NISA

PERSPECTIVES

Breaking Beta

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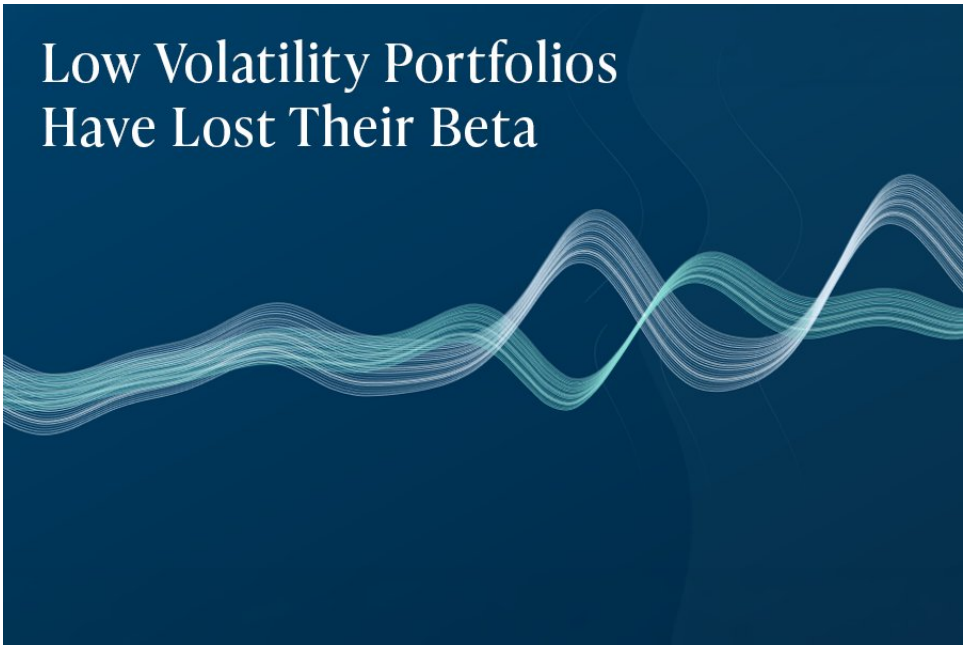
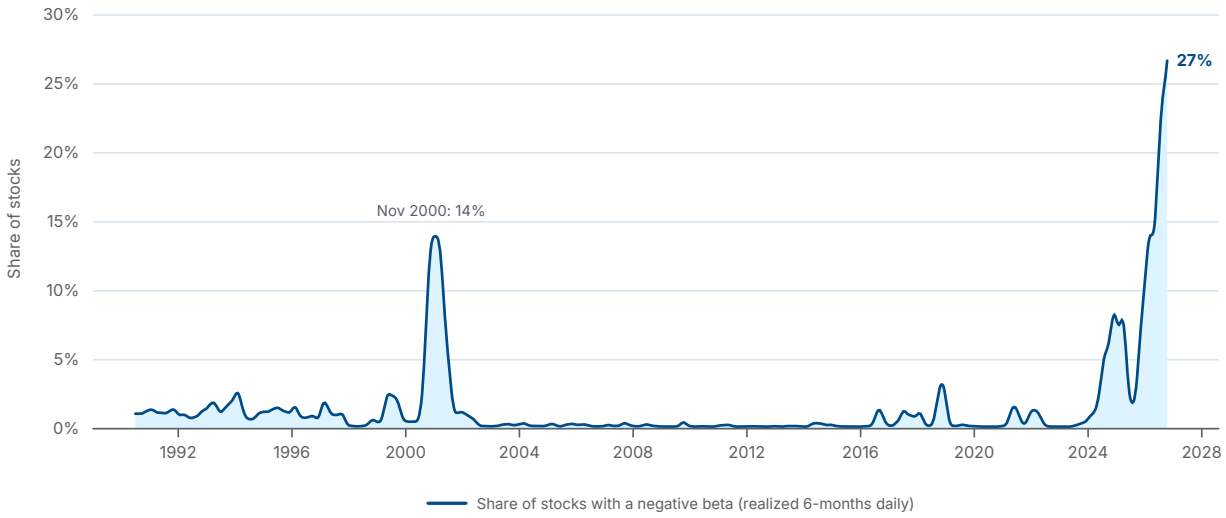


