QUANT RESEARCH NOTE 02

Long-Term
Contrarian Turnaround

A mass-experiment framework for buying former losers only after objective stabilization - tested with next-open execution, walk-forward OOS, multiple-testing correction and explicit cash-state auditing.

PRE-SPECIFIED EXPERIMENTS **1,500**	CONTRARIAN FAMILIES **16**
STOCK-LIKE CANDIDATES **719**	WALK-FORWARD FOLDS **9**

RESEARCH PARTNERS

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Publication standard

This note reports the hypothesis, experiment breadth, statistical controls, the 2022 audit, limitations and the next validation step. It does not present historical simulation as proof of future performance.

A strong research result — not yet a live-performance claim

The final audited run clears every pre-specified research gate, including a 10,000-bootstrap Reality Check and an independent reproduction of the 2022 all-cash period.

DEVELOPMENT OOS CAGR	DEVELOPMENT OOS SHARPE	DEVELOPMENT OOS MAX DRAWDOWN	DEFLATED-SHARPE PROBABILITY
14.33%	1.75	-6.68%	99.3%

DIAGNOSTIC HOLDOUT CAGR	DIAGNOSTIC HOLDOUT SHARPE	REALITY CHECK P-VALUE	POSITIVE NEIGHBOR CAGR RATE
18.56%	1.89	3.77%	100%

Research verdict

CTR0166 has earned the right to be frozen and tested prospectively. *It* has not earned the right to be described as proven alpha. The next decisive evidence must come from future paper-account data with no parameter changes.

Why the result is interesting

- Risk-adjusted performance is high while market dependence is low: development SPY correlation 0.25 and beta 0.11.
- The champion is not an isolated spike: 40/40 tested neighboring configurations had positive CAGR; median neighbor Sharpe 1.26.
- Cost sensitivity is modest: at 50 bps one-way turnover cost, the development OOS CAGR remains 13.37% and Sharpe 1.65.
- The 2022 zero-return year was re-simulated from fresh rules and fully explained by the strategy filters, with zero cache mismatch and zero unexplained targets.

RESEARCH QUESTION

Can long-horizon equity losers become investable only after stabilization?

This is not short-term mean reversion. The economic hypothesis is that some persistent losers experience a delayed turnaround, but only after the decline has stopped behaving like an uncontrolled collapse.

Core hypothesis: buy former losers when recent price behavior starts to stabilize - not while the decline is still accelerating.

The selected stabilization logic

Layer	CTR0166 rule	Interpretation
Long-horizon loser	126-session lookback; bottom 40%	Targets established underperformers.
Recent stabilization	42-session return >= 0%	Requires the recent path to stop deteriorating.
Collapse protection	126d return > -75%; recent crash > -20%	Avoids extreme ongoing breakdowns.
Volatility stabilization	40d / 252d vol ratio <= 1.15	Rejects names whose risk is still expanding sharply.
Trend recovery	Price above SMA100	Requires a medium-term recovery signal.
Recovery from lows	At least 12% above the 52-week low	Avoids buying at the exact bottom of an unresolved collapse.
Breadth	Top 40	Requires a diversified set rather than a few distressed names.
Rebalance	Every 63 sessions	Longer holding horizon; limits turnover.
Market crash gate	SPY 20d return not below -7%	Reduces entry during abrupt market-wide stress.

The strategy is long-only and can remain entirely in cash when the full set of requirements cannot support a 40-stock portfolio. That cash state is a feature of the rules, not a post-hoc overlay.

RESEARCH DESIGN

Common test harness, causal timing, realistic friction

All 1,500 configurations were evaluated under the same execution and cost assumptions so that differences are attributable to the signal rather than changing backtest rules.

