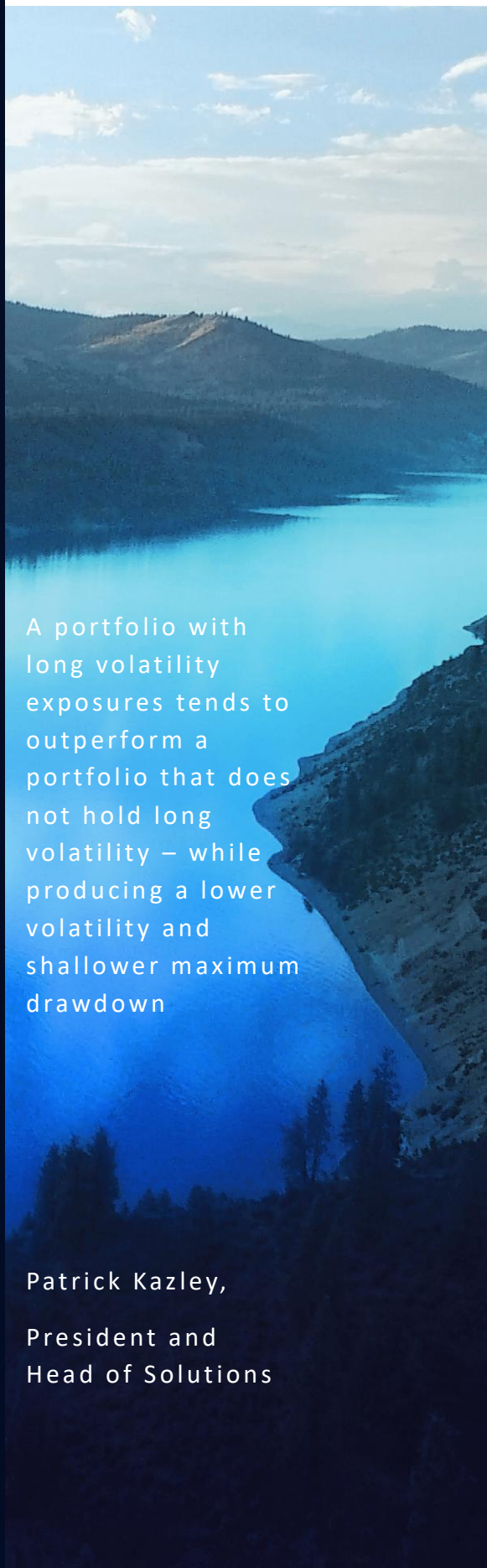
OneRiver
ASSET MANAGEMENT

Heretical Thinking: The Long Volatility Premium

How Investors are Paid to Protect Themselves



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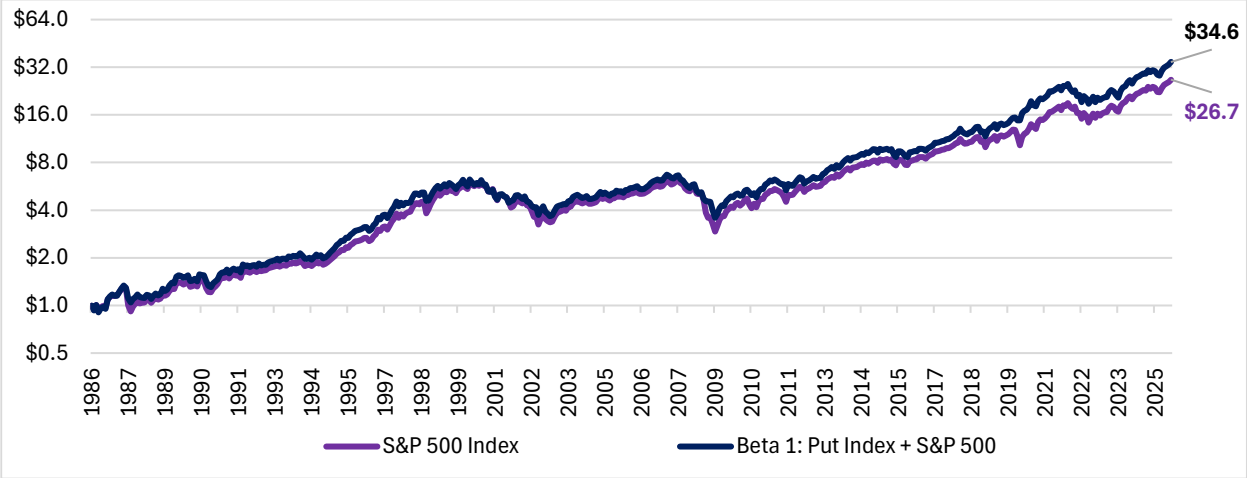
Introduction: The Long Volatility Premium

