



For Alpha

Ai-Powered Investment Replication

Strategy Spotlight

Hedging Long-Term Trend Reversal Risk: Speed Diversification in CTA Trend Following

June 2026, Ai For Alpha Team

Abstract

- **Question.** How can a CTA trend strategy hedge a long-term trend reversal without abandoning trend following? We test whether faster trend horizons protect the 250d/500d long-term trend block during its lower-tail months.
- **Definition.** A trend reversal is a lower-tail outcome for the long-term trend cluster, $R_t^{LT} = 0.5R_t^{250d} + 0.5R_t^{500d}$. Bottom-20% LT months are material reversals; bottom-10% months are extreme reversals.
- **Result.** In the completed-month sample Feb-2005–May-2026, the bottom-20% threshold is -2.07% and the bottom-10% threshold is -3.25%. In bottom-10% months, LT loses -4.39% on average, while the 20d/60d basket loses only -1.05%.
- **Hedge read-through.** Fast horizons are a relative hedge, not a pure standalone safe asset. A long short-term / short LT overlay earns 3.34% on average in bottom-10% reversal months and is positive in 80.8% of them, but it carries -2.83% annualized over the full sample.



1 Strategy Dictionary

The “N-day” trend strategies are horizon-controlled CTA trend sleeves. The number N is the look-back window used to define the trend signal, not a guaranteed holding period. A 20d sleeve has roughly one month of signal memory and reacts quickly when prices break their recent range; a 500d sleeve has roughly two years of signal memory and reacts only after a much more persistent move. The source-of-inspiration multi-horizon framework uses the same five canonical trend factors, $H = \{20, 60, 125, 250, 500\}$, plus a raw market-return baseline, and describes them as investable sleeves with distinct reaction speeds (Ai For Alpha Research Team, 2025d).

Conceptually, each sleeve is a diversified long/short futures trend strategy. It is long markets showing strength, short markets showing weakness, close to flat in noisy ranges, and volatility-targeted so that returns across horizons are comparable. Shorter horizons emphasize adaptation; longer horizons emphasize persistence.

Table 1: Interpretation of the N-day trend strategy sleeves

Sleeve	Speed profile	What it represents	Role in this paper
20d	Fast, about one month	The most reactive trend sleeve. It adapts quickly when a prior trend breaks, but is most exposed to noise and whipsaw.	Primary optionality sleeve in LT reversal months.
60d	Short-term, about one quarter	A faster trend sleeve that is less jumpy than 20d while still reacting before the slow block.	Paired with 20d to form ST, the practical fast hedge basket.
125d	Intermediate, about half a year	A bridge between fast adaptation and classical medium-term CTA trend exposure.	Included in FastMix to smooth the hedge while retaining some speed.
250d	Long-term, about one year	A slow trend sleeve designed to capture durable macro trends, but slower to adapt at turning points.	One half of the LT growth engine.
500d	Very long-term, about two years	The most persistent trend sleeve. It filters noise most aggressively but can remain stale longest after a reversal.	One half of the LT growth engine.

The composite labels used throughout the paper are therefore straightforward. ST is the equal-weight 20d/60d speed basket. FastMix is the equal-weight 20d/60d/125d fast-to-intermediate basket. LT is the equal-weight 250d/500d long-term cluster. The hedge question is whether adding or overweighting the faster sleeves can reduce losses when the long-term cluster is in its own left tail.

2 Key Conclusions

The title of this note is **Hedging Long-Term Trend Reversal Risk: Speed Diversification in CTA Trend Following**. It is more precise than “How to hedge trend reversal” because the hedge is not against every negative CTA month. It is specifically against a lower-tail month for slow trend-following signals.

Main conclusion. The institutional framing is a division of roles: LT trend is the engine of growth, while ST trend is the engine of risk management. The 20d and 60d sleeves react faster when persistent trends break; they materially reduce the loss versus the 250d/500d cluster in LT reversal months. However, the same speed creates negative carry and whipsaw risk outside reversal regimes, so the hedge should be implemented as bounded speed diversification or as a conditional overlay, not as a permanent large short-LT trade.

- **Definition.** We define the long-term trend cluster as $R_t^{LT} = 0.5R_t^{250d} + 0.5R_t^{500d}$. A material LT reversal is a month where R_t^{LT} is in the bottom 20% of its own historical distribution; an extreme LT reversal is the bottom 10%.
- **Thresholds.** On completed months from Feb-2005 to May-2026, material reversals start at -2.07% and extreme reversals start at -3.25%. June 2026 is excluded because the latest available daily observation is 2026-06-10.
- **Conditional return.** In bottom-20% LT months, LT loses -3.53% on average, while the 20d/60d short-term basket loses -1.16%. In bottom-10% LT months, LT loses -4.39% and the short-term basket loses -1.05%.
- **Relative protection.** The long ST / short LT overlay earns 2.37% in bottom-20% LT months and 3.34% in bottom-10% LT months. Its hit rate is 73.1% and 80.8%, respectively.
- **Multi-Horizon read-through.** The result supports the Multi-Horizon model setup: over the daily horizon-weight sample 2005-02-28–2026-05-29, the Multi-Horizon decoding allocates 27.5% of the normalized five-horizon stack to the 20d sleeve (32.8% raw horizon weight). This is economically meaningful because 20d is the least correlated horizon to LT, yet remains a significant marginal explanatory factor of CTA performance around turning points.
- **Cost of insurance.** The same overlay has -2.83% annualized full-sample carry. That is the central trade-off: short-term trend speed is useful when slow trends reverse, but expensive as a passive always-on hedge.
- **Episode shape.** Bottom-20% LT reversals are frequent enough to matter but rarely persistent: they occur in 41 episodes, with a maximum run of 2 consecutive months. This favors tactical speed diversification over a permanently large anti-LT position.