2018-2026	2,181	1,929	1,134
RESEARCH WINDOW	RESEARCH SESSIONS	DEVELOPMENT SESSIONS	POOLED WF OOS SESSIONS

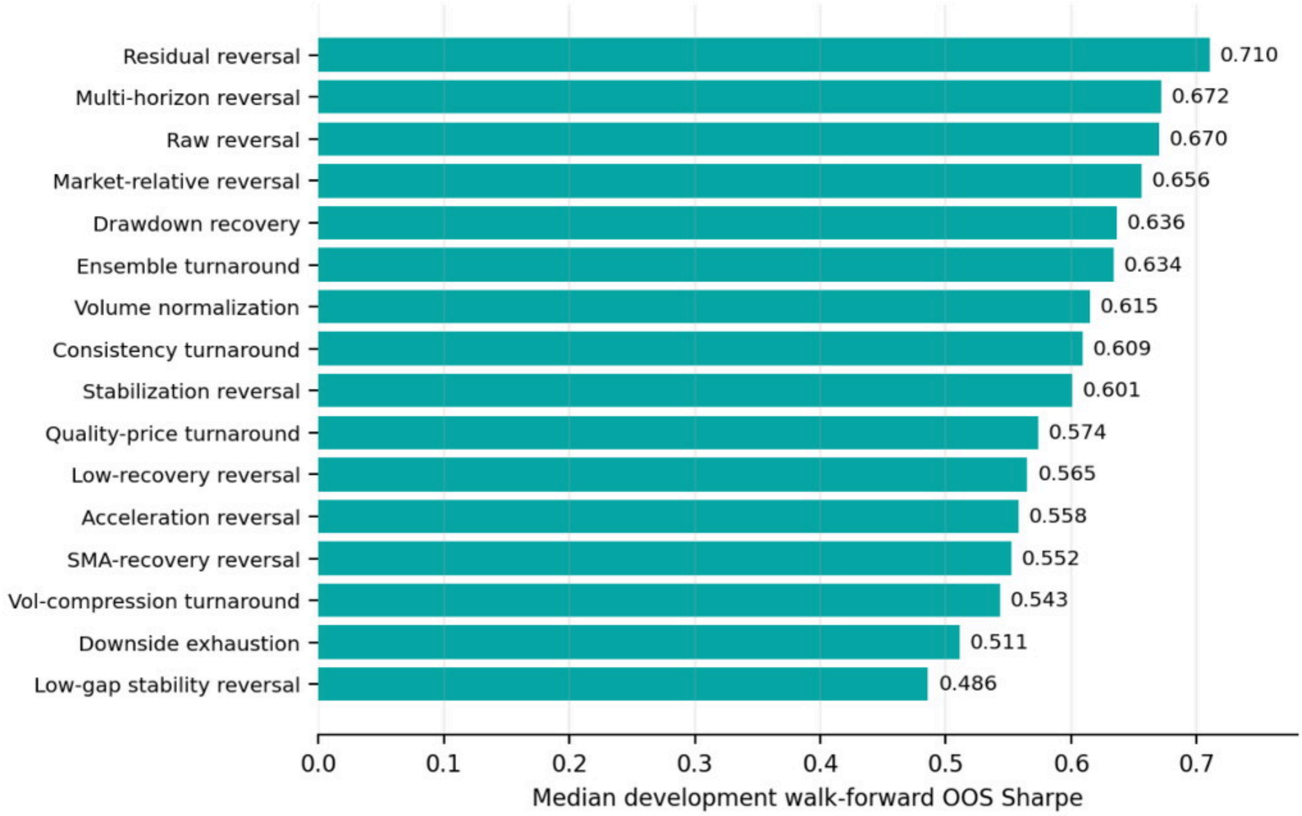
Research layer	Final design	Why it matters
Data	IBKR daily OHLCV; 998 starting candidates; 279 likely ETP/funds removed; 719 stock-like names	A broad stock universe with explicit product classification.
Signal timing	Computed at Close T	No future open information enters ranking.
Execution	Trade at Open T+1	Avoids same-close look-ahead fills.
Costs	10 bps one-way turnover; stress to 50 bps	Tests whether the alpha survives materially worse execution.
Validation	9 walk-forward folds; 252-session diagnostic holdout	Separates development OOS evidence from a later diagnostic window.
Statistics	Deflated-Sharpe-style probability; moving-block Reality Check	Raises the hurdle after trying many related variants.
Robustness	Neighbor stability, regimes, annual slices, 5,000-path Monte Carlo	Looks beyond the best line on a leaderboard.

