Strategy Spotlight

CTA Style Performance in 2025: Pure vs. Adaptive vs. Barbell

January 2026 — Ai For Alpha Team

Abstract

Using 2025 attribution dashboards and longer-run performance evidence as context, we compare three systematic CTA replication implementations applied to a liquid, cross-asset futures universe:

1. **CTA Pure Trend Decoding** (*Pure*): a *Trend-Factors-only* decoding of the CTA benchmark, expressed through transparent, futures-based horizon Trend Factors.

2. **CTA Adaptive Decoding** (*Adaptive*): a *hybrid* decoder that explains the CTA benchmark using a **mix of Trend Factors and Market Return Factors**. The Market Return Factors leg is implemented via a dynamic long/short futures exposure, enabling model-light cross-asset positioning and directional/relative-value spreads.

3. **Barbell Horizons CTA Replication** (*Barbell*): a replication stack combining **Short-Term Trend Factors** (fast horizons only: 10/20/60 trading days) with **Market Return Factors**, shown in the flagship **50/50 MKT+STT** configuration documented in Ai For Alpha's CTA replication research programme (Ai For Alpha, 2025a).

The focus of this note is the **one-year performance attribution** of the three implementations: (i) *styles* at the instrument level; and (ii) aggregated *performance engines* at the asset-class level (Equities, Rates, Commodities, FX). Correlation, tracking, and longer-run performance context for **Pure**, **Adaptive**, and **Barbell** are provided using the accompanying 2025 and 10Y performance series.

> **Key takeaways from 2025 attribution.**
>
> - **A step-up in realised "style mix" from Pure → Adaptive → Barbell.** Over the trailing 1Y window shown in the dashboards, the excess return performance rises from **−2.0%** (Pure) to **+5.7%** (Adaptive) to **+15.6%** (Barbell). The incremental gap *Barbell minus Adaptive* is **+9.9 pp**.
>
> - **Gold is the dominant return engine across all three.** Gold contributes **+7.5%** (Pure), **+7.9%** (Adaptive), and **+12.2%** (Barbell) over the same 1Y window.
>
> - **Barbell adds stronger pro-cyclical engines.** Relative to Adaptive, Barbell's 1Y attribution shows higher **Equities** and **Commodities** contributions (notably **Gold** and **Copper**), while Rates remain a drag in all three.
>
> - **Tracking to the benchmark is robust across implementations.** Using daily returns, correlations to the SG CTA Trend (NEIXCTAT) index are **0.83** (Pure), **0.82** (Adaptive), and **0.77** (Barbell) over 10Y; over the 2025 calendar window, correlations are **0.78** (Pure), **0.78** (Adaptive), and **0.76** (Barbell).

1 Investment Universe and Cost Assumptions

1.1 Liquid Futures Universe

All implementations analysed in this note (*Pure*, *Adaptive*, and *Barbell*) are evaluated on a common, diversified and highly liquid futures universe designed to represent the standard opportunity set of large CTA programmes across **equities**, **rates**, **FX**, and **commodities**. The universe is intentionally compact (on the order of two dozen contracts) and focuses on the most liquid front contracts across major exchanges in North America, Europe, and Asia. This design choice supports three objectives: (i) realistic capacity and implementation feasibility, (ii) consistent cross-strategy comparability of attribution results, and (iii) robust execution with low operational complexity.

1.2 Cost Model and Implementation Conventions

Unless stated otherwise, performance and attribution are interpreted *net* of a consistent cost model applied uniformly across sleeves and factors. Costs are defined in basis points of *notional traded* and are applied after instrument-level netting of orders.

- **Transaction cost (Tx).** Round-turn execution cost (bid–ask, brokerage, exchange/clearing fees, and slippage), expressed in basis points of notional traded. Where multiple sleeves generate trades in the same contract, orders are *netted at the instrument level* prior to execution, so turnover and costs reflect the implementation of the *combined* portfolio rather than any single sleeve in isolation.

- **Replication (roll) cost.** Systematic carry/roll drag incurred when rolling the front contract to the next maturity. Roll costs are calibrated using long-run average front-to-next calendar spreads and are only incurred on actual roll dates.

- **Management fee provision.** A flat **50 bps per annum** provision on AUM is reserved for management/operational fees when reporting net performance.

Asset class	Costs (Tx, Roll)	Instruments (exchange)
Commodities	2 / 15 bps	GC (COMEX); CL, NG (NYMEX); CO (ICE Europe); HG (COMEX)
Equity Indices	2 / 15 bps	ES, NQ (CME); NK (OSE); FESX (Eurex); Z (ICE Europe); E-mini EM (CME)
Fixed Income (Rates)	2 / 10 bps	TU, TY (CBOT); RX (Eurex); G (ICE UK Gilts); JGB (OSE); XM (ASX)
FX (vs USD)	2 / 2 bps	EUR, JPY, GBP, AUD, CAD (CME)

Table 1: Futures universe and cost assumptions used throughout this note (Tx = round-turn transaction cost; Roll = average front-to-next spread). Costs are expressed in basis points of notional and applied consistently across sleeves/factors.

All sleeves/factors are volatility-targeted to a common annualised volatility. Costs are applied to *filled* notional after sleeve netting. Rolls follow exchange calendars and incur costs only when contracts are actually rolled. This implementation convention is particularly important when combining multiple sleeves (e.g., Trend Factors and Market Return Factors), because it avoids double-counting turnover and preserves a realistic estimate of total portfolio trading costs.

2 Strategy Framework (from Ai For Alpha Spotlights)

2.1 Common building blocks: liquid futures + horizon-controlled trend

Across Ai For Alpha's CTA replication research, trend exposures are engineered on a diversified futures universe spanning equities, rates, FX and commodities, and expressed through **horizon-controlled Trend Factors** based on **look-back straddle** mechanics (Ai For Alpha, 2025c,b). The key design idea is to make trend *investable* and *decomposable* by horizon (e.g., 20d, 60d, 125d, 250d, 500d) so that CTA behaviour can be analysed as a mixture of interpretable horizon sleeves (Ai For Alpha, 2025c).