3 Research Framing

Trend following is often described as a crisis-risk diversifier because it can build long positions in sustained bull markets and short positions in sustained bear markets. The empirical time-series momentum evidence across liquid futures markets is strong (Moskowitz et al., 2012), and the longer-run managed-futures evidence supports a persistent trend-following premium across asset classes and market regimes (Hurst et al., 2017). Crisis-hedging studies also find that trend following has historically been one of the more effective diversifying strategies during severe equity drawdowns (Harvey et al., 2019).

That broad crisis story does not remove reversal risk. Fung and Hsieh show that trend followers can be represented by option-like lookback-straddle exposures (Fung and Hsieh, 2001). This helps explain why trend following can perform well in large directional moves, but it also clarifies the weakness: if markets reverse sharply after the model has accumulated slow-trend exposure, the strategy can give back gains before the signal fully adapts. More recent research on momentum turning points and broken trends makes the same point from a signal-timing perspective: the inflection zone around a trend change is where persistence decays and reversal risk rises (Goulding et al., 2023, 2024).

Speed is therefore the natural hedge dimension. Faster models adapt sooner, but they are more exposed to noise and whipsaw. Slower models capture durable trends, but they are late when trends turn. Industry research on trend speed frames this as the core design trade-off for

CTAs (Bethke et al., 2018; Graham Capital Management, 2026). The empirical question in this note is whether the 20d/60d/125d horizons actually reduce losses when the 250d/500d long-term cluster suffers its left-tail months.

This note also extends the internal Ai For Alpha Strategy Spotlight thread on CTA decoding. The multi-horizon synthesis and horizon-style notes establish that a CTA index can be decomposed into speed blocks rather than treated as a single homogeneous trend model (Ai For Alpha Research Team, 2025d,c). The medium-term and barbell replication spotlights show that horizon choice is an allocation decision, not only a replication detail (Ai For Alpha Research Team, 2025e,b). The long-term CTA and risk-off spotlights frame why slow trend remains valuable even when its reversal risk must be actively managed (Ai For Alpha Research Team, 2025a,f). This paper uses that same language for a narrower risk question: when the long-term block itself is in the left tail, which faster sleeves provide the cleanest relative protection?

4 Data and Methodology

The analysis uses daily index levels for CTA strategy variants, including the five pure trend horizons: 20d, 60d, 125d, 250d, and 500d. Monthly returns are computed from the last available daily level in each calendar month. The analysis uses completed months only: Feb-2005 to May-2026, for 256 monthly observations. The latest available daily observation is 2026-06-10, so June 2026 is treated as month-to-date and excluded from percentile calculations.

The regime definition is intentionally portfolio-state based. A **trend reversal** in this paper is not a generic equity selloff, not a negative month for the CTA benchmark, and not a full strategy drawdown. It is a month in which the slow trend state embedded in the 250d/500d cluster suffers a lower-tail return. A market reversal can be the cause, but the measurement object is the LT trend block itself. This prevents the hedge test from mixing three different questions: whether trend following hedges equities, whether CTAs are in drawdown, and whether fast trend horizons diversify slow trend reversals.

The five horizons are grouped as follows:

$$R_t^{ST} = 0.5R_t^{20d} + 0.5R_t^{60d}, \quad R_t^{\text{FastMix}} = \frac{1}{3} \left(R_t^{20d} + R_t^{60d} + R_t^{125d} \right),$$

$$R_t^{LT} = 0.5R_t^{250d} + 0.5R_t^{500d}.$$

The short-term basket is the cleanest hedge candidate because it has the largest speed difference versus LT. The FastMix basket is a smoother hedge candidate because it includes the 125d intermediate sleeve.

Table 2: Trend reversal regime definition

Scenario	Definition	Threshold	Months	Frequency	Avg. LT	Median LT
All months	Completed monthly sample	–	256	100.0%	0.90%	0.96%
Non-reversal	LT > 20th pct.	-2.07%	204	79.7%	2.02%	1.67%
Bottom 20%	LT ≤ 20th pct.	-2.07%	52	20.3%	-3.53%	-3.25%
Bottom 10%	LT ≤ 10th pct.	-3.25%	26	10.2%	-4.39%	-3.95%

The bottom-20% and bottom-10% thresholds are used because they are empirical regime definitions, not fitted crisis labels. Bottom-20% creates enough observations to estimate conditional behavior without making the event set too broad. Bottom-10% isolates the extreme tail and tests whether the hedge still works when the long-term block is under the most stress.