Important boundary: the 252-session holdout is diagnostic, not a claim of genuinely unseen future evidence. The publication standard therefore treats the next paper-account period as the decisive forward-OOS stage.

EXPERIMENT LIBRARY

Sixteen contrarian families, one shared standard

A robust conclusion should appear at the family level. If only one narrow specification wins, data-mining risk remains high even when its Sharpe is impressive.



Family evidence is broad: every family shown has a positive median OOS Sharpe, and the positive-configuration rate ranges from 83.0% to 96.9%. This does not prove persistence, but it is materially stronger than a single isolated winner.

Selected family context

- STABILIZATION_REVERSAL: 52 valid experiments; median OOS Sharpe 0.601; best 1.753; 92.3% positive configurations.
- The champion is the best result inside a family whose median result is much more modest. The brochure therefore distinguishes champion evidence from family-level evidence.

SELECTED CHAMPION

CTR0166 - Stabilization Reversal

Selected from development walk-forward OOS only after the ranking-direction defect found in an earlier exploratory output had been corrected. The final audited run did not alter the grid, alpha rules, ranking weights, costs or champion-selection logic.

14.33% OOS CAGR	7.81% OOS VOLATILITY	1.753 OOS SHARPE	-6.68% OOS MAX DD
0.25 SPY CORRELATION	0.11 SPY BETA	12.55% REGRESSION ALPHA VS SPY	2.09x ANNUAL TURNOVER

Diagnostic holdout

Window	CAGR	Sharpe	Volatility	MaxDD	SPY corr.	SPY beta
Development WF OOS	14.33%	1.753	7.81%	-6.68%	0.25	0.11
252-session diagnostic holdout	18.56%	1.889	9.24%	-4.38%	0.41	0.29

The holdout is encouraging because performance did not collapse after selection. It is still labelled diagnostic because the historical period has now been observed during the research process. Only future dates after freeze can become true independent forward OOS.

Benchmark nuance

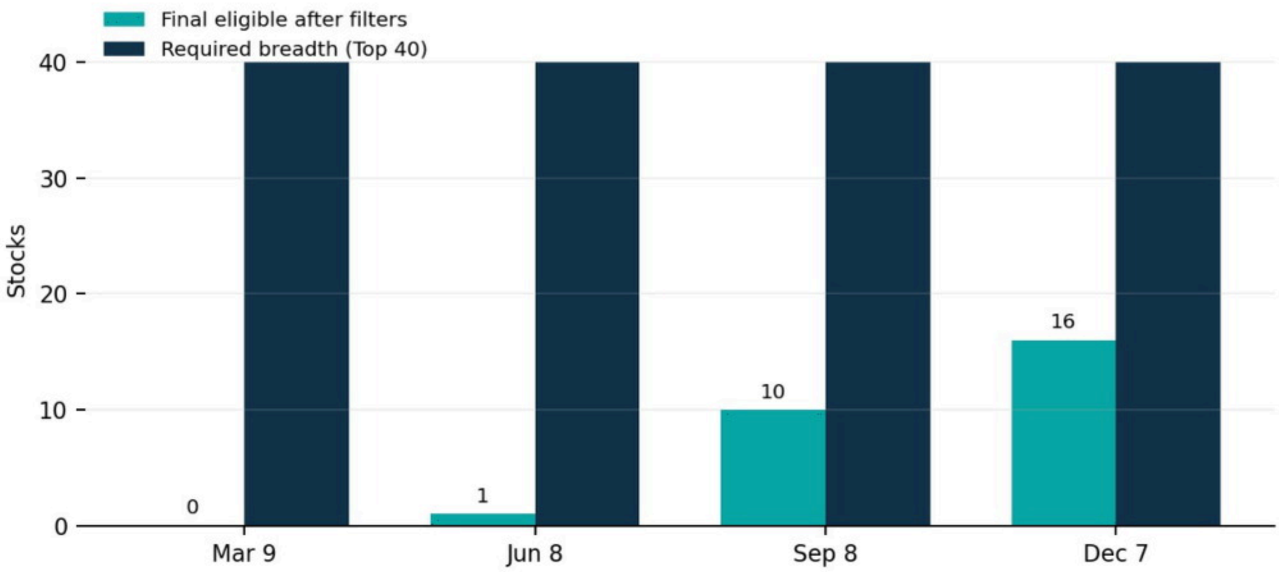
SPY CAGR over the development OOS window was 14.07%, close to the strategy's 14.33%. The attraction is therefore not raw index outperformance; it is comparable absolute return with substantially lower volatility, drawdown and market beta. The diagnostic holdout likewise delivered 18.56% versus SPY 20.40%.