Over the long-term, investors tend to be paid to hold long volatility exposures. It's a premium accrued to the total portfolio in the form of superior compounded returns. We've written extensively about how lowly correlated, positively convex, capital-efficient solutions that are sufficiently liquid to be rebalanced alongside equity beta tend to outperform portfolios that eschew long volatility altogether. The idea that long volatility exposures can enhance total returns in addition to reducing volatility and drawdowns is a deeply misunderstood notion - and may seem heretical to some. Academics can un-clutch their pearls - both the long volatility and short volatility premium as defined in this paper can coexist. Data has always been the best arbiter of truth, and that's the focus here – it certainly was some 30+ years ago for what we now know as risk premia.

For risk premia, Fama and French's 1992 *The Cross-Section of Expected Stock Returns* paper was a watershed moment, in that the unveiling of a 3-factor model (including Value and Size) challenged the established academic thought of the 1950s-1970s (Markowitz, Sharpe, Lintner, etc.) of a single-beta CAPM model, and to an extent Fama's own work on efficient markets. The possibility of multiple persistent, pervasive, and scalable factors that could explain average returns was so revolutionary that Fama and French referred to these non-market betas as "return anomalies" to the CAPM model. Heretical as it may have been, the data supported the thesis. So began an era of academic exploration into the contentious notion that multiple risk premia exist, and that their excavation wouldn't necessarily cause their extinction.

The most common critique of long volatility investing is that one is necessarily harvesting a negative risk premium, as there is more-than-sufficient evidence of a short volatility premium (the so-called Volatility Risk Premium, or VRP) to cement allocators into dogmatic biases against explicit forms of long volatility. The suggestion that long volatility also tends to be positively compensated at the total portfolio level, while appearing to deviate from established doctrine, is supported by long-term data (e.g., **Exhibit 1** below) which we will expand upon and discuss in this piece.

Exhibit 1: Growth of $1 - S&P 500 versus a Beta 1 5% OTM Put Index + S&P 500
July 1986 – September 2025



Source: One River, Bloomberg, CBOE. The Bloomberg ticket for the index is "PPUT Index". The beta adjustment methodology is disclosed in the paper.

Table 1 below examines the long-term return statistics underlying the exhibit above. This non-traded index simply purchases 5% OTM puts each month (compiled by the CBOE) with no monetization triggers, and no dynamic volatility exposure - just plain vanilla long S&P 500 puts. The standalone rolling 5% OTM S&P 500 put options produce a consistently negative return with episodic, moderately convex payoffs along the journey as expected. However, (similar to defensive equity factors) there is an explicit and persistent beta bias baked into directional volatility exposures that must be neutralized in order to properly evaluate beta-neutral factor compensation. By neutralizing this market beta exposure, one not only isolates the long volatility factor, but also benefits from the integration effects of equity beta and long convexity exposures, as we wrote about here.

We adjust for the negative beta of long volatility exposures using two different approaches in this piece:

1. ***Total Portfolio Factor*** *Construction (Beta 1)* – by combining long volatility with enough S&P 500 exposure to achieve ex-ante benign market beta of 1, the long volatility factor return is defined as the long-term outperformance versus the S&P 500. The excess return is a combination of both the long volatility premium and rebalancing effects.

2. ***Standalone Factor*** *Construction (Beta Neutral)* – by directly offsetting the benign-market negative beta of a long volatility exposure to be ex-ante market-neutral, the return of this series represents a long volatility factor return with far more muted rebalancing effects.

Table 1: Monthly 5% OTM S&P 500 Put Index, S&P 500, and Long Volatility Factor Performance Statistics
July 1986 – September 2025

	Rolling 5% OTM Put Index	S&P 500 Index [A]	Beta 1: Put Index + S&P 500 [B]	Total Portfolio Long Volatility Factor Return [B] - [A]	Standalone Long Volatility Factor Return
Ann. Returns	-1.3%	8.7%	9.4%	0.7%	0.5%
Ann. Volatility	6.3%	15.2%	14.9%	5.1%	5.1%
Downside Volatility	3.0%	11.6%	9.7%	2.5%	2.5%
Information Ratio (IR)	-0.2	0.6	0.6	0.14	0.09
Sortino IR	-0.4	0.8	1.0	0.3	0.2
Skew	4.4	-0.7	-0.3	4.3	4.3
Beta to S&P	-0.26	-	0.92	-0.08	-0.08
Benign Beta to S&P*	-0.18	-	1.00	0.00	0.00
% Positive Months	31.6%	64.1%	61.6%	51.8%	51.8%
Max DD	-47.0%	-52.6%	-46.5%	-18.2%	-18.2%

Source: One River, Bloomberg, CBOE. *A beta that represents exposure to equity markets in non-crisis periods, methodology is disclosed in the paper. The Bloomberg ticker for the rolling put index is "PPUT Index".