5 Horizon Structure

The last-60-month correlation matrix supports the same cluster interpretation used in the source-of-inspiration synthesis: 250d and 500d form the long-term block, 60d and 125d form the medium-term block, and 20d is the most reactive sleeve.

Table 3: Last-60-month horizon correlation: fast, medium, and slow clusters

	20d	60d	125d	250d	500d
20d	1.00	0.84	0.59	0.43	0.36
60d	0.84	1.00	0.85	0.63	0.54
125d	0.59	0.85	1.00	0.84	0.72
250d	0.43	0.63	0.84	1.00	0.91
500d	0.36	0.54	0.72	0.91	1.00

Darker cells indicate higher correlation. The slow block is 250d/500d; 20d is the main reactivity sleeve.

The key point for hedging is that lower correlation is necessary but not sufficient. The 20d sleeve is less correlated with LT than the 250d/500d pair, but it is still a trend-following strategy. It should therefore be expected to *mitigate* LT reversal losses, not reliably deliver positive returns in every LT reversal month.

6 Conditional Return Evidence

Table 4: Conditional monthly returns around LT reversal regimes

Strategy	All months	Bottom 20%	Bottom 10%	Next after 20%	Next after 10%
20d	0.66%	-0.67%	-0.44%	0.28%	0.36%
60d	0.74%	-1.65%	-1.66%	0.59%	0.54%
125d	0.79%	-2.81%	-2.97%	0.68%	0.66%
250d	0.87%	-3.56%	-4.18%	0.88%	1.04%
500d	0.93%	-3.50%	-4.60%	0.85%	0.84%
ST	0.70%	-1.16%	-1.05%	0.43%	0.45%
FastMix	0.73%	-1.71%	-1.69%	0.51%	0.52%
LT	0.90%	-3.53%	-4.39%	0.87%	0.94%
Pure trend	0.89%	-2.74%	-3.11%	0.68%	0.62%
Multi-Horizon	0.90%	-2.58%	-3.07%	0.80%	0.80%
NEIXCTAT	0.46%	-2.90%	-3.29%	0.08%	0.01%
ST - LT	-0.20%	2.37%	3.34%	-0.43%	-0.49%

The conditional-return table is the main empirical result. Loss severity increases monotonically from fast to slow horizons in LT reversal months. In bottom-20% months, 20d loses only -0.67% on average, while 250d and 500d lose -3.56% and -3.50%. In bottom-10% months, 20d loses -0.44%, while LT loses -4.39%. The short-term basket therefore reduces the average loss by 3.34% in the most extreme LT reversals.

Average monthly return in LT reversal regimes

Bottom-20% and bottom-10% months of the 250d/500d long-term trend cluster.

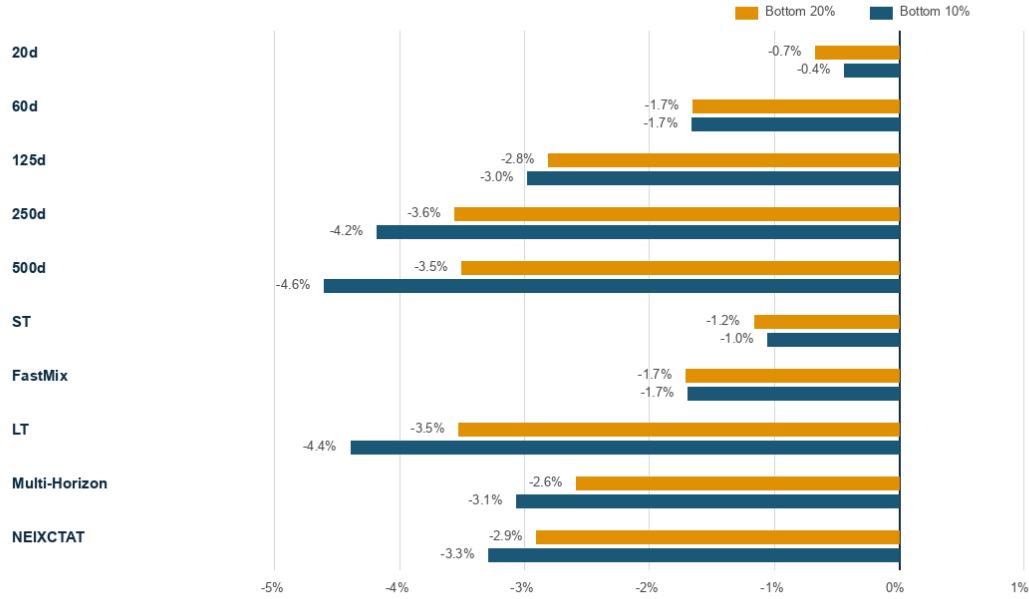


Figure 1: Average monthly return during material and extreme LT reversal months.