We see something truly extraordinary happening beneath the surface of the equity markets. Over the six months prior to September 30, 2026, 27% of large U.S. stocks had negative realized beta, compared with a long-run average of just 1.3%.[1] The breadth of negative betas has no precedent in our U.S. large-cap record dating back to 1990. The closest historical comparison is the dot-com crash, when the market was declining, but the negative-beta share peaked at only 14% in late 2000. Today, we are nearly twice that prior high. This dislocation is extreme in both breadth and duration and has significant implications for portfolio and risk management. In particular, it causes acute stress for low-volatility, minimum-variance and low-beta allocations.

The percentage of large U.S. stocks with a negative realized beta has never been this high

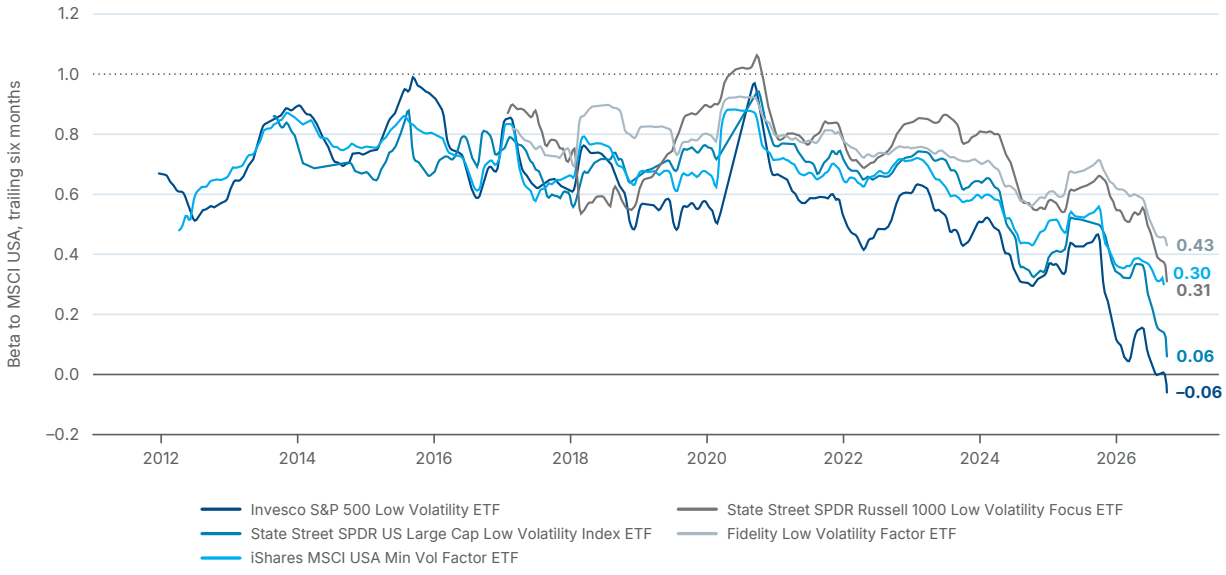


Source: NISA analysis. U.S. large cap = roughly the 600 largest U.S.-listed stocks (Capital IQ by market cap, January 1990–July 2007; MSCI USA constituents thereafter). Beta of each stock's daily returns to the cap-weighted index of the other names, trailing six months. Average since 1990: 1.3%.

Share of large U.S. stocks with negative six-month realized beta since 1990: 27% today versus a prior peak of 14% in late 2000

When we look at the largest ETFs in the space, we find U.S. low-volatility strategies are delivering substantially less equity market exposure than their history and mandate would imply. The six-month betas of five widely held ETFs[2] now range from -0.06 to 0.43, versus long-run averages of about 0.7 to 0.8. Two of the largest ETFs have essentially begun to exhibit market-neutral characteristics. The change is driven by a sharp decline in correlation with the market, not a comparable decline in the funds' volatility relative to it. The result is rapidly increasing tracking errors between this fund family and the indices they are built against.

