CLIENT	Demonstration report	**DATE**	17 Nov 2026
STRATEGY	EMA 9/21 cross + MACD > 0, long	**PACKAGE**	Full Diagnostic
UNIVERSE	Binance USD-M crypto perpetuals (617)	**TIMEFRAME**	5m

EDGE SCORE

1 / 5

CONCLUSION

No evidence of edge. The signal loses money even before costs, and realistic fees, slippage and funding deepen the loss. The result does not improve out-of-sample or with other parameters. Net result per trade: **-14.8 bps** over 1,124,099 trades.

Edge Score scale: 1 No evidence of edge · 2 Weak / unstable · 3 Inconclusive · 4 Probable edge · 5 Robust, consistent edge

Request

Evaluate whether a long-only EMA 9/21 crossover, taken only when the MACD line (12,26) is above zero, has a statistical edge on 5m candles across Binance crypto futures. Rules: enter long at the next candle open after EMA(9) closes above EMA(21) with MACD > 0; exit at the next candle open after EMA(9) closes below EMA(21).

Technique

Engine	Backtest Doctor custom engine (Python). Signals on candle close, execution at the next candle open.
Data	Binance USD-M USDT perpetuals, 5m candles, Jan 2024 to Oct 2026. 617 crypto symbols, including delisted ones (no survivorship bias). 285 TradFi contracts (stocks, ETFs, commodities) excluded.
Costs	Taker fee 0.04% and slippage 0.02% per side; actual historical funding rates while in position.
Split	In-sample 2024-01 to before 2025-07; out-of-sample 2025-07 to 2026-10.
Tests	Cost decomposition, IS/OOS, parameter map (27 sets), per-symbol breakdown, quarterly walk-forward, Monte Carlo (5,000), deflated Sharpe ratio.

Code review

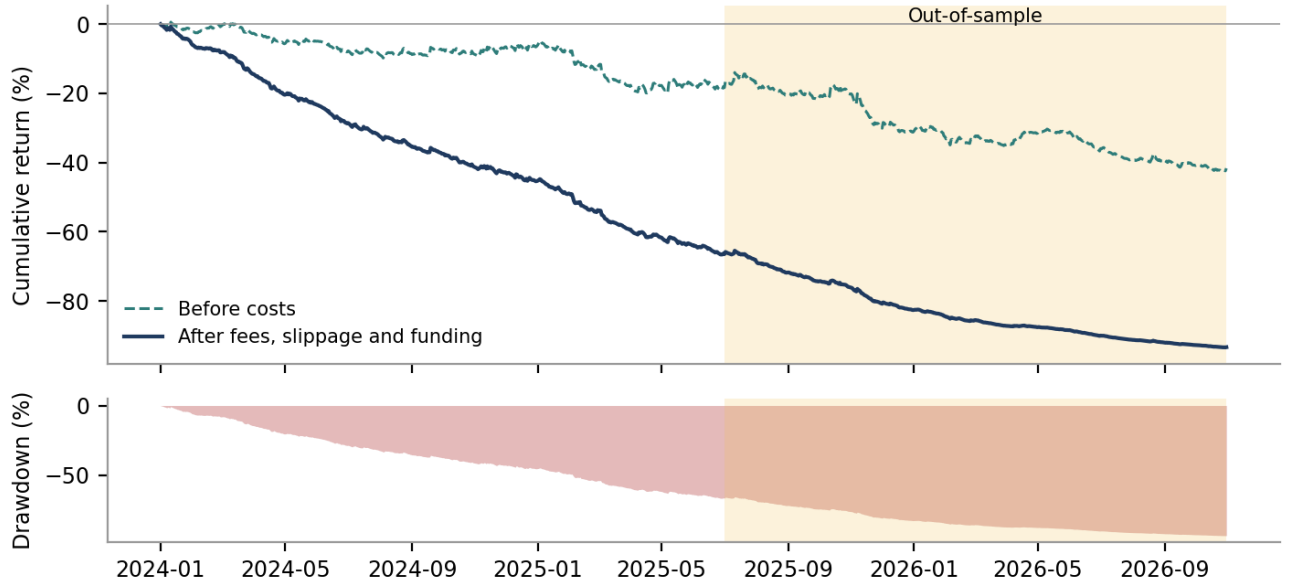
Rules use confirmed candle closes only, with execution at the next open: no lookahead or repainting. Data gaps longer than one hour end any open position, so no trade spans missing data.

