IBS and Momentum/ROC · MSFT · simple variant

Strategy evaluated · Development · Sample 2018-04-06 13:30:00+00:00 to 2024-12-31 14:30:00+00:00

N/A marks an undefined or missing value. Return and risk fractions are shown as percentages. The JSON evidence preserves the original precision of the results.

Assessment limits

Survivorship bias. Not assessed. Evidence on historical universe membership is missing.

Look-ahead bias. Not assessed. The report does not verify when signals became available.

Multiple testing. DSR and PBO cannot be assessed from the evidence supplied.

Costs and execution. Gross and net returns were reconciled with recorded costs. Cost sensitivity and actual execution were not assessed.

Use of AI. The engine computes the metrics. Use of AI in strategy development was not assessed.

Advice. This report does not constitute investment advice.

Performance and risk

Absolute performance · Strategy and benchmark

Metric	Strategy	Benchmark
Annualized arithmetic return `annual_return_arithmetic`	16.5132%	13.5519%
Annualized volatility `annual_volatility`	19.5433%	18.3321%
Periods per year `annualization`	252	252
Annualized compound return (CAGR) `cagr`	15.7187%	12.5914%
Calmar `calmar`	0.7192272	0.3880715
Excess kurtosis `excess_kurtosis`	9.354837	6.974211
Alias for the share of positive periods `hit_rate`	23.7028%	55.4245%
Maximum drawdown `max_drawdown`	-21.8549%	-32.4462%
Periods from the previous peak to recovery `max_drawdown_recovery_periods`	N/A	125
Periods to the maximum drawdown trough `max_drawdown_underwater_periods`	204	23
Observations `n_obs`	1696	1696
Share of positive periods `positive_period_rate`	23.7028%	55.4245%
Annual risk-free rate `risk_free_annual`	0%	0%
Sharpe `sharpe`	0.8449538	0.7392426
Skewness `skewness`	-0.04866752	-0.7743077

Absolute performance · Strategy and benchmark

Metric	Strategy	Benchmark
Sortino `sortino`	1.239563	1.007833
Cumulative return `total_return`	167.125%	122.146%

Active performance · Strategy versus benchmark

Field	Value
Annualized active return `active_return_annual`	2.96134%
Periods per year `annualization`	252
Benchmark Sharpe ratio `benchmark_sharpe`	0.7392426
Beta `beta`	0.6470147
Correlation with the benchmark `correlation`	0.6069149
Information ratio `information_ratio`	0.1759936
Annualized Jensen alpha `jensen_alpha_annual`	7.74495%
Observations `n_obs`	1696
Annualized regression alpha `regression_alpha_annual`	7.74495%
Annual risk-free rate `risk_free_annual`	0%
Strategy Sharpe ratio `strategy_sharpe`	0.8449538
Annualized tracking error `tracking_error_annual`	16.8264%

Statistical uncertainty

Strategy · Sharpe ratio interval · block bootstrap

Field	Value
Replications attempted `attempted_repetitions`	1000
Block length `block_length`	5
Lower interval bound `ci_lower`	0.1708578
Upper interval bound `ci_upper`	1.529326
Confidence level `confidence`	95%
Lower-tail probability `lower_probability`	2.5%
Observations `n_obs`	1696
Point estimate `point_estimate`	0.8449538

Strategy · Sharpe ratio interval · block bootstrap	
Field	**Value**
Replications `repetitions`	1000
Seed `seed`	20261116
Standard error `standard_error`	0.3505564
Status `status`	evaluated
Replications with no defined estimate `undefined_repetitions`	0
Upper-tail probability `upper_probability`	97.5%
Valid replications `valid_repetitions`	1000

Strategy · Mean excess return · HAC	
Field	**Value**
Annualized estimate `annualized_estimate`	16.5132%
Annualized standard error `annualized_standard_error`	6.39219%
Estimate per period `estimate`	0.0655286%
Weighting kernel `kernel`	bartlett
Lags `lags`	7
Observations `n_obs`	1696
Two-sided p-value (normal) `p_value_two_sided_normal`	0.009784899
Standard error `standard_error`	0.0253658%
Status `status`	evaluated
t-statistic `t_stat`	2.583339

Benchmark · No uncertainty estimate supplied.

