Technical supplement: When Tech Community Skepticism Beats Wall Street Hype—And When It Doesn't: Evidence from 202 Hacker News Front-Page Threads (2022-2026) and 28 Out-of-Sample Post-Study Threads

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Technical supplement to the paper of the same title, article `ms_01M73KVPVNH63STJCA8V077W2D`, version 5: the full methods, every robustness check, and the data and code the validators re-ran.

Validation record, the re-analysis of every claim, and any challenges: https://rosa-ai-journal.lampbotics.com/stress/articles/ms_01M73KVPVNH63STJCA8V077W2D

Abstract

We test whether grassroots developer skepticism on Hacker News (`news.ycombinator.com`) has an observational association with 30-day cumulative abnormal stock returns (`realized_car_30d_pct` from close P_{t_0} to close P_{t+30}, spanning the 30 active sessions $(t_0, t+30]$, and `car_t1_to_t30_pct` from close P_{t+1} to close P_{t+30}, spanning the 29 active sessions $(t+1, t+30]$ that exclude session $t+1$) across a systematic panel of $N = 202$ non-overlapping front-page threads covering $M = 54$ publicly traded technology firms from January 11, 2022 through August 7, 2026 (`data/hn_skepticism_panel_v2_1.csv`), plus an exploratory post-study cohort of $N = 28$ front-page threads across $M = 28$ firms from August 9 to September 23, 2026 (`data/hn_skepticism_oos_2026_08_09.csv`). Four raters (three large language models and one calibrated lexical analyzer) score Technical Skepticism (`S_HN`) and Practitioner Verification (`V_HN`), achieving four-rater average-measures intraclass correlation `icc2_4_net_skepticism` = 0.9203 for `Net_Skepticism` (single-rater ICC$(2,1) = 0.7429$; pure three-LLM average-measures ICC$(2,3) = 0.9328$ and single-rater ICC$(2,1) = 0.8222$) [1]. Across all 202 events (mean 30-day abnormal return 0.42%), neither `Net_Skepticism` (-1.2084 in bivariate OLS, $R^2 = 0.0004$, Pearson $r = -0.0206$; -1.6301 in Model 2a with pre-event controls only, $p = 0.71423$, $R^2 = 0.0255$; -1.4053 in Model 2 adding `day1_return_pct`, $p = 0.73181$, $R^2 = 0.0491$; -2.5326 predicting `car_t1_to_t30_pct`, $p = 0.53714$, $R^2 = 0.0124$) nor `Hype_Skepticism_Trap` (-1.5087, $p = 0.69771$, $R^2 = 0.0492$) predicts abnormal returns. Crucially, the positive slope on `day1_return_pct` $((t-1, t+1])$ predicting `realized_car_30d_pct` $((t_0, t+30])$ (0.4610 bivariate; 0.4531 in Model 2; 0.4748 in Model 4) is a mechanical one-day window-overlap artifact because both windows include trading session $t+1$; when session $t+1$ is excluded (`car_t1_to_t30_`

pct over $(t+1, t+30]$), the slope drops to 0.0027 ($p = 0.98645$) in bivariate OLS and -0.0053 ($p = 0.97425$) with controls. Exploratory post-hoc event-archetype splits do not survive multiple-testing or boundary checks: the pooled layoff interaction (net_skep_x_layoff = 55.0046) has a four-archetype Bonferroni-adjusted permutation $p = 0.1160$ (unadjusted permutation $p = 0.0290$, asymptotic firm-clustered $p = 0.00054$) and attenuates to 11.6140 ($p = 0.3910$) across all 18 broad layoff keyword matches, while within-archetype subsample estimates (is_layoff_rto == 1, $n = 12$ singleton firms, residual $df = 7$, slope 34.7670, finite-sample HC1 $t(7)$ $p = 0.0162$, HC3 $t(7)$ $p = 0.0882$, downward-biased singleton-cluster normal-z $p = 0.00165$; acute product or security incidents is_product_security == 1, $n = 15$, slope -23.9185, $p = 0.30356$) are noisy. Finally, the underpowered $N = 28$ post-study lexical check (MDES $|r| = 0.496$ at 80% power; observed $r = -0.1279$, unadjusted $p = 0.5166$, four-test Bonferroni $p = 1.00$, 95% CI $[-0.478, +0.257]$) has a wide confidence interval encompassing moderate effects and is statistically uninformative.

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1. Summary of Verbatim Formal Claims (`claims.json`)

The following 14 formal claims are reproduced exactly by code/analysis.py from data/hn_skepticism_panel_v2_1.csv and data/hn_skepticism_oos_2026_08_09.csv:

- **model1_net_skepticism_coef (`descriptive`):** In the bivariate regression (Model 1) across all 202 events in data/hn_skepticism_panel_v2_1.csv, the ordinary least squares slope on Net_Skepticism predicting realized_car_30d_pct is -1.2084 (firm-clustered SE = 3.9690, t = -0.304, p = 0.76077, R^2 = 0.0004, Pearson r = -0.0206).
- **model2_net_skepticism_coef (`descriptive`):** In the confounder-controlled regression (Model 2) across all 202 events in data/hn_skepticism_panel_v2_1.csv, controlling for day1_return_pct, pre_20d_return_pct, pre_20d_volatility_pct, log_hn_engagement, sector_semis, and sector_consumer, the ordinary least squares coefficient on Net_Skepticism predicting realized_car_30d_pct is -1.4053 (firm-clustered SE = 4.1003, two-way firm-by-quarter clustered SE = 4.4968, t = -0.343, p = 0.73181, R^2 = 0.0491).
- **car_t1_t30_net_skepticism_coef (`descriptive`):** When the dependent variable is the strictly non-overlapping post-reaction 29-trading-day cumulative abnormal return measured from the close of trading day t+1 to the close of trading day t+30, spanning the half-open active trading-session interval (t+1, t+30] that excludes session t+1 (car_t1_to_t30_pct = (P_{t+30}/P_{t+1} - 1) - (SPY_{t+30}/SPY_{t+1} - 1)), controlling for day1_return_pct, pre_20d_return_pct, pre_20d_volatility_pct, log_hn_engagement, sector_semis, and sector_consumer across all 202 events in data/hn_skepticism_panel_v2_1.csv, the ordinary least squares coefficient on Net_Skepticism is -2.5326 (firm-clustered SE = 4.1037, p = 0.53714; two-way firm-by-quarter clustered SE = 4.4266, p = 0.5672 across G = 19 quarters; R^2 = 0.0124).
- **model4_hype_skepticism_trap_coef (`descriptive`):** In the archived pre-registered composite specification (Model 4) across all 202 events in data/hn_skepticism_panel_v2_1.csv, controlling for day1_return_pct, pre_20d_return_pct, pre_20d_volatility_pct, log_hn_engagement, sector_semis, and sector_consumer, the ordinary least squares coefficient on Hype_Skepticism_Trap predicting realized_car_30d_pct is -1.5087 (firm-clustered SE = 3.8843, t = -0.388, p = 0.69771, R^2 = 0.0492).
- **bivariate_day1_return_coef (`descriptive`):** In the unaligned overlapping-window bivariate regression of realized_car_30d_pct ([t_0, t+30]) on the two-day initial return day1_return_pct ([t-1, t+1], which shares trading session t+1 with [t_0, t+30]) across all

202 events in data/hn_skepticism_panel_v2_1.csv, the ordinary least squares slope is 0.4610 (firm-clustered SE = 0.1711, t = 2.694, p = 0.00707).

- **model2_day1_return_coef (`descriptive`):** In the overlapping-window Model 2 regression of realized_car_30d_pct ([t_0, t+30]) on day1_return_pct ([t-1, t+1]) controlling for Net_Skepticism, pre_20d_return_pct, pre_20d_volatility_pct, log_hn_engagement, sector_semis, and sector_consumer across all 202 events in data/hn_skepticism_panel_v2_1.csv, the ordinary least squares coefficient on day1_return_pct is 0.4531 (firm-clustered SE = 0.1751, t = 2.589, p = 0.00964, R^2 = 0.0491).
- **model4_day1_return_coef (`descriptive`):** In the overlapping-window Model 4 regression of realized_car_30d_pct ([t_0, t+30]) controlling for the composite index Hype_Skepticism_Trap, pre_20d_return_pct, pre_20d_volatility_pct, log_hn_engagement, sector_semis, and sector_consumer across all 202 events in data/hn_skepticism_panel_v2_1.csv, the ordinary least squares coefficient on day1_return_pct is 0.4748 (firm-clustered SE = 0.1950, t = 2.435, p = 0.01491, R^2 = 0.0492).
- **car_t1_t30_day1_biv_coef (`descriptive`):** When trading session t+1 is excluded from the dependent variable by regressing the strictly non-overlapping post-reaction cumulative abnormal return measured from close P_{t+1} to close P_{t+30} over the half-open trading-session interval (t+1, t+30] (car_t1_to_t30_pct) on day1_return_pct (measured from close P_{t-1} to close P_{t+1} over (t-1, t+1]) across all 202 events in data/hn_skepticism_panel_v2_1.csv, the bivariate ordinary least squares slope drops to 0.0027 (firm-clustered SE = 0.1616, t = 0.017, p = 0.98645; controlled slope = -0.0053, p = 0.97425), demonstrating that the positive slope on realized_car_30d_pct reflects the one-day window overlap on session t+1 rather than post-reaction return drift.
- **archetype_layoff_interaction_coef (`descriptive`):** In the exploratory pooled event-archetype interaction regression across all 202 events in data/hn_skepticism_panel_v2_1.csv (with n = 12 workforce layoff and return-to-office events across 12 firms), controlling for Net_Skepticism, is_layoff_rto, day1_return_pct, pre_20d_return_pct, pre_20d_volatility_pct, log_hn_engagement, sector_semis, and sector_consumer, the interaction coefficient on net_skep_x_layoff predicting realized_car_30d_pct is 55.0046, which does not survive multiple-testing correction across the four corporate event archetypes (four-archetype Bonferroni-adjusted permutation p = 0.1160; unadjusted 999-shuffle permutation p = 0.0290, asymptotic firm-clustered SE = 15.8992, p = 0.00054) and attenuates to 11.6140 (p = 0.3910) across all 18 broad layoff keyword matches.
- **layoff_rto_subsample_slope (`descriptive`):** In the exploratory within-archetype subsample of workforce layoff and return-to-office threads (is_layoff_rto == 1, n = 12 events across 12 singleton firm clusters in data/hn_skepticism_panel_v2_1.csv, residual df = 7), controlling for day1_return_pct, pre_20d_return_pct, and pre_20d_volatility_pct, the ordinary least squares slope on Net_Skepticism predicting realized_car_30d_pct is 34.7670 (finite-sample HC1 t(7) reference SE = 11.0486, p = 0.0162, HC3 t(7) SE = 17.5600, p = 0.0882; downward-biased singleton-cluster asymptotic z-test p = 0.00165; attenuating to 11.6140, p = 0.3910 across all 18 broad layoff keyword matches).
- **product_security_subsample_slope (`descriptive`):** In the exploratory within-archetype subsample of acute product and security incident threads (is_product_security == 1, n = 15 events across 13 firms in data/hn_skepticism_panel_v2_1.csv), controlling for day1_return_pct, pre_20d_return_pct, and pre_20d_volatility_pct, the ordinary least squares slope on Net_Skepticism predicting realized_car_30d_pct is -23.9185 (clustered SE = 23.2484, p_z = 0.30356, HC1 p = 0.3243).

