



GETTING PAID TO LOWER YOUR RISK

USING LOW VOLATILITY STRATEGIES TO LOWER RISK AND CAPTURE ALPHA

Given slowing global growth and persistently low interest rates, investors are understandably skeptical about meeting their investment goals. Uncertainty over the global economy, central bank policy, trade war politics and Brexit are just a few items making volatility spikes more common. Pairing these issues with historically low yields and elevated equity valuations means investors may need to go beyond cap-weighted index returns to reach their goals. Further complicating matters, U.S. and European institutional investors are continuing to de-risk their portfolios.

This only heightens the prospect of returns coming up short.

Highlighting this conundrum, a recent study of state and local government retirement systems shows that the *average* return assumption is 7.3%¹. According to our [Capital Market Assumptions](#), we estimate that a simple 60% equity/40% fixed income portfolio will only return 4.3%²; leaving a 3.0% *return gap* before considering any required de-risking. What can investors do about this? We think low volatility equities are a big part of the solution.

LOW VOLATILITY: THE ICONOCLAST

"It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so." — Mark Twain

The idea that low volatility stocks can consistently outperform may seem too good to be true. It goes against the cardinal rule of investing: To achieve higher returns, you have to take on more risk. But studies dating back to 1972, along with several recent updates, have empirically documented the historical outperformance of low volatility equities. Why? Table 1 below lays out the most prominent explanations.

MICHAEL HUNSTAD, PH.D.
Head of Quantitative Strategies

JORDAN DEKHAYSER, CFA
Head of Quantitative Research and Strategy

ROBERT LEHNHERR, CFA
Quantitative Research Analyst

Investors face falling short of their objectives with what we see as a low-return and more volatile future market. The traditional portfolio adjustments may not help. That's where low volatility equity strategies come in.

¹ <https://www.nasra.org/files/Issue%20Briefs/NASRAInvReturnAssumptBrief.pdf>

² <https://www.capitalmarketassumptions.com>, 60% ACWI IMI Index/40% BBG Barclays Global Aggregate Bond Index

TABLE 1: EXPLANATIONS FOR LOW VOLATILITY ANOMALY

THEME	RATIONALE
Structural Explanations	<ul style="list-style-type: none"> Many investors cannot use leverage, so they turn to high beta stocks in order to achieve high returns. In doing so, they bid up the price of high beta stocks until the shares are over-priced, causing lower beta stocks to be undervalued. (Black, 1972 and Frazzini and Pedersen, 2011) Fixed-benchmark mandates discourage investment in low volatility and low beta stocks that have high marginal contributions to active risk. As a result, demand for low beta stocks tends to lag. (Baker, Bradley and Wurgler, 2011)
Behavioral Explanations	<ul style="list-style-type: none"> Investor overconfidence and willingness to pay a premium for a small chance of earning large returns, known as the “lottery effect,” leads to a demand for high volatility stocks that is not warranted by fundamentals. (Blitz and van Vliet, 2007, and Kumar, 2009)

Source: Northern Trust Asset Management

Low volatility equities present an opportunity for investors, but there are a number of practical questions to answer before including low volatility equities in their portfolios, including:

1. What other risks need to be considered?
2. Can investors expect to outperform on *both* a risk-adjusted and non-risk adjusted basis?

What other risks need to be considered?