Active performance · Information ratio interval · block bootstrap	
Field	**Value**
Replications attempted `attempted_repetitions`	1000
Block length `block_length`	5
Lower interval bound `ci_lower`	-0.6100968
Upper interval bound `ci_upper`	0.9641135
Confidence level `confidence`	95%

Active performance · Information ratio interval · block bootstrap	
Field	**Value**
Lower-tail probability `lower_probability`	2.5%
Observations `n_obs`	1696
Point estimate `point_estimate`	0.1759936
Replications `repetitions`	1000
Seed `seed`	20261116
Standard error `standard_error`	0.4005188
Status `status`	evaluated
Replications with no defined estimate `undefined_repetitions`	0
Upper-tail probability `upper_probability`	97.5%
Valid replications `valid_repetitions`	1000

Active performance · Mean active return · HAC	
Field	**Value**
Annualized estimate `annualized_estimate`	2.96134%
Annualized standard error `annualized_standard_error`	6.36515%
Estimate per period `estimate`	0.0117513%
Weighting kernel `kernel`	bartlett
Lags `lags`	7
Observations `n_obs`	1696
Two-sided p-value (normal) `p_value_two_sided_normal`	0.6417574
Standard error `standard_error`	0.0252585%
Status `status`	evaluated
t-statistic `t_stat`	0.4652431

Subperiods and robustness

Additional metrics · No evidence supplied.

Verification and configuration

Engine checks	
Field	**Value**
Schemas valid `schema_valid`	Yes
Evidence hash valid `hash_valid`	Yes
Signature verified `signature_verified`	No
Confirmatory provenance verified `confirmatory_provenance_verified`	No
`reconciliation.tolerance`	1e-09
Status `reconciliation.status`	reconciled
Metric paths checked `reconciliation.checkedPathCount`	96
Hash bindings valid `hash_bindings_valid`	Yes
Metrics reconciled `metrics_reconciled`	Yes
Simulations reproduced `simulations_reproduced`	Yes
`kernelVersion`	1.1.0

Decision thresholds · No evidence supplied.

Engine configuration	
Field	**Value**
`allowPositional`	No
Periods per year `annualization`	252
Annualization method `annualizationMethod`	declared by StrategyTrace.frequency.periodsPerYear
`calendar`	NASDAQ
Annual risk-free rate `riskFreeAnnual`	0%
`timezone`	UTC
Block length `uncertainty.blockLength`	5
Confidence level `uncertainty.confidence`	95%
`uncertainty.hacLagPolicy.kind`	sample-size-bartlett-v1
Replications `uncertainty.repetitions`	1000
Seed `uncertainty.seed`	20261116
Expected calendar hash `uncertainty.timeBasis.expectedEndsHash`	`34ee363ed2bb1e1868209e58dc8f73dcbb4c92bfeea8dc2b21ab316fcb14bd8b`
`uncertainty.timeBasis.kind`	session-grid

Monte Carlo

Observed path

Field	Value
Longest losing streak (periods) `longestLosingStreak`	6
Longest stretch below the peak (periods) `longestUnderwaterStreakPeriods`	744
Maximum drawdown magnitude `maximumDrawdown`	21.8549%
Ruin threshold reached `ruined`	No
Terminal wealth (multiple) `terminalWealth`	2.671252
Share of periods below the peak `timeUnderWaterFraction`	85.3184%
Cumulative return `totalReturn`	167.125%

Circular block bootstrap

Metric	Minimum	Mean	Maximum	Quantiles
Longest losing streak (periods) `longestLosingStreak`	4	6.025	13	5% = 5 · 50% = 6 · 95% = 8
Longest stretch below the peak (periods) `longestUnderwaterStreakPeriods`	99	476.192	1658	5% = 177 · 50% = 403 · 95% = 1015.15
Maximum drawdown magnitude `maximumDrawdown`	11.1698%	25.627%	54.1155%	5% = 15.431% · 50% = 24.5086% · 95% = 40.5522%
Probability of reaching the ruin threshold `ruinProbability`		0%		
Terminal wealth (multiple) `terminalWealth`	0.5849057	2.917146	11.00506	5% = 1.285455 · 50% = 2.641257 · 95% = 5.389396
Share of periods below the peak `timeUnderWaterFraction`	70.9906%	87.0128%	99.5873%	5% = 77.3585% · 50% = 87.2052% · 95% = 95.0501%
Cumulative return `totalReturn`	-41.5094%	191.715%	1000.51%	5% = 28.5455% · 50% = 164.126% · 95% = 438.94%

Return-order permutation

Metric	Minimum	Mean	Maximum	Quantiles
Longest losing streak (periods) `longestLosingStreak`	3	4.363	8	5% = 3 · 50% = 4 · 95% = 6
Longest stretch below the peak (periods) `longestUnderwaterStreakPeriods`	159	472.464	1234	5% = 251 · 50% = 436 · 95% = 812.1
Maximum drawdown magnitude `maximumDrawdown`	14.5981%	28.2341%	54.4204%	5% = 19.5958% · 50% = 27.343% · 95% = 39.1849%
Probability of reaching the ruin threshold `ruinProbability`		0%		
Share of periods below the peak `timeUnderWaterFraction`	80.7193%	88.5906%	93.8679%	5% = 85.7871% · 50% = 88.7382% · 95% = 91.0377%

