The Soybean Real-Rate Overlay, Reading Twenty-Four Years of US 10Y TIPS Yields, Where the Real-Return Bar on Commodity Capital Taxes Inventory Carry Even When Fundamentals Are Bullish

Why the DFII10 composite delivers a clean monotonic plus 2.08 percentage-point edge on the low-real-rate tail and a minus 2.35 percentage-point edge on the high-real-rate tail, the fifth leg of the soy stack and the complement to the dollar overlay, reading the competing-return-on-capital channel rather than the EM-purchasing-power channel. How the three-leg composite composes and why 2022-23 is the archetype where a bullish fundamentals tape was overridden by a real-rate spike.

David Stendahl · Market Lab Analytics · November 4, 2026

What this signal is

The US 10-year TIPS real yield, the DFII10 series from FRED, is the bar on commodity ownership. Every dollar held in commodity inventory faces a real-rate drag equal to the TIPS yield. When DFII10 sits at 2 percent, inventory carry is paying 2 percent per year to the opportunity-cost of risk-free bonds. When DFII10 sits near 0, inventory holds its value and commodities compete on fundamentals alone. When DFII10 goes meaningfully negative, inventory gets a tailwind, cash in bonds loses value, cash in commodities does not.

The signal reads a three-leg composite of DFII10: fifty percent weight on the 252-day z-score of the level, thirty percent on the 252-day z-score of the 63-day change, and twenty percent on the 63-day z-score of the 21-day change. All legs clipped to plus-or-minus three standard deviations. Final composite computed as the negative of the weighted sum, which flips polarity so that RISING real yields (bearish commodity) produce a NEGATIVE composite reading and FALLING real yields (bullish commodity) produce a POSITIVE composite reading.

Current reading as of November 3, 2026: composite minus 0.337, Moderate NEG, 2 trading days in band since November 2, 2026. US 10Y TIPS real yields are elevated enough to trigger the bearish-commodity band, speculators face a real-rate drag on inventory carry. The 21st percentile reading indicates real yields are high relative to the five-year trailing average.

Daily Spearman IC against CBOT soybean forward sixty-day return is plus 0.008 at p-value 0.42 across 5,875 live-signal days from 2003-07-03 through 2026-11-03, NOT significant at the daily resolution. Non-overlapping sixty-three-day independent-sample IC is plus 0.085 at p-value 0.31 across 93 independent blocks, not individually significant. The signal is a state-conditional backdrop, not a tactical trigger.

State-conditional edges are clean and monotonic. Low real yields (composite above plus 0.3) covers 43.7 percent of the sample, delivering plus 3.98 percent per-day forward sixty-day, an edge of plus 2.08 percentage points above the plus 1.87 percent baseline. Neutral real-rate backdrop (composite between minus 0.3 and plus 0.3) covers 16.8 percent of the sample, delivering plus 1.86 percent (edge minus 0.04pp, essentially baseline). High real yields (composite below minus 0.3) covers 39.4 percent of the sample, delivering minus 0.45 percent (edge minus 2.35pp below baseline). The spread is 4.43 percentage points from one tail to the other, the widest clean-monotonic spread of any signal in the five-signal soy stack.

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How the real-rate composite composes

The signal reads one input series: the Federal Reserve Economic Data DFII10 series (10-Year Treasury Inflation-Indexed Security, Constant Maturity). This is the market-traded yield on the 10-year TIPS instrument, which equals the 10-year nominal yield minus the market's 10-year breakeven inflation expectation. Economically, DFII10 is what the market demands as a real return for holding duration risk.

The three-leg composite captures three horizons of the real-rate signal.

Leg one, fifty percent weight: the 252-day z-score of the raw DFII10 level, clipped to plus-or-minus three standard deviations. This leg captures where real yields sit relative to their rolling one-year baseline. Level dominates because level drives storage economics, an inventory holder cares about the absolute real return they are giving up by holding commodity rather than cash in bonds, not primarily about the direction of change.

Leg two, thirty percent weight: the 252-day z-score of the 63-day change in DFII10. The sixty-three-trading-day lookback captures the quarterly drift in real yields, which is the horizon on which Fed policy signals propagate through the yield curve. When this leg deviates meaningfully from zero, the market has repriced monetary policy expectations enough to create a tactical signal independent of the current level.

Leg three, twenty percent weight: the 63-day z-score of the 21-day change in DFII10. The monthly-change leg captures the fast-moving tactical repricing that follows FOMC meetings and major data prints. It has the smallest weight because fast-moving real-rate repricing often reverses within weeks; the structural bar on commodity capital is set by the level.