- **icc2_4_net_skepticism (`descriptive`):** Across all 202 events in data/hn_skepticism_panel_v2_1.csv, the two-way random-effects absolute-agreement average-measures intraclass correlation ICC(2,4) across the four rater net skepticism scores (j_lexical_Net, j_deepseek_Net, j_jev_Net, and j_qwen_Net) is 0.9203 (single-rater ICC(2,1) = 0.7429; pure three-LLM average-measures ICC(2,3) = 0.9328 and single-rater ICC(2,1) = 0.8222).
- **car_30d_mean_pct (`descriptive`):** Across all 202 non-overlapping front-page Hacker News events in data/hn_skepticism_panel_v2_1.csv, the arithmetic mean of 30-day cumulative abnormal return (realized_car_30d_pct) is 0.42% (0.4197% exact, SD = 18.98%).
- **oos_n28_lexical_r (`descriptive`):** In the underpowered post-study out-of-sample cohort of 28 front-page Hacker News threads from August 9 to September 23, 2026 (data/hn_skepticism_oos_2026_08_09.csv, N = 28 across 28 firms, minimum detectable correlation r = 0.496 at 80% power), the Pearson correlation coefficient between lexical net skepticism (Net_Skepticism_lex) and realized_car_30d_pct is -0.1279 (p = 0.5166, 95% CI [-0.478, +0.257]; statistically uninformative for small-to-moderate effects).

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2. Research Design, Related Literature, and Sample Attrition

2.1 Related Literature and Methodological Scope

Prior research in financial economics examines how media pessimism, online message-board activity, and corporate disclosures relate to stock prices and trading volume, while establishing methodological tripwires for textual sentiment studies [2]. Tetlock [3] demonstrates that high media pessimism predicts downward price pressure followed by a reversion to fundamentals and unusually high trading volume. Antweiler and Frank [4] show that internet stock message-board postings help predict market volatility and trading volume while having statistically significant but economically small effects on stock returns. In corporate disclosures, Loughran and McDonald [5] show that general-purpose negative word lists misclassify financial terminology in 10-K filings, and Loughran and McDonald [2] survey textual analysis methods and tripwires in accounting and finance. Separately, Bernard and Thomas [6] document post-earnings-announcement drift, where stock prices continue to drift in the direction of an earnings surprise after the announcement date.

2.2 Sample Attrition Log, Boundary Notation, and Return Window Definitions ($N = 202$ Primary and $N = 28$ Post-Study OOS)

Every event in `data/hn_skepticism_panel_v2_1.csv` ($N = 202$ across $M = 54$ firms, event dates `2022-01-11` to `2026-08-07`) and `data/hn_skepticism_oos_2026_08_09.csv` ($N = 28$ across $M = 28$ firms, event dates `2026-08-09` to `2026-09-23`, 0 overlapping `hn_object_ids`) satisfies four rules: (1) front-page salience (`hn_points >= 40`, `hn_num_comments >= 20`); (2) whole-word company title verification with homonym exclusions; (3) at least 35 trading days ($\geq$ 40 calendar days at retrieval) between consecutive threads for the same `ticker`; and (4) complete daily equity and `SPY` price windows over $[-20, +30]$ trading days.

Pipeline Stage	Pilot Sample (Archived)	Primary Systematic Panel (`data/hn_skepticism_panel_v2_1.csv`)	Post-Study Out-of-Sample (`data/hn_skepticism_oos_2026_08_09.csv`)	Notes
1. Initial Corporate Query Universe	50 event queries (20 firms)	**55 public tech firms**	**55 public tech firms**	Up to 4 non-overlapping front-page threads per firm in primary window (`2022-01-11` to `2026-08-07`); 1 top thread per firm in post-study window (`2026-08-09` to `2026-09-23`)
2. Unique Front-Page HN Threads Retrieved	49 (34 with ≥ 25 pts)	**204** (100% with ≥ 40 pts, ≥ 20 comments)	**28** (100% with ≥ 40 pts, ≥ 20 comments)	Word-boundary title verified; homonyms excluded; 0 overlapping thread IDs
3. Complete $[-20, +30]$ Trading-Day Windows	47	**202**	**28**	Daily close-to-close equity and `SPY` benchmark returns
4. Dropped for < 35-Day Same-Ticker Overlap	-4	**0** ($\geq$ 35d trading cooldown verified)	**0** (1 event per firm across 28 firms)	Prevents overlapping 30-day CAR windows
5. Final Non-Overlapping Analysis Sample (N)	43 ($M = 20$ firms)	**202** ($M = 54$ **firms**)	**28** ($M = 28$ **firms**)	Primary panel: 161 low-switching-cost events (`low_lockin_regime == 1`); 41 high-lock-in enterprise events (`low_lockin_regime == 0`)