2.2 Pure vs. Adaptive Decoding

Within the same liquid, cross-asset futures universe, **Pure** and **Adaptive** differ primarily in the *factor set* used to decode the CTA benchmark:

- **Pure** is a *Trend-Factors-only* decoder: it expresses the benchmark exclusively through **Trend Factors** (horizon-controlled trend sleeves). This restriction yields the cleanest interpretability: realised P&L maps directly to a horizon-by-instrument *style map*.

- **Adaptive** is a *hybrid* decoder: it decodes the benchmark using a **mix of Trend Factors and Market Return Factors**. The Market Return Factors sleeve is implemented as a *dynamic long/short* futures exposure, designed to be *model-light* (no assumptions on trend modelling) and flexible enough to express *directional and relative-value spreads* across instruments in the investment universe. In practical terms, Adaptive can shift explanatory power between trend-driven and market-return-driven exposures as regimes change.

Operationally, the attribution dashboards provide a direct, investable read-out of the realised factor mix: which instruments and asset classes are driving performance over each trailing window.

2.3 Barbell Horizons CTA Replication

In this note, **Barbell Horizons** is implemented as a two-sleeve replication stack that combines:

- a **Short-Term Trend** sleeve (**STT**) built from fast horizons only (10, 20, and 60 trading days); and

- a **Market Return Factors** sleeve (**MKT**) implemented via the same *dynamic long/short* futures decoding approach described above.

This barbell structure deliberately pairs a *fast trend* engine (short-horizon Trend Factors) with a *flexible market-return* engine (dynamic long/short Market Return Factors). The implementation used throughout this note is the **flagship 50/50 blend of MKT and STT** (Ai For Alpha, 2025a).

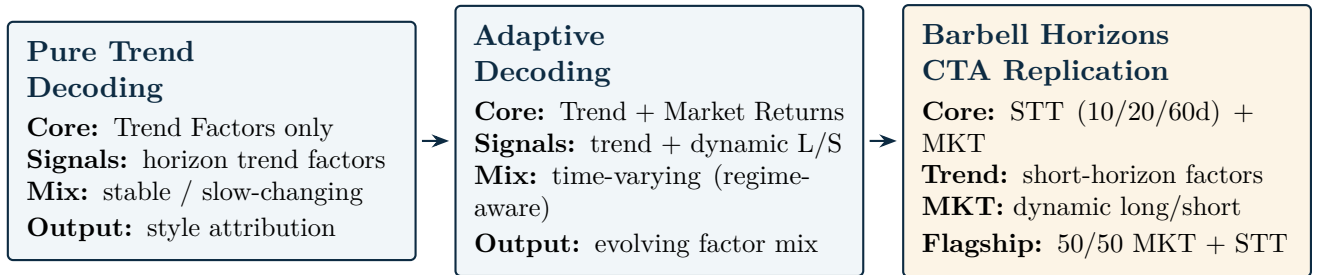| **Pure Trend Decoding**	**Adaptive Decoding**	**Barbell Horizons CTA Replication**
Core: Trend Factors only **Signals:** horizon trend factors **Mix:** stable / slow-changing **Output:** style attribution	**Core:** Trend + Market Returns **Signals:** trend + dynamic L/S **Mix:** time-varying (regime-aware) **Output:** evolving factor mix	**Core:** STT (10/20/60d) + MKT **Trend:** short-horizon factors **MKT:** dynamic long/short **Flagship:** 50/50 MKT + STT

Figure 1: Conceptual positioning. Pure decodes the benchmark using Trend Factors only. Adaptive adds Market Return Factors (dynamic long/short) alongside Trend Factors with a time-varying (regime-aware) factor mix. Barbell Horizons concentrates the trend leg into short-term horizons (10/20/60d) and combines it with the Market Return Factors sleeve (flagship: 50/50 MKT+STT).

3 One-year Attribution: Styles and Performance Engines

3.1 Instrument-level attribution dashboards (1Y)

Figure 2 reproduces the instrument-level attribution dashboards for the three implementations. The headline numbers are the 1Y totals in the bottom row: **−2.0%** (Pure), **+5.7%** (Adaptive), and **+15.6%** (Barbell).

	Daily	MTD	YTD	1W	1M	3M	6M	1Y
US Equities	-0.0%	0.1%	0.1%	0.1%	0.0%	0.2%	0.8%	-0.1%
US Tech Equities	0.0%	0.0%	0.0%	0.0%	-0.0%	0.1%	0.6%	0.0%
Japan Equities	-0.1%	0.2%	0.2%	0.2%	0.2%	0.6%	2.1%	1.3%
Euro Equities	-0.0%	0.3%	0.3%	0.3%	0.5%	0.7%	1.1%	-0.9%
UK Equities	-0.1%	0.2%	0.2%	0.2%	0.6%	0.9%	1.9%	1.3%
EM Equities	-0.1%	0.3%	0.3%	0.3%	0.4%	0.5%	1.9%	1.2%
US 2Y Bond	-0.0%	-0.0%	-0.0%	-0.0%	-0.1%	-0.3%	-0.7%	-2.0%
Germany 2Y Bond	-0.0%	-0.0%	-0.0%	-0.0%	-0.0%	0.1%	0.1%	-0.4%
US 10Y Bond	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.4%	-0.5%	-2.0%
Germany 10Y Bond	-0.0%	-0.0%	-0.0%	-0.0%	-0.0%	-0.0%	-0.0%	-0.2%
UK 10Y Bond	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%	-0.2%
Japan 10Y Bond	-0.0%	0.1%	0.1%	0.1%	0.3%	0.7%	0.9%	0.6%
Australia 10Y Bond	-0.0%	-0.0%	-0.0%	-0.0%	0.0%	-0.0%	-0.1%	-0.3%
Canada 10Y Bond	-0.0%	-0.0%	-0.0%	-0.0%	-0.1%	-0.3%	-0.4%	-0.6%
Gold	-0.1%	0.4%	0.4%	0.4%	0.7%	1.4%	3.5%	7.5%
Crude Oil	0.0%	-0.0%	-0.0%	-0.0%	-0.0%	-0.0%	-0.0%	-0.0%
Nat Gas	-0.1%	0.2%	0.2%	0.2%	0.5%	-0.1%	0.2%	-0.9%
Oil Brent	0.1%	0.1%	0.1%	0.1%	0.3%	0.0%	-0.2%	-2.3%
Copper	-0.1%	0.1%	0.1%	0.1%	0.3%	0.3%	-0.5%	-1.3%
EUR/USD	-0.0%	-0.1%	-0.1%	-0.1%	-0.1%	-0.3%	-0.7%	-0.7%
JPY/USD	0.0%	-0.0%	-0.0%	-0.0%	0.3%	0.9%	1.1%	-0.4%
GBP/USD	-0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.4%	0.2%
AUD/USD	-0.0%	0.1%	0.1%	0.1%	0.1%	-0.0%	-0.0%	-0.2%
CAD/USD	-0.0%	-0.0%	-0.0%	-0.0%	-0.2%	-0.5%	-0.7%	-1.8%
Total	**-0.7%**	**1.9%**	**1.9%**	**1.9%**	**3.6%**	**4.2%**	**9.9%**	**-2.0%**