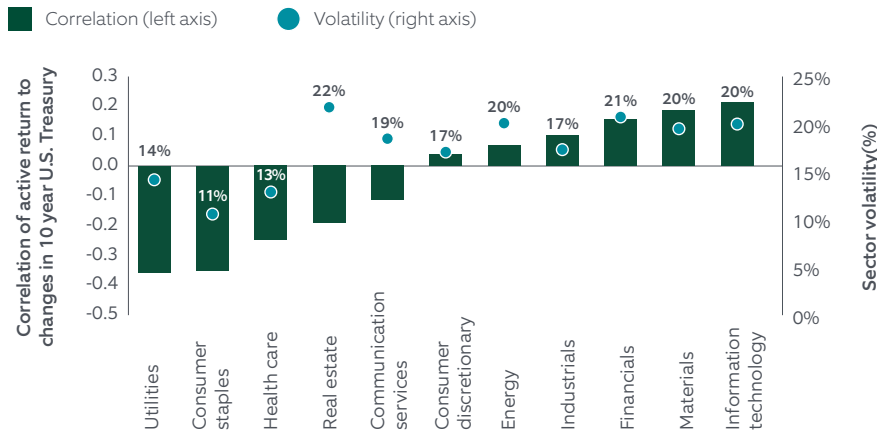
We believe that investors should stay focused on taking risks that they are getting paid to take and avoid other uncompensated risks. This philosophy applies particularly well to low volatility strategies which, if not properly designed, can fall victim to unintended and uncompensated risks.

For example, low volatility investing is often characterized as a “bond proxy” because it tends to perform well when interest rates fall and underperform when rates rise. However, as we highlight in [Factors, Not Sectors](#) and [Taking the Interest Rate Risk Out of Factor Investing](#), the bond tendencies have more to do with sector exposures than interest rates. This is because certain sectors have more stable, bond-like cash flows than others. For example, a significant overweight to stable utilities stocks likely means that a rise in rates will meaningfully hurt performance. In Exhibit 1 we show the relationship of sectors to changes in the 10-year Treasury. Whether low volatility strategies are indeed a “bond proxy” depends on whether the sectors that have interest rate exposures are controlled or not. Of course, some amount of these exposures is inevitable; but our belief is that a low volatility portfolio ought to control these risks.

We believe that investors should stay focused on taking risks that they are getting paid to take and avoid other uncompensated risks. This philosophy applies particularly well to low volatility strategies which, if not properly designed, can fall victim to unintended and uncompensated risks.

EXHIBIT 1: WHERE THE RATE RISK LIES

Performance of the least volatile sectors tends to go the opposite direction of interest rates. Low volatility investors should avoid over-concentration in these sectors or they may run into unintended interest rate risk.



Sources: Northern Trust Asset Management, S&P Dow Jones, Bloomberg. Represents the correlation of the active sector returns of the S&P 500 to changes in the 10-year U.S. Treasury. From 10/31/2000 through 10/31/2019.

Another significant risk that can impact a low volatility strategy is its sole reliance on historical volatility. We believe it is essential to add a quantitative assessment of companies' underlying fundamentals to help predict future volatility and improve results. In Exhibit 2 we show that, within the lowest volatility quintile of the Russell 1000, those stocks with the lowest quality have both the lowest performance *and* the highest realized risk.³ Therefore, a low volatility strategy that adds quality can help to avoid companies that are not likely to exhibit low volatility in the future.

³ We use ROE as a proxy for quality but see similar results for other quality measures, including Northern Trust's quality factor described later.

EXHIBIT 2: HYPOTHETICAL ILLUSTRATION: WHAT QUALITY MEANS TO LOW VOLATILITY

Low quality companies have the lowest return and the highest realized risk. (Only looking at the lowest 20% (quintile) of stocks as measured by one-year price volatility.)



Sources: Northern Trust Asset Management, FTSE-Russell, Factset. From 12/31/1973 through 6/30/2019. Based on the Russell 1000 Index of large-cap equities, not actual portfolio results. The quintiles portfolios, which are constructed annually, are based on quality (defined as return on equity) and one-year price volatility. Please see important information on hypothetical returns at the end of this presentation. For illustrative purposes only. **Past performance is not indicative of future results.** Returns reflect the reinvestment of dividends. Returns of the indexes do not reflect the deduction of investment management fees, trading costs or other expenses. It is not possible to invest directly in an index.

Can investors expect to outperform?

A common objection to low volatility equities is that outperformance on a risk-adjusted basis does not translate into outperformance against a benchmark. We challenge this objection and suggest that while low volatility equities will indeed lower volatility, they can also potentially improve returns. To understand why, we turn to the topic of volatility asymmetry.

