure than ever to do something about their fixed income allocations. With BBB U.S. corporate option-adjusted spreads already back to pre-COVID levels, BBB US corporate effective yields are making all-time lows. This means that the pursuit of return may push investors out on the yield curve farther than ever before. In the short-term, this could create a sustained bid for risky assets.

For some investors, being moved up the risk curve may become an institutionalized decision, made on their behalf by their pension or their target date funds. For example, T. Rowe Price announced in February that it would be increasing equity exposure in their glide paths during both accumulation and post-retirement years. While individual investors may have the flexibility to simply accept lower returns, many institutions are restricted by their mandated withdrawal rates and obligations.

Volatility-Contingent Strategies: For many systematic players – such as Risk Parity, CTAs, or target-risk variable annuities – our current best estimates of equity positioning remain significantly below pre-March levels (though well above April lows). While we prefer to model these exposures by replicating their underlying methodologies, one naïve proxy is simply to look at their trailing beta to equity markets.

Below we plot realized rolling 90-day betas to the S&P 500, normalized to the maximum beta level achieved in Q1 2020. We can see that as of the end of the year, all the betas are less than 50% of their Q1 high.
In these different models, there are various driving factors, including the cross-asset correlations, volatilities, and relative returns. A partial explanation, however, may simply be elevated volatility levels. For many of these strategies, notional exposure is a function of realized volatility. A simple model of this relationship might be: \[ \text{Exposure} = \frac{\text{Target Volatility}}{\text{Realized Volatility}}. \]

For example, if Target Volatility is 10% and Realized Volatility is 15%, then Exposure is 66%. If Realized Volatility is 5%, though, Exposure is levered to 200%. The key insight here is that Leverage is a non-linear function with respect to Realized Volatility; Leverage will adjust more dramatically to changes in Realized Volatility when Realized Volatility is low rather than when it is high.

This means that these players are less sensitive to changes in realized volatility today than they were in late January. If realized volatility falls, however, they will begin adding leverage at an increasing rate. One simple means by which this may occur is just the passage of time: by April 2021, the March 2020 crisis will have decayed out of most slow-moving volatility estimates and equity momentum will look particularly strong on traditional 12-month measures.

An Exogenous Shock: Somewhat by definition, this remains a mystery. Some “grey swans” may include:

- A sudden and dramatic drop in levered, speculative capital (note that total volume in US call options nearly doubled in 2020).
- A new strain of COVID-19 slows recovery timelines.
- A significant increase in corporate tax rates.
- A material progression in anti-trust regulations against big technology firms.

**Figure 6. Rolling 90-day Beta to S&P 500 Index Normalized to Peak Q1 2020 Level**

Source: Bloomberg. Calculations by Newfound Research.
The Cascade: While our current positioning estimates would suggest that the magnitude of forced selling from an exogenous shock would be meaningfully less than what we saw in March 2020, one variable we must contend with is market liquidity.

Consider the Chicago Fed ANFCI Leverage E-Mini S&P Futures Market Depth, which seeks to quantify market liquidity by estimating the round-trip impact of a 200-lot trade. It has not only spent most of the post-2017 era below October 2008 levels, but has exhibited far greater variance than it had prior and its movement is more highly correlated to changes in the VIX.

Another oddity of the post-2017 era is the stark difference in overnight versus intraday returns, which may also reflect changing liquidity dynamics. From 12/31/2008 to 12/31/2017, intraday and overnight returns were nearly identical in magnitude for the S&P 500. After 2017, something dramatically changed. Overnight returns in the S&P 500 have offered an annualized return of 14.5% with a Sharpe ratio of 0.89, whereas intraday returns have had an annualized return of -0.88% and a Sharpe ratio of -0.06.
Figure 8. Intraday and Overnight Returns for SSgA S&P 500 ETF (“SPY”)

Source: Tiingo. Calculations by Newfound Research.
Taken in concert, it is easy to string together a bullish narrative:

- Interest rates remain low, forcing investors to pursue return and yield up the risk curve, creating further demand for riskier assets.