Conditional Correlation and Capture

Table 5: Conditional correlation, beta, and beat-rate diagnostics versus LT

Strategy	All-month corr. to LT	B20 corr. to LT	B20 beta to LT	B20 beat LT	B10 corr. to LT	B10 beta to LT	B10 beat LT
20d	50.26%	5.51%	0.16	75.0%	19.95%	0.67	80.8%
60d	65.00%	24.19%	0.67	71.2%	39.99%	1.35	80.8%
125d	83.66%	38.03%	0.79	63.5%	53.44%	1.48	80.8%
250d	97.84%	86.61%	0.86	40.4%	85.95%	1.02	50.0%
500d	97.81%	91.69%	1.14	59.6%	85.19%	0.98	50.0%
ST	60.09%	15.19%	0.42	73.1%	31.11%	1.01	80.8%
FastMix	71.78%	23.29%	0.54	73.1%	39.93%	1.16	80.8%
Pure trend	89.85%	48.78%	0.74	71.2%	58.22%	1.04	84.6%
Multi-Horizon	88.61%	40.11%	0.67	67.3%	39.31%	0.77	69.2%
NEIXCTAT	79.49%	18.64%	0.38	57.7%	10.99%	0.20	65.4%
ST - LT	-46.24%	-20.95%	-0.58	98.1%	0.24%	0.01	100.0%

B20 denotes bottom-20% LT reversal months; B10 denotes bottom-10% LT reversal months. All-month corr. to LT is the full-sample monthly correlation with the 250d/500d LT cluster. Regime corr. to LT is the same correlation restricted to B20 or B10 months. Beta to LT is the conditional OLS slope of candidate returns on LT returns, $\text{Cov}(R^{\text{candidate}}, R^{\text{LT}}) / \text{Var}(R^{\text{LT}})$; lower beta indicates less participation in LT reversal moves. Beat LT is the share of months in the stated regime where the candidate return exceeds the LT return.

The correlation diagnostics sharpen the interpretation:

- The 20d sleeve has a 50.26% full-sample correlation to LT, but only 5.51% correlation during bottom-20% LT months. This is the cleanest horizon-level diversification effect.
- The short-term basket has a bottom-20% LT beta of 0.42 and beats LT in 73.1% of material reversal months.
- Multi-Horizon remains exposed because it still owns trend risk, but its bottom-20% beta of 0.67 is below LT by construction and it beats LT in 67.3% of those months.

- The benchmark is not a reliable LT-reversal hedge in this sample. During bottom-10% LT months, NEIXCTAT loses -3.29% on average.

Table 6: Hedge scorecard: return, loss capture, protection, hit rate, and carry

Candidate	B20 avg. return	B20 loss capture	B20 protection vs LT	B10 protection vs LT	B20 beat LT	Annual spread carry
20d	-0.67%	19.0%	2.86%	3.95%	75.0%	-3.43%
ST	-1.16%	32.9%	2.37%	3.34%	73.1%	-2.83%
FastMix	-1.71%	48.5%	1.82%	2.70%	73.1%	-2.31%
Multi-Horizon	-2.58%	73.3%	0.94%	1.32%	67.3%	-0.08%
NEIXCTAT	-2.90%	82.3%	0.63%	1.10%	57.7%	-5.35%

B20 denotes bottom-20% LT reversal months; B10 denotes bottom-10% LT reversal months. B20 avg. return is the candidate's mean monthly return in B20 months. B20 loss capture is candidate B20 avg. return divided by LT B20 avg. return; lower is more defensive because LT is negative in this regime. Protection vs LT is the candidate return minus LT return in the stated regime, in monthly percentage points. B20 beat LT is the share of B20 months where the candidate outperforms LT. Annual spread carry is the full-sample annualized return of a long-candidate / short-LT overlay.

The scorecard separates *protection* from *implementation quality*. The 20d sleeve gives the strongest event protection, capturing only 19.0% of the average bottom-20% LT loss, but it has the most negative spread carry versus LT. The 20d/60d short-term basket is a better practical compromise: it captures 32.9% of the bottom-20% LT loss, beats LT in 73.1% of material reversal months, and gives up -2.83% annualized as an always-on spread. FastMix is smoother but less protective. Multi-Horizon is close to carry-neutral versus LT, but its hedge effect is smaller because it still owns a large slow-trend component.

This is consistent with the Multi-Horizon allocation design. The dynamic stack is not a purely slow-trend implementation: in the horizon-weight file, the 20d sleeve represents 27.5% of the normalized five-horizon stack over the completed-month analysis window (32.8% in raw horizon weight). The decoding allocates to 20d because it contributes marginal explanatory information that is not spanned by the slower sleeves. It is the least correlated horizon to LT, but that lower correlation is useful: it captures fast adaptation around turning points, precisely where slow 250d/500d signals can become stale. LT remains the growth engine, while the 20d sleeve contributes state-contingent risk-management optionality.

7 Where the Hedge Pays

The decile profile shows the asymmetric trade-off. Fast horizons protect in the left tail of LT returns, but they lag when LT has its strongest months. This is why the hedge has negative carry over the full sample.

Horizon behavior by LT return decile

Fast horizons protect in the left tail but lag in the strongest LT trend months.