U.S. low-volatility ETFs have lost most of their market exposure

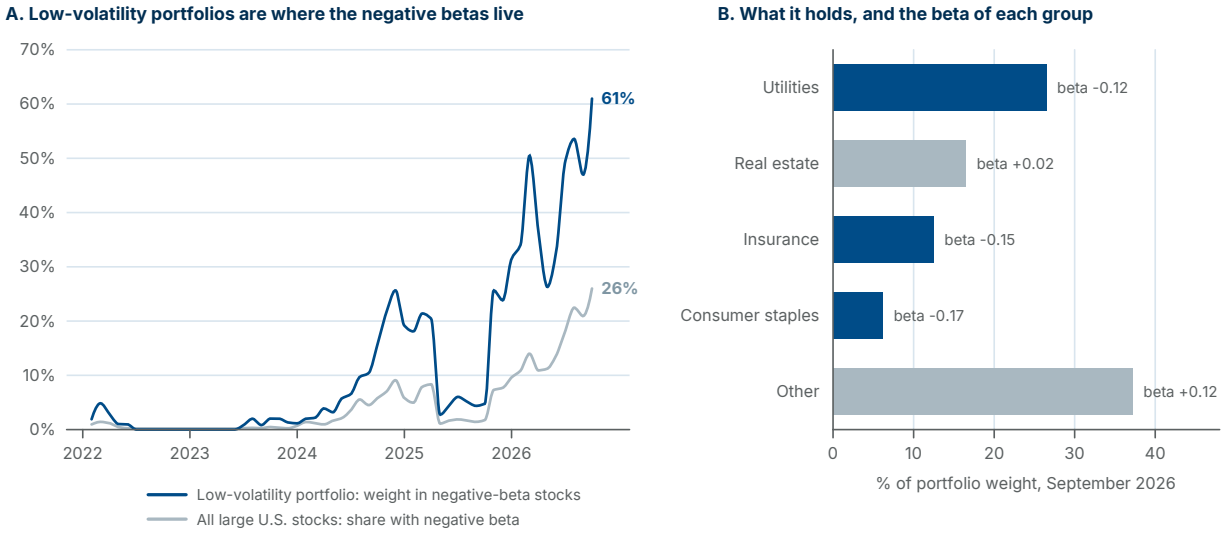


Sources: NISA analysis; S&P Capital IQ daily total returns. MSCI USA: NISA reconstruction from constituent weights and daily total returns. Beta of daily returns over the trailing 126 trading days, through September 30, 2026.

Six-month realized betas of five U.S. low-volatility ETFs

We see the market as clearly splitting along the dimension of AI and most everything else. We measure the ten largest U.S. stocks as accounting for 37% of index weight but 55% of the MSCI USA index risk today.[1] Defensive sectors increasingly trade with negative correlation to the major index drivers. We built a low-volatility proxy portfolio that goes long the 100 lowest-volatility stocks weighted by inverse volatility.[3] In our simple, low-volatility proxy, negative-beta stocks account for 61% of portfolio weight today. Low-volatility funds exhibiting low to negative betas reflect the current state of this AI-driven market.