In summary, the Beta 1 portfolio with long volatility outperformed a portfolio that did not hold long volatility – while producing a lower volatility and shallower maximum drawdown. The persistence of this phenomenon over a roughly 40-year period, even for a source of long volatility that is so simplistic in its construction and execution, points to the potential for even further portfolio benefit for long volatility investing if it is implemented with superior craftsmanship.

As mentioned earlier, the existence of a long volatility portfolio premium (LVP) does not necessarily negate the established short volatility risk premium (VRP). It is possible for short volatility exposures to deliver a premium over the long run on a standalone unadjusted basis, while long volatility exposures concurrently deliver a premium to the total portfolio on a beta-adjusted basis. The LVP assumes a mispricing between the return distribution of long volatility versus that of equities, while the VRP is an expression of portfolio insurance dynamics (in which sellers make money off buyers of insurance). In this piece, we decompose directional volatility exposures to better understand the drivers of the observed LVP. Further, we expand this framework beyond non-traded indices and to live, net-of-fee long active volatility approaches, to examine the practical total portfolio benefits.

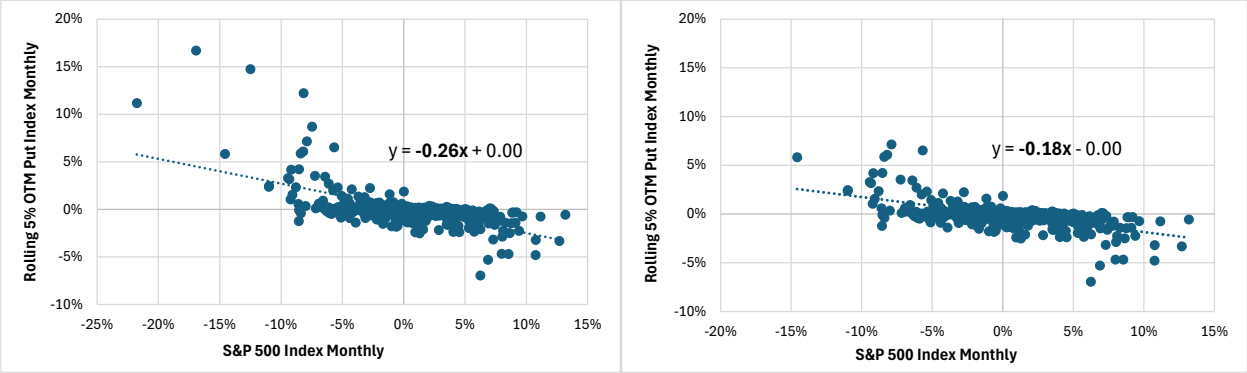
Methodology: Decomposing Long Volatility

A pure long equity put, long VIX future, long VIX call, or other explicitly defensive long volatility exposure should produce a negative expected return in most market environments. However, the source of this negative return isn't fully intrinsic to long volatility itself, but rather comes primarily (perhaps almost entirely) from the negative exposure to the equity risk premium. To simplify, consider a simple CAPM interpretation of a given long volatility exposure as below:

$$Return_{Long\ Volatility} = \beta_{Benign\ Market} + \varepsilon_{Long\ Volatility\ Residual}$$

Of course, orthogonalizing (i.e., neutralizing) in factor construction is not a new technique in studying factor returns. In this instance, adjusting for the negative equity beta of a long volatility exposure is nuanced. A long-term full sample beta of long volatility exposures to equity markets will meaningfully overstate the negative beta realization due to the explosive growth in this negative beta in the midst of a chaotic equity market decline. In other words, the heavily right-tailed return distribution of long volatility exposures does not lend itself to an accurate beta estimation, which itself assumes a normally behaved return distribution. To account for this, one can take the full distribution of long volatility returns and winsorize (cap) the most extreme negative beta realizations, with the rationale that when long volatility exposures face chaotic equity market declines, the over-realization of negative beta is the mechanism through which long volatility factor is positively compensated.

Exhibit 2: 5% OTM Put Index vs. S&P 500 - Full Sample Beta (Left), Full Sample 99% Winsorized Beta, "Benign Beta" (Right)
July 1986 – September 2025



Source: One River, Bloomberg, CBOE. The Bloomberg ticker for the rolling put index is "PPUT Index".