2022 CASH AUDIT

The flat 2022 return is rule-based - and was reproduced independently

A full year at 0% return deserved an explicit audit. The strategy was freshly re-simulated, the cache was compared against the new path, and each scheduled rebalance was traced through the signal filters.

251	4	0	PASS
CASH SESSIONS	REBALANCES AUDITED	UNEXPLAINED ZERO TARGETS	INDEPENDENT AUDIT



Signal date	SPY 20d	Basic eligible	After loser filter	After recent stability	After final filters	Decision
2022-03-09	-5.22%	323	112	2	0	Cash
2022-06-08	+3.04%	322	109	6	1	Cash
2022-09-08	-4.67%	317	115	53	10	Cash
2022-12-07	+2.92%	327	113	50	16	Cash

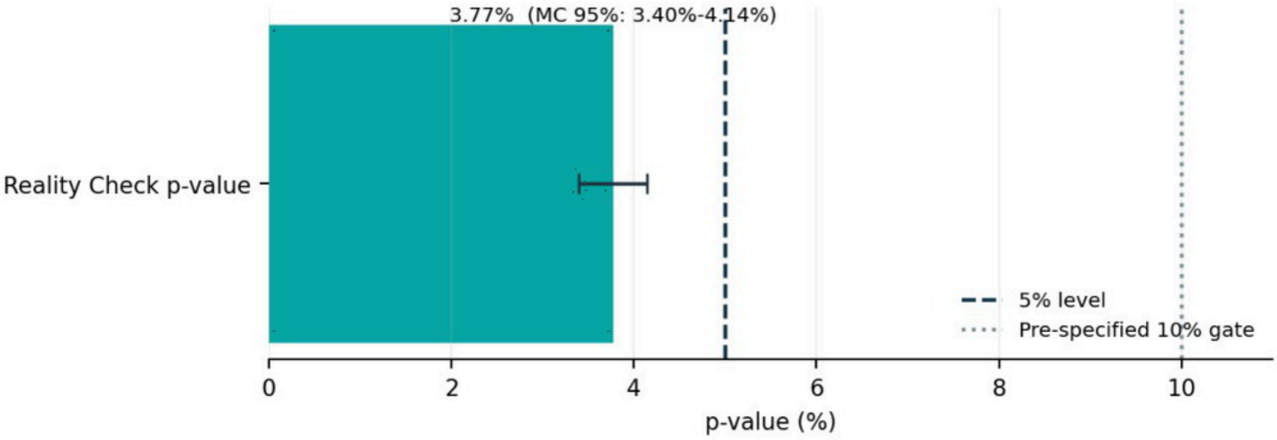
What the audit actually proved: all four SPY regime checks passed. The strategy stayed in cash because the full filter stack never produced the required diversified Top-40 portfolio. Fresh and cached returns/exposure matched exactly, and the audit reported zero unexplained targets.

Interpretation caution: this should not be marketed as “the model predicted the 2022 bear market.” It is a mechanical consequence of the strategy requiring a broad set of stabilized turnaround candidates. The cash assumption in this backtest is 0% daily return.

MULTIPLE-TESTING DISCIPLINE

The 10,000-bootstrap Reality Check now clears the 5% level

Trying 1,500 related specifications makes naive Sharpe comparison unsafe. The final audit increased the moving-block Reality Check from 500 to 10,000 replications without changing any model or ranking rule.