Most of a low-volatility portfolio now moves against the market

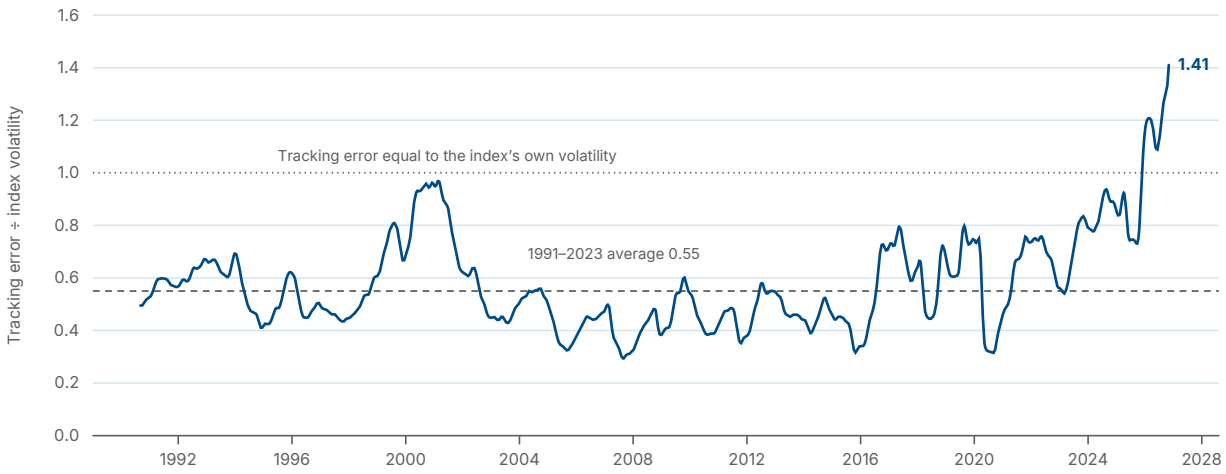


Sources: NISA analysis; S&P Capital IQ daily total returns; MSCI USA constituents. Low-volatility portfolio: each month, the 100 least volatile of the 500 largest U.S. stocks, weighted by inverse volatility. Betas: six months of daily returns against the cap-weighted index of the other names. B: dark bars have a negative weighted beta.

Negative-beta holdings in a low-volatility proxy and their sector exposures

A side effect of this is materially increasing tracking error of these mandates. In our proxy, annualized tracking error as a ratio of index volatility has roughly doubled from its average over the last decade, from ~0.7 to ~1.4. Thus, these strategies have become significant anti-AI allocations. Investors have underwritten these strategies for a myriad of reasons, but outright market hedges with tracking errors that may exceed index volatility itself was likely not part of the mandate.

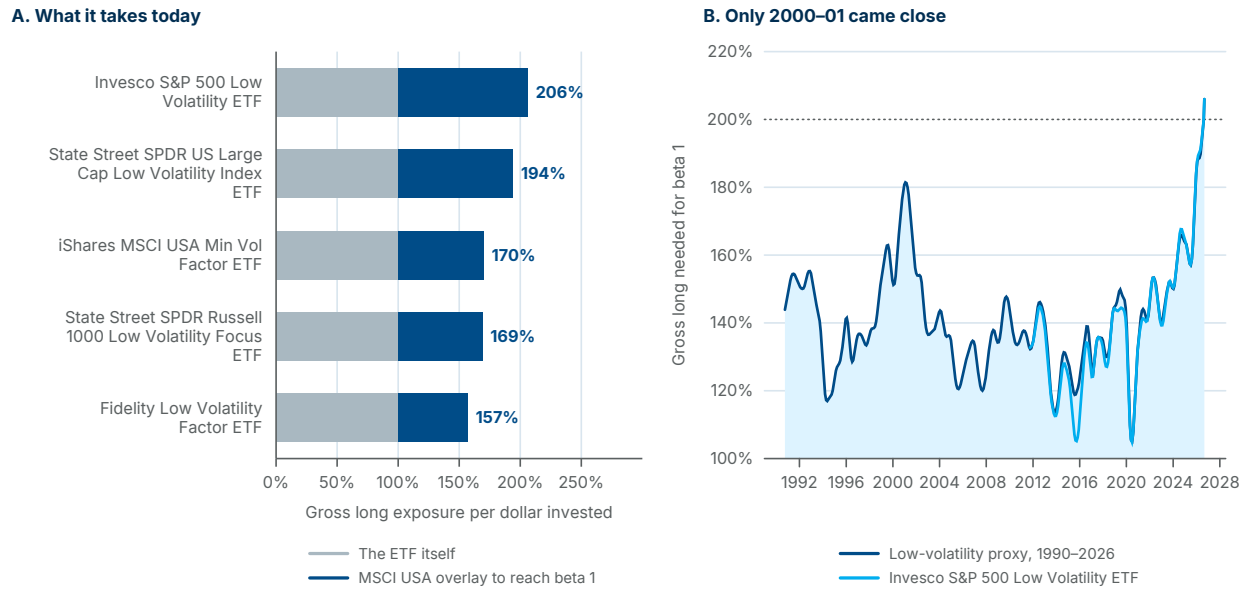
Low-volatility tracking error now exceeds the market's own volatility



Sources: NISA analysis; S&P Capital IQ daily total returns. MSCI USA: NISA reconstruction from constituent weights and daily total returns. Proxy: each quarter, the 100 least volatile of the 500 largest names in our U.S. large-cap universe (Capital IQ top ~600 by market cap to July 2007, MSCI USA constituents thereafter), weighted by inverse volatility. Tracking error and index volatility: annualized standard deviation of daily returns (differences with MSCI USA, and MSCI USA itself) over the trailing 126 trading days, through September 30, 2026.

