

LightGBM Top-Quintile Gate

Conditional top-quintile selection evidence for a residual-return rank.

FAMILY ML top-quintile gate	UNIVERSE Broad listed-equity research panel	RESEARCH HORIZON 126d top-quintile gate
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Executive Summary

LightGBM Top-Quintile Gate evaluates a conditional filter applied to the LightGBM residual-return rank. The full-period selected-group return improvement is +2.91%, with a +3.47% success-rate lift.

Research horizon	126d top-quintile gate
Return improvement	+2.91%
Success-rate lift	+3.47%
Selection rate	52.26%
Average turnover	57.80%

Observations

1. The gate is evaluated on historical top-quintile research events, not current holdings.
2. The evidence depends on the underlying rank model and should be read as filter diagnostics.
3. Formula details, feature recipes and model parameters are intentionally not disclosed.

Data and Research Setup

The setup evaluates conditional selection within historical top-quintile events from a base ML rank.

UNIVERSE

Broad listed-equity research panel. Current holdings and issuer-level selections are not shown.

INPUTS

Dated base-rank scores and historical forward outcomes are aligned to the same research calendar.

COMPARISON BASIS

Baseline top-quintile outcomes are compared with the filtered subset under the same dates.

OUTPUT BOUNDARY

The figures are historical diagnostics and do not present current positions or instrument rankings.

Signal Methodology

Without disclosing the exact functional, the construction proceeds along three conceptual steps.

STEP 1

Base-event definition

The filter starts from historical top-quintile observations generated by the base rank.

STEP 2

Conditional scoring

Each event receives a dated success score based only on information available at that research date.

STEP 3

Gate evaluation

Selected events are compared with the unfiltered top-quintile baseline over the same forward window.

The description is intentionally conceptual. Formula details, exact construction rules and implementation parameters are not disclosed.

Results and Diagnostic Context

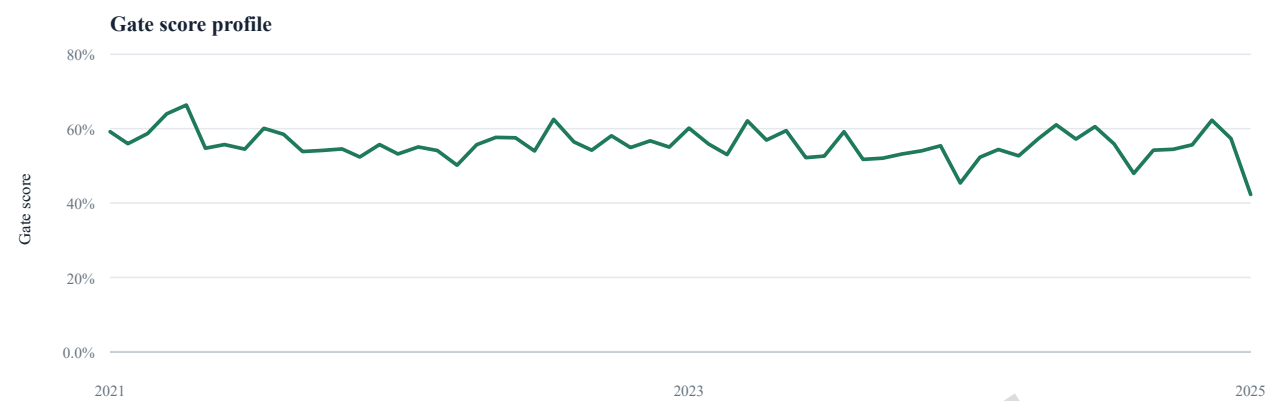


Figure 1. Monthly average top-quintile gate score. The vertical scale is anchored at zero, and the series should be read as a filter diagnostic, not as a standalone return path.