CTA Pure Trend Decoding — performance attribution.

	Daily	MTD	YTD	1W	1M	3M	6M	1Y
US Equities	-0.0%	0.1%	0.1%	0.1%	0.1%	0.3%	1.0%	0.3%
US Tech Equities	0.0%	0.0%	0.0%	0.0%	-0.0%	0.1%	0.6%	0.5%
Japan Equities	-0.1%	0.2%	0.2%	0.2%	0.2%	0.6%	2.6%	2.1%
Euro Equities	-0.0%	0.3%	0.3%	0.3%	0.5%	0.8%	1.1%	0.4%
UK Equities	-0.2%	0.2%	0.2%	0.2%	0.7%	1.0%	2.2%	2.5%
EM Equities	-0.0%	0.1%	0.1%	0.1%	0.0%	0.1%	1.0%	-0.6%
US 2Y Bond	-0.0%	-0.0%	-0.0%	-0.0%	-0.1%	-0.2%	-0.6%	-1.7%
Germany 2Y Bond	-0.0%	-0.0%	-0.0%	-0.0%	-0.0%	0.1%	0.2%	-0.4%
US 10Y Bond	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.4%	-0.3%	-1.6%
Germany 10Y Bond	0.0%	-0.0%	-0.0%	0.0%	-0.1%	-0.4%	-0.5%	-0.8%
UK 10Y Bond	0.0%	0.0%	0.0%	0.0%	0.0%	-0.0%	-0.0%	-0.2%
Japan 10Y Bond	-0.0%	0.1%	0.1%	0.1%	0.3%	0.7%	0.9%	0.7%
Australia 10Y Bond	-0.0%	-0.0%	-0.0%	-0.0%	0.0%	-0.0%	-0.2%	-0.2%
Canada 10Y Bond	-0.0%	-0.0%	-0.0%	-0.0%	-0.0%	-0.0%	-0.1%	-0.2%
Gold	-0.1%	0.4%	0.4%	0.4%	0.8%	1.5%	4.0%	7.9%
Crude Oil	-0.1%	-0.1%	-0.1%	-0.1%	-0.5%	-0.4%	-0.7%	-0.3%
Nat Gas	-0.1%	0.1%	0.1%	0.1%	0.3%	-0.5%	0.0%	-1.1%
Oil Brent	0.1%	0.1%	0.1%	0.1%	0.6%	0.3%	0.3%	-0.3%
Copper	-0.2%	0.2%	0.2%	0.2%	0.4%	0.4%	-0.6%	-0.7%
EUR/USD	-0.0%	-0.1%	-0.1%	-0.1%	-0.2%	-0.3%	-0.7%	-0.8%
JPY/USD	0.0%	-0.0%	-0.0%	-0.0%	0.5%	1.3%	2.1%	0.2%
GBP/USD	-0.1%	0.1%	0.1%	0.1%	0.3%	0.1%	-0.6%	2.6%
AUD/USD	-0.0%	0.1%	0.1%	0.1%	0.0%	-0.2%	-0.4%	-1.0%
CAD/USD	0.0%	0.0%	0.0%	0.0%	-0.3%	-0.7%	-0.4%	-1.8%
Total	**-0.8%**	**1.8%**	**1.8%**	**1.8%**	**3.4%**	**3.9%**	**10.8%**	**5.7%**

CTA Adaptive Decoding — performance attribution.

	Daily	MTD	YTD	1W	1M	3M	6M	1Y
US Equities	-0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.9%	0.9%
US Tech Equities	0.0%	0.1%	0.1%	0.1%	-0.1%	0.2%	1.1%	1.8%
Japan Equities	-0.1%	0.2%	0.2%	0.2%	0.2%	0.9%	3.2%	3.0%
Euro Equities	-0.0%	0.2%	0.2%	0.2%	0.3%	0.5%	0.7%	1.2%
UK Equities	-0.2%	0.2%	0.2%	0.2%	0.7%	1.0%	2.3%	3.0%
EM Equities	0.0%	-0.1%	-0.1%	-0.1%	-0.2%	-0.2%	-0.3%	-1.9%
US 2Y Bond	-0.0%	-0.0%	-0.0%	-0.0%	-0.1%	-0.2%	-0.7%	-1.1%
Germany 2Y Bond	-0.0%	-0.0%	-0.0%	-0.0%	-0.0%	-0.1%	0.1%	-0.3%
US 10Y Bond	-0.0%	-0.0%	-0.0%	-0.0%	-0.0%	-0.1%	-0.4%	-1.2%
Germany 10Y Bond	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.2%	-0.4%	-0.8%
UK 10Y Bond	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%	-0.2%
Japan 10Y Bond	-0.0%	0.1%	0.1%	0.1%	0.3%	0.6%	0.8%	0.5%
Australia 10Y Bond	-0.0%	-0.0%	-0.0%	-0.0%	0.0%	-0.1%	-0.3%	-0.4%
Canada 10Y Bond	0.0%	0.0%	0.0%	0.0%	-0.0%	-0.0%	-0.0%	-0.1%
Gold	-0.2%	0.6%	0.6%	0.6%	1.3%	2.4%	7.2%	12.2%
Crude Oil	-0.1%	-0.1%	-0.1%	-0.1%	-0.2%	-0.2%	-0.3%	-0.1%
Nat Gas	-0.1%	0.1%	0.1%	0.1%	0.1%	-0.4%	0.1%	-0.8%
Oil Brent	0.1%	0.1%	0.1%	0.1%	0.3%	0.2%	0.1%	-1.1%
Copper	-0.2%	0.2%	0.2%	0.2%	0.5%	0.7%	0.4%	1.0%
EUR/USD	-0.0%	-0.1%	-0.1%	-0.1%	-0.2%	-0.3%	-0.6%	-0.8%
JPY/USD	0.0%	-0.0%	-0.0%	-0.0%	0.3%	1.2%	2.2%	0.6%
GBP/USD	-0.1%	0.1%	0.1%	0.1%	0.2%	0.0%	-0.7%	2.4%
AUD/USD	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	-0.3%	-0.6%	-1.3%
CAD/USD	-0.0%	-0.0%	-0.0%	-0.0%	-0.3%	-0.4%	0.2%	-1.2%
Total	**-0.9%**	**1.6%**	**1.6%**	**1.6%**	**3.1%**	**5.0%**	**14.9%**	**15.6%**