Simulation settings and bindings

Field	Value
`simulationSchemaVersion`	strateva-simulation-evidence/v2

Simulation settings and bindings	
Field	**Value**
`engineVersion`	0.9.0
`kernelVersion`	1.1.0
`observationCount`	1696
`strategyTraceHash`	`198b04d2494aeee34afee01bbf02579a6f968564ea2fdbb4dcee2484273211db`
`contentHash`	`c75e39c442aa7f4febd9cc9302eaddcf51570696f6eadd1ffbaf16740628f784`
Block length `configuration.blockLength`	5
Initial wealth `configuration.initialWealth`	1
`configuration.quantiles`	5% · 50% · 95%
Replications `configuration.repetitions`	1000
Ruin threshold (share of initial wealth) `configuration.ruinWealthFraction`	50%
Seed `configuration.seed`	20261116
`classic.method`	CIRCULAR_MOVING_BLOCK_BOOTSTRAP
`classic.sampling`	WITH_REPLACEMENT
`permuted.method`	FISHER_YATES_RETURN_ORDER_PERMUTATION
`permuted.sampling`	WITHOUT_REPLACEMENT
Terminal wealth (multiple) `permuted.terminalWealth`	2.671252
Terminal wealth invariant `permuted.terminalWealthInvariant`	Yes

Provenance and traceability

Evidence and input hashes	
Field	**Value**
`bundleSchemaVersion`	strateva-evidence-bundle/v3
`artifactId`	`urn:strateva:strategy-trace:198b04d2494aeee34afee01bbf02579a6f968564ea2fdbb4dcee2484273211db`
`engineVersion`	0.9.0
`kernelVersion`	1.1.0
`generatedAt`	2026-11-17T12:09:51Z
`contentHash`	`49d688d9bb973718b4c3f3f72c8a98e3d46159358d3476eef64de2dd79294a52`
Benchmark return series hash `inputHashes.benchmarkReturns`	f7bb2ac27708695c5e5ec0102d43450ba903cbaa1459d668d976c6623b0fe9ad
Strategy return series hash `inputHashes.strategyReturns`	2f91b3494fda477f7fcf0ebc87d3557f74990d456f3ad790ed186ee1c839ad73

Evidence and input hashes	
Field	**Value**
`lineage`	strategyTrace:198b04d2494aeee34afee01bbf02579a6f968564ea2fdbb4dcee2484273211db · scope:3ca081e844fc3083ca030006c73d723237baba7702a5e5beae5aadea127d9a25 · artifact:711addc7a17241c26ba9611c75f66a07ffcae72b7954d35a651219145e626d57 · data:eaf4f187fec892628b7f7e82d330caaa340224dbb78f48c2a6f9596e5fb32c9e

Provenance statement	
Field	**Value**
`claim`	development
`containerImageDigest`	N/A
`engineCommit`	N/A
`freezeHash`	N/A
`runId`	N/A

Evidence signature · No evidence supplied.

StrategyTrace · Identity, frequency, conventions and benchmark	
Field	**Value**
`traceSchemaVersion`	strateva-strategy-trace/v1
`engagementId`	eng-00000001
`runId`	quant-strategies-ibs-roc-simple-docker-20261117
`generatedAt`	2026-11-17T12:09:51Z
`scopeContentHash`	`3ca081e844fc3083ca030006c73d723237baba7702a5e5beae5aadea127d9a25`
`artifactContentHash`	`711addc7a17241c26ba9611c75f66a07ffcae72b7954d35a651219145e626d57`
`dataContentHash`	`eaf4f187fec892628b7f7e82d330caaa340224dbb78f48c2a6f9596e5fb32c9e`
`frequency.barInterval`	1d
Periods per year `frequency.periodsPerYear`	252
`frequency.calendar`	NASDAQ
`frequency.sourceTimezone`	America/New_York
`conventions.returnType`	SIMPLE
`conventions.returnUnit`	FRACTION
`conventions.timestampMeaning`	UTC_PERIOD_END
`conventions.turnover`	SUM_ABSOLUTE_POSITION_CHANGES
`conventions.exposure`	FRACTION_OF_EQUITY
`conventions.costs`	RETURN_FRACTION
`benchmark.kind`	SERIES
`benchmark.symbol`	SPY
`contentHash`	`198b04d2494aeee34afee01bbf02579a6f968564ea2fdbb4dcee2484273211db`

Notes included in the evidence	
Field	**Value**
`disclosures`	The engine recomputed the metrics from verified StrategyTrace net returns. · Monte Carlo has its own hash. It affects criteria only if preregistered for that purpose.