One may attempt to lower the tracking error of these mandates with index overlays. An overlay[4] recovers beta exposure but introduces risks if correlations were to normalize. For example, bringing combined beta to 1 of the ETFs we analyzed would require index exposure of 57% to 106% on top of the funds, taking gross long exposure as high as 206%.

Keeping a low-volatility Allocation at beta 1 now takes up to 200% long

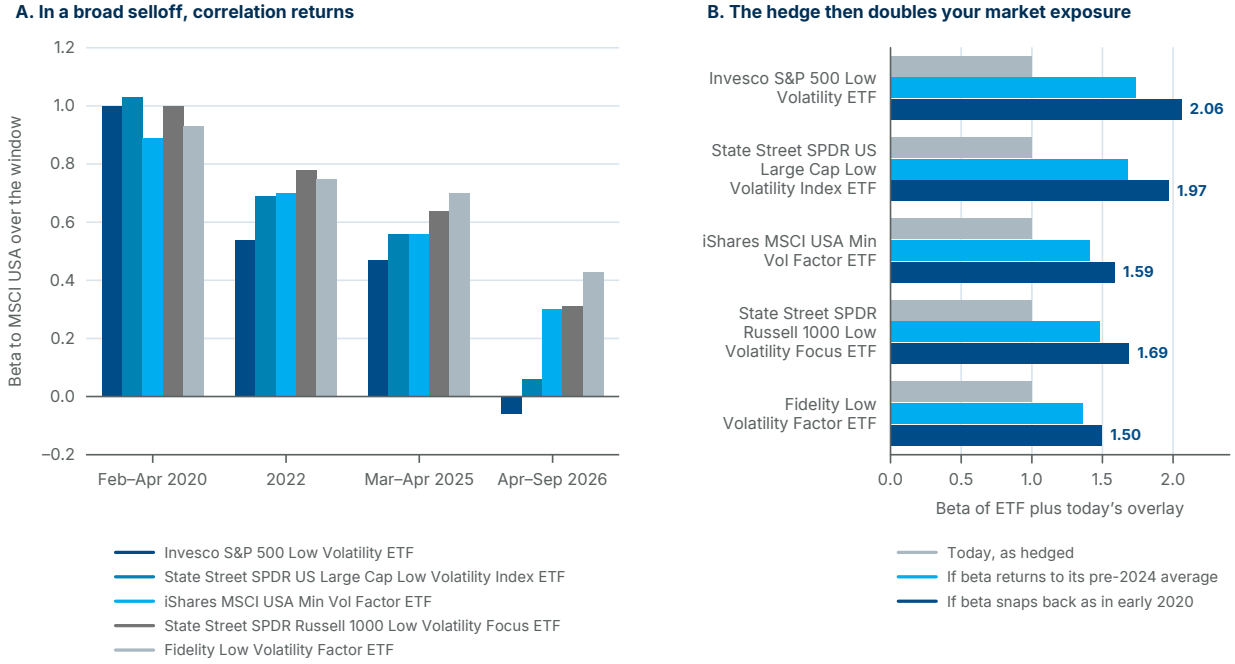


Sources: NISA analysis; S&P Capital IQ daily total returns. MSCI USA: NISA reconstruction from constituent weights and daily total returns. Overlay = 1 minus the trailing 126-day beta to MSCI USA, as of September 30, 2026. Proxy: each quarter, the 100 least volatile of the 500 largest names in our U.S. large-cap universe (MSCI USA constituents), weighted by inverse volatility (daily

correlation with Invesco S&P 500 Low Volatility ETF 0.99).

If fund betas returned to their pre-2024 averages with those overlays lagging as risk model estimates updated, combined betas would rise to 1.4-1.7, significantly overshooting the target. A rebound comparable to early 2020 would lift them to about 1.5 -2.1. Beta 1 is an analytical reference point, not an allocation recommendation, but it highlights the difficulty in managing these exposures in this unprecedented environment.