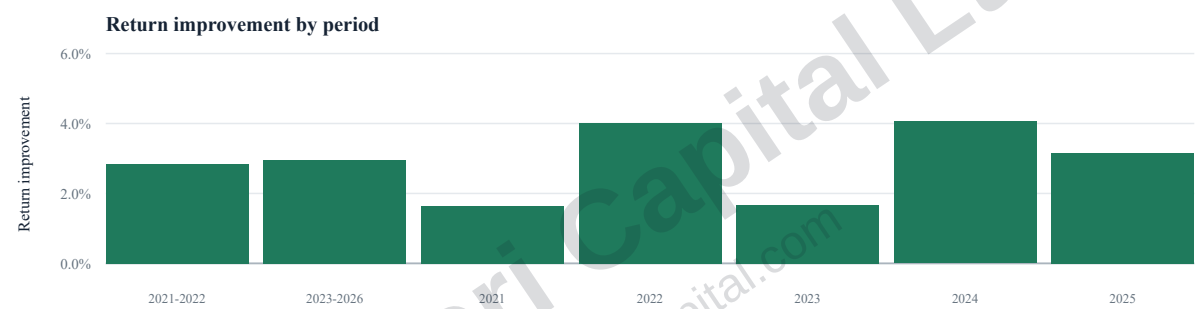


Figure 2. Selected-group return improvement across available research periods.

Period	Baseline return	Gated return	Improvement	Selection rate
2021-2022	13.88%	16.71%	+2.83%	51.62%
2023-2026	20.74%	23.70%	+2.96%	52.70%
2021	13.95%	15.60%	+1.65%	52.06%
2022	13.81%	17.83%	+4.02%	51.17%
2023	17.44%	19.11%	+1.67%	51.64%
2024	22.04%	26.10%	+4.06%	51.41%
2025	22.72%	25.89%	+3.17%	55.03%

The period rows show whether the filter evidence is concentrated in a single window or appears across multiple research periods.

Stability and Robustness

Stability is assessed from success-rate lift across the available research periods.

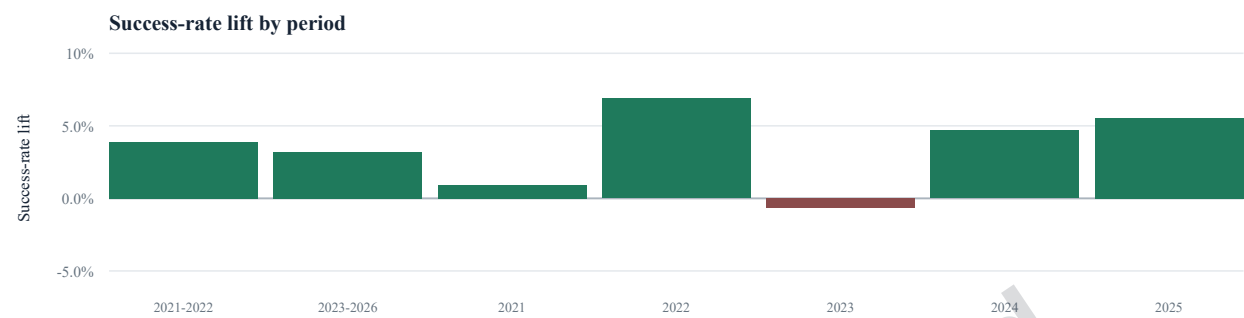


Figure 3. Success-rate lift by research period. The vertical scale is anchored at zero.

Period	Baseline success	Gated success	Success-rate lift
2021-2022	54.85%	58.76%	+3.91%
2023-2026	54.79%	57.97%	+3.18%
2021	52.46%	53.40%	+0.94%
2022	57.24%	64.12%	+6.88%
2023	52.99%	52.34%	-0.64%
2024	60.34%	65.01%	+4.67%
2025	51.04%	56.56%	+5.52%

A useful filter should improve the baseline without relying entirely on one split.

Research Interpretation

The gate is retained in the research library as conditional filter evidence.

ROLE Secondary ML filter diagnostic.	CAPTURES Conditional probability that a top-ranked observation remains in the stronger outcome group.
USE Filter or diagnostic component inside broader systematic allocation research.	LIMITATIONS The note does not disclose construction details, feature recipes, model parameters, issuer-level selections, execution assumptions or product suitability.