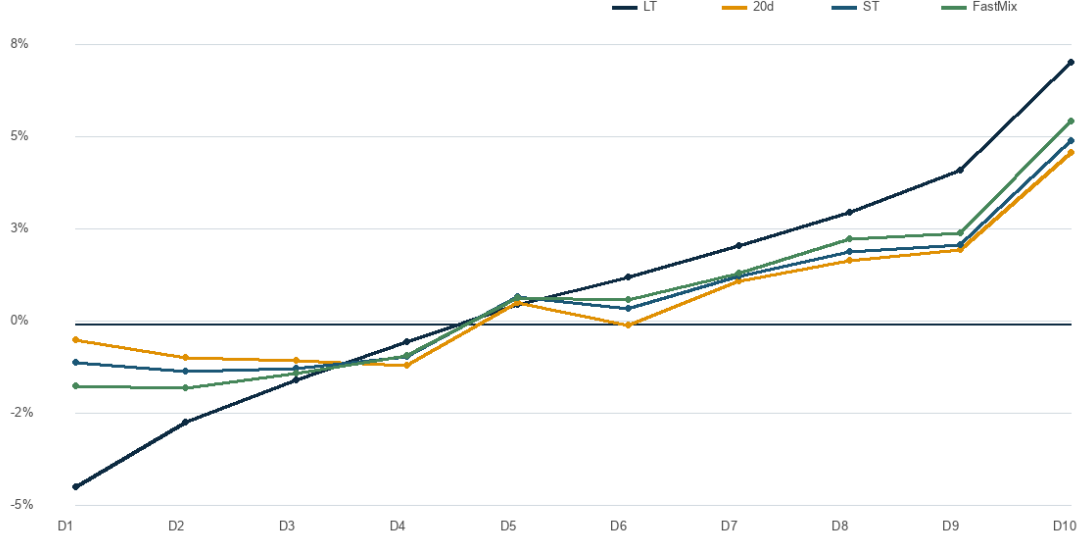


Figure 2: Average horizon return by LT return decile. D1 is worst; D10 is best. LT is the growth engine; ST is the risk-management engine.

Table 7: Average monthly return by LT return decile

LT decile	LT	20d	ST	FastMix	ST - LT
D1	-4.39%	-0.44%	-1.05%	-1.69%	3.34%
D2	-2.66%	-0.90%	-1.27%	-1.73%	1.39%
D3	-1.52%	-0.98%	-1.20%	-1.33%	0.32%
D4	-0.48%	-1.11%	-0.90%	-0.85%	-0.42%
D5	0.53%	0.58%	0.72%	0.71%	0.20%
D6	1.25%	-0.04%	0.42%	0.65%	-0.83%
D7	2.11%	1.16%	1.27%	1.36%	-0.84%
D8	3.01%	1.72%	1.94%	2.30%	-1.06%
D9	4.15%	2.00%	2.14%	2.44%	-2.01%
D10	7.04%	4.62%	4.92%	5.45%	-2.11%

Short-Term Trend Optionality

The decile profile can be read as an empirical payoff diagram for short-term trend optionality. Define the state-contingent relative value of the short-term basket as:

$$O_j^{\text{ST}} = \mathbb{E} \left[R_t^{\text{ST}} - R_t^{\text{LT}} \mid R_t^{\text{LT}} \in D_j \right],$$

where D_j is the j th LT return decile. This is not a traded option premium and should not be presented as guaranteed convexity. It is an option-like profile: ST trend has positive relative value when LT is in its weakest states and negative relative value when LT is in its strongest states.

Empirically, O_1^{ST} is 3.34% in the worst LT decile and O_2^{ST} is 1.39% in the second-worst decile. By contrast, O_{10}^{ST} is -2.11% in the strongest LT decile. The institutional role split is therefore clear: **LT is the engine of growth; ST is the engine of risk management**. The cost is lower participation in the best LT trend regimes and negative carry for a permanent fast-over-slow overlay.

Event Window

Table 8: Average event window around bottom-20% LT reversal months

Lag	20d	ST	FastMix	LT	ST - LT
-2	0.95%	1.08%	1.21%	1.36%	-0.28%
-1	0.80%	0.62%	0.54%	0.80%	-0.19%
0	-0.67%	-1.16%	-1.71%	-3.53%	2.37%
+1	0.28%	0.43%	0.51%	0.87%	-0.43%
+2	0.92%	0.99%	1.06%	1.13%	-0.14%
+3	1.57%	1.39%	1.38%	1.73%	-0.34%

The event window confirms that the hedge payoff is concentrated in the reversal month. The average long ST / short LT spread earns 2.37% in the bottom-20% LT month, then gives back -0.43% in the following month. This is consistent with a speed hedge: it is most valuable when slow signals are caught wrong-footed, not necessarily in the recovery month after the reversal.

Average event window around bottom-20% LT reversal months

The relative hedge pays in the reversal month, then gives back part of the protection.