The overlay that fixes beta today is a bet that correlation stays low

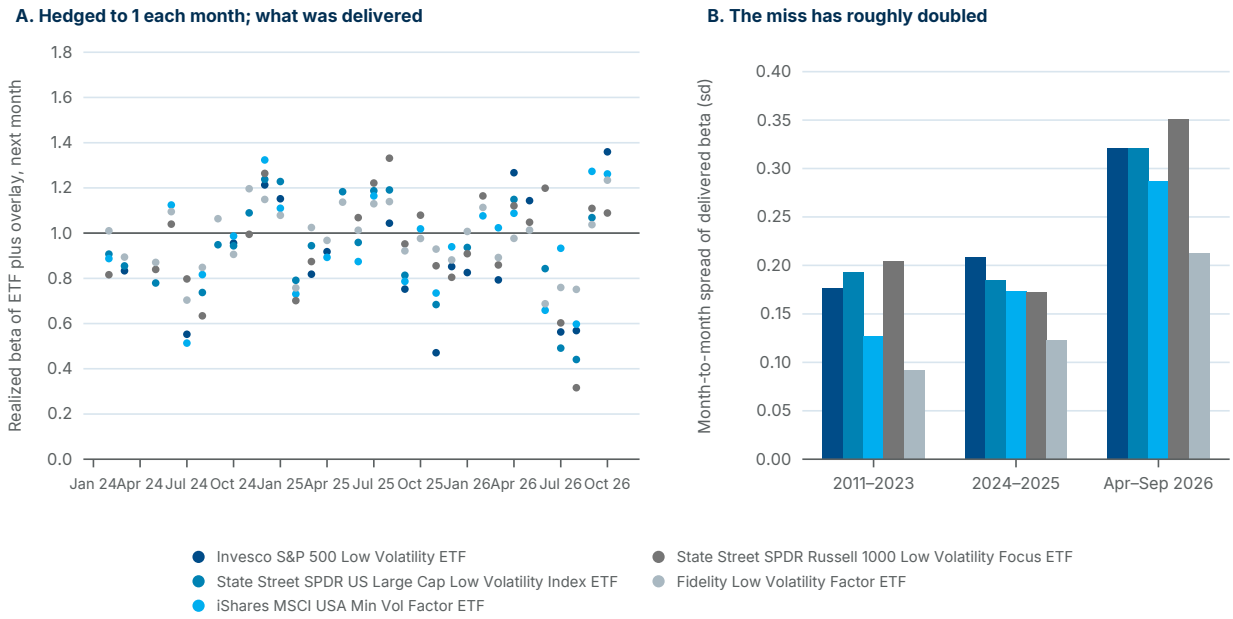


Sources: NISA analysis; S&P Capital IQ daily total returns. MSCI USA: NISA reconstruction from constituent weights and daily total returns. A: beta of daily returns over each window. B: today's overlay (1 minus the September 30, 2026 beta) added to the ETF's beta in each scenario.

Combined fund and overlay betas under historical-average and early-2020 rebound scenarios

This hedging exercise is becoming less stable. An overlay must be sized in advance, using observed beta to estimate future market exposure. We tested this approach by setting the overlay at each month-end to one minus the fund's trailing six-month beta, holding it for the following month and measuring the beta delivered by the combined position.