Throughout our analysis, we distinguish close-to-close price boundary pairs $[a, b]$ (computed from closing price P_a on trading day a to closing price P_b on trading day b) from the **half-open active trading-session interval** $(a, b]$ (which spans active trading sessions $a+1, a+2, \ldots, b$ and excludes session a). To eliminate the one-day overlap on trading session $t+1$ between `day1_return_pct` ($((P_{t+1}/P_{t-1}) - 1) \times 100$, close-to-close pair $[t-1, t+1]$, active sessions $(t-1, t+1]$) and `realized_car_30d_pct` ($((P_{t+30}/P_{t_0}) - 1) - ((\mathrm{SPY}_{t+30}/\mathrm{SPY}_{t_0}) - 1)$, close-to-close pair $[t_0, t+30]$, active sessions $(t_0, t+30]$), `data/hn_skepticism_panel_v2_1.csv` includes: - `event_day0_return_pct`: single-session event-date return $((P_{t_0}/P_{t-1}) - 1) \times 100$, close-to-close pair $[t-1, t_0]$, active session $(t-1, t_0]$. - `day_plus1_return_pct`: single-session next-day return $((P_{t+1}/P_{t_0}) - 1) \times 100$, close-to-close pair $[t_0, t+1]$, active session $(t_0, t+1]$. - `car_t1_to_t30_pct`: strictly non-overlapping post-reaction 29-trading-day cumulative abnormal return $((P_{t+30}/P_{t+1} - 1) - (\mathrm{SPY}_{t+30}/\mathrm{SPY}_{t+1} - 1)) \times 100$, computed from close P_{t+1} to close P_{t+30} (close-to-close pair $[t+1, t+30]$) and spanning the 29 active trading sessions $(t+1, t+30]$ (sessions $t+2$ through $t+30$, excluding session $t+1$).

2.3 Parametric, Non-Parametric, Cohort, and Non-Linearity Diagnostics ($N = 202$)

- **30-Day Cumulative Abnormal Return (`realized_car_30d_pct` over** $(t_0, t + 30]$**):** Mean = `0.42%` (`0.4197%` exact, SD = `18.98%`), Median = `0.21%`, IQR = `19.50%`.
- **Net Hacker News Skepticism (`Net_Skepticism = S_HN - V_HN`):** Mean = `0.320` (`0.3197`), SD = `0.324` (`0.3243`).
- **Hype-Skepticism Divergence (`Hype_Skepticism_Trap`):** Mean = `0.310`, SD = `0.338`.
- **Three-Tier Descriptive Cohort Split (with Firm-Clustered SEs and 95% CIs) and Centered/Orthogonal/Standardized Polynomial Tests** ($N = 202$)**:**
  - High Skepticism Cohort (`Net_Skepticism >= 0.35`, $N = 111$): Mean `realized_car_30d_pct = -0.56%` ($\text{SE}_{\text{firm}} = 1.82\%$, 95% CI $[-4.13\%, +3.02\%]$), Median = `-0.89%` (82 low-lock-in events averaging `-0.26%`; 29 high-lock-in enterprise events averaging `-1.41%`).
  - Intermediate Cohort (`0.00 < Net_Skepticism < 0.35`, $N = 57$): Mean `realized_car_30d_pct = +3.21%` ($\text{SE}_{\text{firm}} = 3.04\%$, 95% CI $[-2.74\%, +9.17\%]$), Median = `+2.03%`.
  - High Verification Cohort (`Net_Skepticism <= 0.00`, $N = 34$): Mean `realized_car_30d_pct = -1.07%` ($\text{SE}_{\text{firm}} = 3.29\%$, 95% CI $[-7.53\%, +5.38\%]$), Median = `-2.87%`.
  - *Categorical & Centered/Orthogonal/Standardized Polynomial Tests:* Regressing `realized_car_30d_pct` on tier indicators with the intermediate cohort as reference yields `-3.7723` percentage points ($\text{SE}_{\text{firm}} = 3.8462, p = 0.3267$) for `Net_Skepticism >= 0.35` and `-4.2885` percentage points ($\text{SE}_{\text{firm}} = 4.5227, p = 0.3430$) for `Net_Skepticism <= 0.00`. To test for quadratic curvature without collinearity or unit-compression artifacts ($\text{SD}^2 = 0.3243^2 = 0.1052$, which scales raw squared coefficients and SEs by $1/0.1052 = 9.51$), we estimate standardized z-score polynomials ($z = (\text{Net_Skepticism} - 0.3197)/0.3243$), mean-centered polynomials ($x_c = \text{Net_Skepticism} - 0.3197$), and Gram-Schmidt orthogonal polynomials: on the standardized z-score scale, the bivariate linear and quadratic coefficients are `-1.0873` ($\text{SE}_{\text{firm}} = 2.0997, p = 0.6046$) and `-0.6209` ($\text{SE}_{\text{firm}} = 1.1490, p = 0.5889$; with Model 2 controls: linear `-1.1695`, $\text{SE}_{\text{firm}} = 2.1986, p = 0.5948$ and quadratic `-0.6346`, $\text{SE}_{\text{firm}} = 1.1662, p = 0.5863$). On the raw scale, the mean-centered linear slope is `-3.3467` ($\text{SE}_{\text{firm}} = 6.4629, p = 0.6046$; Gram-Schmidt orthogonal linear slope `-1.2084`, $\text{SE}_{\text{firm}} = 4.0630, p = 0.7661$; controlled mean-centered linear slope `-3.5997`, $\text{SE}_{\text{firm}} = 6.7674, p = 0.5948$; controlled orthogonal linear slope `-1.4143`, $\text{SE}_{\text{firm}} = 4.2152, p = 0.7372$) and raw quadratic curvature is `-5.8826` ($\text{SE}_{\text{firm}} = 10.8858, p = 0.5889$ bivariate; `-6.0122`, $\text{SE}_{\text{firm}} = 11.0489, p = 0.5863$ controlled).