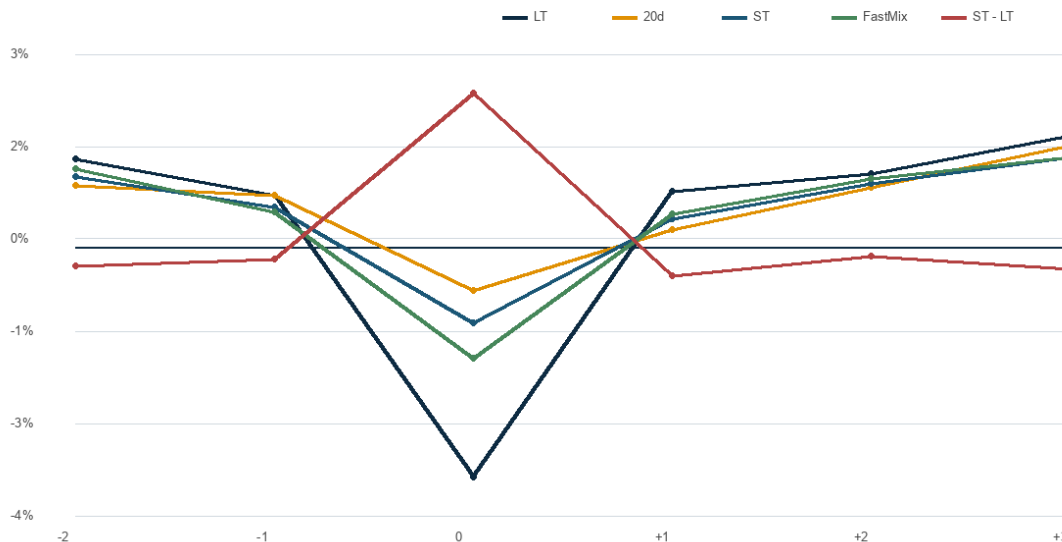


Figure 3: Average event window around bottom-20% LT reversal months. Lag 0 is the reversal month.

Always-On Overlay Cost

An always-on long ST / short LT overlay is not attractive as a standalone strategy. It earns positive relative returns in LT reversal months, but the full-sample annualized carry is -2.83%. This is the empirical insurance premium for holding faster trend against slower trend.

Cumulative relative hedge return

Long fast horizons / short LT pays in LT reversals but has negative carry over the full sample.

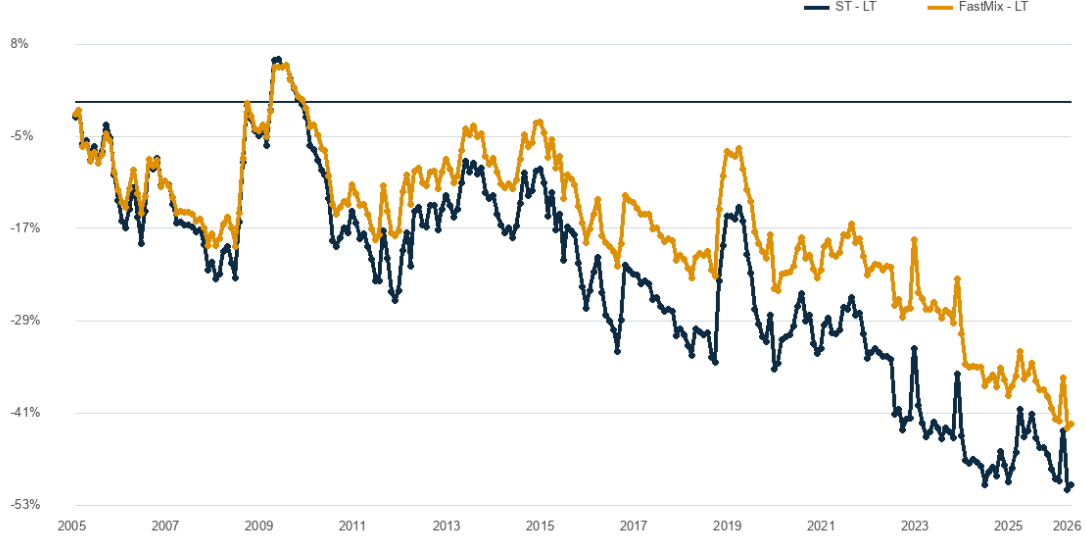


Figure 4: Cumulative simple return of long fast-horizon / short-LT relative hedges.

8 Model Design

The empirical result points to a model architecture rather than a single static allocation. The base trend process should remain multi-horizon, while the explicit hedge should be treated as a speed overlay whose size increases only when the cost of slow-trend staleness is high enough.

Let $D_t = R_t^{\text{ST}} - R_t^{\text{LT}}$ be the fast-minus-slow spread and let V_t be a cross-horizon dispersion measure across the 20d, 60d, 125d, 250d, and 500d sleeves. A practical hedge-intensity score can be written as:

$$h_t = \text{clip} \left(h_0 + h_1 z(D_t) + h_2 z(V_t) + h_3 I_t^{\text{turn}}, 0, h_{\max} \right),$$

where I_t^{turn} is a momentum-turning indicator such as a fast-horizon sign change against a still-positive LT signal. This score should control the size of a long ST / short LT overlay, not replace the core trend model. The calibration objective is not to maximize standalone overlay Sharpe; it is to reduce LT left-tail capture while keeping whipsaw cost bounded.