The combined composite is computed as `composite = -(0.50 * z_252 + 0.30 * z_63chg + 0.20 * z_21chg)`. The negation is the polarity flip, without it, rising real yields (bearish commodity) would produce a positive composite, which would invert the signal direction. The inline engine comment reads "Rising real yields bearish commodities", this is the correct economic framing, and the state-conditional edges confirm the sign is right.

The state machine places plus-or-minus 0.3 as the Low-real-rates / Neutral / High-real-rates band boundaries. State plus one fires when composite is above plus 0.3 (low real yields, bullish commodity carry). State zero fires when composite is between minus 0.3 and plus 0.3 (neutral real-rate backdrop). State minus one fires when composite is below minus 0.3 (high real yields, bearish commodity carry).

The design is structurally simple. One input series, three horizons, one weighted composite, one polarity flip. No multi-asset basket, no event dummies, no behavioral layer. The PM's framing is that this simplicity reflects the signal's role, the real-rate overlay is a structural backdrop, not a tactical event detector.

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What the state-conditional returns have actually done

> **Reference baseline, CBOT soybean fwd 60-day unconditional over live window**
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> CBOT soybean ratio-adjusted continuous forward-sixty-day return baseline over the live-signal window of 2003-07-03 through 2026-11-03: mean plus 1.87 percent, median plus 1.08 percent, standard deviation 10.93 percent, percent negative 45.0 percent. Sample 5,875 trading days with observable forward sixty-day.

Low real yields (composite above plus 0.3). 2,569 trading days, 43.7 percent of the sample. Per-day mean forward sixty-day plus 3.98 percent, edge plus 2.08 percentage points above baseline. The low-real-rate tail is the cleanest bullish signature in the macro channel. When TIPS 10Y falls, Fed emergency easing, flight-to-quality duration bid, deflationary shock, the real-rate drag on commodity carry disappears and speculator flow rotates back into inventory. The 2020 COVID zero-rate episode is the archetype: Fed emergency zero plus QE drove DFII10 to deeply negative territory, and the state-plus-one window overlapping that period delivered a plus 18.5 percent CBOT soybean rally in 103 sessions.

Neutral real-rate backdrop (composite between minus 0.3 and plus 0.3). 989 trading days, 16.8 percent of the sample. Per-day mean forward sixty-day plus 1.86 percent, edge minus 0.04 percentage points below baseline, essentially at baseline. The middle state is the smallest of the three, consistent with real-rate regimes spending most of their time pushed to one side or the other of the five-year trailing average. The signal spends only 17 percent of its live sample in the neutral band.

High real yields (composite below minus 0.3). 2,317 trading days, 39.4 percent of the sample. Per-day mean forward sixty-day minus 0.45 percent, edge minus 2.35 percentage points below baseline. The high-real-rate tail is the price-side readout of a restrictive monetary stance. When the real-rate bar on commodity capital exceeds the structural carry commodities offer, flow rotates out even when fundamentals are bullish. The 2022 post-Ukraine inflation-fighting Fed hiking cycle is the archetype: TIPS 10Y rose from deeply negative to firmly positive within months, and CBOT soybean corrected minus 10.6 percent during the state-minus-one run even though the underlying fundamentals were historically strong.

The directional spread is 4.43 percentage points from the high-real-rate tail to the low-real-rate tail, the widest clean-monotonic spread of any single signal in the five-signal soy stack. The signal delivers its edge through structural backdrop rather than tactical conviction, but the backdrop is strong and consistent.

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A PM's reading: the real-rate complement to the dollar overlay

To size a position against this signal, the first operational fact is that real yields are the competing-return bar on commodity capital. A PM reading this signal frames the mechanic this way: the dollar overlay asks is the US currency too strong for EM buyers; the real-rate overlay asks is the competing bond return too attractive versus commodity carry. Both can be true simultaneously, which is the current regime.

The empirical anchor is the 2020 COVID zero-rate episode. From June 2020 through September 2020 the composite stayed in state-plus-one as Fed emergency zero plus QE drove TIPS 10Y real yields to deeply negative territory. The combination removed the real-rate drag on commodity inventory and opened the door for a classic carry-plus-fundamentals rally. Over the 103-session window CBOT soybean ran from 681 cents per bushel to 807, a plus 18.5 percent move. The real-rate channel was telling you, every single trading day, that the macro environment was paying speculators to hold commodity rather than cash.

The reverse case, the 2022 post-Ukraine real-rate spike, delivered 122 consecutive trading days in state minus one as the Fed hiked aggressively to fight post-invasion inflation. TIPS 10Y rose from deeply negative to firmly positive within months. CBOT soybean fell from 1430 cents per bushel to 1278, a minus 10.6 percent move, against historically strong fundamentals. The real-rate channel was telling you, every single trading day, that the opportunity cost of holding commodity was too high for the fundamentals thesis to work.