This winsorized beta estimate (demonstrated in **Exhibit** 2 above) is what we refer to as the benign market beta, in that the winsorization by construction will cap observations that occur in the midst of a major market event, and produce an estimated beta that is more representative of the beta drag of a long volatility exposure in non-crisis (i.e., benign) markets.[1]

Thus, in our long volatility factor construction we use this benign market beta to neutralize the (non-crisis) ex-ante beta to 0. For simplicity, we rebalance the beta neutralization exposure on a monthly basis to mimic a monthly rebalancing between the equity beta offset and the long volatility exposure. Thus, we can further split the total factor return into: 1) inefficiencies in convexity pricing during market crises (the long volatility factor return), and 2) rebalancing synergies that arise from combining negatively correlated, positively convex portfolio ingredients as we wrote about here.

$$Total\ Factor\ Return_{Long\ Volatility} = \beta_{Benign\ Market} + Standalone\ Factor\ Return_{Long\ Volatilty} + Rebalancing\ Synergies$$

The Theory of Long Volatility

What separates a risk premium from any profitable style of investing? That's a question that academics and practitioners alike wrestle with on a daily basis. In order for a given risk premium to be resilient over the long-term, it should be:

- **Persistent** – positively compensated over most medium-term or long-term periods,
- **Pervasive** – robust cross asset classes, geographies, and macroeconomic regimes,

[1] An important practical consideration is how exactly to size the benign beta offset for convex exposures. Of course, one doesn't always have a multi-decade full sample over which to ascertain a benign market beta. Alternative methods that are far more practical include using daily observations and rolling 3-year windows with similar winsorization techniques. Or one could use a holdings-based ex-ante equity beta, which is least preferable, as risk models will tend to make the same estimation errors that the market does. We could flesh out these alternative techniques, but it would make for a much longer and more technical paper.

- **Scalable** – not disappear when exploited in meaningful size, and
- **Intuitive** – be supported by sound economic rationale, which can be behavioral and/or risk-based in nature.

The first three criteria can all be tested using return data of a factor itself, which we will expand on in this paper. The fourth criterion, however, is a more qualitative assessment. What is the intuition behind the existence of a long volatility premium?

Let's begin with the rationale for the VRP, or the short volatility premium. The VRP describes a form of compensation that investors can earn for selling insurance-like instruments to others. Behaviorally, those who wish to cap downside risks or extract convexity in chaotic market downturns should pay those who bear the risk of the highly negatively skewed return profile of being short convexity. Further, through a risk-based lens, short convexity positions are inherently riskier than are the long convexity counterparts, and so a premium paid to the riskier leg of that trade makes intuitive sense.

For the Long Volatility Premium, the rationale lies not in the mispricing of the exposure itself, but rather a mispricing of the relative distribution of equity returns versus that of long volatility returns. Put differently - long volatility tends to be far more right-tailed than equities are left-tailed. While markets attempt to price this in (e.g., the presence of skew in options), the long-term benefit of long volatility exposures still exceeds their cost when the benign market beta drag is neutralized. The behavioral rationale for why this inefficiency persists is the highly episodic and unpredictable nature with which long volatility positions produce profit. This concept is often explored in long volatility investing (we wrote about it in this paper). Investors tend to fixate on the frequency of events rather than their magnitude. This leads to a habitual mispricing of the magnitude of rare events, creating persistent inefficiencies that can be exploited when they inevitably occur.

While a long-term index can provide a clean dataset from which we can examine a factor time series, a common argument against long volatility strategies is that when real life portfolios implement long volatility, the net of transaction cost, net of fee result doesn't match up to the idealized theory.

Practical Portfolio Applications – Long Volatility

Replicating the earlier long volatility factor construction involves some practical portfolio construction frictions:

- Active long volatility managers charge fees, which raises the bar for value-add to the total portfolio
- Equity beta cannot just be added to an existing return. Equity exposure must be combined with the long volatility returns in a liquid portfolio using derivatives (e.g., equity futures, swaps, etc.)
    - These derivatives come at a carry cost that (in this case) roughly resembles the risk-free rate
- Traded portfolios incur transaction costs that are not reflected in non-traded indices