Findings

Test	Trades	Win rate	Gross/trade	Net/trade	t-stat
Full period	1,124,099	22%	-2.9 bps	-14.8 bps	-68.2
In-sample	455,514	23%	-2.6 bps	-14.6 bps	-52.2
Out-of-sample	668,585	22%	-3.1 bps	-14.8 bps	-48.0

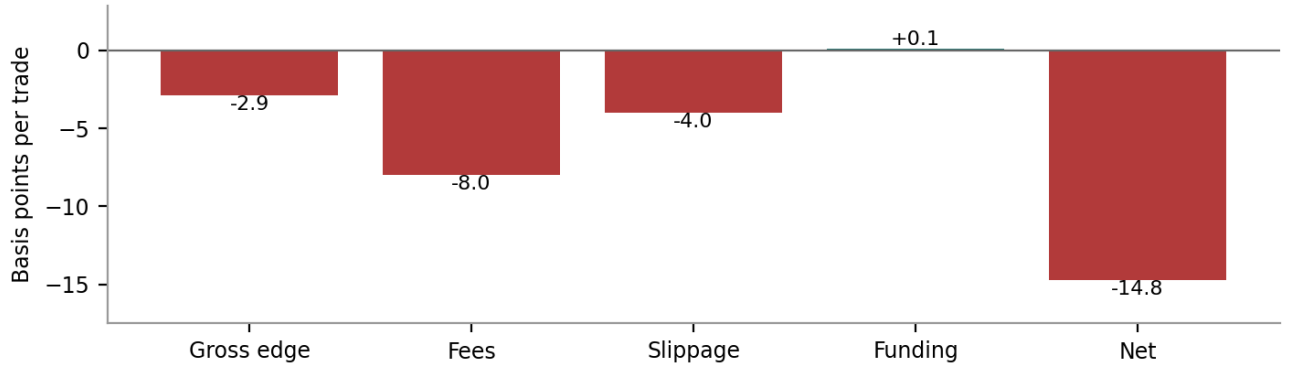
Portfolio (equal capital per symbol)	Before costs	After costs	Out-of-sample	Max drawdown
Total return	-41.7%	-93.3%	-80.2%	-93.4%

Figure 1. Portfolio return and drawdown, equal capital per symbol, EMA 9/21 + MACD > 0



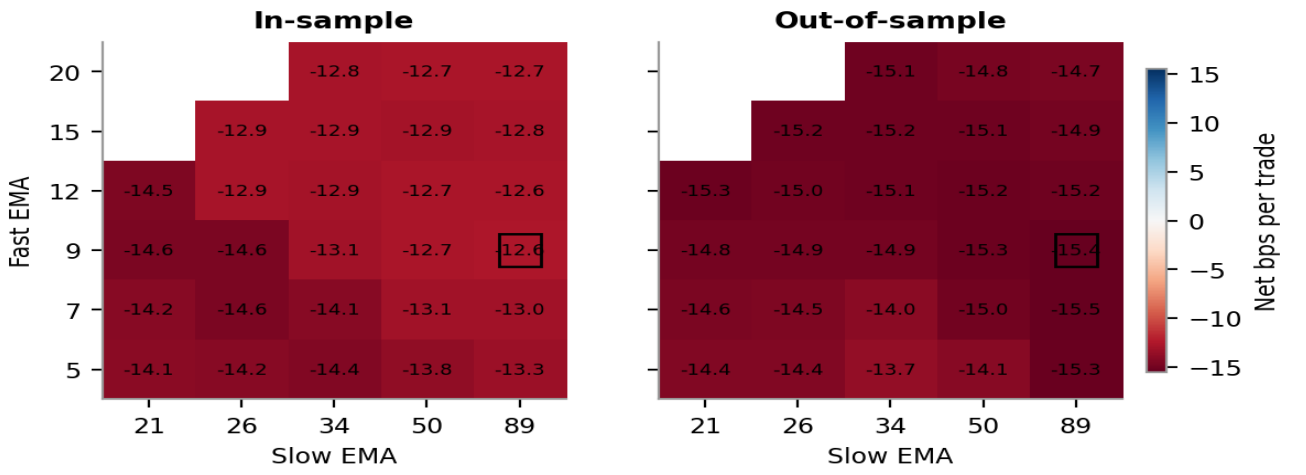
1. Costs. The signal itself loses money: the average trade is negative even before costs. The average trade returns -2.9 bps before costs. Fees and slippage take 12 bps per round trip and funding adds 0.1 bps, leaving -14.8 bps. Average holding time: 22 candles.