The practical rule. Read the real-rate overlay as the structural backdrop in the five-signal stack. When the backdrop CONFIRMS the fundamentals signal (low real yields plus bullish fundamentals), the stacked read earns full book size. When the backdrop DISSENTS from the fundamentals signal (high real yields plus bullish fundamentals), the fundamentals thesis requires a path for the real-rate channel to normalize before it can work. Run the fundamentals trade smaller, or hedge the macro leg with a long-TIPS or short-nominal position.

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Three cases that frame how to read this signal

Case 1: Jun 2020, Sep 2020. The COVID zero-rate crush and the commodity carry re-opening.

The composite moved into the Moderate POS band in June 2020 as Fed emergency zero plus QE drove TIPS 10Y real yields to deeply negative territory. The combination removed the real-rate drag on commodity inventory and opened the door for a classic carry-plus-fundamentals rally. Over the 103-session window CBOT soybean ran from 681 cents per bushel to 807, a plus 18.5 percent move.

The 2020 case is the canonical low-real-rate rally. Importantly for the five-signal soy stack, the US ending-stocks fundamentals signal and the CFTC MM positioning signal were both confirming bullish through this window, and the 1m-12m term-structure signal was starting to move into backwardation. Four of the five signals stacked bullish with the dollar overlay being mixed. The real-rate overlay was the structural permission slip that let the fundamentals thesis work without a macro headwind.

Case 2: Mar 2022, Jul 2022. The post-Ukraine inflation-fighting real-rate spike.

The composite moved into the Moderate NEG band in March 2022 as the Fed began aggressive rate hikes to fight post-Ukraine inflation. TIPS 10Y real yields rose from deeply negative to firmly positive within months, and the real-rate drag on commodity carry became severe. Over the 122-session window CBOT soybean fell from 1430 cents per bushel to 1278, a minus 10.6 percent move.

The 2022 case illustrates the override power of the real-rate channel. Soybean fundamentals were historically strong, Ukraine supply disruption, tight stocks, El Nino SA weather concerns. The ending-stocks signal, the CFTC positioning signal, and the term-structure signal were all confirming bullish through much of this window. But the real-rate bar on commodity capital was high enough to force a correction anyway. The signal was right about the macro headwind even when the fundamentals thesis was right about the balance sheet.

Case 3: May 2013, Sep 2013. The taper-tantrum real-rate spike, the counter-example.

The composite moved into the Moderate NEG band in May 2013 as the Fed signaled taper of asset purchases. TIPS 10Y real yields spiked from near-zero to firmly positive over the 135-session window as the taper tantrum repriced the entire yield curve. Over that window CBOT soybean ran from 979 cents per bushel to 1147, a plus 17.2 percent move, strongly against the signal.

The 2013 case is the counter-example that illustrates the signal's blind spot. A dominant fundamental story, that summer the US soy crop had serious drought concerns through the pod-fill window, can override the real-rate bar. The real-rate drag on inventory carry is a backdrop, not a trigger; it loses when fundamentals are sufficiently compelling in the other direction. A PM reading this case takes the lesson that the real-rate overlay is a structural backdrop that reweights fundamentals, when fundamentals are extraordinarily bullish (drought, war, supply disruption), the real-rate channel can be overridden. When fundamentals are moderately bullish, the real-rate channel dominates.

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How to use the signal today

As of November 3, 2026, the composite reads minus 0.337 in the Moderate NEG band and the phase has been running 2 trading days since November 2, 2026. The state-conditional forward sixty-day expectation is minus 0.45 percent, a minus 2.35 percentage-point edge below the structurally-positive baseline, consistent with elevated real yields taxing commodity carry.

This creates a specific diagnostic in the five-signal soy stack. The ending-stocks fundamentals sibling reads bullish (Moderate POS, stocks tightening year-over-year). The DX plus 5Y macro-stress sibling reads bearish (Extreme NEG, risk-off macro). The CFTC MM positioning sibling reads neutral (Normal band, no extreme). The 1m-12m term-structure sibling reads bearish (Moderate NEG, deep contango). This signal reads bearish (Moderate NEG, elevated real yields).

Three macro-and-curve signals read bearish. One fundamentals signal reads bullish. One positioning signal reads neutral. The three-against-one macro-plus-curve bearish stack dominates the lone fundamentals bullish read. The PM's three readings of this divergence pattern: the fundamentals thesis is right in isolation but cannot work against the current macro-plus-curve headwind; the ending-stocks

tightening is being adequately covered by existing forward books and SA supply visibility; the real-rate bar must come down before the fundamentals channel can transmit to price.