3.77%	3.40%-4.14%	3.719	6.04
REALITY CHECK P-VALUE	MC 95% INTERVAL	OBSERVED MAX T-STAT	EFFECTIVE TRIALS

How to read the result

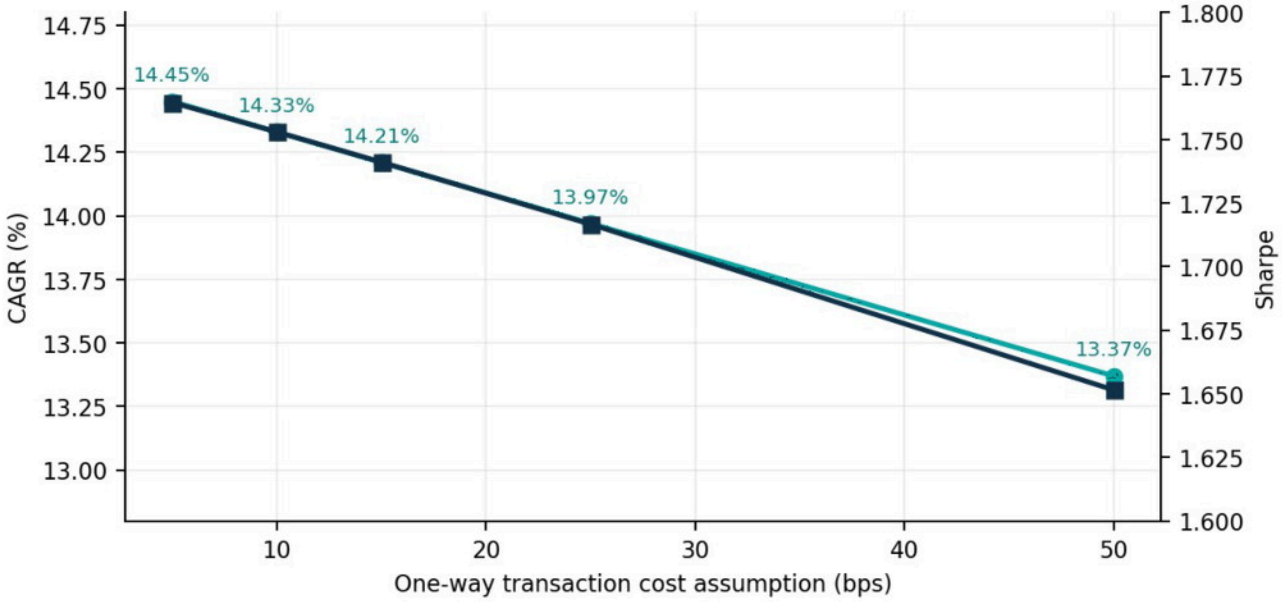
- The bootstrap p-value is 0.0377 with 376 exceedances in 10,000 replications. Under this test and its assumptions, the observed maximum t-stat is difficult to explain by search luck alone.
- The Monte Carlo interval is uncertainty in the bootstrap estimate itself; it is not a confidence interval for the future profitability of the strategy.
- The effective-trial estimate is far below 1,500 because many variants are highly correlated. That reduces, but does not eliminate, multiple-testing risk.
- A statistically strong historical result can still decay economically. Forward paper trading remains mandatory.

Governance result: all eight pre-specified gates passed - WF Sharpe, deflated-Sharpe probability, positive-fold rate, max drawdown, 25-bps cost CAGR, neighbor positivity, Monte Carlo positivity and Reality Check.

IMPLEMENTATION ROBUSTNESS

The result survives much worse trading-cost assumptions

A lower-turnover long-horizon strategy should not depend on unrealistically precise fills. Cost stress is therefore an important plausibility check.



One-way cost	CAGR	Sharpe	MaxDD
5 bps	14.45%	1.765	-6.68%
10 bps	14.33%	1.753	-6.68%
15 bps	14.21%	1.741	-6.68%
25 bps	13.97%	1.717	-6.68%
50 bps	13.37%	1.652	-6.68%

