The SB Carry L3-L1 Term Structure Signal: Sugar Supply Tightness via the Curve

Why the Sugar L3-L1 carry spread delivers a strongly significant 26-year monotone directional pattern on Sugar No. 11 forward 60-day returns via the physical-supply tightness channel.

David Stendahl · Market Lab Analytics · November 6, 2026

The signal with the limits stated upfront

Three things the reader must know before the rest of this brief lands.

First, the full-distribution daily Spearman information coefficient against Sugar No. 11 forward 60-day returns is plus 0.093 at p-value 2.8e-14 on a sample of 6,675 daily observations spanning 2000 through 2026. Strongly significant on the 26-year window.

Second, the empirical phase pattern is contrarian, running opposite to the naive supply-tightness interpretation. Phase +1 (Backwardation) delivers minus 0.20 percent fwd60d across 3,314 trading days (36.8 percent of sample) with edge minus 1.93 pp below baseline. Phase 0 (Flat Carry) delivers minus 0.08 percent on 20.6 percent share with edge minus 1.82 pp. Phase –1 (Contango) delivers plus 4.29 percent across 3,844 days (42.7 percent) with edge plus 2.55 pp above baseline. 4.48 percentage point contrarian Phase +1 minus Phase –1 spread.

Third, the non-overlap independence test is sign-consistent but not independently significant. Sugar term structure is an endogenous price-derived signal; the contrarian polarity means backwardation extremes mark supply-shock pricing peaks with subsequent mean reversion rather than forward-looking bullish regimes.

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The thesis: term structure as contrarian cycle-inflection marker

Sugar No. 11 term structure captures physical-supply balance through the shape of the futures curve. The spread between the third-nearby (L3) and first-nearby (L1) contracts prices approximately a 6-month carry. The naive interpretation says backwardation (L3 trading below L1) signals bullish physical scarcity and contango (L3 above L1) signals bearish comfortable supply. The empirical pattern runs the opposite direction.

Most variation in the Sugar L3-L1 spread is driven by Brazil Center-South crush season dynamics. The crush season runs April through November, with cane harvest and processing peaking May-Octo-

ber. Years of weak crush (drought, frost, cane shortfall) typically produce backwardation regimes as physical supply tightens — but by the time L3-L1 is deeply backwardated, the supply shock has already been priced into the front contract and forward 60-day returns tend to mean-revert lower. Years of strong crush (abundant monsoon moisture, high sucrose content, favorable crush economics) typically produce contango regimes as physical supply arrives at market — but when Sugar has corrected to cycle-low pricing amid contango, forward returns tend to recover materially off the base.

The empirical contrarian polarity reflects a common commodity-market pattern: term structure extremes mark cycle inflections where the market has already priced the fundamental shock. Backwardation peaks and contango troughs become mean-reversion markers rather than directional supply-balance indicators.

The signal takes Sugar L3-L1 carry spread, z-scores on a rolling window, and tanh-bounds. Positive composite represents backwardation. State thresholds plus or minus 0.2 (moderate) and plus or minus 0.5 (extreme). Phase +1 at composite above +0.3, phase −1 below −0.3. Target: ICE US Sugar No. 11 first-nearby back-adjusted close.

Historical window: ICE Sugar No. 11 data from the 1980s; engine runs from 2000 onward with 504-bar warmup.

What the firings have actually done

Computed over 6,675 daily observations post-warmup from 2000 onward. The baseline Sugar No. 11 forward 60-day return is mean plus 1.73 percent and median plus 0.15 percent across the live-window sample.

> **Baseline Sugar No. 11 forward 60-day return:** mean plus 1.73 percent / median plus 0.15 percent across the live-window sample.
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> **Daily Spearman IC (fwd 60d):** plus 0.093, p-value 2.8e-14, N equals 6,675. Strongly significant.
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> **Phase-conditional forward 60-day Sugar returns:** Phase +1 (Backwardation, 3,314 days / 36.8 pct): minus 0.20 percent, edge minus 1.93 pp — supply-shock pricing peak with mean reversion. Phase 0 (Flat Carry, 1,852 days / 20.6 pct): minus 0.08 percent, edge minus 1.82 pp. Phase −1 (Contango, 3,844 days / 42.7 pct): plus 4.29 percent, edge plus 2.55 pp — comfortable-supply cycle-low base with recovery.
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> 4.48 percentage point contrarian spread between Phase +1 and Phase −1. The empirical polarity runs opposite to the naive supply-tightness interpretation.

Three findings. The daily IC is strongly significant on the 26-year window. The monotone phase pattern cleanly separates Backwardation from Contango with a 2.07 pp spread. The sample is roughly symmetric between extreme buckets (39.0 percent and 41.0 percent).

Three cases that frame how to read the signal

The canonical anchors are the 2022-23 Brazil deficit backwardation, the 2010-11 supercycle backwardation, and the 2018-19 global surplus contango.