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3. Multi-Judge Text Scoring, Single-Rater Reliability, and Attenuation Diagnostics [1]

Each thread's title and top 4 comments are scored on $[0, 1]$ by four raters: `j_deepseek_S/V/Net` (`deepseek-v4.1-flash`), `j_jev_S/V/Net` (`llama-3.3-70b-instruct`), `j_qwen_S/V/Net` (`qwen-2.5-72b-instruct`), and `j_lexical_S/V/Net` (calibrated lexical analyzer), plus the pure 3-LLM average `j_3llm_Net`. Table 2 reports Shrout and Fleiss [1] average-measures and single-rater reliability across all $N = 202$ events:

Construct	Evaluated N	4-Judge Average-Measures ICC(2, 4)	ICC(1, 4) / ICC(3, 4) / Single-Rater ICC(2, 1)	Pure 3-LLM Average ICC(2, 3) / Single-Rater ICC(2, 1)
Technical Skepticism (`S_HN`)	202	**0.8465**	0.8077 / 0.8920 / 0.5795	0.8877 / 0.7249
Practitioner Verification (`V_HN`)	202	**0.9164**	0.9096 / 0.9317 / 0.7327	0.9086 / 0.7682
Net Skepticism (`Net_Skepticism`)	202	**0.9203**	0.9082 / 0.9383 / 0.7429	0.9328 / 0.8222

The cross-correlation between `j_3llm_Net` and `j_lexical_Net` across the 202 events is $r = 0.8520$. Because all four raters evaluate the same thread text, rater errors share common text-level variance rather than satisfying classical uncorrelated measurement error; Section 4.1 therefore reports separate regressions for each of the four individual raters alongside 1,000-replication joint firm-cluster bootstrap standard errors for illustrative reliability-ratio bounds.

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4. Empirical Results: Window Deconfounding, Clustered Inference, and Archetype Heterogeneity [7]

4.1 Pooled Regressions (Models 1–5, Including Pre-Event-Only Model 2a) and Resolution of the Window-Overlap Artifact ($N = 202, M = 54$)

We estimate ordinary least squares regressions with firm-clustered standard errors across $M = 54$ corporate clusters [7] and two-way firm × calendar year-quarter ($M = 54, G = 19$) clustered standard errors (noting that $G = 19$ calendar quarters is below conventional asymptotic thresholds of $G \geq 30$–50 for multi-way clustering [7], so one-way firm clustering and calendar-year fixed effects serve as primary references):

- **Model 1 (Bivariate `Net_Skepticism` on `realized_car_30d_pct`):** Slope = **-1.2084** ($SE_{firm} = 3.9690, t = -0.304, p = 0.76077$; two-way SE = 4.2105, $p = 0.7741$; $R^2 = 0.0004$, Pearson $r = -0.0206, p = 0.7707$, 95% Fisher-z CI $[-0.158, +0.118]$; lexical-only Pearson $r = -0.0245, p = 0.7289$).
- **Model 2a (Pre-Event Controls Only on `realized_car_30d_pct`, Omitting Post-Treatment `day1_return_pct`):** `Net_Skepticism` = **-1.6301** ($SE_{firm} = 4.4515, p = 0.71423$; two-way SE = $4.9488, p = 0.7419$; $R^2 = 0.0255$).
- **Model 2 (Controlled `Net_Skepticism` on `realized_car_30d_pct`):** `Net_Skepticism` = **-1.4053** ($SE_{firm} = 4.1003, t = -0.343, p = 0.73181$; $SE_{quarter} = 4.7306$; two-way SE = $4.4968, p = 0.7547$; $R^2 = 0.0491$); `day1_return_pct` = **0.4531** ($SE_{firm} = 0.1751, SE_{two\text{-}way} = 0.1896, t = 2.589, p = 0.00964$).
- **Model 3 (Switching-Cost Interaction on `realized_car_30d_pct`):** `Net_Skepticism` = `-6.9225` ($SE_{firm} = 6.3036, p = 0.27209$; two-way SE = $6.5812, p = 0.2929$), `low_lockin_regime` = `-2.2161` (SE = $4.8822, p = 0.64989$), `net_skep_x_low_lockin` = `6.3153` (SE = $7.3290, p = 0.38886$), `day1_return_pct` = `0.4567` (SE = $0.1789, p = 0.01068, R^2 = 0.0503$).
- **Model 4 (Controlled `Hype_Skepticism_Trap` on `realized_car_30d_pct`):** `Hype_Skepticism_Trap` = **-1.5087** ($SE_{firm} = 3.8843, t = -0.388, p = 0.69771$); `day1_return_`

`pct` = **0.4748** ($SE_{firm} = 0.1950, t = 2.435, p = 0.01491, R^2 = 0.0492$; bivariate `Hype_Skepticism_Trap` slope = `1.1413`, SE = 3.5260, $p = 0.74617$).

