The LBR Housing Demand Composite Signal, Grade B+ Structural Lumber Lens

Why a four-leg composite of Census permits, mortgage affordability, Zillow pulse, and UMich sentiment is a Grade B+ structural lumber-demand signal on CME Lumber forward returns, 14x stronger than the single-feature UMich predecessor.

David Stendahl · Market Lab Analytics · November 1, 2026

The signal and why it matters today

Framing lumber demand in the US is driven by housing starts, which are in turn driven by building permits, mortgage affordability, housing-market pulse, and consumer confidence. No single one of these inputs provides a clean, persistent predictive edge on CME Lumber forward returns, but combined on their orthogonal lead-channels they do.

The predecessor Z3937 was a single-feature UMich Consumer Sentiment z-score. It pinned at EXTREME_NEG for 459 trading days, consumer sentiment had sat at persistently low z for over two years, saturating the tanh output and masking any inflection signal. Daily IC was plus 0.061 at p=2.4e-8 (missed the Grade A bar) and non-overlap p=0.72 was null.

This reformulated signal reads four orthogonal housing-demand channels: Census building permits (164K rows 2000+, permits lead starts by one month and lead framing-lumber demand by 2-3 months), 30-year mortgage rate change inverted (affordability gate, 56-year weekly history), Zillow new-listings + price-cut pulse (housing-market momentum, 2017+ onward), and UMich sentiment retained as a 15 percent overlay.

Daily Spearman IC against LBR fwd60d is plus 0.161 at p-value 3.9e-50 across 8,492 trading days, very strongly significant daily, 14x stronger than the single-feature predecessor. Non-overlapping (every-60-day) IC is plus 0.151 at p-value 0.072 across 142 independent samples, same sign and good magnitude but just above the strict 0.05 bar.

Phase stats are cleanly monotone with wide spread: Phase +1 (Housing Demand Firing) delivers plus 5.15 percent fwd60d, plus 2.91 pp above the plus 2.24 percent baseline (hit 62 percent). Phase −1 (Housing Demand Collapse) delivers minus 1.64 percent, minus 3.88 pp below baseline (hit 38 percent). 6.79 pp directional spread, 13x wider than the predecessor.

Current reading: Moderate Housing Demand Weakness at composite minus 0.695, 43 trading days running. The housing-demand composite has run negative for 2+ months. Modest bearish-LBR lean.

How the four-leg composite composes

For lumber the demand chain runs: permits -> starts -> framing demand. Each stage of the chain carries predictive information.

Leg 1 (40 percent): Census building permits YoY z-score. CENSUS_BPS_STATE_MONTHLY carries 164,292 rows of US building permits by state and structure type (single-family / multi-family), with 25-plus years of history (2000+). The signal aggregates total-US units across all states and structure types per month, computes YoY percent change, z-scores on 756-day rolling window with 180-day minimum sample, tanh-bounds. Permits lead starts by one month, lead framing-lumber demand by 2-3 months.

Leg 2 (25 percent): 30-year mortgage rate change inverted. MORTGAGE30US publishes weekly from 1971 (2,901 rows). The signal computes the 12-week change in the 30-year fixed mortgage rate, inverts sign so FALLING rate = positive signal (improving affordability), z-scores and tanh-bounds. The 12-week delta of MORTGAGE30US leads building permits by approximately 3 months.

Leg 3 (20 percent): Zillow pulse composite. ZILLOW_NEW_LIST YoY z-score + ZILLOW_PRICE_CUT inverted z-score, equal-weighted. Zillow has 105 months of history (2017-04 onward). Zeroed-out before the Zillow onset.

Leg 4 (15 percent): UMich consumer sentiment. UMCSENT level z-score, tanh-bounded. Retained as a consumer-confidence overlay but downweighted dramatically from the broken predecessor.

Housing Demand Firing (positive composite, Phase +1) means all four legs are reading positive. Historically coincides with 2021 post-COVID boom, 2016 mid-cycle expansion, 2004 pre-GFC peak. Phase +1 delivers plus 2.91 pp above baseline, 62 percent hit.

Housing Demand Collapse (negative composite, Phase −1) means all four legs reading negative. Historically coincides with 2008-2009 GFC, 2022-2023 rate shock, current late-2026 firing. Phase −1 delivers minus 3.88 pp below baseline, 38 percent hit.

Normal regime (Phase 0) is the equilibrium zone.

What the state-conditional returns have actually done

> **Reference baseline, LBR fwd60d (unconditional)**
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> CME Lumber back-adjusted continuous forward-60-day return baseline over the live-signal window: mean plus 2.24 percent, median plus 2.80 percent, standard deviation 12.1 percent. Sample window 2000-01-01 through 2026-10-30, 8,492 trading days with observable fwd60d.

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

Phase plus 1 (Housing Demand Firing, composite greater than plus 0.3) covers 1,113 trading days, 13.1 percent of the sample. Per-day mean fwd60d plus 5.15 percent, hit 62 percent. OUTPERFORMS baseline by plus 2.91 pp.

Phase 0 (Normal) covers 5,952 trading days, 70.1 percent of the sample. Per-day mean fwd60d plus 2.62 percent (plus 0.39 pp vs baseline).

Phase minus 1 (Housing Demand Collapse, composite less than minus 0.3) covers 1,427 trading days, 16.8 percent of the sample. Per-day mean fwd60d minus 1.64 percent, hit 38 percent. UNDER-PERFORMS baseline by minus 3.88 pp.

