# IBS and two EMAs · AAPL

2011-01-04 to 2023-08-04 · 3,167 observations

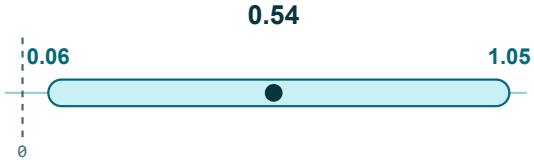
FINDING Historical backtest

**The historical replay returned +209.9% net, with Sharpe 0.54 and maximum drawdown -37.6%. Executing those signals at the next open returned +284.4%.**

RETURN AND RISK

| METRIC | STRATEGY | BENCHMARK |
|---|---|---|
| Compound annual growth | 9.42% | — |
| Sharpe | 0.54 | — |
| Maximum drawdown | −37.61% | — |

**Sharpe ratio interval**




95.00% block-bootstrap interval. Standard error 0.25.

HOW IT WAS PRODUCED

Buy when IBS ≤0.25 and EMA8 <EMA24. Sell when IBS ≥0.75 and EMA8 >EMA24. The notebook uses the closing price for both the signal and its execution, and liquidates any open position at the last close.

USD 2,000 starting capital, with zero commission, slippage and risk-free rate as explicit reproduction assumptions. The notebook supplies no benchmark.

EVIDENCE SCOPE

EVIDENCE LEVEL **Historical backtest** Unsigned research evidence

- The finalized close informs the signal and sets the execution price of that same order. The literal replay is exploratory. A separate sensitivity shifts those signals to the next open with the same terminal liquidation.
- Single historical path. Quotes are adjusted for splits and exclude dividends. Costs reflect the declared notebook commissions; spread and slippage are unmodeled.

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## RETURN AND RISK

| METRIC | STRATEGY | BENCHMARK |
|---|---|---|
| Compound annual growth | 9.42% | — |
| Arithmetic annual return | 11.14% | — |
| Cumulative return | 209.87% | — |
| Annual volatility | 20.65% | — |
| Sharpe | 0.54 | — |
| Sortino | 0.78 | — |
| Calmar | 0.25 | — |
| Maximum drawdown | −37.61% | — |
| Positive periods | 18.38% | — |
| Peak to trough periods | 208 | — |
| Recovery periods | 662 | — |
| Skewness | −0.12 | — |
| Excess kurtosis | 18.70 | — |

## AGAINST THE BENCHMARK

| METRIC | ESTIMATE |
|---|---|
| Arithmetic annual difference | — |
| Tracking error | — |
| Information ratio | — |
| Beta | — |
| Correlation | — |
| Annual Jensen alpha | — |

## UNCERTAINTY AND VERIFICATION

| METRIC | ESTIMATE |
|---|---|
| Sharpe interval | 0.06 … 1.05 |
| Information ratio interval | — |
| Active return HAC t | — |
| Two-sided HAC p | — |
| Block length | 5 |
| Valid resamples | 1,000 |

## CONFIGURATION

| METRIC | ESTIMATE |
|---|---|
| Benchmark | — |
| Annual risk-free rate | 0.00% |
| Periods per year | 252 |
| Calendar | NASDAQ |