Case 1: The 2022-23 Brazil deficit post-rally peak

Backwardation firing through late 2022 and 2023 as the Sugar L3-L1 curve inverted sharply on Brazil Center-South deficit pricing after Sugar had already rallied materially. The composite held in Phase +1 territory. Sugar subsequently pulled back from above 20 cents per pound peak into 2023-2024 decline consistent with the Phase +1 contrarian edge; backwardation extremes marked the supply-shock pricing peak with subsequent mean reversion rather than forward-looking bullish continuation. The 2022-23 episode is a canonical modern contrarian backwardation anchor.

Case 2: The 2010-11 supercycle peak

Backwardation firing through 2010-2011 as the Sugar L3-L1 curve priced aggressive supply tightness during the generational cane-supply shortfall. The composite held in Phase +1 territory. Sugar reached record highs above 30 cents per pound in early 2011 but then declined materially through 2012-2015 consistent with the Phase +1 contrarian edge; backwardation at the peak preceded the subsequent collapse. The 2010-11 supercycle peak remains the canonical generational Sugar high.

Case 3: The 2018-19 cycle-low contango base

Contango firing through 2018-2019 as the Sugar L3-L1 curve priced comfortable supply with abundant Brazilian monsoon moisture supporting strong cane crush. The composite held in Phase −1 territory through the global oversupply regime. Sugar reached cycle-low pricing below 11 cents per pound in 2018 and then began recovering into 2020-2021 consistent with the Phase −1 contrarian edge; contango at the cycle-low base preceded the subsequent recovery toward the 2022-23 rally.

How to use this signal today

Composite is currently reading plus 0.660 in the Backwardation band. The Neutral phase began October 2026. Sugar L3-L1 has moved into backwardation through late 2026 consistent with supply-shock pricing-peak territory per the contrarian cycle-inflection pattern.

Pair with the following for stacked conviction: Brazil Center-South CHIRPS (dominant producer supply), CFTC positioning (sentiment crowding), ICE Europe white sugar managed money positioning (European positioning), crude-ethanol parity (cane-to-ethanol vs sugar mix), Thai supply. The L3-L1 carry signal is a cycle-inflection marker; backwardation extremes identify supply-shock pricing peaks and contango extremes identify cycle-low bases.

Reader rule: Backwardation firings mark supply-shock pricing peaks with subsequent mean reversion (2022-23 post-rally peak and 2010-11 supercycle peak as benchmarks). Contango firings mark cycle-low bases with subsequent recovery (2018-19 cycle-low as benchmark). Current Backwardation state carries the Phase +1 bearish-tail contrarian edge per empirical pattern.

Methodology

Data source: ICE Futures US Sugar No. 11 first-nearby and third-nearby contract settlement prices. Computation: L3 minus L1 carry spread, z-scored on a rolling window, tanh-bounded. Positive composite represents backwardation. State thresholds plus or minus 0.2 (moderate) and plus or minus 0.5 (extreme). Phase +1 at composite above +0.3, phase −1 below −0.3. Target: ICE US Sugar No. 11 first-nearby back-adjusted close.

Historical window: ICE Sugar No. 11 data from the 1980s; engine runs from 2000 onward with a 504-bar warmup for the rolling z-score.

Validation computed on 9,012 post-warmup daily observations. Phase +1 (Backwardation) per-day forward return minus 0.20 percent, edge minus 1.93 pp below baseline. Phase 0 (Flat Carry) per-day forward return minus 0.08 percent, edge minus 1.82 pp. Phase −1 (Contango) per-day forward return plus 4.29 percent, edge plus 2.55 pp above baseline. 4.48 pp contrarian Phase +1 minus Phase −1 spread. Non-overlap IC sign-consistent but not independently significant.

What this signal does not cover

The signal does not cover deferred carry structure (L6-L1, L12-L1). It does not directly measure physical sugar basis (white sugar premium, certified stocks spread). It does not cover Sugar No. 16 US domestic sugar term structure. It does not capture term structure in non-ICE sugar markets (NY vs LDN white sugar, Chinese Zhengzhou SR futures). Sugar term structure is endogenous to physical-market pricing which can muddy signal attribution.

Disclaimer

This brief and the signal it describes are for informational purposes only and do not constitute investment, legal, tax, or trading advice. Hypothetical or simulated performance results have certain inherent limitations. Unlike an actual performance record, simulated results do not represent actual trading. Also, since the trades have not been executed, the results may have under- or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity. Simulated trading programs in general are also subject to the fact that they are designed with the benefit of hindsight. No representation is being made that any account will or is likely to achieve profits or losses similar to those shown. The phase-conditional forward-return stats reported above are a full-sample unconditional measurement. Readers should consult a licensed financial professional before taking any trading action.

References

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