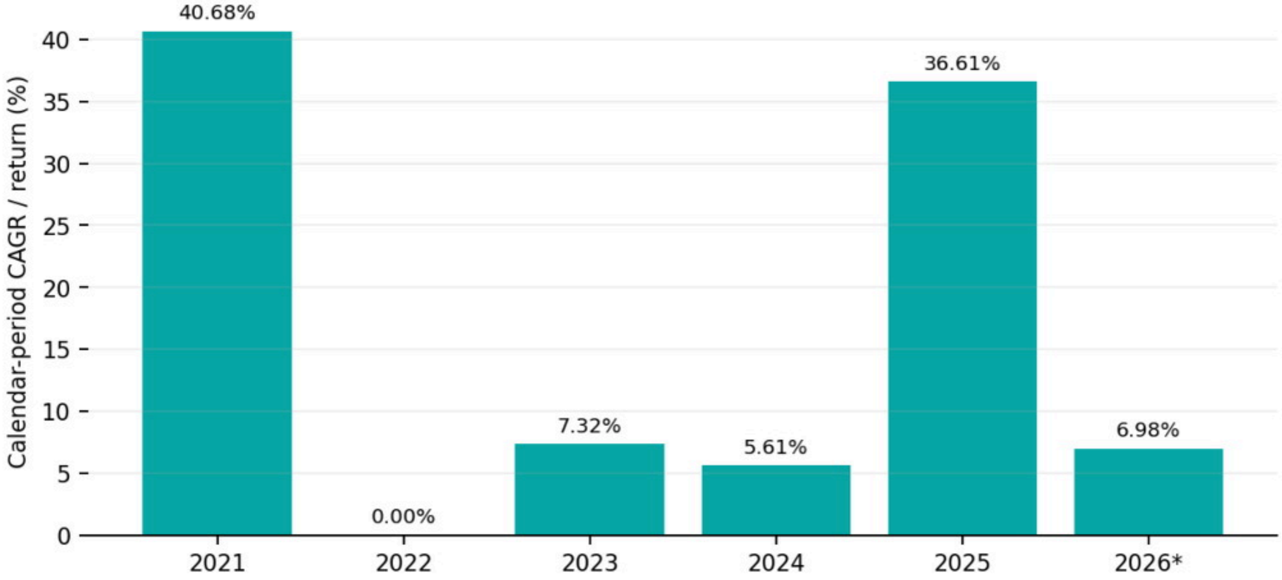
Constituent trade ledger

390 TRADES	**64.4%** TRADE WIN RATE	**+21.07%** AVG WINNING TRADE	**-13.60%** AVG LOSING TRADE
7.09% MEDIAN TRADE	**69.3** AVG HOLDING SESSIONS	**2.80** PROFIT FACTOR	**Top 40** PORTFOLIO BREADTH