Barbell Horizons CTA Replication — performance attribution.

Figure 2: Instrument-level attribution dashboards. We focus on the trailing 1Y column (rightmost).

3.2 Performance engines: Equities, Rates, Commodities, FX

To isolate *which engine* drives performance, we aggregate the 1Y instrument contributions into four engines. Figure 3 and Table 2 show that Barbell has materially larger **Commodities** and **Equities** contributions than the decoders, while Rates remain a drag across all three.
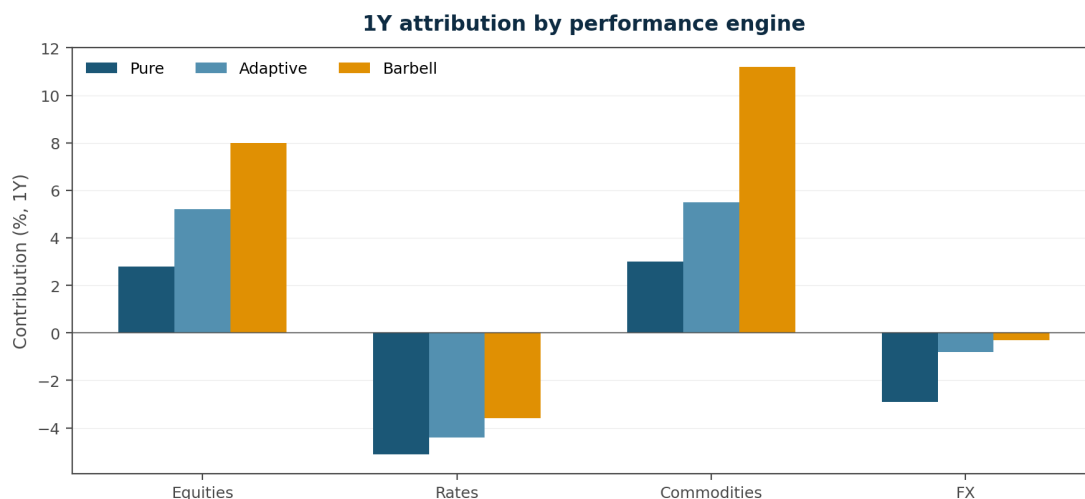
Figure 3: 1Y attribution by performance engine (aggregated from the dashboard instrument contributions).

Table 2: 1Y attribution by performance engine. Deltas are computed from the dashboard values (subject to rounding).

Engine	Pure	Adaptive	Barbell	Δ (Adaptive–Pure)	Δ (Barbell–Adaptive)
Equities	2.8%	5.2%	8.0%	**+2.4%**	**+2.8%**
Rates	-5.1%	-4.4%	-3.6%	**+0.7%**	**+0.8%**
Commodities	3.0%	5.5%	11.2%	**+2.5%**	**+5.7%**
FX	-2.9%	-0.8%	-0.3%	**+2.1%**	**+0.5%**

3.3 Full 1Y instrument attribution comparison

Table 3 reports the full 1Y instrument-level comparison across the three implementations. Because the dashboard numbers are rounded, engine sums may not match the reported 1Y totals exactly.

Table 3: Full 1Y instrument attribution comparison (values from the dashboards).

Instrument	Pure	Adaptive	Barbell	Δ (Adaptive–Pure)	Δ (Barbell–Adaptive)
US Equities	-0.1%	0.3%	0.9%	+0.4%	+0.6%
US Tech Equities	0.0%	0.5%	1.8%	+0.5%	+1.3%
Japan Equities	1.3%	2.1%	3.0%	+0.8%	+0.9%
Euro Equities	-0.9%	0.4%	1.2%	+1.3%	+0.8%
UK Equities	1.3%	2.5%	3.0%	+1.2%	+0.5%
EM Equities	1.2%	-0.6%	-1.9%	-1.8%	-1.3%
US 2Y Bond	-2.0%	-1.7%	-1.1%	+0.3%	+0.6%
Germany 2Y Bond	-0.4%	-0.4%	-0.3%	+0.0%	+0.1%
US 10Y Bond	-2.0%	-1.6%	-1.2%	+0.4%	+0.4%
Germany 10Y Bond	-0.2%	-0.8%	-0.8%	-0.6%	+0.0%
UK 10Y Bond	-0.2%	-0.2%	-0.2%	+0.0%	+0.0%
Japan 10Y Bond	0.6%	0.7%	0.5%	+0.1%	-0.2%
Australia 10Y Bond	-0.3%	-0.2%	-0.4%	+0.1%	-0.2%
Canada 10Y Bond	-0.6%	-0.2%	-0.1%	+0.4%	+0.1%
Gold	7.5%	7.9%	12.2%	+0.4%	+4.3%
Crude Oil	-0.0%	-0.3%	-0.1%	-0.3%	+0.2%
Nat Gas	-0.9%	-1.1%	-0.8%	-0.2%	+0.3%
Oil Brent	-2.3%	-0.3%	-1.1%	+2.0%	-0.8%
Copper	-1.3%	-0.7%	1.0%	+0.6%	+1.7%
EUR/USD	-0.7%	-0.8%	-0.8%	-0.1%	+0.0%
JPY/USD	-0.4%	0.2%	0.6%	+0.6%	+0.4%
GBP/USD	0.2%	2.6%	2.4%	+2.4%	-0.2%
AUD/USD	-0.2%	-1.0%	-1.3%	-0.8%	-0.3%
CAD/USD	-1.8%	-1.8%	-1.2%	+0.0%	+0.6%