Figure 2. Where the average trade's return goes



2. Parameter robustness. The best in-sample set is EMA 9/89 (-12.6 bps per trade, t = -28.8). Out-of-sample it returns -15.4 bps (t = -31.7). 0% of all 27 sets are profitable out-of-sample.

Figure 3. Parameter map (27 sets). Square = best in-sample (9/89)



3. Data snooping. After adjusting for 27 tested sets, the deflated Sharpe ratio of the best in-sample set is 0.00 (threshold 0.95).

4. Consistency across symbols. 4% of symbols with at least 30 trades have a positive mean net result.

5. Walk-forward. Re-selecting parameters each quarter on the previous 12 months gives a cumulative return of -76.6% (equal capital per symbol, compounded). Selected sets: 2025 Q1: 12/26, 2025 Q2: 5/50, 2025 Q3: 20/89, 2025 Q4: 20/89, 2026 Q1: 20/89, 2026 Q2: 5/21, 2026 Q3: 5/34, 2026 Q4: 5/34.

6. Monte Carlo. Block-bootstrapping the out-of-sample daily results 5,000 times gives a loss in **100.0%** of runs (median -80.2%; 5th to 95th percentile -84.2% to -75.5%).

Figure 4. Result by symbol

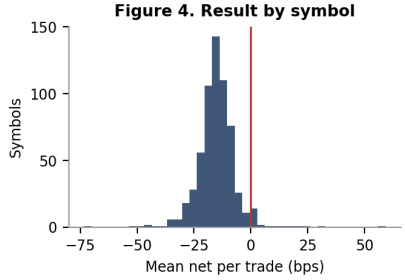


Figure 5. Walk-forward, quarterly

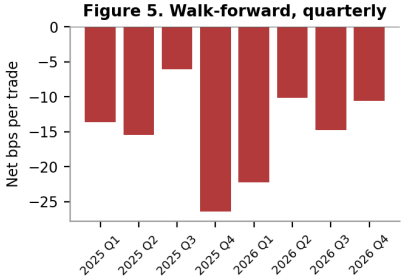
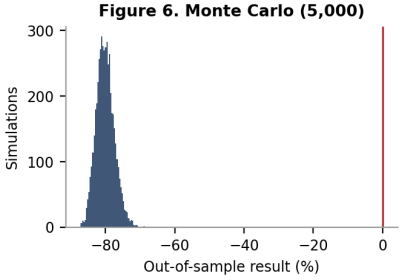


Figure 6. Monte Carlo (5,000)



Summary of bias screening

Bias	Status	Comment
Lookahead / repainting	Not present	Close-only signals, next-open execution
Survivorship bias	Not present	Delisted symbols included
Cost bias	Not present	Fees, slippage and actual funding modelled
Overfitting	Present	Best IS set: -15.4 bps out-of-sample
Data snooping	Present	Deflated Sharpe 0.00 after 27 trials
Insufficient sample	Not present	1,124,099 trades

Monthly returns (%), portfolio after costs

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
2024	-5.7	-2.6	-6.8	-7.0	-3.6	-7.1	-5.0	-4.3	-3.5	-6.0	-2.7	-4.5	**-45.4**
2025	-6.5	-9.4	-12.2	-5.4	-6.1	-6.5	-5.3	-11.6	-9.2	-6.6	-19.2	-10.1	**-68.2**
2026	-10.2	-8.3	-10.4	-2.9	-7.1	-14.3	-11.2	-8.6	-9.3	-8.7			**-61.6**

Conclusion

No evidence of edge. The signal loses money even before costs, and realistic fees, slippage and funding deepen the loss. The result does not improve out-of-sample or with other parameters. **Edge Score: 1 / 5.**

Recommendations

• Do not trade this strategy live in its current form.
• The gross edge per trade is smaller than realistic round-trip costs: on 5m candles, cost control matters more than signal choice.
• Consider testing on higher timeframes or with filters that reduce trade frequency; a follow-up diagnostic will apply the same protocol.

Reported by: Backtest Doctor

Disclaimer. This report is a historical statistical analysis of the strategy supplied by the client. It is not investment advice or a recommendation to buy or sell any asset. Trading leveraged products involves substantial risk of loss.

Demonstration report. The strategy was selected by Backtest Doctor to illustrate the diagnostic protocol. All figures come from actual Binance historical data.