- Further stimulus checks find their way back into the market, either explicitly (e.g. “gambling in the call option casino”) or implicitly (via the profit margins of the public companies they are spent at).

- Through a combination of time passing and a decline in realized volatility, systematic strategies continue to increase their exposure to U.S. equities.

- The economy continues to re-open at the expected pace, and “pent-up demand” leads to a surge of spending and positive earnings surprises.

Of course, it is trivial to construct a bearish case as well:

- The new B117 strain of COVID-19 proves worse than expected, causing further economic shutdowns.

- The fractal nature of consumer spending begins to “bubble up,” creating downward pressure on corporate earnings; fiscal policy is unable to curb growing solvency issues.

- Backlash from the working class creates mounting political pressure for an increase in corporate taxes and a meaningful regulatory review of Big Tech.

- Fragile market liquidity exacerbates bouts of volatility, wiping out highly levered, speculative players, whose influence was already waning due to elevated levels of implied volatility.

- Systematic players begin to de-lever in a pro-cyclical manner.

We believe that all melt-up and melt-down scenarios generally require a catalyst, but it is the 2nd and 3rd order effects that create the meaningful accelerator. While the goal of an all-weather portfolio is to be prepared for any eventuality, better understanding these accelerants may have important implications for portfolio positioning. If many short-volatility players were wiped out in March, and systematic strategies remain largely de-levered, it becomes more difficult to imagine the scenario whereby another March could unfold in the short term.

Yet, “generals always fight the last war.” So, as the market bids up short-term protection, the most painful path for markets to take might be a slow, tech-driven sell-off with persistently elevated levels of implied volatility and no corresponding response in Treasury rates.

Our research agenda in 2021 is heavily focused on better understanding these accelerants. We spent a significant portion of Q4 2020 building positioning models for systematic sellers (including option dealers, risk parity, CTAs, and other target-risk strategies) and plan to continue building upon this work in 2021. In particular, we hope to gain a better understanding of the dynamics leading to the curious post-2017 “break” in the Chicago Fed’s market depth models.

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We appreciate the trust you place in having Newfound Research oversee your capital; helping to manage these assets is a responsibility we do not take lightly. We firmly believe that the changes we have implemented this quarter will provide our Fund the best opportunity to meet their objectives going forward, seeking to capture a significant portion of market growth while reducing the impact of severe and prolonged market declines. If you have any questions, please do not hesitate to reach out.

Sincerely,

Corey M. Hoffstein
Chief Investment Officer
Newfound Research
Current performance may be lower or higher than the performance data quoted above. Past performance is no guarantee of future results. The investment return and principal value of an investment in the Fund will fluctuate so that investors’ shares, when redeemed, may be worth more or less than their original cost. For more current information, please call toll-free 1-855-394-9777 or visit our website, www.thinknewfoundfunds.com.

Investors should carefully consider the investment objectives, risks, charges and expenses of the Newfound Risk Managed U.S. Growth Fund. This and other important information about the Fund is contained in the prospectus, which can be obtained by calling 1-855-394-9777. The prospectus should be read carefully before investing. The Newfound Risk Managed U.S. Growth Fund is distributed by Northern Lights Distributors, LLC, Member FINRA/SIPC. Newfound Research LLC is not affiliated with Northern Lights Distributors, LLC.

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Like all quantitative analysis, the adviser’s investment model carries a risk that the mathematical model used might be based on one or more incorrect assumptions. No assurance can be given that the fund will be successful under all or any market conditions. Overall equity and fixed income securities market risks affect the value of the Fund. Factors such as domestic economic growth and market conditions, interest rate levels, and political events affect the securities markets. The earnings prospects of small and medium sized companies are more volatile than larger companies and may experience higher failure rates than larger companies.

Click HERE for the current NFDIX prospectus.

NLD Review Code: 4011-NLD-1/5/2021
Newfound Case #11784515