An ex-ante hedge gets beta right on average and wrong in any given month

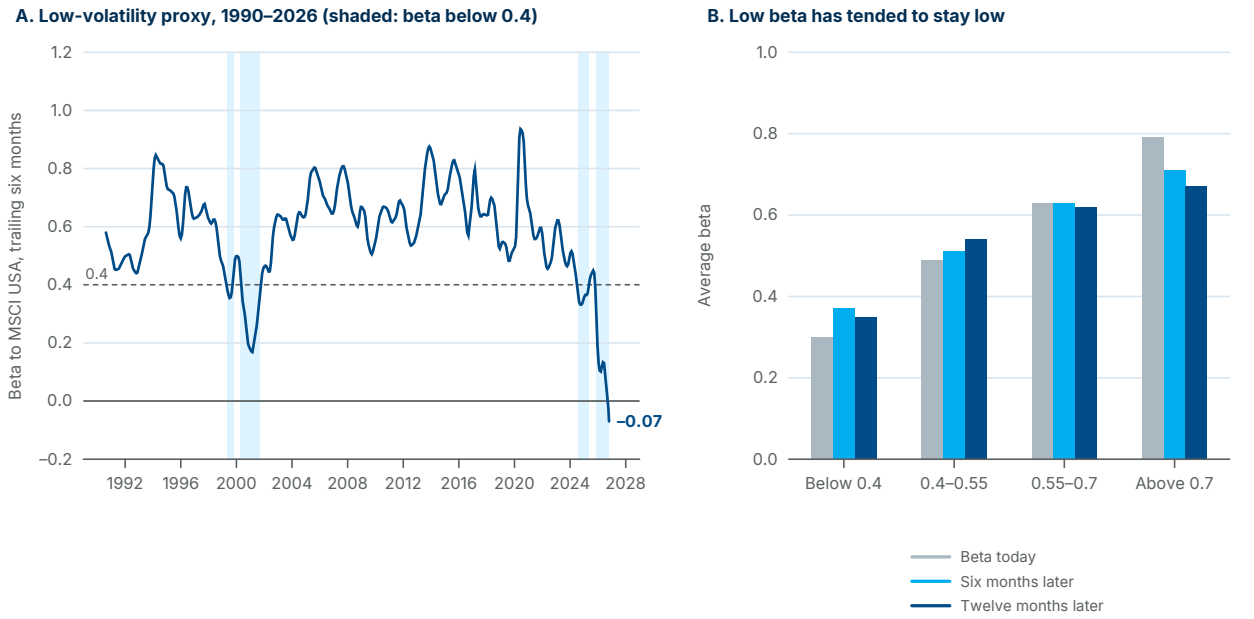


Sources: NISA analysis; S&P Capital IQ daily total returns. MSCI USA: NISA reconstruction from constituent weights and daily total returns. Each month-end the overlay is set to 1 minus the trailing 126-day beta and held for the following month; delivered beta is the daily regression of ETF plus overlay on MSCI USA over that month.

Average results have been reasonably close to target. Across the funds, hedged positions delivered an average beta of about 0.85 to 0.95 over the past six months. Monthly outcomes have been less reliable. The month-to-month spread of delivered beta has increased from about 0.1 to 0.2 over 2011 to 2023 to about 0.2 to 0.35, with individual monthly betas ranging from about 0.3 to 1.35, based on our six monthly observations since April 2026. Measurement noise accounts for part of any single month's estimate, but not for the increase in dispersion. The overlay has delivered close to its intended exposure on average, while allowing substantial deviations in individual months.

Without an overlay, the allocation retains very low to negative market exposure. Historical experience offers some guidance on the persistence of low betas, although the number of comparable episodes is limited. Low-beta historical deviations have historically had a half-life of about 12 to 19 months,[5] although only three comparable episodes occur in the 35-year sample, with a fourth currently under way since October 2025.

Low-beta regimes have been sticky: half-lives of more than a year



Sources: NISA analysis; S&P Capital IQ daily total returns. MSCI USA: NISA reconstruction from constituent weights and daily total returns. Proxy: each quarter, the 100 least volatile of the 500 largest U.S. stocks, weighted by inverse volatility; U.S. large cap = Capital IQ by market cap to July 2007, MSCI USA constituents thereafter. B: month-end betas grouped by level, with the average beta six and twelve months later, 1990–2026; the lowest group rests on three episodes.

Low-volatility betas have been persistent looking forward for 12 months. Across the five funds since launch and our proxy since 1990, roughly 70% to 80% of a deviation from long-run average beta remains six months later, implying a half-life of about 12 to 19 months. When the proxy's last beta fell below 0.4, its average beta was 0.37 six months later and 0.35 twelve months later.

The closest precedent is 2000–01. The proxy's beta fell below 0.4 in April 2000, remained there for 18 months and reached a low of 0.14. Two years after the episode began, beta was still only 0.46. The current episode has lasted 12 months, with beta falling further to below zero.