3.4 Key contributors across strategies

Figure 4 compares 1Y contributions across Pure, Adaptive, and Barbell for a set of instruments that are material drivers of the 1Y attribution totals (both positive and negative). This view is intended as a practical "short list" for allocator monitoring: it highlights where the realised factor mix is most economically meaningful over the window.
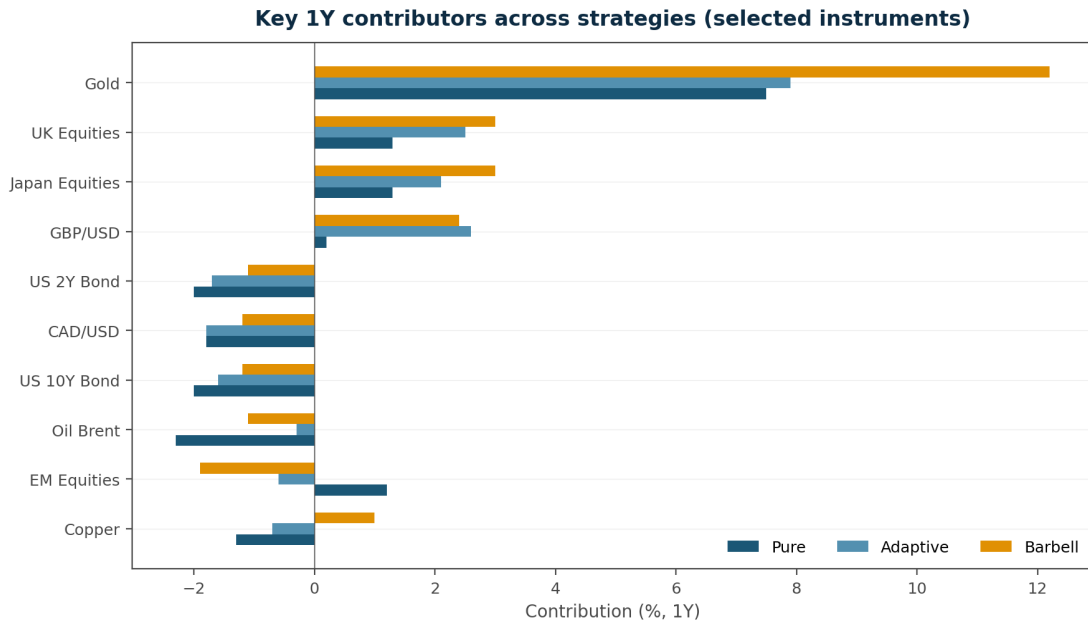

Figure 4: Key 1Y contributors across strategies (selected instruments).

3.5 Delta views: what changes across implementations?

Adaptive minus Pure. Figure 5 ranks the largest positive and negative differences in 1Y contribution (Adaptive minus Pure). The gap is dominated by **GBP/USD** and **Brent**, alongside stronger developed-equity contributions, partially offset by weaker **EM equities** and **AUD/USD**.
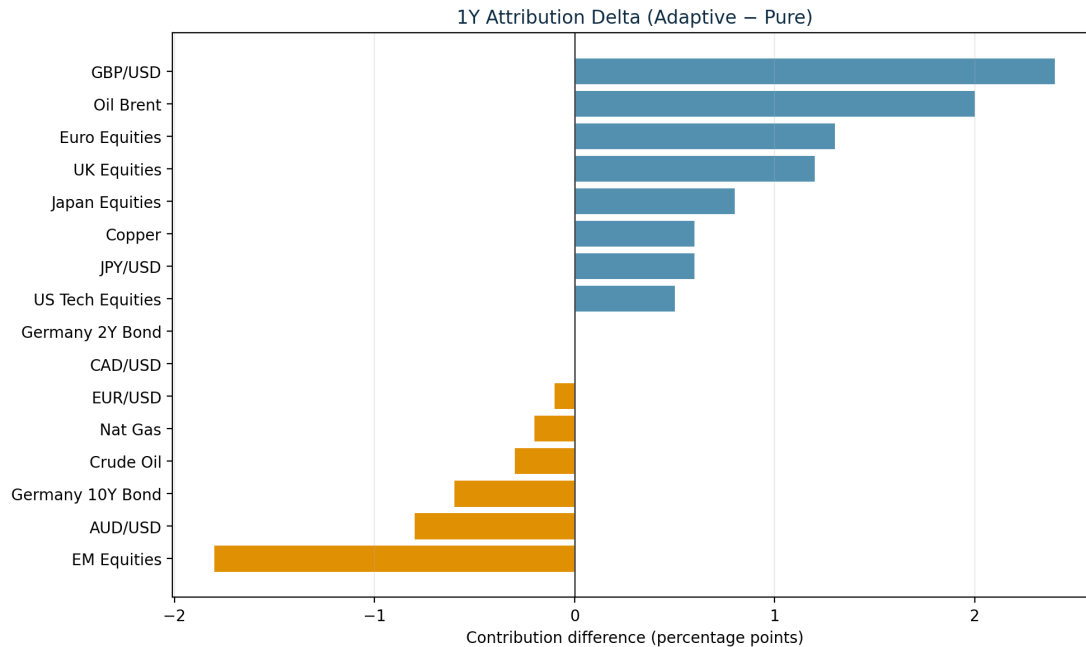

Figure 5: Largest 1Y contribution differences (Adaptive minus Pure), based on the dashboard attribution values.