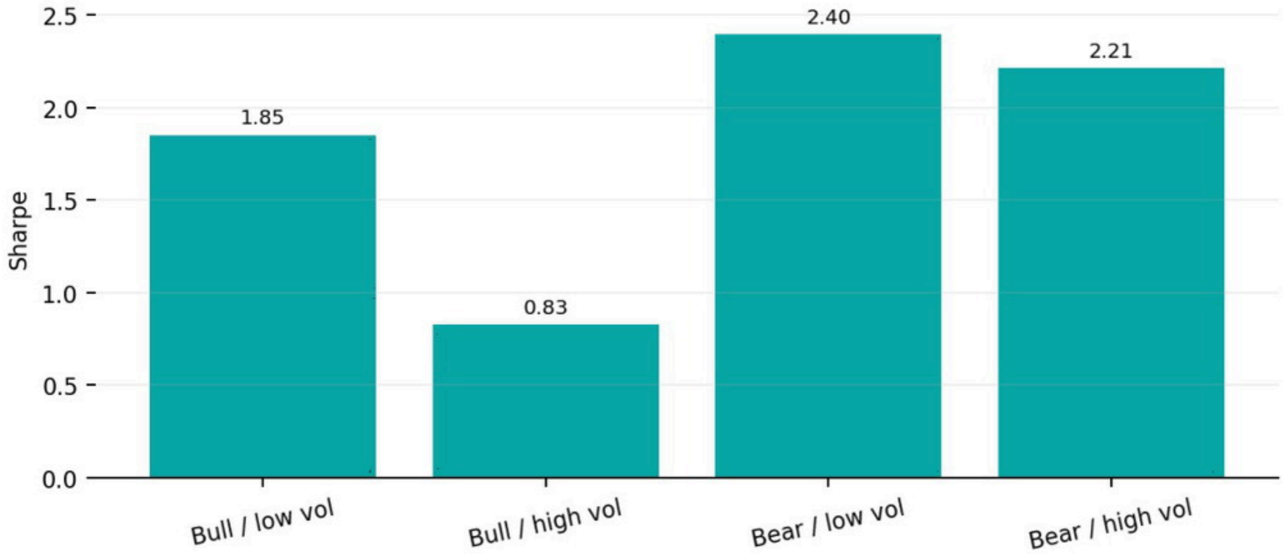
TIME & REGIME BEHAVIOR

Performance is episodic - not uniformly strong every year

The strategy had excellent years, modest years and one fully audited cash year. Publishing that dispersion is more informative than showing only an aggregate CAGR.



*2026 is partial through the September 4 research cutoff.



Regime caveat: these are conditional diagnostics for a strategy that can choose zero exposure. Strong bear-regime numbers should not be interpreted as an unconditional ability to profit from every bear market.

ROBUSTNESS & LIMITATIONS

Strong resampling evidence does not remove structural risk

Moving-block Monte Carlo asks how the observed OOS return process behaves under reordered dependent blocks. It does not simulate an alpha that permanently disappears.

5,000 MONTE CARLO PATHS	100% POSITIVE-CAGR PATHS	7.09% 5TH-PCTL CAGR	1.01 5TH-PCTL SHARPE
-6.55% MEDIAN MAX DD	-10.76% 5TH-PCTL MAX DD	1.76 MEDIAN SHARPE	14.15% MEDIAN CAGR

Known limitations that remain after this audit

- Universe bias: the IBKR/current candidate set is not a true point-in-time survivorship-free security master. Historical liquidity and filtering reduce, but do not eliminate, survivorship and membership bias.
- Daily OHLCV limits: daily bars cannot reproduce intraday path, opening-auction queue position, historical market impact, exact corporate-action microstructure or every execution constraint.
- Historical holdout status: the 252-session holdout is now visible and therefore diagnostic. It must not be used for further tuning.
- Long benchmark-lag periods: the development OOS run reports up to 686 sessions of relative underperformance versus SPY. A diversifying strategy can remain behind a strong equity benchmark for years.
- Cash economics: the research assumed 0% cash return. Paper/live cash interest, commissions, taxes and capital constraints can alter realized performance.
- Model decay: no statistical test can guarantee that the turnaround effect will survive future crowding, structural change or execution deterioration.

The publication claim is therefore deliberately narrow: the historical research is robust enough to justify a frozen prospective test. It is not a forecast, an offer, or evidence that similar returns will be achieved in live trading.

PUBLICATION & NEXT STAGE

Freeze the research. Let future data decide.

The main risk now is no longer insufficient backtesting; it is contaminating a promising result by continuing to optimize after seeing it.

Research governance pipeline

Stage	Status	Rule from here
Mass experiment discovery	Complete	No new parameter search for CTR0166.
Ranking correction / code audit	Complete	Earlier invalid leaderboard is excluded from evidence.
2022 cash audit	PASS	No unexplained targets; cache reproduced exactly.
10,000-bootstrap Reality Check	PASS	p = 3.77%; no statistical retuning.
Diagnostic holdout	Positive	Publish as diagnostic only; never tune to it.
Frozen forward OOS	NEXT	Freeze code, parameters, universe policy and cutoff.
IBKR paper account	NEXT	Trade the frozen model with actual order/fill logging.
Live capital consideration	NOT YET	Only after sufficient forward evidence and operational review.

Recommended website headline: “Long-term stabilization reversal survived 1,500 pre-specified experiments, walk-forward OOS, parameter-neighbor checks, cost stress, a 10,000-bootstrap multiple-testing Reality Check and an explicit audit of its 2022 all-cash behavior. The model is now ready for frozen forward validation.”

Research Partners

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Independent quantitative research collaboration. Research objective: transparent, reproducible evaluation of systematic strategies from hypothesis through forward validation.

Disclosure