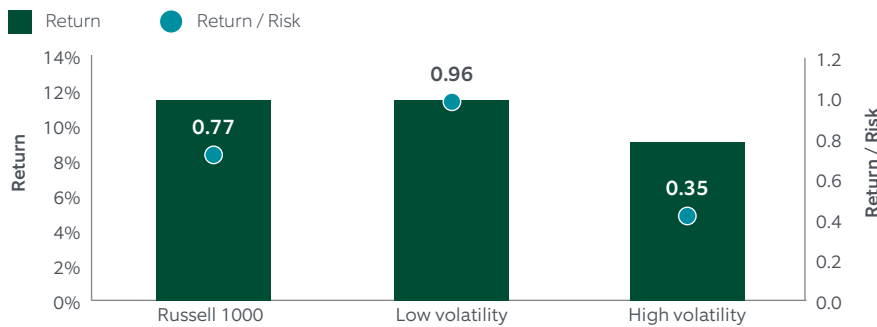
It is well known that when markets go down, they tend do so with more volatility than when markets go up. This is known as *volatility asymmetry* (for instance, see Bekaert and Wu, 2000). However, this dynamic has increased over time. In the 1990s, down markets were 17% more volatile than up markets. Last decade, they were 75% more volatile.

As it turns out, this volatility asymmetry also translates into return asymmetry, meaning that although low volatility strategies may miss out on full participation during up markets, they more than make up for this by an even greater avoidance of full participation in down markets. By compounding this difference in up and down market capture over time, low volatility investors are able to not only reduce risk, but also enhance returns, in up or down markets. Exhibit 3 shows that low volatility stocks have significantly outperformed high volatility stocks, risk-adjusted and not risk-adjusted.

Against the broader Russell 1000, we see very similar performance from low volatility stocks, but with 20% less risk. In other words, the data showing simple cuts of the Russell 1000 based on historical volatility support the case that low volatility portfolios can provide improved Sharpe ratios through both a decrease in volatility *and* potentially an improvement in returns.

EXHIBIT 3: HYPOTHETICAL ILLUSTRATION: THE LOW VOLATILITY ANOMALY

Low volatility stocks have significantly outperformed high volatility stocks, risk-adjusted and not risk-adjusted.



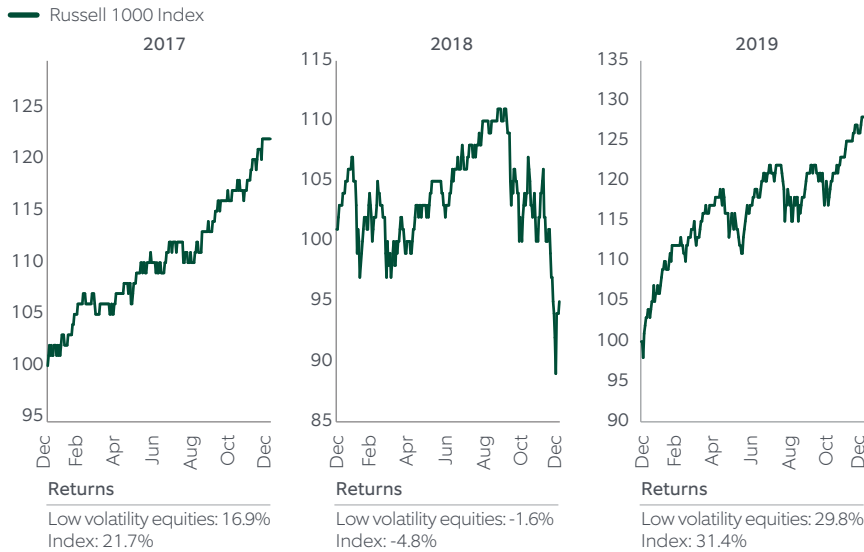
Sources: Northern Trust Asset Management, FTSE Russell, FactSet. From 12/31/1984 through 12/31/2019. The high volatility portfolio represents the most volatile 30% of equities in the Russell 1000 Index and the low volatility portfolio represents the least volatile 30% of equities in the index, based on three-year weekly trailing volatility. Portfolios are equal-weighted and rebalanced monthly. Please see important information on hypothetical returns at the end of this presentation. For illustrative purposes only. **Past performance is not indicative of future results.** Returns reflect the reinvestment of dividends and other earnings and are shown before the deduction of investment management fees. Returns of the indexes also do not typically reflect the deduction of investment management fees, trading costs or other expenses. It is not possible to invest directly in an index. Indexes are the property of their respective owners, all rights reserved.