Table 9: Model interpretation of the hedge

Model layer	Signal meaning	Implementation message
LT state	250d/500d defines the slow trend exposure that can become stale around turning points.	Measure reversal regimes from LT itself, not from the benchmark or from broad market stress.
Speed conflict	20d/60d reacting differently from 250d/500d indicates that the old trend state is losing consensus across horizons.	Increase the hedge when fast-minus-slow dispersion rises, but cap the overlay to control whipsaw.
Event protection	Bottom-20% and bottom-10% LT months measure realized left-tail protection.	Score hedges on conditional protection, beta to LT, beat-LT rate, and full-sample carry.
Post-event behavior	The next-month spread is often negative after the reversal month.	Treat the overlay as tactical insurance; avoid leaving it mechanically on after the shock has passed.

9 Bottom-10% Reversal Months

Table 10: Bottom-10% LT reversal months ranked by LT return

Month	LT	20d	ST	FastMix	Multi-Horizon	NEIXCTAT
2015-08	-7.29%	-2.30%	-2.89%	-4.27%	-4.55%	-2.13%
2022-11	-7.25%	-4.71%	-5.85%	-6.23%	-6.24%	-6.03%
2015-04	-6.24%	-2.83%	-3.09%	-3.81%	-3.90%	-3.91%
2026-03	-5.94%	3.00%	0.67%	-0.34%	-3.84%	-1.58%
2016-10	-5.30%	-0.58%	-1.22%	-2.32%	-3.71%	-3.87%
2005-10	-5.07%	0.21%	-1.61%	-2.27%	-2.30%	-0.45%
2021-11	-5.01%	-4.32%	-4.83%	-4.55%	-6.12%	-4.73%
2008-08	-4.71%	6.13%	2.65%	-0.36%	-0.63%	-2.90%
2016-11	-4.30%	3.41%	2.93%	2.03%	-0.23%	-1.25%
2018-02	-4.18%	-4.88%	-4.94%	-4.72%	-6.45%	-8.96%
2010-05	-4.10%	-3.70%	-5.32%	-6.01%	-6.87%	-4.50%
2015-06	-4.09%	-2.26%	-2.10%	-2.55%	-2.72%	-4.86%
2008-07	-3.97%	-4.45%	-5.97%	-6.41%	-4.78%	-5.05%
2019-01	-3.93%	1.43%	0.00%	-0.64%	-2.67%	-3.21%
2014-01	-3.87%	-3.33%	-3.41%	-3.18%	-4.18%	-4.51%
2018-11	-3.81%	7.95%	6.85%	4.89%	1.65%	-1.76%
2012-06	-3.75%	-3.32%	-3.28%	-3.40%	-3.34%	-4.74%
2018-10	-3.74%	-3.90%	-4.33%	-4.48%	-5.14%	-4.29%
2009-05	-3.64%	2.82%	2.90%	2.15%	-0.25%	0.49%
2023-12	-3.63%	5.18%	4.72%	2.10%	-0.66%	-0.29%
2016-03	-3.58%	-0.68%	-1.18%	-1.56%	-2.22%	-2.92%
2009-12	-3.44%	-4.65%	-4.01%	-3.75%	-3.87%	-3.09%
2013-05	-3.40%	1.02%	0.13%	-0.05%	-1.98%	-3.66%
2011-09	-3.33%	2.68%	3.20%	3.11%	0.03%	-1.08%
2012-10	-3.31%	-3.89%	-3.20%	-3.20%	-4.32%	-4.86%
2023-01	-3.26%	4.60%	5.90%	5.85%	-0.43%	-1.35%

The ranked event list shows that LT reversals are not restricted to one macro environment. They include post-crisis rebounds, bond-yield shocks, trend breaks in 2015, the late-2022 reversal, and recent 2026 losses. Adding the contemporaneous 20d return shows whether the fastest sleeve had already adapted in each episode; positive 20d returns in several severe LT drawdowns are the empirical source of the optionality discussed above. That cross-regime diversity argues against designing a hedge around a single historical story. The robust implementation should

use the common feature across these episodes: slow trend exposure is stale relative to faster trend exposure.

Bottom-10% LT reversal months

LT loss ranked left; 20d trend performance shown for the same months.