Barbell minus Adaptive. Figure 6 shows where Barbell differs most from Adaptive over the same 1Y window. The incremental outperformance is concentrated in **Gold** and **Copper**, alongside higher **US Tech** and **developed equities**, partially offset by weaker **EM equities** and **Brent**.
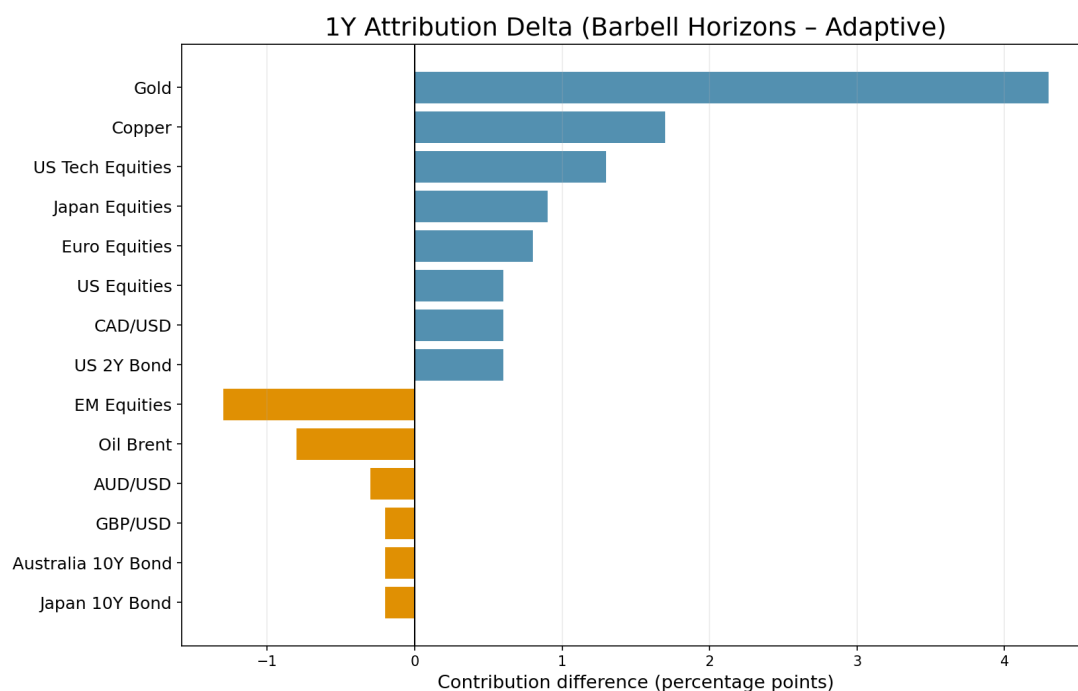
Figure 6: Largest 1Y contribution differences (Barbell minus Adaptive), based on the dashboard attribution values.

Barbell minus Pure. Figure 7 provides a direct comparison of Barbell and Pure, highlighting the full "step-up" in realised engine mix when moving from a Trend-Factors-only decoder to the Barbell Horizons (MKT+STT) stack.
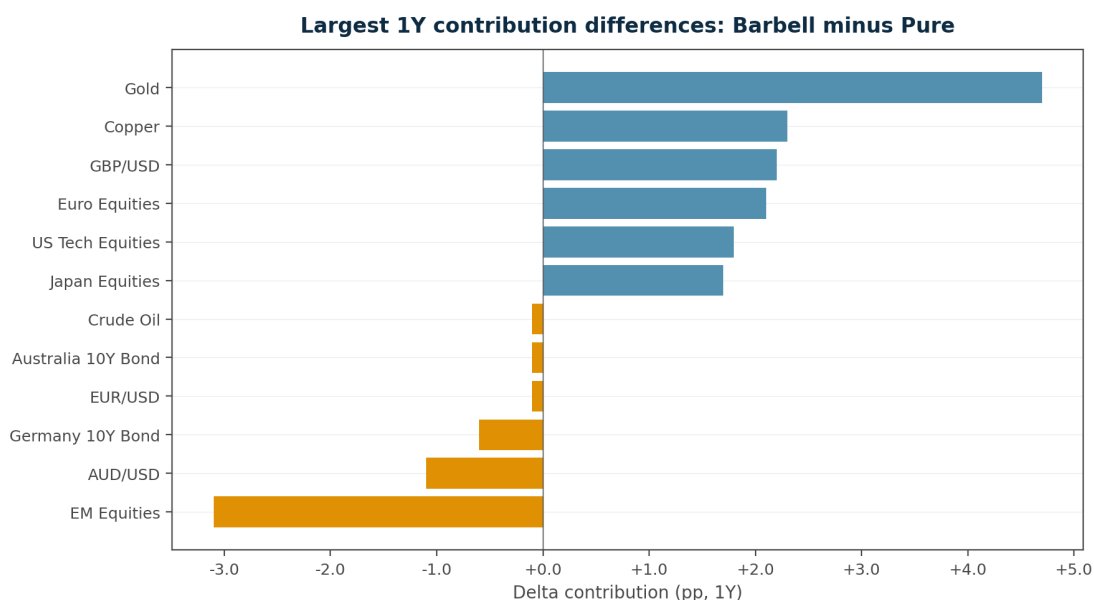

Figure 7: Largest 1Y contribution differences (Barbell minus Pure), based on the dashboard attribution values.

4 Correlation and Tracking (Pure, Adaptive, and Barbell)

Correlation and tracking error are standard diagnostics for replication quality. Tables 4–5 report correlations computed from daily returns on a consistent calendar and under a common cost model.

Table 4: Correlation matrix (2025). Percentages are daily-return correlations ×100.

	Pure	Adaptive	Barbell	SG CTA Trend (NEIXCTAT)
Pure	100%	96%	88%	78%
Adaptive	96%	100%	94%	78%
Barbell	88%	94%	100%	76%
SG CTA Trend (NEIXCTAT)	78%	78%	76%	100%

Table 5: Correlation matrix (10Y). Percentages are daily-return correlations ×100.