If the previous exhibit highlights the long run credentials for low volatility, what about shorter periods? Are there certain environments where low volatility can be expected to underperform? We’ve found that low volatility strategies tend to underperform in a rising market where volatility is low and the level of volatility is stable, like we saw in 2017.

However, compare 2017 to 2019. In 2017, the Russell 1000 Index rallied 22% with volatility at a historically low level. Meanwhile, for 2019, the index returned 31% but in a much choppier fashion. For low volatility strategies to keep up with and potentially outperform in up markets, they require some market churn to perform well. That is, some down days should be mixed in with the up days. This is exemplified in Exhibit 4, where the lowest volatility stocks underperformed the benchmark by 4.8% in 2017 compared to a performance gap of only 1.6% in 2019.

EXHIBIT 4: RETURN PATH MATTERS

Low volatility strategies perform better when markets are more volatile.



Sources: Northern Trust, FTSE Russell, FactSet. Shows the return of the Russell 1000. Past performance is no guarantee of future results. Index performance returns do not reflect any management fees, transaction cost or expenses. It is not possible to invest directly in any index. The low volatility returns represent the 30% of companies with the lowest volatility in the Russell 1000 using trailing three-year weekly volatility. The portfolio is equal-weighted and rebalanced monthly. Please see important information on hypothetical returns at the end of this presentation. For illustrative purposes only. **Past performance is not indicative of future results.** Returns reflect the reinvestment of dividends and other earnings and are shown before the deduction of investment management fees. Returns of the indexes also do not typically reflect the deduction of investment management fees, trading costs or other expenses. It is not possible to invest directly in an index. Indexes are the property of their respective owners, all rights reserved.

Let’s bridge this with a third scenario. In 2018 the Russell 1000 fell 4.8%. Here we see a roller coaster market that favors low volatility strategies because investors participate less in the downside and more on the upside. In 2018, the lowest volatility stocks outperformed the benchmark by 3.2%.

These results are meant to be illustrative and do not incorporate the risk controls discussed above. With the proper risk controls in place, such as sector and region neutrality, investors can further benefit from this favorable up-down capture spread which provides low volatility investors with returns that keep pace with the benchmark even when the market is up. For example, over the same period shown (2017 –2019), Northern Trust’s Quality Low Volatility strategy, which we will discuss shortly, was up 16.3%⁴ annually versus the Russell 1000, which was up 15.0%.

Like any investment strategy, there are favorable and unfavorable market environments that can be difficult, if not impossible, to successfully time. Investors that have chosen low volatility and stayed the course over the long run have been handsomely rewarded with higher risk-adjusted performance and, depending on the approach, higher returns as well. This suggests that low volatility can be useful as a core equity allocation, especially when risk allocation is front and center.

⁴ Gross of Investment Management Fees.

DE-RISKING 1.0: MORE BONDS

When tasked with de-risking, the traditional approach — which we’re calling De-Risking 1.0 — is to shift from equities into bonds. Industry surveys show this is the traditional approach in the U.S. and Europe¹. The challenge facing investors today with the traditional approach is that expected returns for bonds are so low that investors risk falling short of their goals or meeting their liabilities in the case of pensions. We start with a portfolio of 60% developed market equities and 40% global aggregate bonds, then “de-risk” the portfolio by shifting 10% of equity into bonds. The results are shown in Exhibit 5, based on historical returns of indexes.

Expected returns for bonds are so low that investors risk falling short of their goals or meeting their liabilities in the case of pensions.