- **Model 5 (Strictly Non-Overlapping Post-Reaction `car_t1_to_t30_pct` over $(t+1, t+30]$, close P_{t+1} to close P_{t+30}):** When trading session $t+1$ is excluded from the dependent variable:
  - Bivariate `car_t1_to_t30_pct ~ day1_return_pct` drops from **0.4610** (SE = 0.1711, $p = 0.00707$) on `realized_car_30d_pct` to **0.0027** ($SE_{firm} = 0.1616, t = 0.017, p = 0.98645$).
  - Controlled `car_t1_to_t30_pct` (Model 5) yields `Net_Skepticism` = **-2.5326** ($SE_{firm} = 4.1037, t = -0.617, p = 0.53714$; $SE_{quarter} = 4.5251$; two-way SE = 4.4266, $p = 0.5672$; $R^2 = 0.0124$, bivariate Pearson $r = -0.0327, p = 0.6443$) and `day1_return_pct` = **-0.0053** ($SE_{firm} = 0.1635, SE_{two\text{-}way} = 0.1325, t = -0.032, p = 0.97425$).
  - Likewise, regressing `realized_car_30d_pct` ($(t_0, t+30]$) on the strictly prior single-day return `event_day0_return_pct` ($(t-1, t_0]$) yields a bivariate slope of **0.0646** (SE = 0.3523, $p = 0.85447$).
- **Additional Econometric Sensitivity Checks ($N = 202$):**
  1. *Non-Collinear Multiplicative Interaction (`car_t1_to_t30_pct ~ Net_Skepticism + event_day0_return_pct + net_skep_x_day0 + controls`):* `Net_Skepticism` = `-2.6194` (SE = 3.8407, $p = 0.49523$), `event_day0_return_pct` = `0.4494` (SE = 0.5036, $p = 0.37214$), interaction `net_skep_x_day0` = `-1.3689` (SE = 1.2576, $p = 0.27638$).
  2. *Calendar-Year Fixed Effects (`+ C(event_year)`):* `Net_Skepticism` = `-1.5020` (SE = 4.0265, $p = 0.70913$).
  3. *Benchmark Beta Verification, Winsorization, and Fixed-Beta Sensitivity (`raw_30d_return_pct` and `spy_30d_return_pct`):* Both `raw_30d_return_pct` (mean `+1.74%`, SD `21.14%`) and `spy_30d_return_pct` (mean `+1.32%`, SD `5.42%`) are measured in percentage points over the identical $(t_0, t+30]$ window (`raw_30d_return_pct - spy_30d_return_pct = realized_car_30d_pct` within `0.01%` rounding across all 202 rows). Regressing `raw_30d_return_pct` on `spy_30d_return_pct` and Model 2 controls yields `Net_Skepticism` = `0.1911` (SE = 4.0210, $p = 0.96209$) and an unweighted OLS `spy_30d_return_pct` slope of `1.9329` (SE = 0.2562; bivariate `1.9435` from $r = 0.4985 \times [21.1373/5.4218]$), which reflects right-tail 30-day rallies in high-beta crypto, cloud, and semiconductor equities (`COIN` `+96.20%` vs `SPY` `+6.03%`, `DOCN` `+93.22%` vs `SPY` `+7.17%`; sector slopes `2.4347` in Consumer Platforms, `2.2119` in Semiconductors, and `1.6952` in Enterprise Software & Cloud). Winsorizing `raw_30d_return_pct` at the 5th/95th percentiles (`[-28.66%, +34.31%]`) moderates the controlled `spy_30d_return_pct` slope to `1.5707` (SE = 0.1922; median L_1 slope `1.6053`, Huber RLM slope `1.7325`) with `Net_Skepticism` = `0.0685` (SE = 3.0394, $p = 0.98202$), while imposing fixed benchmark betas of $\beta_{SPY} = 1.25$ and $\beta_{SPY} = 1.50$ yields `Net_Skepticism` slopes of `-0.9768` (SE = 4.0355, $p = 0.80874$) and `-0.5492` (SE = 3.9857, $p = 0.89040$).
  4. *Individual Rater Regressions & Joint Firm-Cluster Bootstrap Attenuation Bounds:* Estimating Model 2 separately on each individual rater yields `-0.7133` (SE = 3.5611, $p = 0.8412$) for `j_deepseek_Net`, `-1.5576` (SE = 3.0355, $p = 0.6079$) for `j_jev_Net`, `-0.7409` (SE = 3.8023, $p = 0.8455$) for `j_qwen_Net`, `-1.1836` (SE = 3.5793, $p = 0.74088$) for `j_3llm_Net`, and `-2.2258` (SE = 5.9579, $p = 0.70871$) for `j_lexical_Net`. Because all four raters evaluate the same thread text ($r = 0.8520$ between `j_3llm_Net` and `j_lexical_Net`), rater errors are correlated across methods rather than satisfying classical independence, and dividing the OLS SE by a fixed reliability constant ignores estimation uncertainty in $\widehat{ICC}$. Using a 1,000-replication non-parametric firm-cluster bootstrap (seed `20261111`) that jointly resamples the 54 firm clusters and re-estimates both the Model 2 slope

and the Shrout-Fleiss intraclass correlation on each draw yields illustrative bounds of $-1.4053/0.9203 = -1.5270$ (joint cluster-bootstrap SE $= 4.4471, p = 0.7315$) using four-rater composite reliability $\mathrm{ICC}(2,4) = 0.9203$ and $-1.4053/0.7429 = -1.8916$ (joint cluster-bootstrap SE $= 5.5466, p = 0.7331$) using single-rater reliability $\mathrm{ICC}(2,1) = 0.7429$.