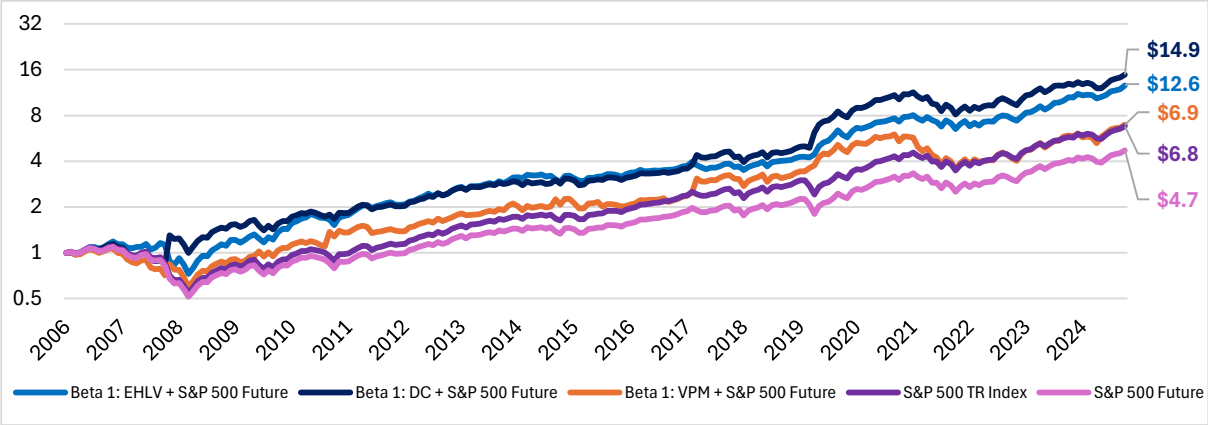
Here we examine three distinct long volatility return series:

1. **Eurekahedge Long Volatility Index (EHLV)** A net-of-fee continuous live composite of active long volatility managers[2]
2. **Dynamic Convexity (DC)** One River's systematic long equity volatility strategy
3. **VIX Preemptive Monetization QIS (VPM)** a QIS strategy[3] that is a VIX-focused long volatility strategy that preemptively monetizes gains intra-crisis, producing a return profile akin to a gamma-oriented approach that is frequently delta-hedged (thus, call it VIX Preemptive Monetization QIS, or **VPM**)

[2] One River's Dynamic Convexity strategy is itself a part of this composite.

[3] Morgan Stanley QIS – "VIX Call Spread Replication" (based on a modified MSCBDLVS Index) is a QIS strategy that seeks to replicate a VIX Call spreads over relatively short-term tenors with dynamic delta-hedging.

Exhibit 3: Growth of $1 - S&P 500 versus Beta 1 EHLV, DC, and VPM + S&P 500 Future Combination Portfolios
January 2007 – September 2025



Source: One River, Bloomberg, WithIntelligence. S&P 500 uses the S&P 500 Total Return Index. The performance for Dynamic Convexity went live in April 2015, with returns prior to that being a hypothetical backtest. The most recent month returns are estimated, and subject to change. The return simulation uses live returns when possible, and backtested returns when necessary. Past performance does not guarantee future results. The Eurekahedge Long Volatility Index is maintained by WithIntelligence. QIS Source: Morgan Stanley QIS – "VIX Call Spread Replication", based on a modified MSCBDLVS Index. This material was not prepared by the Morgan Stanley Research Department. This does not constitute advice. In this piece we deduct a 125bps management fee from Dynamic Convexity and 75 bps from VPM portfolio to reflect a fee drag.

In **Exhibit 3** above, we observe that portfolios enhanced with beta-neutralized long volatility overlays tend to outperform the equity market itself. **Table 2** below further details the return characteristics of these practical long volatility portfolios. The aforementioned tailwind of convexity, negative correlation, and rebalancing drive this outperformance. The benefit is also strong enough to hurdle financing costs in a portable alpha construct.

Table 2: Beta 1 EHLV, DC, and VPM + S&P 500 Future Combination Portfolios Performance Statistics
January 2007 – September 2025

