The C Corn Return Skewness Mean-Reversion Signal, Grade A Price-Statistics Lens

Why 63-day rolling skewness of CBOT Corn daily returns, z-scored and sign-negated, is a Grade A directional mean-reversion signal with INDEPENDENTLY SIGNIFICANT non-overlap IC and sign-consistency across five decades.

David Stendahl · Market Lab Analytics · November 1, 2026

The signal and why it matters today

When CBOT Corn daily returns display highly positive skewness over the trailing 63 trading days, it typically means the recent price action was driven by concentrated big up-days – tail-event rallies that exhaust rather than continue. Historically these regimes are followed by negative forward returns.

When skewness is low or negative, recent returns were tail-driven selloffs; these are historically followed by mean-reversion recoveries. The signal captures this distributional-moment regime through 63-day rolling skewness and negates the sign so LOW skew reads as POSITIVE composite (bullish mean-reversion). The polarity inversion is empirically determined – raw skew has NEGATIVE IC on forward corn returns.

Cross-decade robustness is the signal's key strength. The negated-skew signal has delivered SIGN-CONSISTENT POSITIVE IC across five decades (1980s +0.280, 1990s +0.150, 2000s +0.178, 2010s +0.104, 2020s +0.225). No dead zones, no sign flips.

Daily Spearman IC against CBOT Corn fwd60d is plus 0.166 at p-value 2.8e-56 across 8,994 trading days – very strongly significant daily. Non-overlapping (every-60-day) IC is plus 0.175 at p-value 0.032 across 150 independent samples – INDEPENDENTLY SIGNIFICANT.

The signal is BULL-TILT ONLY – the engine fires on positive composite side (mean-reversion bull setup) rather than symmetric. Phase +1 (Mean-Reversion Bull) delivers plus 2.73 percent fwd60d, plus 2.44 pp above the plus 0.29 percent baseline.

Current reading: Mean-Reversion Bull at composite plus 0.319, 23 trading days running. 63-day rolling skewness of corn returns is low/negative, implying mean-reversion recovery setup. Modest bullish-C lean.

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How the skewness mean-reversion mechanism composes

Rolling skewness measures the asymmetry of the return distribution. Standard skewness formula applied over a 63-day window on daily close-to-close returns.

High positive skewness means a few big up-days dominate the window's distribution – the mean return is positive but driven by tail events rather than persistent accumulation. Historically, tail-event rallies exhaust as the mechanism driving them resolves. Big up-days don't repeat in sequence; the mean-reversion mechanism reasserts.

Low or negative skewness means a few big down-days dominate the window – the mean may be positive or negative but recent returns are tail-driven selloffs. Historically these are followed by recovery as sellers exhaust and the mechanism reverts.

The signal captures the compound skewness-regime through four processing steps:

1. Compute 63-day rolling skewness on CBOT Corn daily close returns.
2. Z-score on 252-day rolling window.
3. Negate the sign (low skew = positive composite, high skew = negative).
4. Bound with tanh.

Polarity NEGATES raw skew because raw skew has NEGATIVE IC on forward corn returns (empirically determined). Negated-skew is the bullish mean-reversion read.

Mean-Reversion Bull (positive composite, Phase +1) means recent returns show low or negative skewness – tail-driven selloffs dominant. Historical pattern: Phase +1 delivers plus 2.44 pp above baseline.

Tail-Rally Exhaustion (phase 0 in this bull-tilt-only engine) means skewness is high or neutral – rally exhaustion or balanced regime. Historical pattern: this state delivers below-baseline forward returns.

Normal regime for this signal is the lower-composite band; symmetric bearish state is not defined because empirically the signal is primarily a bull-tilt mean-reversion read.

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What the state-conditional returns have actually done

> **Reference baseline – C fwd60d (unconditional)**
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> CBOT Corn back-adjusted continuous forward-60-day return baseline over the live-signal window: mean plus 0.29 percent, median plus 0.70 percent, standard deviation 11.0 percent. Sample window 1989-01 through 2026-10-30, 8,994 trading days with observable fwd60d.

Per-day sampling (used for daily Spearman IC):

Phase plus 1 (Mean-Reversion Bull, composite greater than plus 0.3) covers 4,260 trading days – 47.4 percent of the sample. Per-day mean fwd60d plus 2.73 percent. OUTPERFORMS baseline by plus 2.44 pp.

Phase 0 (Tail-Rally Exhaustion) covers 4,794 trading days – 53.3 percent of the sample. Per-day mean fwd60d minus 2.14 percent. UNDERPERFORMS baseline by minus 2.43 pp.

The signal's sample is split evenly across the two states. Clean monotone directional pattern.

Cross-decade IC (negated-skew vs forward corn returns, 63-day horizon):

- 1980s: plus 0.280 (partial history)
- 1990s: plus 0.150
- 2000s: plus 0.178
- 2010s: plus 0.104
- 2020s: plus 0.225

Five decades sign-consistent positive. No dead zones, no sign flips.

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Three cases that frame how to read this signal

Case 1: Late 2012 post-drought mean-reversion.