EXHIBIT 5: HYPOTHETICAL ILLUSTRATION: DE-RISKING 1.0: THE TRADITIONAL APPROACH

Adding bonds reduced risk, but also cut performance.



	BASELINE	DE-RISKING 1.0	CHANGE
Annualized returns	6.26%	5.86%	-0.40%
Risk	9.61%	8.53%	-1.08%
Sharpe ratio	0.52	0.54	0.02
Max drawdown	-36.1%	-30.9%	5.18%

Sources: Northern Trust Asset Management, MSCI, Bloomberg, HFRI. From 12/31/2003 – 10/31/2019. Illustrative purposes only. **Past performance is no guarantee of future results.** Index performance returns do not reflect any management fees, transaction cost or expenses. It is not possible to invest directly in any index. Please see important information on Hypothetical Returns at the end of this paper.

De-Risking 1.0 reduced volatility from 9.61% to 8.53% with a modest give-up on return and a significant improvement in maximum drawdown. However, the returns still fall short of what many investors require. Even more, our outlook of a slow-growing global economy and lower asset class returns over the next five years threatens to increase the shortfall in required returns. How might investors close this gap?

DE-RISKING 2.0: ADDING LOW VOLATILITY EQUITY TO THE TOOLKIT

As discussed earlier, low volatility equity has historically offered superior risk-adjusted returns through both a decrease in risk and an increase in return. So it is not surprising to see an improvement in historical risk-adjusted returns when using a low volatility strategy. Let’s explore what happens when we replace the MSCI World Index with a low volatility strategy. We call this asset allocation De-Risking 2.0. We then explore what happens with a “risk-neutral” approach,

where we increase the allocation of the low volatility strategy to make the risk the same as in De-Risking 1.0. We'll call this approach De-Risking 2.1. Table 2 summarizes the differences. Exhibit 6 shows how De-Risking 2.0 and 2.1 dramatically improve the portfolio's performance profile.

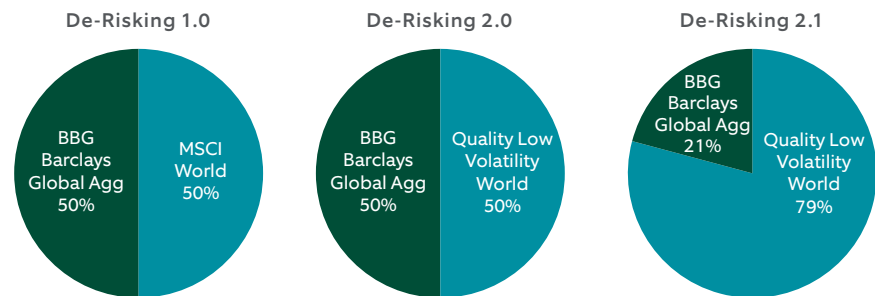
TABLE 2: AN EVOLUTION IN DE-RISKING

ALLOCATION	DESCRIPTION
De-Risking 1.0	De-risk by moving 10% from equities to fixed income
De-Risking 2.0	Using the already de-risked allocation from 1.0, replace cap-weighted investment with a low volatility strategy
De-Risking 2.1	Target the same risk in De-Risking 1.0 but optimize weights to maximize return

Source: Northern Trust Asset Management

EXHIBIT 6: HYPOTHETICAL ILLUSTRATION: PATH TO DE-RISKING 2.1

Creative use of low volatility equity strategies may improve performance and risk-adjusted returns.



	DE-RISKING 1.0	DE-RISKING 2.0	DE-RISKING 2.1
Annualized return	5.86%	6.51%	8.12%
Risk	8.53%	6.73%	8.53%
Sharpe ratio	0.54	0.78	0.80
Max drawdown	-30.9%	-21.5%	-32.2%

Sources: Northern Trust Asset Management, MSCI, Bloomberg, HFRI. From 12/31/2003 – 10/31/2019. QLV World returns are back tested and net of a hypothetical annual 0.35% investment management fee applied monthly. Illustrative purposes only. **Past performance is no guarantee of future results.** Index performance returns do not reflect any management fees, transaction cost or expenses. It is not possible to invest directly in any index. Please see important information on hypothetical returns at the end of this paper.

