NORTHERN TRUST
ASSET MANAGEMENT

FACTOR PROFILE: LOW VOLATILITY

Low volatility strategies target securities that exhibit less price volatility than the broader equity market. Ideally these strategies fall significantly less in down markets and participate in a meaningful portion of the up-market. This risk and return pattern is referred to as an asymmetrical return pattern, which can have powerful alpha generation effects over time. The idea that return should be positively related to risk is intuitive and forms the hallmark of William Sharpe's capital asset pricing model (CAPM). Contrary to this traditional theory, research has shown that lower volatility stocks tend to outperform higher volatility stocks over time ("low volatility anomaly").

This anomaly can be explained by behavioral tendencies and structural issues, and has persisted across markets for long periods of time. For example, the "lottery preference" is a behavioral tendency of investors to overpay for small chances of earning large gains, which means they prefer high volatility stocks and cause them to be overpriced [Bali, et al. [2011].

Further, structural limitations may also contribute to the low volatility anomaly. For example, investors may be prohibited or reluctant to employ leverage, and with leverage unavailable, high return seeking investors bid high volatility stocks up and subsequently, push expected returns on those same stocks downward.

Compared to other factors, low volatility is somewhat unique because there are two efficient ways to gain low volatility factor exposure. Our low volatility investing view includes both approaches: a portfolio variance minimization approach combined with high quality, and a security level factor perspective. The scope of this factor profile will be on the latter view in which we take a stock level rather than portfolio level view of low volatility.

LV
LOW VOLATILITY

INVESTOR PROFILE:
Lower risk tolerance; Defensive

FACTOR APPLICATION:
Reduce absolute risk; Seek asymmetrical returns for long-term outperformance

AVERAGE FACTOR CYCLE LENGTH:
Short[1]

1 Relative to other factors. See "Factor Investing: Not Which, But When", Northern Trust Research Paper [2015].

OUR APPROACH TO FACTOR DESIGN

Simple factor definitions have the potential to create very large sector and region biases in a portfolio. For example, a ranking of stocks by a singular measure like beta would likely show sector and regional concentrations. We believe these concentrations are uncompensated over time because they add risk to the portfolio, but not necessarily return. Furthermore, factor definitions change among regions and sectors due to differing business models and accounting customs and regulations.

For the last 25 years, Northern Trust's approach to defining factors has incorporated three primary elements:

Multidimensionality: Factor anomalies are very complex and strictly unobservable. As such, no single metric can hope to fully describe the anomaly. Our research shows that constructing factors using multiple metrics or signals that complement each other is a more robust way capture the factor phenomenon.

Region and Sector Neutrality: To reduce biases inherent in naïve factor design, all Northern Trust factor strategies are region- and sector-neutral, with factors being ranked and scored in unique regional and sector combinations. This process limits the presence of unintended exposures that can become embedded in factor definitions that do not take this approach.

Region and Sector Specific Factor Definitions: In some instances the business models of sectors are so dissimilar they require different factor definitions. For example, one cannot use the same criteria to judge the quality of a REIT, a commercial bank, or an information technology firm. Similarly, accounting data among regions is inconsistent. For these reasons, Northern Trust's factor definitions are customized to regional and sector needs, as appropriate.

OUR APPROACH TO LOW VOLATILITY

Our approach utilizes signals of asymmetric risk, fundamental variability, and historical volatility to define our low volatility factor, which are applied in a regional and sector neutral manner. This is particularly important for low volatility because certain sectors have systematically lower volatility, such as utilities and consumer staples. This is how low volatility strategies can become sector concentrated.