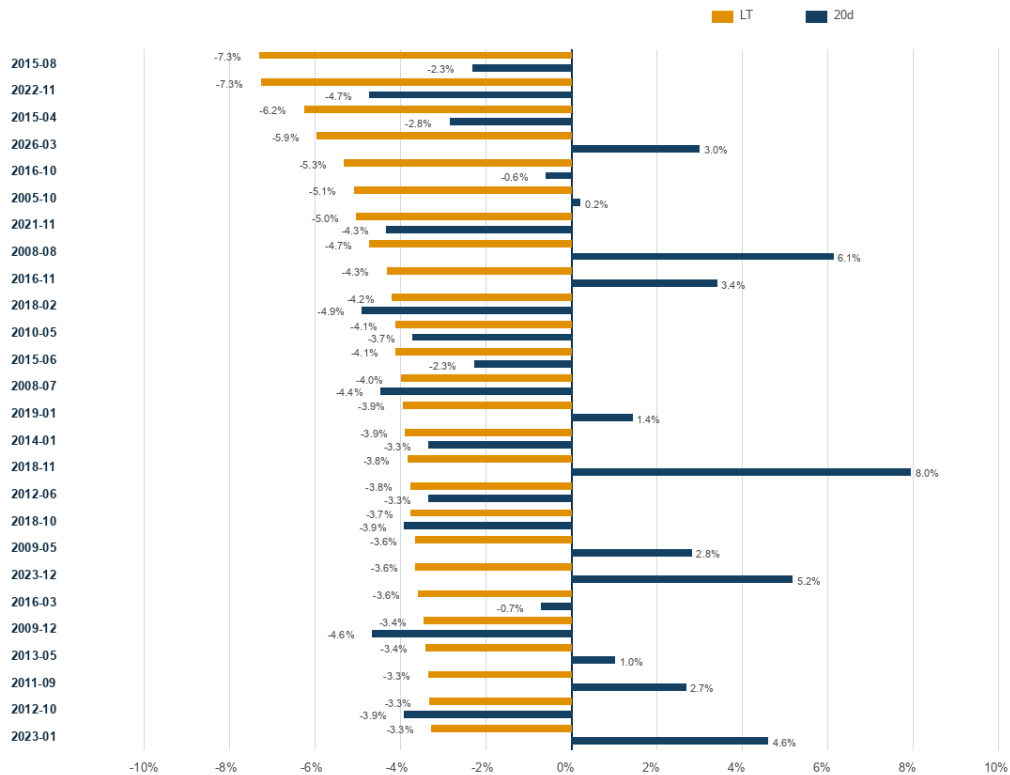


Figure 5: Ranked bottom-10% LT reversal months with contemporaneous 20d trend performance.

10 How to Hedge Trend Reversal

Table 11: Practical hedging menu

Hedge	What it does	Main trade-off
Bounded speed diversification	Keep a structural allocation to 20d/60d/125d sleeves alongside LT. This reduces LT reversal capture without requiring a hard timing signal.	Lower expected participation in the strongest LT trend months.
Conditional fast-over-slow overlay	Add long ST / short LT when LT reversal risk is elevated, for example after rising fast-minus-slow dispersion or a detected momentum turning point.	Requires timing discipline; false positives create whipsaw losses and the always-on spread carry is negative.
Dynamic Multi-Horizon allocation	Let the model allocate across 20d, 60d, 125d, 250d, and 500d rather than holding a static LT block.	Still exposed to trend risk; hedge quality depends on current horizon weights.
Drawdown-aware LT de-risking	Reduce 250d/500d exposure after large adverse LT moves or after fast horizons diverge materially from slow horizons.	Can reduce convexity if a persistent trend resumes after the initial reversal.
Post-event deactivation rule	Reduce the explicit overlay after the reversal month unless fast/slow dispersion remains high.	Avoids paying hedge carry after the protection window, but can exit too early in a multi-month reversal episode.

Recommended implementation. Use bounded speed diversification as the default hedge, with explicit limits on fast-horizon concentration. Treat the long ST / short LT overlay as conditional insurance, not a permanent allocation. The evidence supports a relative-protection role for fast horizons, but the negative full-sample carry means the hedge should be sized, activated, and deactivated deliberately.

11 Conclusion

The evidence supports a balanced institutional interpretation of trend speed. The long-term 250d/500d block remains the primary growth engine of the trend-following allocation, because it participates most fully in persistent trend regimes. The short-term 20d/60d block is better understood as a risk-management engine: it adapts faster when the long-term trend state deteriorates and reduces left-tail capture during LT reversal months.

The hedge value of short-term trend is therefore state-contingent. In the LT decile profile, ST behaves like a relative insurance sleeve: it has positive value versus LT in the weakest LT deciles, but gives up participation when LT trend is strongest. This option-like profile is useful, but it is not free. A permanent long ST / short LT overlay has negative full-sample carry, so implementation should emphasize bounded speed diversification and conditional overlay sizing rather than an unconditional anti-LT position.

For portfolio construction, the practical conclusion is neutral and disciplined: maintain LT exposure as the core return engine, embed faster horizons to improve reversal resilience, and activate explicit fast-over-slow hedges only when indicators such as cross-horizon dispersion, fast-minus-slow disagreement, or momentum-turning signals justify paying the insurance premium. The objective is not to eliminate trend-reversal losses; it is to reduce their severity without compromising the structural role of long-term trend following.

12 Appendix: Implementation Rules

1. Use monthly returns from completed months only when estimating reversal percentiles.
2. Define $R_t^{LT} = 0.5R_t^{250d} + 0.5R_t^{500d}$.
3. Define material LT reversals as $R_t^{LT} \leq$ the 20th percentile, and extreme LT reversals as $R_t^{LT} \leq$ the 10th percentile.
4. Track conditional return, conditional correlation, beta to LT, positive-hit rate, beat-LT rate, and next-month giveback.
5. Treat 20d/60d as the tactical speed hedge, 125d as the intermediate smoother, and 250d/500d as the slow trend anchor.
6. Use the long ST / short LT spread as a diagnostic or conditional hedge, not as a default carry-positive allocation.

Disclaimer

This document is for research discussion only. Backtested results are hypothetical and subject to model risk; they do not reflect trading costs, capacity limits, or operational frictions beyond those stated. Past performance is not indicative of future results.



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