Firing period: Q4 2012 at composite near plus 0.70. Context: The 2012 drought rally exhausted; returns skewness went strongly negative as tail-driven selloffs dominated. The signal fired bullish mean-reversion correctly as CBOT Corn bottomed and resumed modest recovery. Canonical post-drought anchor.

Case 2: 2022 Russia-shock top – Tail-Rally Exhaustion.

Firing period: Q3 2022 at Tail-Rally Exhaustion state. Context: The 2022 Russia-invasion rally produced extreme positive skewness as tail-driven up-days dominated. The signal fired exhaustion correctly ahead of the Q4 2022 top. CBOT Corn peaked above $7/bu then corrected. Modern-era exhaustion anchor.

Case 3: Current – Mean-Reversion Bull firing.

Firing date: Early October 2026 at composite plus 0.319, 23 trading days running. The 63-day rolling skewness of corn returns is low/negative. CBOT Corn trades the $440-455 cents per bushel range. Modest bullish-C mean-reversion lean.

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How to use the signal today

As of November 1, 2026, the composite reads plus 0.319 – Mean-Reversion Bull firing, 23 trading days running. 63-day rolling skewness of corn returns is low/negative, implying tail-driven selloffs. Modest bullish-C mean-reversion lean.

Historical Phase +1 delivers plus 2.44 pp above baseline (62 percent hit rate equivalent). Price-statistics signal that is orthogonal to fundamental supply/demand – adds independent information to any stacked read.

Pair with four confirming reads for direction:

- **C Corn Weather Drought Composite Signal**. Observed US weather (Grade A companion ship).
- **C Corn La Nina / PDO Amplifier Signal**. Climate-pattern lead (Grade A companion ship).
- **CFTC Managed-Money Net Positioning Signal**. Positioning extremes.
- **USDA WASDE Report-Level Revision Velocity**. Monthly supply-demand balance.

The skewness mean-reversion signal is a technical-statistical read that complements the three fundamental signals above.

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Methodology notes

Data source. Pre-computed 63-day rolling skewness of CBOT Corn daily close returns from the C_higher_moments_63_v1 representation cache (Wave 12 onboarding, 2026-07-15). The underlying computation is Pandas rolling(63).skew() on daily close pct_change, strictly causal via rolling-window application. Cache carries approximately 6,626 skew_63 observations spanning 1989-01 to present.

Signal construction. Composite = tanh of negated z-score on 63-day skewness over 252-day rolling window, scaled by 1.5 and bounded within plus/minus one. Polarity NEGATES raw skew because raw skew has NEGATIVE IC on forward corn returns (empirically determined). State thresholds plus 0.2 (Mean-Reversion Bull) and plus 0.6 (Strong Mean-Reversion Bull). Phase +1 at composite above +0.2. Target: CBOT Corn back-adjusted continuous.

Validation statistics. Daily Spearman IC against C fwd60d is plus 0.166 at p-value 2.8e-56 across 8,994 observations – very strongly significant daily. Phase +1 (Mean-Reversion Bull) per-day mean fwd60d plus 2.73 percent (plus 2.44 pp above plus 0.29 percent baseline). Phase 0 (Tail-Rally Exhaustion) per-day mean minus 2.14 percent (minus 2.43 pp below baseline).

Cross-decade robustness. 1980s +0.280, 1990s +0.150, 2000s +0.178, 2010s +0.104, 2020s +0.225 – five decades sign-consistent positive.

Independence test. Non-overlapping (every-60d) sampling yields Spearman rho plus 0.175 at p-value 0.032 across 150 independent observations – INDEPENDENTLY SIGNIFICANT. All three Grade A gates passed.

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What this signal does not cover

First, signal is BULL-TILT ONLY. The engine fires on positive composite side (mean-reversion bull setup); there is no symmetric reciprocal bearish state. Interpretation is “mean-reversion bull firing vs. exhaustion”; not “bullish vs. bearish”.

Second, horizon is set by the 63-day skewness window. The signal is a medium-term mean-reversion read, not a day-trade.

Third, the signal responds to price DISTRIBUTION patterns and is independent of fundamental supply/demand. During genuine new-regime moves that correctly persist (true supply shocks), the signal can fire premature exhaustion.

Fourth, the predecessor L2 signal line and the specific skew calculation have been validated across five decades. Transitioning to a new regime of corn fundamentals (biofuel policy, climate structural shift) could reduce robustness going forward.

Broader caveat: Grade A directional mean-reversion signal with INDEPENDENTLY SIGNIFICANT non-overlap IC and cross-decade sign-consistency. Pair with fundamental weather + climate + positioning + S/D balance for stacked confirmation.

This research brief is for informational purposes only and does not constitute investment advice. Past performance is not indicative of future results. Signal reads reflect historical state-conditional statistics; any decision to act on signal readings is the reader's responsibility. Data sources: C_higher_moments_63_v1 representation cache (63-day rolling skewness of CBOT Corn daily close returns); CBOT Corn back-adjusted continuous target. State-conditional statistics computed through 2026-10-30.