Two triggers would re-engage the signal bullishly. First, a composite cross above plus 0.3 (low real yields return). That would require TIPS 10Y to fall meaningfully relative to its five-year trailing average, which historically requires a Fed pivot toward easier policy or a deflationary shock. Watch the 63-day change leg for pivot signals, it carries thirty percent of the composite weight and is the fastest-moving indicator of Fed policy shift. Second, the composite drifts back toward Normal. That is a less aggressive signal but it would remove the current real-rate dissent and clear the path for the fundamentals thesis to work without macro resistance.

Pair with the US ending-stocks fundamentals sibling for the balance-sheet read, the DX plus 5Y Note macro-stress sibling for the EM-purchasing-power overlay, the CFTC MM positioning sibling for the positioning-flow confirmation, and the 1m-12m term-structure sibling for the physical-market voice.

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Methodology notes

Data sources. (A) Federal Reserve Economic Data (FRED) DFII10 series, 10-Year Treasury Inflation-Indexed Security, Constant Maturity, loaded from the `DFII10` table in the symbol_data estate. Refreshed daily. (B) CBOT soybean ratio-adjusted continuous (`S__1170RD` from CSI) as the forward-return benchmark.

Signal construction. Three-leg composite. Fifty percent weight on the 252-day z-score of the DFII10 level with 63-day minimum (clipped to plus-or-minus three standard deviations). Thirty percent weight on the 252-day z-score of the 63-day difference. Twenty percent weight on the 63-day z-score of the 21-day difference. Final composite computed as negative of the weighted sum, which flips polarity so rising real yields (bearish commodity) produce a negative composite reading. State machine uses plus-or-minus 0.3 as the Low-real-rates / Neutral / High-real-rates band boundaries.

Validation statistics. Daily Spearman IC against CBOT soybean forward sixty-day return is plus 0.0084 at p-value 0.42 across 5,875 live-signal days from 2003-07-03 through 2026-11-03, NOT significant at the daily resolution. Non-overlapping sixty-three-day independent-sample IC is plus 0.0852 at p-value 0.31 across 93 independent blocks, not individually significant. State-conditional per-day means: Low real yields plus 3.98 percent (edge plus 2.08 percentage points), Neutral real-rate backdrop plus 1.86 percent (edge minus 0.04 percentage points), High real yields minus 0.45 percent (edge minus 2.35 percentage points).

Polarity history. The engine applies a single explicit negation in the composite construction. The inline code comment reads “Rising real yields bearish commodities”, this is the correct economic framing. The negation is a POLARITY FLIP that aligns the composite direction with the forward-return direction, not a mean-reversion operation. State-conditional edges prove the sign is correct.

Benchmark construction. CBOT soybean 60-day forward return computed as `close.pct_change()` from the `S__1170RD` ratio-adjusted continuous CSI file, rolled over 63 trading days and shifted forward.

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What this signal does not cover

Blind spots a PM cares about before sizing

First, the DFII10 series begins January 2003. Pre-2003 history uses placeholder zeros, so the signal's effective track record is 24 years, not the full 36-year CBOT soybean history. The signal cannot speak to the pre-2003 real-rate regimes, most notably the Volcker disinflation of the 1980s or the 1990s dot-com-era-rate structure. A PM evaluating the signal's robustness should budget for the possibility that the 2003-2026 sample is unrepresentative of the full historical real-rate distribution.

Second, the daily IC of plus 0.008 is not significant at p=0.42. The signal is a state-conditional backdrop, not a tactical trigger. A PM using this signal should not be entering positions on daily composite moves; they should be using the state as a filter on fundamentals-driven entries. The signal rewards being right about the macro regime over multi-week windows, not about the daily tape.

Third, the 2013 taper-tantrum counter-example, state minus one for 135 days with CBOT soybean up 17.2 percent against the signal, shows that a dominant fundamental story can override the real-rate bar. Drought, war, supply disruption, or regulatory shock can push a commodity through a bearish macro backdrop. A PM reading this signal should always check whether the fundamentals signal is reading EXTREME rather than merely moderate, an extreme fundamentals reading can defeat the macro overlay.

Fourth, the 63-day change leg can lag turning points. Fed pivots are often discontinuous rather than smoothly z-score-able. The three-month change in DFII10 can take weeks to register a tactical Fed pivot that the market has already priced. A PM watching for a pivot trigger should overlay FOMC meeting dates, Powell press conferences, and the 5-year-5-year forward breakeven, the 63-day change leg will register the pivot a month after it happens.

This research brief is for informational purposes only and does not constitute investment advice. Past performance is not indicative of future results. State-conditional statistics are computed through 2026-11-03 against CBOT soybean ratio-adjusted continuous. The post-2003 effective sample and Fed-pivot discontinuity considerations are explicitly disclosed. Data sources: FRED DFII10 10-Year TIPS Constant Maturity, CSI `S__1170RD` ratio-adjusted continuous target. Internal Phase 0 audit dated 2026-11-04.