	EH Long Vol Index (EHLV, Net)	Dynamic Convexity Live + Backtest (DC, Net)	VIX Preemptive Monetization QIS (VPM, Net)	S&P 500 TR	S&P 500 Future [A]	Beta 1: EHLV + S&P 500 Future [B]	Beta 1: DC + S&P 500 Future [C]	Beta 1: VPM + S&P 500 Future [D]
Ann. Returns	3.2%	4.0%	-0.4%	10.7%	8.6%	14.5%	15.5%	10.9%
Ann. Volatility	8.2%	20.7%	16.9%	15.5%	15.6%	16.2%	20.8%	19.8%
Downside Volatility	3.1%	1.7%	4.5%	11.3%	11.5%	11.4%	9.9%	12.0%
Information Ratio (IR)	0.4	0.2	0.0	0.7	0.6	0.9	0.7	0.5
Sortino IR	1.0	2.3	-0.1	1.0	0.8	1.3	1.6	0.9
Skew	3.4	10.0	5.3	-0.6	-0.6	-0.5	3.2	0.4
Beta to S&P	-0.27	-0.57	-0.42	-	-	0.94	0.59	0.79
Benign Beta to S&P*	-0.21	-0.15	-0.20	-	-	1.00	1.00	1.00
% Positive Months	46.2%	26.7%	12.9%	66.7%	64.0%	65.3%	63.6%	62.2%
Max DD	-28.6%	-22.2%	-44.9%	-50.9%	-52.8%	-38.8%	-28.8%	-44.3%
2007	9.3%	3.9%	-5.2%	5.5%	3.4%	13.8%	8.1%	-1.4%
2008	45.8%	83.6%	33.3%	-37.0%	-39.1%	-19.1%	15.1%	-21.7%
2009	3.0%	-2.5%	-8.2%	26.5%	23.4%	31.7%	24.2%	17.9%
2010	12.4%	-2.8%	6.1%	15.1%	12.8%	29.7%	11.5%	24.6%
2011	12.8%	5.1%	17.3%	2.1%	-0.0%	13.0%	6.0%	19.7%
2012	0.3%	-3.5%	-12.3%	16.0%	13.4%	16.8%	11.5%	2.0%
2013	-4.4%	-2.7%	-4.0%	32.4%	29.6%	30.7%	31.2%	31.2%
2014	1.6%	-4.0%	-2.5%	13.7%	11.5%	15.7%	8.9%	11.3%
2015	-1.1%	2.4%	4.3%	1.4%	-0.8%	-1.8%	2.2%	4.1%
2016	-2.8%	-4.7%	-11.9%	12.0%	9.9%	9.1%	6.2%	-1.4%
2017	-10.9%	-8.1%	-8.2%	21.8%	19.7%	10.8%	13.0%	14.0%
2018	0.8%	18.3%	23.9%	-4.4%	-6.4%	-6.1%	10.8%	16.0%
2019	-10.9%	-6.0%	-7.5%	31.5%	29.0%	22.1%	26.1%	25.2%
2020	25.4%	43.3%	23.5%	18.4%	16.0%	55.6%	79.9%	53.9%
2021	-9.5%	-3.7%	-19.2%	28.7%	26.9%	21.1%	26.7%	7.8%
2022	7.5%	-4.0%	-12.3%	-18.1%	-18.9%	-15.7%	-24.6%	-32.6%
2023	-6.4%	-1.8%	-6.0%	26.3%	24.8%	22.8%	26.5%	22.7%
2024	1.2%	-6.7%	-5.1%	25.0%	23.1%	30.1%	18.5%	21.6%
2025	-0.5%	0.0%	3.8%	14.8%	13.5%	16.3%	15.6%	21.1%

Source: One River, Bloomberg, WithIntelligence. S&P 500 uses the S&P 500 Total Return Index. *A beta that represents exposure to equity markets in non-crisis periods, methodology is disclosed in the paper. The performance for Dynamic Convexity went live in April 2015, with returns prior to that being a hypothetical backtest. The most recent month returns are estimated, and subject to change. The return simulation uses live returns when possible, and backtested returns when necessary. Past performance does not guarantee future results. The Eurekahedge Long Volatility Index is maintained by WithIntelligence. QIS Source: Morgan Stanley QIS – "VIX Call Spread Replication", based on a modified MSCBDLVS Index. This material was not prepared by the Morgan Stanley Research Department. This does not constitute advice. In this piece we deduct a 125bps management fee from Dynamic Convexity and 75 bps from VPM portfolio to reflect a fee drag.

Table 3 below further examines both the Total Portfolio Factor Return (portable alpha / beta 1 excess return versus equity future return) and the Standalone Factor Return (beta neutral excess return). This factor construction mirrors the construction choices regarding beta neutralization as described earlier in the paper. It happens to be the case that all three long volatility return streams have a similar benign market beta of approximately -0.2. Unsurprisingly, the long volatility index has the highest information ratio given the extent of diversification across different types of long volatility investing. However, the same forces meaningfully dilute convexity generation leading to lower compounded returns.

Table 3: EHLV, DC, and VPM + S&P 500 Future Combination Portfolios – Factor Return Performance Statistics