These estimates are based on only four episodes in 35 years: 1999, 2000–01, mid-2024 to early 2025 and the period under way since October 2025. Two are from the AI period, including this current one, leaving a limited historical sample. The persistence of low-volatility beta also needs to be reconciled with the instability of market-wide correlation. The distinction is between the level of correlation, which can change quickly, and the pattern of co-movement among stocks, which has proved more durable. Today, that pattern separates AI leaders from the rest of the market, with low-volatility strategies firmly positioned as hedges to the latter group.

What the environment means for low volatility mandates today:

- The allocation is contributing limited beta. An allocation sized for a beta of 0.6 to 0.8 delivers substantially less equity exposure than planned, and in some cases almost none.
- Benchmark-relative risk has increased. Tracking error is now roughly twice its historical level as a ratio to benchmark volatility.
- An overlay exchanges lower current exposure for greater rebound risk. An overlay based on current beta delivers the intended market exposure if the regime persists but materially overshoots if correlation renormalizes. A partial overlay, sized between the amounts implied by current beta and the historical average beta, leaves more of the current exposure shortfall

while reducing the excess exposure following a rebound. In any case, the risk of an ex-post beta mismatch is larger than it has historically been.

- Risk model estimates may have overstated market exposure. Risk models based on medium (~12-month half-life) and longer horizons have been slow to capture the shift. In our testing over the past year, a medium-horizon statistical model consistently overstated U.S. portfolio market exposure over the last six months.[6] Realized beta or shorter-horizon risk models have been the more reliable guide but would lead you to substantial leverage levels today.[7]
- Portfolio construction is the primary distinction and stabilizer. The five funds have lost different amounts of market exposure, ranging from almost all to about half. A purposefully designed process with explicit sector and risk controls can produce a more tightly structured exposure profile than an unconstrained expression of the signal. Integrating low volatility with additional signals can add some resilience to environments like this. Even in low-volatility-only portfolios, outcomes are highly sensitive to how the signal is expressed through stock selection, weighting and sector, and risk constraints.

For now, many low-volatility stocks trade with a negative correlation to the index's dominant exposures rather than serving as a lower-beta version of the index. An existing allocation, therefore, brings less market exposure and more benchmark-relative risk than any time in our history dating to 1990. An index overlay can bring that exposure back towards beta one but also increases sensitivity to a rebound in correlation. Potential solutions for protection in this environment include tracking error-aware mandates or fully integrated quantitative mandates. For existing allocations, overlay exposure and/or allocation sizing are the dominant questions to answer.

About the data

[1] MSCI USA: NISA reconstruction of the cap-weighted index from constituent weights and daily total returns. U.S. large cap is Capital IQ by market cap through July 2007 and MSCI USA constituents thereafter. Beta, correlation and share of variance explained (correlation squared) are from daily returns over the trailing 126 trading days; historical comparisons average nonoverlapping six-month windows. Tracking error is the annualized standard deviation of daily return differences from the index.

[2] ETF returns: daily total returns in U.S. dollars from S&P Capital IQ for each fund's primary U.S. listing: Invesco S&P 500 Low Volatility ETF (from May 2011), iShares MSCI USA Min Vol Factor ETF (October 2011), State Street SPDR US Large Cap Low Volatility Index ETF (February 2013, with a data gap in 2014), State Street SPDR Russell 1000 Low Volatility Focus ETF (December 2015) and Fidelity Low Volatility Factor ETF (September 2016).

[3] Low-volatility proxy: each quarter, the 100 least volatile (252-day) of the 500 largest U.S. stocks by benchmark weight, weighted by inverse volatility.

[4] Overlay: MSCI USA exposure equal to one minus the fund's trailing beta, set at each month-end and held for the following month; financing and trading costs are ignored.

[5] Persistence: slope of beta six months ahead on current beta, nonoverlapping; half-life = ln(0.5)/ln(slope) x 6 months. Fund names are used for identification only; this note is not a recommendation to buy or sell any fund. Past performance is not indicative of future results.

[6] The statistical risk model is a proprietary risk model developed by NISA that uses a medium-term one-year half-life for correlations.

[7] Short-term risk models were proxied using rolling 6-month realized betas as the estimate for next month's beta exposure.

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