	Pure	Adaptive	Barbell	SG CTA Trend (NEIXCTAT)
Pure	100%	95%	84%	83%
Adaptive	95%	100%	87%	82%
Barbell	84%	87%	100%	76%
SG CTA Trend (NEIXCTAT)	83%	82%	76%	100%

Interpretation. Pure and Adaptive exhibit the highest benchmark tracking because both are explicitly fitted to the benchmark through the decoding framework. Barbell remains meaningfully correlated to SG CTA Trend (NEIXCTAT), while exhibiting a different realised engine mix consistent with its explicit Market Return Factors sleeve and short-horizon trend focus.

5 Performance Context: 2025 and 10Y (Pure, Adaptive, and Barbell)

5.1 Calendar-year 2025

Figure 8 plots the 2025 rebased performance series. In this calendar window, Barbell materially outperforms both decoders, while Adaptive outperforms Pure. This ranking is consistent with the 1Y attribution evidence that Barbell captured stronger pro-cyclical engines and commodity trends.
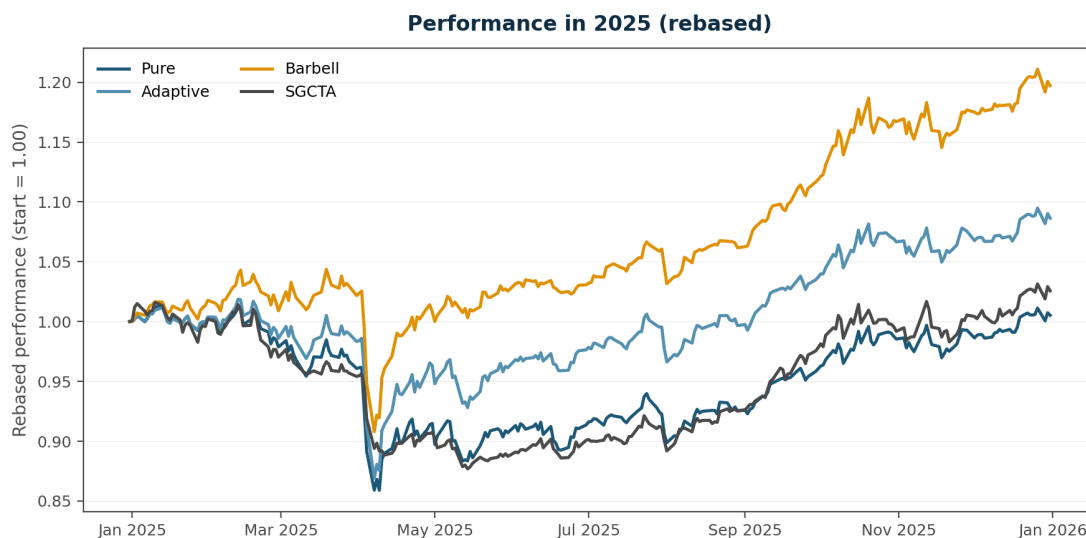

Figure 8: Performance in 2025 (rebased).

Table 6: Performance summary for 2025 (based on daily returns from the provided series).

Strategy	Total	Ann. Return	Ann. Vol	Sharpe	Max DD	Calmar
Pure Trend	0.5%	0.5%	11.8%	0.10	-15.3%	0.03
Adaptive Decoding	8.6%	8.3%	12.7%	0.69	-14.7%	0.57
Barbell Horizons	19.7%	19.1%	11.5%	1.69	-8.4%	2.28
SG CTA Trend (NEIXCTAT) Index	2.6%	2.5%	10.0%	0.30	-13.7%	0.18

5.2 Full decade

Figure 9 and Figure 10 place the three implementations in long-run context. Over the decade, Adaptive and Barbell deliver higher risk-adjusted efficiency than Pure and the benchmark, with Barbell exhibiting the smallest maximum drawdown in this sample.
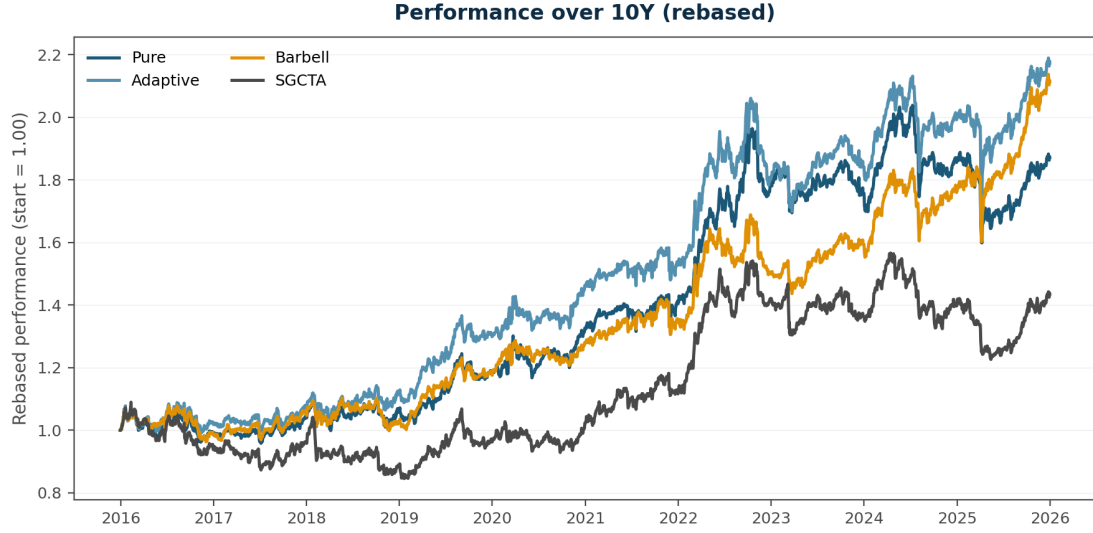
Figure 9: Performance over 10Y (rebased). Each series is a cumulative value index rebased to 100 at the start of the window: $I_t = 100 \times \frac{V_t}{V_{t_0}}$.
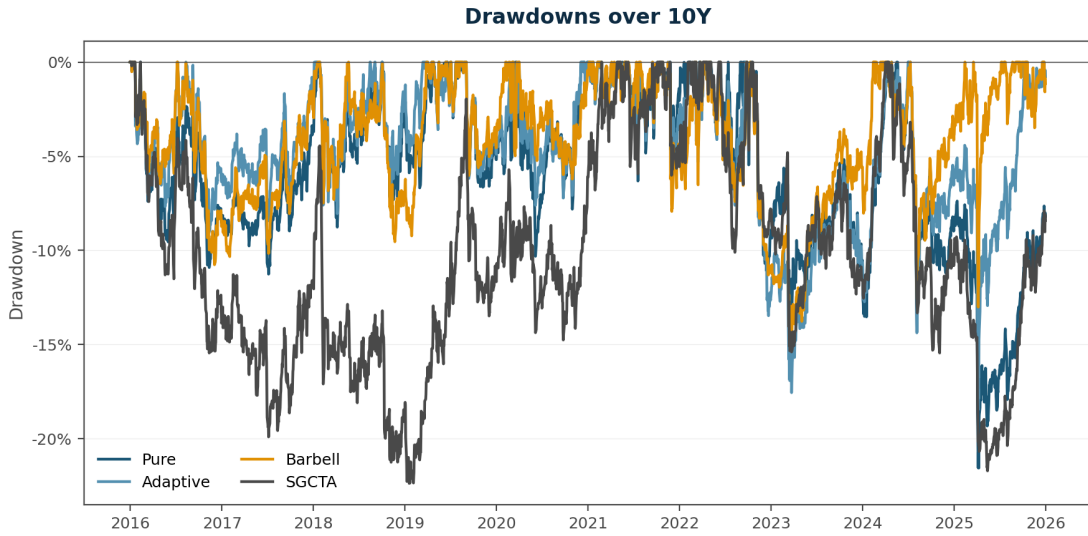