VALUE	QUALITY	MOMENTUM	LOW VOLATILITY
Current Value	Management Efficiency	Market Sentiment	Asymmetric Risk
Normalized Value	Profitability	Analyst Sentiment	Fundamental Variability
Prospective Value	Cash Flow		Historical Volatility

Source: Northern Trust

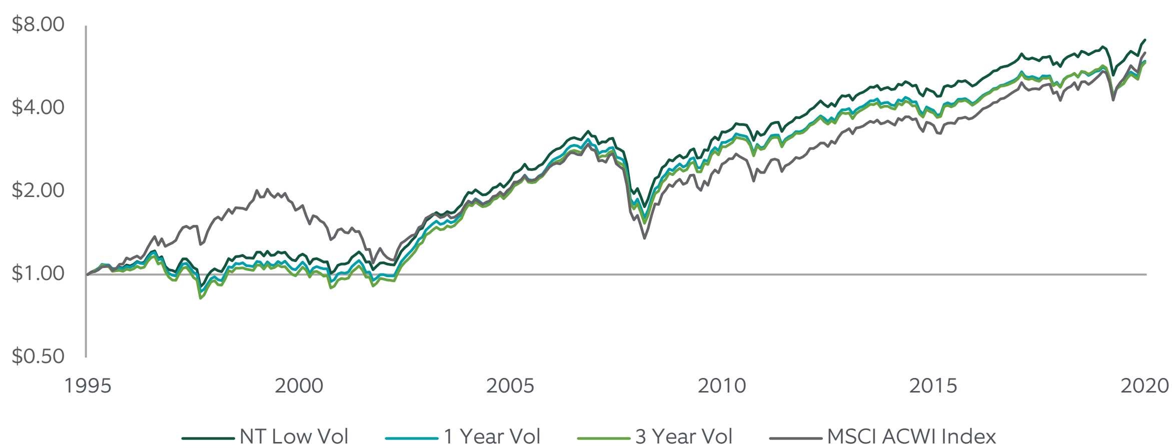
There are three sets of signals that comprise our proprietary low volatility factor:

Asymmetric risk signals look at the distribution of historic volatility. Our research shows that stocks that are more volatile on the downside relative to their volatility on the upside are undesirable in a low volatility portfolio. These stocks tend to have negative skew (more frequent extreme returns below the average) in their return patterns and simply avoiding these stocks can be a powerful way to capture favorable asymmetry in returns.

Fundamental variability signals provide a fundamental underpinning to our factor design based on data directly from company financial statements. Fundamental variability is a great way to identify low volatility stocks using signals that are not tied to valuation movements. We believe these signals add a unique perspective and tend to decrease turnover associated with simplistic strategies based only on historical price volatility. Examples of fundamental signals include variability of free cash flow and variability of sales.

Smoothed historical volatility signals are based on stock price volatility, which is a well-researched approach to exploit the low volatility anomaly. Our signals measure volatility over time and place a greater weight on recent price return observations. Examples of our historical volatility signals include a one year weekly volatility and a three year weekly volatility measure.

OUR RESEARCH AND SUPPORTING EVIDENCE:



Source: Northern Trust Quantitative Research; Cumulative performance (log scale) of the top 20% of stocks ranked by the low volatility measure. The research portfolios are equally weighted portfolios rebalanced monthly that are sector- and region-neutral. Period 12/31/1995 – 12/31/2020. Benchmark is the MSCI ACWI Total Return Index. "NT Low Vol" = Northern Trust proprietary definition, "1 Year Vol" = standard deviation of monthly returns over the last 12 months, "3 Year Vol" = standard deviation of monthly returns over the last 36 months. This graph does not show actual performance results. For illustrative purposes only. Past performance is not indicative or a guarantee of future results. Index performance returns do not reflect any management fees, transaction costs or expenses. It is not possible to invest directly in any index.

	Annualized Ret, %	Annualized Vol, %	Annualized Excess Return, %	Sharpe Ratio	Max Drawdown
NT Low Vol	8.16%	12.92%	0.47%	0.46	-46.8%
1 Year Vol	7.39%	13.33%	-0.30%	0.39	-48.1%
3 Year Vol	7.34%	13.56%	-0.35%	0.38	-48.4%
MSCI ACWI Index	7.69%	15.64%		0.35	-54.5%

REFERENCES AND RELATED READING

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