The equity strategy used is Northern Trust's Quality Low Volatility World.⁵ This is a low volatility strategy that efficiently manages unintended risks such as sector exposures and integrates a quantitative assessment of a company's quality to improve results.⁶ These controls also limit exposures to risks that are present in uncontrolled low volatility portfolios – such as exposure to interest rate changes.

Comparing De-Risking 2.0 to 1.0, we see a 0.65% improvement in return and a reduction in risk from 8.53% down to 6.73%. Further, the maximum loss in 2.0 has lessened by nearly 10%. These are all good results, but what if the risk reduction has gone too far? That is, what would the results be for an investor who is comfortable with the risk reduction level of 1.0, but is looking to improve other outcomes?

De-Risking 2.1 addresses this scenario. We take advantage of the high risk-adjusted returns produced by the low volatility strategy and allocate more to it. For a similar risk budget, this increases returns 2.26% relative to De-Risking 1.0, while improving the Sharpe ratio to 0.80 from 0.54. We note a modest 1.3% increase in the maximum drawdown.

Although this exercise was run with full hindsight, we note that the allocation to De-Risking 2.1 was driven by maintaining the risk budget. Although we certainly have faith in the return credentials of low volatility, we acknowledge that past performance is no guarantee of future success. However, from a *risk* standpoint, we feel quite confident that a low volatility portfolio will produce lower risk than the market during intermediate and long-term investment horizons.

FILLING THE PERFORMANCE GAP

The new volatility environment, where markets seemingly change risk posture on a dime, appears here to stay. As we discussed, volatility asymmetry has been on the rise, and we continue to see periods of calm dappled with intermittent volatility storms. We think the current volatility environment should continue to provide a tailwind to low volatility equities, even as low volatility goes through performance cycles like any other class.⁷

In designing low volatility strategies, our philosophy is to focus on risks that we are getting paid to take through low volatility and quality factors. We aim to avoid unintended sector exposures that add to risk without adding to return. A portfolio constructed with this in mind is well positioned for strong up-market capture while mitigating losses during market drawdowns. Viewed over the long run, we feel that using low volatility equities as part of a diverse portfolio can go a long way towards filling the performance gap between expected and target returns.

– with contributions from Isabel Machlin

⁵ Although this strategy has been live since April 2015, these results represent a back test to allow a greater history for performance analysis. Performance presented is net of a hypothetical 0.35% per year investment management fee applied monthly.

⁶ See [Factor Profile – Quality](#).

⁷ See *Not Which, But When* for a more detailed discussion on factor cycles.

We feel that using low volatility equities as part of a diverse portfolio can go a long way towards filling the performance gap between expected and target returns.

REFERENCES

- "Asset Allocation Trends in Institutional Asset Management – U.S." *Greenwich Associates LLC* (2019).
- Baker, Malcolm P. and Bradley, Brendan and Wurgler, Jeffrey A., "Benchmarks as Limits to Arbitrage: Understanding the Low Volatility Anomaly", *Financial Analysts Journal*, Volume 67, Issue 1, 2011.
- Bekaert, Geert, and Guojun Wu. "Asymmetric Volatility and Risk in Equity Markets." *The Review of Financial Studies* 13.1 (2000): 1-42.
- Black, Fischer, Michael C. Jensen, and Myron Scholes. "The Capital Asset Pricing Model: Some Empirical Tests." *Studies in the Theory of Capital Markets* 81.3 (1972): 79-121.
- Blitz, David C. and van Vliet, Pim, "The Volatility Effect", *Journal of Portfolio Management*, Volume 34, Issue 1, Pages 102-113, 2007.
- Brainard, Keith, and Alex Brown. "Public Pension Plan Investment Return Assumptions." *National Association of State Retirement Administrators* (2019).
- Carhart, Mark M. "On Persistence in Mutual Fund Performance." *The Journal of Finance* 52.1 (1997): 57-82.
- "European Asset Allocation Survey." *Mercer LLC* (2019).
- Fama, Eugene F. "The Behavior of Stock-market Prices." *The Journal of Business* 38.1 (1965): 34-105.
- Frazzini, Andrea and Pedersen, Lasse, "Betting against Beta", *Journal of Financial Economics*, Volume 111, Issue 1, Pages 1-25, 2014.
- Hong, Harrison, and Jeremy C. Stein. "Differences of Opinion, Short-sales Constraints, and Market Crashes." *The Review of Financial Studies* 16.2 (2003): 487-525.
- Kumar, Alok, "Who Gambles in the Stock Market?," *Journal of Finance*, Volume 64, Issue 4, Pages 1889-1933, 2009.