Figure 10: Drawdowns over 10Y. Let P_t be the portfolio value (NAV) at date t and define the rebased value index $V_t = 100 \frac{P_t}{P_{t_0}}$ (so $V_{t_0} = 100$). The running peak is $M_t = \max_{u \leq t} V_u$. Drawdown is $DD_t = \frac{V_t}{M_t} - 1$ (in %).

Table 7: Performance summary for 10Y (based on daily returns from the provided series). Corr. to S&P 500 is the 10Y weekly-return correlation to SPXT (S&P 500 total return).

Strategy	Total	CAGR	Ann. Vol	Sharpe	Max DD	Calmar	Corr. S&P 500 (weekly)
Pure Trend	87.2%	6.2%	10.5%	0.63	-21.6%	0.29	0.08
Adaptive Decoding	117.3%	7.8%	10.8%	0.75	-18.5%	0.42	0.10
Barbell Horizons	111.3%	7.8%	10.1%	0.77	-14.9%	0.52	0.19
SG CTA Trend (NEIXCTAT)	43.5%	3.5%	10.9%	0.37	-22.4%	0.16	0.08

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6   Allocation Takeaways

Taken together, the 1Y attribution dashboards and the 10Y risk–return statistics support the following allocator-oriented interpretation of the three implementations:

1. **Pure: convex, Trend-Factors-only exposure.** Pure isolates horizon Trend Factors and deliberately excludes a Market Return Factors sleeve. The result is a more *convex* payoff profile—strong participation in sustained directional moves and a faster "time-to-help" in sharp dislocations—but with more episodic return delivery when persistent trends are scarce.

2. **Adaptive: diversified factor mix and improved regime robustness.** Adaptive combines Trend Factors with Market Return Factors (dynamic long/short), allowing the return engine to rotate between trend-driven exposures and a model-light market-return component as conditions evolve. For allocators, this broader factor set typically improves *robustness* in low-trend regimes, while preserving an interpretable cross-asset attribution map.

3. **Barbell: strongest long-run efficiency with modestly higher equity linkage.** Barbell pairs short-term Trend Factors (10/20/60d) with Market Return Factors in a dynamically rebalanced mix governed by the Replication Graphical Model. This two-engine structure preserves convexity in crisis regimes through the short-term trend sleeve, while helping to amortise the P&L drag associated with false trend signals: in the 2025 analysis, shallow losses in range-bound (untrendy) rates and FX segments are partially offset by the market-return sleeve, stabilising performance when trend alone is temporarily noisy.

   Over the last decade it delivers the strongest efficiency metrics in this comparison (highest Sharpe and Calmar, shallowest maximum drawdown), while exhibiting a *modest* increase in equity linkage: its correlation to the S&P 500 is **0.19** versus **0.08–0.10** for Pure and Adaptive.

7   Related Strategy Spotlights

This note sits within Ai For Alpha's CTA research programme documented on the Strategy Spotlight page (`https://aiforalpha.com/strategy_spotlight.html`). Key references used in this document include:

- CTA Horizon Style Decomposition (Nov 2025)
- CTA Trend Replication: Is Medium-Term Trend Following the Weakest Link? (Sep 2025)
- Barbell Horizons CTA Replication (Jun 2025)
- CTA Execution Timing: Turning the Clock into Alpha (Nov 2025)

References

Ai For Alpha Team (2025a). *Strategy Spotlight: Barbell Horizons CTA Replication.* June 2025. Available at: `https://aiforalpha.com/dist/img/Strategy_Spotlight___Barbell_Horizons_CTA_Replication.pdf`.

Ai For Alpha Team (2025b). *CTA Trend Replication: Is Medium-Term Trend Following the Weakest Link?* September 2025. Available at: `https://aiforalpha.com/dist/img/Spotlight_MediumTerm.pdf`.

Ai For Alpha Team (2025c). *Strategy Spotlight: CTA Horizon Style Decomposition.* November 2025. Available at: `https://aiforalpha.com/dist/img/Strategy_Spotlight___CTA_Style_Analysis.pdf`.

Ai For Alpha Team (2025d). *Strategy Spotlight: CTA Execution Timing: Turning the Clock into Alpha*. November 2025. Available at: `https://aiforalpha.com/dist/img/Strategy_Spotl ight___CTA_execution_timing__turning_the_clock_into_alpha.pdf`.

Disclaimer

This document is for research discussion only. The results are based on the accompanying dashboards and performance series and may be hypothetical. They do not constitute investment advice. Past performance is not indicative of future results.