

Crypto Statistical Arbitrage:

Momentum Wins, Reversal Needs Work (2019-2025)

This project explores momentum and reversal trading strategies in the cryptocurrency market using 5 years of hourly BTC/USDT data (2019-2025). The goal was to identify statistical inefficiencies by applying volume- and price-based signals during different market regimes.

We tested two strategies:

1. Momentum - capturing price surges backed by volume during bull markets.
2. Reversal - buying after sharp drops on low volume (mean reversion thesis).

The momentum strategy delivered strong returns when filtered by regime. The reversal approach, while intuitive, produced sparse signals and lacked profitability in its raw form.

Strategy Logic

Momentum Strategy:

- Volume Z-score > 1.5
- 24h return > +1.5%
- Bull regime (30 MA > 200 MA)
- Hold for 24 hours

Reversal Strategy:

- Volume Z-score < -1.5
- 3h return < -1%
- Hold for 12 hours

Performance Summary

Metric	Momentum Strategy	Reversal Strategy
Sharpe Ratio	15.33	-42.56
CAGR	156.02%	-6.57%
Win Rate	53.85%	21.43%
Total Trades	845	14
Final Equity	\$1,882,268.24	\$8,516.32

Equity curve comparison (Momentum vs. Reversal vs. BTC)

Momentum vs. Reversal Strategy vs. BTC (2019-2025)