LEARN MORE

To learn more about Northern Trust Asset Management's Quantitative strategies, please visit northerntrust.com or call us at 877.651.9156.

How helpful was
this white paper?



For Europe, this material is directed to professional and eligible counterparties only and should not be relied upon by retail investors. For Asia-Pacific, this material is directed to expert, institutional, professional and wholesale clients or investors only and should not be relied upon by retail investors. For Australia, this material is directed to and should only be accessed by wholesale and professional investors within the meaning of the Corporations Act 2001 (Cth) and is not intended for retail clients. For New Zealand, this material is directed to and should only be accessed by registered financial service providers and is not intended for retail clients.

The information is not intended for distribution or use by any person in any jurisdiction where such distribution would be contrary to local law or regulation. Northern Trust and its affiliates may have positions in and may effect transactions in the markets, contracts and related investments different than described in this information. This information is obtained from sources believed to be reliable, and its accuracy and completeness are not guaranteed. Information does not constitute a recommendation of any investment strategy, is not intended as investment advice and does not take into account all the circumstances of each investor. Opinions and forecasts discussed are those of the author, do not necessarily reflect the views of Northern Trust and are subject to change without notice.

This report is provided for informational purposes only and is not intended to be, and should not be construed as, an offer, solicitation or recommendation with respect to any transaction and should not be treated as legal advice, investment advice or tax advice. Recipients should not rely upon this information as a substitute for obtaining specific legal or tax advice from their own professional legal or tax advisors. References to specific securities and their issuers are for illustrative purposes only and are not intended and should not be interpreted as recommendations to purchase or sell such securities. Indices and trademarks are the property of their respective owners. Information is subject to change based on market or other conditions.

Investing involves risk- no investment strategy or risk management technique can guarantee returns or eliminate risk in any market environment.

Simulated and actual past performance is not a reliable indicator of future results and should not be the sole factor of consideration when selecting an investment product or strategy.

Forward-looking statements and assumptions are Northern Trust's current estimates or expectations of future events or future results based upon proprietary research and should not be construed as an estimate or promise of results that a portfolio may achieve. Actual results could differ materially from the results indicated by this information.

For investors in Australia, pursuant to transitional relief granted by the Australian Securities and Investments Commission (ASIC), Northern Trust Global Investments Limited ("NTGIL") is exempt from the requirement to hold an Australian Financial Services Licence ("AFSL") under the Corporations Act. NTGIL is authorised and regulated by the FCA under UK laws, which differ from Australian laws. Similarly, The Northern Trust Company of Hong Kong Limited ("TNTCHK") is exempt from the requirement to hold an AFSL under the Corporations Act. TNTCHK is authorized and regulated by the SFC under Hong Kong laws, which differ from Australian laws.

Northern Trust Asset Management is composed of Northern Trust Investments, Inc. Northern Trust Global Investments Limited, Northern Trust Fund Managers (Ireland) Limited, Northern Trust Global Investments Japan, K.K, NT Global Advisors Inc., 50 South Capital Advisors, LLC and investment personnel of The Northern Trust Company of Hong Kong Limited and The Northern Trust Company.

© 2020 Northern Trust Corporation. Head Office: 50 South La Salle Street, Chicago, Illinois 60603 U.S.A.

northerntrust.com



**NORTHERN
TRUST**

ASSET MANAGEMENT