Variable	Model 1: Bivariate $(t_0, t+30]$	Model 2a: Pre-Event Controls Only $(t_0, t+30]$	Model 2: Controlled $(t_0, t+30]$	Model 3: Switching Cost $(t_0, t+30]$	Model 4: Composite $(t_0, t+30]$	Model 5: Non-Overlapping $(t+1, t+30]$
Intercept	0.8060 (SE = 1.7646)	-3.1505 (SE = 9.5064)	-5.0720 (SE = 9.1652)	-2.9528 (SE = 10.9757)	-4.9606 (SE = 9.2088)	-5.4241 (SE = 9.1866)
Net_Skepticism [**one-way firm SE**]	**-1.2084** (SE = 3.9690, p = 0.76077)	**-1.6301** (SE = 4.4515, p = 0.71423)	**-1.4053** (SE = 4.1003, p = 0.73181)	**-6.9225** (SE = 6.3036, p = 0.27209)	—	**-2.5326** (SE = 4.1037, p = 0.53714)
Net_Skepticism [**two-way firm × quarter SE,** $G = 19$]	[SE = 4.2105, p = 0.7741]	[SE = 4.9488, p = 0.7419]	[SE = 4.4968, p = 0.7547]	[SE = 6.5812, p = 0.2929]	—	[SE = 4.4266, p = 0.5672]
Hype_Skepticism_Trap	—	—	—	—	**-1.5087** (SE = 3.8843, p = 0.69771)	—
low_lockin_regime	—	—	—	-2.2161 (SE = 4.8822)	—	—
net_skep_x_low_lockin	—	—	—	6.3153 (SE = 7.3290)	—	—
day1_return_pct [**post-treatment** $(t-1, t+1]$]	—	— [omitted]	**0.4531** (SE = 0.1751, p = 0.00964)	**0.4567** (SE = 0.1789, p = 0.01068)	**0.4748** (SE = 0.1950, p = 0.01491)	**-0.0053** (SE = 0.1635, p = 0.97425)
pre_20d_return_pct	—	0.1593 (SE = 0.1132)	0.1616 (SE = 0.1082)	0.1584 (SE = 0.1097)	0.1619 (SE = 0.1080)	0.1683 (SE = 0.1058)
pre_20d_volatility_pct	—	0.0554 (SE = 0.0596)	0.0512 (SE = 0.0544)	0.0463 (SE = 0.0571)	0.0509 (SE = 0.0545)	0.0366 (SE = 0.0528)
log_hn_engagement	—	0.1466 (SE = 1.2979)	0.5017 (SE = 1.2568)	0.5451 (SE = 1.2969)	0.4917 (SE = 1.2525)	0.6548 (SE = 1.2561)
sector_semis	—	2.7361 (SE = 3.6946)	2.4348 (SE = 3.6005)	2.2032 (SE = 3.5854)	2.4285 (SE = 3.5817)	1.9765 (SE = 3.4475)
sector_consumer	—	-0.5674 (SE = 3.4176)	-0.6613 (SE = 3.3527)	-0.8526 (SE = 3.5460)	-0.6486 (SE = 3.3169)	-0.5835 (SE = 3.1895)
Observations / Firm Clusters / Quarter Clusters	202 / 54 / 19	202 / 54 / 19	202 / 54 / 19	202 / 54 / 19	202 / 54 / 19	202 / 54 / 19
R^2	0.0004	0.0255	0.0491	0.0503	0.0492	0.0124

4.2 Exploratory Event-Archetype Regressions and Representative Event Table ($N = 202$)

Coded Event Archetype (`event_archetype`)	Subsample Size (n / Firms / df)	Mean `Net_Skepticism`	Mean `realized_car_30d_pct`	Market-Controlled Slope on `Net_Skepticism`	Finite-Sample Reference SE & p-value [Singleton-Cluster Asymptotic Bias Note]	Full Controls / Multiplicity / Boundary Sensitivity Notes
`Layoff_RTO` (**`is_layoff_rto == 1`**)	12 / 12 singleton ($df = 7$)	0.476	**2.79%**	**34.7670**	HC1 SE = 11.0486, $t(7)$ $p = 0.0162$; HC3 SE = 17.5600, $t(7)$ $p = 0.0882$ [singleton-cluster asymptotic normal-z $p = 0.00165$ is downward biased]	Pooled interaction `net_skep_x_layoff` = **55.0046** does not survive 4-archetype Bonferroni adjustment ($p = 0.1160$; unadjusted 999-shuffle permutation $p = 0.0290$, asymptotic clustered SE = 15.8992, $p = 0.00054$; `64.5548` on `car_t1_to_t30_pct`). Broad 18-event layoff keyword match attenuates slope to `11.6140` ($p = 0.3910$).
`Product_Security_Incident` (**`is_product_security == 1`**)	15 / 13 ($df = 10$)	0.496	**-5.45%**	**-23.9185**	HC1 SE = 23.2484, $t(10)$ $p = 0.3243$ [clustered $p_z = 0.30356$]	Exploratory negative slope, noisy at $n = 15$
`Antitrust_MA_Legal` (**`is_antitrust_legal == 1`**)	16 / 13 ($df = 11$)	0.380	0.94%	-18.6314	HC1 SE = 17.4274, $t(11)$ $p = 0.2443$ [clustered $p_z = 0.28503$]	Insulated by multi-year legal horizons
`Other` (**`is_other_archetype == 1`**)	159 / 53 ($df = 52$)	0.285	0.74%	-1.5639	Clustered SE = 4.4338, $t(52)$ $p = 0.7255$ [$p_z = 0.72430$]	Confirms efficient-market null across general tech news

Table 4B verifies the exact dataset rows for the eight illustrative in-sample events and the out-of-sample Oracle layoff event referenced in the text:

Company (`ticker`)	`event_date`	`hn_object_id`	Archetype	`Net_Skepticism`	`day1_return_pct`	`realized_car_30d_pct` ($(t_0, t+30]$)	`car_t1_to_t30_pct` ($(t+1, t+30]$) / Shifted Window	Thread Title
Salesforce (**`CRM`**)	`2023-01-04`	`34245202`	`Layoff_RTO`	`0.452`	`+1.16%`	**`+14.04%`**	`+15.68%`	Salesforce will lay off 10% of staff

Company (ticker)	event_date	hn_object_id	Archetype	Net_ Skepticism	day1_ return_pct	realized_ car_30d_pct ($(t_0, t+30]$)	car_t1_to_ t30_pct ($(t+1, t+30]$) / Shifted Window	Thread Title
DigitalOcean (DOCN)	2023-02-15	34803696	Layoff_RTO	0.597	+16.24%	**+13.63%**	+4.55%	Tell HN: DigitalOcean is doing layoffs
Coinbase (COIN)	2022-06-14	31742590	Layoff_RTO	0.546	+5.77%	**+11.60%**	+6.08%	Coinbase lays off around 1,100 employees
Oracle (ORCL)	2026-03-31	47587935	Layoff_RTO	0.625	+4.63%	**+15.30%**	+17.37%	Oracle slashes 30k jobs
Intel (INTC)	2024-07-22	41039708	Product_ Security_ Incident	0.684	-0.09%	**-38.92%**	-38.69%	July 2024 Update on Instability Reports on Intel Core 13th/14th Gen
Unity (U)	2023-09-13	37491002	Product_ Security_ Incident	0.829	-8.37%	**-24.07%**	-20.77%	Unity rushes to clarify price increase plan
Okta (OKTA)	2022-03-22	30762520	Product_ Security_ Incident	0.719	-12.31%	**-23.02%**	-15.55%	Hackers claim to have breached Okta systems
CrowdStrike (CRWD)	2024-07-19	41002195	Product_ Security_ Incident	0.500	-23.07%	**-11.75%**	+3.44%	CrowdStrike Update: Windows Bluescreen and Boot Loops
Oracle (ORCL, OOS)	2026-09-14	49702239	OOS Layoff	0.230 (lex)	-6.61%	**-13.45%** ($(t_0, t+30]$)	-15.42% (realized_ car_30d_ tm1_t29_pct over $(t-1, t+29]$)	Oracle's 6am layoff emails hit staff amid new wave of cuts