January 2007 – September 2025

	S&P 500 TR	S&P 500 Future [A]	Beta 1: EHLV + S&P 500 Future [B]	Beta 1: DC + S&P 500 Future [C]	Beta 1: VPM + S&P 500 Future [D]	Total Portfolio EHLV Factor Return [B] - [A]	Total Portfolio DC Factor Return [C] - [A]	Total Portfolio VPM Factor Return [D] - [A]	Standalone EHLV Factor Return	Standalone DC Factor Return	Standalone VPM Factor Return
Ann. Returns	10.7%	8.6%	14.5%	15.5%	10.9%	5.9%	6.9%	2.3%	5.3%	5.6%	1.7%
Ann. Volatility	15.5%	15.6%	16.2%	20.8%	19.8%	7.1%	19.8%	16.0%	7.1%	19.8%	16.0%
Downside Volatility	11.3%	11.5%	11.4%	9.9%	12.0%	2.9%	1.6%	5.2%	2.9%	1.6%	5.2%
Information Ratio (IR)	0.7	0.6	0.9	0.7	0.5	0.8	0.3	0.1	0.7	0.3	0.1
Sortino IR	1.0	0.8	1.3	1.6	0.9	2.0	4.2	0.4	1.8	3.4	0.3
Skew	-0.6	-0.6	-0.5	3.2	0.4	3.3	10.1	5.0	3.3	10.1	5.0
Beta to S&P	-	-	0.94	0.59	0.79	-0.06	-0.42	-0.22	-0.06	-0.42	-0.22
Benign Beta to S&P*	-	-	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
% Positive Months	66.7%	64.0%	65.3%	63.6%	62.2%	53.8%	43.6%	44.9%	53.8%	43.6%	44.9%
Max DD	-50.9%	-52.8%	-38.8%	-28.8%	-44.3%	-16.7%	-12.6%	-35.7%	-16.7%	-12.6%	-35.7%
2007	5.5%	3.4%	13.8%	8.1%	-1.4%	10.1%	4.5%	-4.5%	10.1%	4.5%	-4.5%
2008	-37.0%	-39.1%	-19.1%	15.1%	-21.7%	32.8%	73.4%	22.4%	32.8%	73.4%	22.4%
2009	26.5%	23.4%	31.7%	24.2%	17.9%	7.9%	1.0%	-3.7%	7.9%	1.0%	-3.7%
2010	15.1%	12.8%	29.7%	11.5%	24.6%	15.5%	-0.8%	9.4%	15.5%	-0.8%	9.4%
2011	2.1%	-0.0%	13.0%	6.0%	19.7%	13.1%	5.4%	17.9%	13.1%	5.4%	17.9%
2012	16.0%	13.4%	16.8%	11.5%	2.0%	3.0%	-1.6%	-9.9%	3.0%	-1.6%	-9.9%
2013	32.4%	29.6%	30.7%	31.2%	31.2%	0.9%	1.3%	1.3%	0.9%	1.3%	1.3%
2014	13.7%	11.5%	15.7%	8.9%	11.3%	3.9%	-2.3%	-0.2%	3.9%	-2.3%	-0.2%
2015	1.4%	-0.8%	-1.8%	2.2%	4.1%	-1.0%	2.5%	4.5%	-1.0%	2.5%	4.5%
2016	12.0%	9.9%	9.1%	6.2%	-1.4%	-0.8%	-3.2%	-10.1%	-0.8%	-3.2%	-10.1%
2017	21.8%	19.7%	10.8%	13.0%	14.0%	-7.5%	-5.6%	-4.7%	-7.5%	-5.6%	-4.7%
2018	-4.4%	-6.4%	-6.1%	10.8%	16.0%	-0.2%	17.5%	22.8%	-0.2%	17.5%	22.8%
2019	31.5%	29.0%	22.1%	26.1%	25.2%	-5.8%	-2.2%	-2.5%	-5.8%	-2.2%	-2.5%
2020	18.4%	16.0%	55.6%	79.9%	53.9%	30.9%	48.2%	29.0%	30.9%	48.2%	29.0%
2021	28.7%	26.9%	21.1%	26.7%	7.8%	-4.8%	-0.1%	-15.1%	-4.8%	-0.1%	-15.1%
2022	-18.1%	-18.9%	-15.7%	-24.6%	-32.6%	3.6%	-6.6%	-15.7%	3.6%	-6.6%	-15.7%
2023	26.3%	24.8%	22.8%	26.5%	22.7%	-1.7%	1.6%	-1.4%	-1.7%	1.6%	-1.4%
2024	25.0%	23.1%	30.1%	18.5%	21.6%	5.8%	-3.7%	-0.9%	5.8%	-3.7%	-0.9%
2025	14.8%	13.5%	16.3%	15.6%	21.1%	2.3%	2.0%	6.7%	2.3%	2.0%	6.7%

Source: One River, Bloomberg, WithIntelligence. S&P 500 uses the S&P 500 Total Return Index. *A beta that represents exposure to equity markets in non-crisis periods, methodology is disclosed in the paper. The performance for Dynamic Convexity went live in April 2015, with returns prior to that being a hypothetical backtest. The most recent month returns are estimated, and subject to change. The return simulation uses live returns when possible, and backtested returns when necessary. Past performance does not guarantee future results. The Eurekahedge Long Volatility Index is maintained by WithIntelligence. QIS Source: Morgan Stanley QIS – "VIX Call Spread Replication", based on a modified MSCBDLVS Index. This material was not prepared by the Morgan Stanley Research Department. This does not constitute advice. In this piece we deduct a 125bps management fee from Dynamic Convexity and 75 bps from VPM portfolio to reflect a fee drag.