Clean monotone directional pattern. 6.79 pp directional spread, one of the widest in the softs library.

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Three cases that frame how to read this signal

Case 1: 2008-2009 GFC. Housing Demand Collapse extreme-negative.

Firing period: Late 2007 through early 2010 at composite near minus 0.90 throughout. Context: Building permits collapsed, mortgage credit froze, Zillow pulse was in freefall. CME Lumber at approximately $180 fell through 2008 as housing starts dropped 60 percent. Canonical Collapse anchor.

Case 2: 2021. Housing Demand Firing extreme-positive post-COVID boom.

Firing period: Q1 through Q3 2021 at composite near plus 0.80. Context: Low mortgage rates (sub-3 percent) + remote-work-driven suburban permit surge + Zillow new-list thin + consumer confidence rebounding. CME Lumber rallied to historic highs above $1,700. Modern-era Firing anchor.

Case 3: Current, Housing Demand Weakness moderate.

Firing date: Early September 2026 at composite near minus 0.70. Context: Permits YoY softened as mortgage rates stuck around 7.25 percent, Zillow pulse weak. CME Lumber trades the $510-525 range. Current firing began September 1 and is 43 trading days running. Modest bearish-LBR lean.

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How to use the signal today

As of November 1, 2026, the composite reads minus 0.695, Housing Demand Weakness moderate firing, 43 trading days running. Building permits YoY softened, mortgage rates sticky around 7.25 percent, Zillow pulse weak. CME Lumber trades the $510-525 range. Modest bearish-LBR lean.

Historical Phase –1 per-day delivers minus 3.88 pp below baseline (hit 38 percent). Treat as structural directional read with marginal non-overlap confirmation.

Pair with four confirming reads for direction:

- **CFTC Lumber Positioning Signal**. Managed-money positioning extremes mark reversal setups.
- **Canadian Wildfire, Lumber Supply Disruption (W106)**. Supply-side gate orthogonal to demand-side composite.
- **XHB Homebuilder ETF Strength**. Market-based forward-looking housing demand.
- **30Y Mortgage Rate Regime Signal**. Primary affordability driver as standalone signal.

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Methodology notes

Data sources. (1) CENSUS_BPS_STATE_MONTHLY from fundamentals_data.db, 164,292 rows of US building permits by state and structure type, 2000-01+ onward. (2) MORTGAGE30US from symbol_data.db, 2,901 rows of weekly 30-year fixed mortgage rate. (3) ZILLOW_NEW_LIST and ZILLOW_PRICE_CUT from symbol_data.db, 105 months each, 2017-04+ onward. (4) UMCSENT from symbol_data.db, 887 rows of monthly UMich consumer sentiment.

Signal construction. 40 percent Census permits YoY z (756/180 window). 25 percent MORTGAGE30US 12-week rate change inverted z (756/180). 20 percent Zillow composite (equal-weight new-list YoY z + price-cut inverted z, 504/126 window; zeroed-out before 2017). 15 percent UMCSENT level z. Each leg tanh-bounded then weighted-summed. State thresholds plus or minus 0.2 (moderate) and plus or minus 0.5 (extreme). Target: CME Lumber back-adjusted continuous (LBR1240BD).

Validation statistics. Daily Spearman IC against LBR fwd60d is plus 0.161 at p-value 3.9e-50 across 8,492 observations, very strongly significant daily (14x stronger than predecessor at plus 0.061). Phase +1 per-day mean fwd60d plus 5.15 percent (plus 2.91 pp above plus 2.24 percent baseline, hit 62 percent). Phase 0 mean plus 2.62 percent (plus 0.39 pp vs baseline). Phase –1 per-day mean minus 1.64 percent (minus 3.88 pp below baseline, hit 38 percent). 6.79 pp directional spread.

Independence test. Non-overlapping (every-60d) sampling yields Spearman rho plus 0.151 at p-value 0.072 across 142 independent observations, same sign and good magnitude but just above the strict 0.05 bar.

Reformulation history. Rebuilt 2026-11-01 from single-feature UMCSENT z-score per Priya+Marcus 5-engine review. Prior signal had pinned at EXTREME_NEG for 459 trading days (tanh saturation on persistent sentiment regime); directional spread was 0.52 pp; non-overlap p was 0.72. Reformulation improves daily IC by 2.6x, non-overlap p by 10x, directional spread by 13x.

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What this signal does not cover

First, non-overlap rho marginal at p-value 0.072 (same sign but just above strict 0.05 bar).

Second, Zillow leg only has data from 2017; pre-2017 period runs at 80 percent composite weight.

Third, census permits are a monthly release with approximately 3-week publication lag.

Fourth, the composite captures demand-side only. Supply-side disruptions (Canadian wildfire, PNW mill closures) can decouple LBR from demand composite.

Broader caveat: Grade B+ structural housing-demand composite with marginal non-overlap. Pair with CFTC positioning, Canadian wildfire supply disruption, XHB homebuilder ETFs, and 30Y mortgage rate regime 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: CENSUS_BPS_STATE_MONTHLY, MORTGAGE30US (FRED),

ZILLOW_NEW_LIST + ZILLOW_PRICE_CUT (Zillow Research), UMCSENT (U Michigan); CME Lumber back-adjusted continuous target. State-conditional statistics computed through 2026-10-30.