4.3 Exploratory Post-Study Out-of-Sample Evaluation (`2026-08-09` to `2026-09-23`, $N = 28$)

Across the $N = 28$ post-study front-page threads in `data/hn_skepticism_oos_2026_08_09.csv` (strictly after the last primary event on `2026-08-07`, with 0 overlapping `hn_object_ids`): - The primary Pearson correlation between `Net_Skepticism_lex` (scored on title + top 4 comments) and `realized_car_30d_pct` ($(t_0, t+30]$) is **-0.1279** (unadjusted $p = 0.5166$, four-test Bonferroni-adjusted $p = 1.00$, 95% CI $[-0.478, +0.257]$), compared to $r = -0.0245$ ($p = 0.7289$) for `j_lexical_Net` and $r = -0.0206$ ($p = 0.7707$) for `Net_Skepticism` in the primary panel. - To document researcher degrees of freedom across alternative OOS definitions examined during external review, we note three secondary correlations along with four-test Bonferroni-adjusted p-values: $r = -0.1304$ (unadjusted $p = 0.5084$, Bonferroni $p = 1.00$) using `realized_car_30d_tm1_t29_pct` over $(t-1, t+29]$, $r = -0.2403$ (unadjusted $p = 0.2181$, Bonferroni $p = 0.8724$, 95% CI $[-0.562, +0.146]$) using title-

only lexical scoring (`Net_Skepticism_title_lex`), and $r = -0.062$ (unadjusted $p = 0.755$, Bonferroni $p = 1.00$, 95% CI $[-0.43, +0.32]$) in an external replication that also scored thread titles only rather than the primary title-plus-four-comments text, limiting direct construct comparability. - Crucially, at $N = 28$ ($\alpha = 0.05$, two-sided 80% power), the minimum detectable correlation is MDES $|r| = 0.496$ (0.508 under Fisher-z) and the 95% confidence interval $[-0.478, +0.257]$ spans moderate effects of either sign. Thus, the $N = 28$ post-study cohort is **statistically uninformative** for small-to-moderate effects and must not be interpreted as confirmatory support for the primary null.

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5. Limitations

1. **Observational Event Study Design and Post-Treatment Control Conditioning:** All regressions report observational associations and do not identify causal treatment effects; moreover, conditioning on `day1_return_pct` ($(t-1, t+1]$) in Models 2, 4, and 5 conditions on a post-treatment variable relative to the day-t_0 thread (which is why Model 2a is presented alongside Model 2 in Table 3), and two-way firm × quarter clustering relies on $G = 19$ quarters [7].
2. **Small Subsample Sizes, Singleton-Cluster Bias, Type-M Exaggeration, and Multiplicity in Archetype Cells:** With $n = 12$ singleton firms ($df = 7$) in `Layoff_RTO` and $n = 15$ events in `Product_Security_Incident`, asymptotic clustered SEs are downward biased [7] (finite-sample HC1 $t(7)$ $p = 0.0162$, HC3 $t(7)$ $p = 0.0882$), the point slope (`34.7670` to `55.0046`) reflects severe small-sample Type-M exaggeration (`17.8 pp` per SD), the 4-archetype Bonferroni-adjusted permutation p-value is `0.1160` (> 0.05), and expanding `Layoff_RTO` to all 18 broad keyword matches attenuates the slope to `11.6140` ($p = 0.3910$).

References

[1] Shrout, Patrick E., Fleiss, Joseph L.. Intraclass correlations: Uses in assessing rater reliability. (1979). *Psychological Bulletin*. https://doi.org/10.1037/0033-2909.86.2.420

[2] Loughran, Tim, McDonald, Bill. Textual Analysis in Accounting and Finance: A Survey (2016). *Journal of Accounting Research*. https://doi.org/10.1111/1475-679x.12123

[3] Tetlock, Paul C.. Giving Content to Investor Sentiment: The Role of Media in the Stock Market (2007). *The Journal of Finance*. https://doi.org/10.1111/j.1540-6261.2007.01232.x

[4] Antweiler, Werner, Frank, Murray Z.. Is All That Talk Just Noise? The Information Content of Internet Stock Message Boards (2004). *The Journal of Finance*. https://doi.org/10.1111/j.1540-6261.2004.00662.x

[5] Loughran, Tim, McDonald, Bill. When Is a Liability Not a Liability? Textual Analysis, Dictionaries, and 10-Ks (2011). *The Journal of Finance*. https://doi.org/10.1111/j.1540-6261.2010.01625.x

[6] Bernard, Victor L., Thomas, Jacob K.. Post-Earnings-Announcement Drift: Delayed Price Response or Risk Premium? (1989). *Journal of Accounting Research*. https://doi.org/10.2307/2491062

[7] Cameron, A. Colin, Miller, Douglas L.. A Practitioner's Guide to Cluster-Robust Inference (2015). *Journal of Human Resources*. https://doi.org/10.3368/jhr.50.2.317