Over the long-term, these combination portfolios reflect a real-life proxy for evaluating the long-term efficacy of long volatility investing for equity-centric portfolios. The results point to a robust, persistent, pervasive, and shockingly stable positive risk premium for these beta-adjusted long volatility portfolios. The addition of these long volatility exposures to equity-centric portfolios generally made them better – higher returning, better risk-managed, with lower drawdowns along the journey. This outcome reinforces the existence of a long volatility portfolio risk premium – a premium for which one bears the annoyance of less frequent compensation in order to extract the mispricing of the right tail of convexity in rare market dislocations. The good news is that once you adjust for the negative beta bias of this strategy, there's no expected "bleed" associated with waiting for a highly profitable period at the portfolio level.

The Total Portfolio Tailwind

The net of fee, net of financing cost, beta 1 (i.e., portable alpha) constructs of these long volatility portfolios (as explored in **Exhibit 3** in this piece) in some cases roughly doubled the compounded equity market total return over the full period, and did so with a meaningfully reduced maximum drawdown. This outcome was not ubiquitously true for all expressions of long volatility, and even the best approaches had meaningful periods of difficult performance along the journey.

The long-term benefit of adding long volatility exposures to equity-centric portfolios is observable and significant. Like many risk premia, the compensation is accrued to the total portfolio's compounded returns over the long run, and over intervals of time that may be tough to stick with – but that's the point. The painful journey of premia is the reason why most investors do not stick around long enough to experience long-term rewards, and why despite well-known and robust long-term evidence these efficiencies can persist with such generous margins of outperformance. The largest shortfall between the data explored in this piece and its implementation in real-life portfolios funnels down to how investors conceptualize and practice portfolio construction – as zero-sum allocation buckets (silos) instead of as one integrated total portfolio.

Allocators and the investment boards that oversee them tend to prefer siloed allocation buckets. Having clean delineations between equity beta, other asset class betas, and alternatives makes for simple evaluations of standalone portfolio exposures. We've covered this behavioral preference extensively in our January 2024 piece, but it bears repeating here as the long volatility factor construction above mimics what many would otherwise bucket as a portable alpha or equity extension strategy. Traditionally, these types of strategies are not permitted to trade long volatility exposures as part of their mandate. Such derivative strategies are often (by default) only eligible for standalone expression in a hedge fund sleeve, which itself may be prohibited from any explicit long beta positions as they are viewed as duplicative to other portfolio exposures.

However, in the case of extracting the long volatility premium, it is the positive synergies of integration alongside equity beta (capital efficiency, rebalancing, dynamic sizing) that enable a holder of long volatility exposures to harvest the pricing inefficiencies for the return distribution of equity versus that for long volatility.

Despite the ever-growing collection of data in support of these findings, a large percentage of allocators forgo the portfolio benefits of long volatility and similar defensive premia rather than embrace a Total Portfolio Approach that would enable them to integrate risks in such a manner. This hesitance to fully integrate portfolio exposures, and under-utilization of portfolio leverage, presents a direct constraint to one's ability to achieve maximum portfolio diversification. The zero-sum funding of diversifying exposures such as standalone hedge fund strategies leads to a potential reduction in optimal long-term portfolio betas, and further presents timing and concentration risks to those who embark on a purely siloed approach to portfolio construction.

This is all fantastic news for allocators who do embrace these Total Portfolio ideals. It means that diversifying exposures are generally under-expressed in institutional portfolios - especially explicitly defensive exposures like long volatility. This same phenomenon in part contributes to a continued over-investment into negatively skewed, but positive standalone carry strategies that can feed further inefficiencies to those willing to hold the other side of those trades. Embracing sensible risk premia before broad acceptance (and perhaps while they are still heretical) has historically signaled the best periods of compensation for such ideas.

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Prior to December 2019, the Dynamic Convexity Strategy returns reflect the actual returns of the strategy within a One River managed SPC (Segregated Portfolio Company). Returns for the SPC are available upon request. Prior to December 2019, operating expenses are excluded for the net return calculation. Operating expenses are capped depending on the net asset value (NAV) of the fund. If the NAV is less than $50m, there is no expense cap. If the NAV is greater than $250m, expenses are capped at 25 bps.

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