IBM simple moving-average crossover

Strategy evaluated · **Nivel de evidencia** Histórico · Development · Sample 2017-12-13 21:00:00+00:00 to 2019-04-09 20:00:00+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. Historical universe membership is missing (SURVIVORSHIP_BIAS_NOT_CONTROLLED).

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 evidence does not say whether Strateva used AI in the review.

Advice. This report does not constitute investment advice.

Performance and risk

Absolute performance · Strategy and benchmark

Metric	Strategy	Benchmark
Observations `n_obs`	331	N/A
Periods per year `annualization`	252	N/A
Annual risk-free rate `risk_free_annual`	0%	N/A
Cumulative return `total_return`	-3.84397%	N/A
Annualized compound return (CAGR) `cagr`	-2.94017%	N/A
Annualized arithmetic return `annual_return_arithmetic`	-2.84637%	N/A
Annualized volatility `annual_volatility`	5.23848%	N/A
Sharpe `sharpe`	-0.5433584	N/A
Sortino `sortino`	-0.6576463	N/A
Maximum drawdown `max_drawdown`	-7.41075%	N/A
Periods to the maximum drawdown trough `max_drawdown_underwater_periods`	83	N/A
Periods from the previous peak to recovery `max_drawdown_recovery_periods`	N/A	N/A
Calmar `calmar`	-0.396744	N/A
Share of positive periods `positive_period_rate`	21.148%	N/A
Alias for the share of positive periods `hit_rate`	21.148%	N/A

Absolute performance · Strategy and benchmark		
Metric	**Strategy**	**Benchmark**
Skewness `skewness`	-2.943636	N/A
Excess kurtosis `excess_kurtosis`	25.45198	N/A

Active performance · Strategy versus benchmark · No evidence supplied.

Statistical uncertainty

Strategy · Mean excess return · HAC	
Field	**Value**
Status `status`	evaluated
Observations `n_obs`	331
Lags `lags`	5
Weighting kernel `kernel`	bartlett
Estimate per period `estimate`	-0.0112951%
Annualized estimate `annualized_estimate`	-2.84637%
Standard error `standard_error`	0.0182914%
Annualized standard error `annualized_standard_error`	4.60944%
t-statistic `t_stat`	-0.6175087
Two-sided p-value (normal) `p_value_two_sided_normal`	0.5368993

Strategy · Sharpe ratio interval · block bootstrap	
Field	**Value**
Observations `n_obs`	331
Block length `block_length`	7
Replications `repetitions`	1000
Seed `seed`	20261117
Confidence level `confidence`	95%
Lower-tail probability `lower_probability`	2.5%
Upper-tail probability `upper_probability`	97.5%
Replications attempted `attempted_repetitions`	1000
Valid replications `valid_repetitions`	1000

Strategy · Sharpe ratio interval · block bootstrap	
Field	**Value**
Replications with no defined estimate `undefined_repetitions`	0
Status `status`	evaluated
Point estimate `point_estimate`	-0.5433584
Standard error `standard_error`	0.9068595
Lower interval bound `ci_lower`	-1.991334
Upper interval bound `ci_upper`	1.575368

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`	42
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**
Periods per year `annualization`	252
Annualization method `annualizationMethod`	declared by StrategyTrace.frequency.periodsPerYear
Annual risk-free rate `riskFreeAnnual`	0%
`allowPositional`	No

Engine configuration	
Field	**Value**
`timezone`	UTC
`calendar`	NYSE
Confidence level `uncertainty.confidence`	95%
`uncertainty.hacLagPolicy.kind`	sample-size-bartlett-v1
`uncertainty.timeBasis.kind`	session-grid
Expected calendar hash `uncertainty.timeBasis.expectedEndsHash`	`f3bf6c88d5dc7164eee8296e1ebd7ab27bbe9380418d4d982c101ef827395c6b`
Block length `uncertainty.blockLength`	7
Replications `uncertainty.repetitions`	1000
Seed `uncertainty.seed`	20261117

Monte Carlo

Observed path	
Field	**Value**
Terminal wealth (multiple) `terminalWealth`	0.9615603
Cumulative return `totalReturn`	-3.84397%
Maximum drawdown magnitude `maximumDrawdown`	7.41075%
Longest stretch below the peak (periods) `longestUnderwaterStreakPeriods`	160
Share of periods below the peak `timeUnderWaterFraction`	88.5196%
Longest losing streak (periods) `longestLosingStreak`	7
Ruin threshold reached `ruined`	No

Circular block bootstrap				
Metric	**Minimum**	**Mean**	**Maximum**	**Quantiles**
Terminal wealth (multiple) `terminalWealth`	0.7772806	0.9632835	1.145109	5% = 0.8565815 · 50% = 0.9663341 · 95% = 1.057477
Cumulative return `totalReturn`	-22.2719%	-3.67165%	14.5109%	5% = -14.3418% · 50% = -3.36659% · 95% = 5.74771%
Maximum drawdown magnitude `maximumDrawdown`	1.09517%	8.31176%	23.6274%	5% = 2.98108% · 50% = 7.50929% · 95% = 16.5564%
Longest stretch below the peak (periods) `longestUnderwaterStreakPeriods`	28	228.018	331	5% = 81.95 · 50% = 242 · 95% = 328
Share of periods below the peak `timeUnderWaterFraction`	50.4532%	89.7468%	100%	5% = 71.6012% · 50% = 91.994% · 95% = 99.3958%
Longest losing streak (periods) `longestLosingStreak`	2	5.421	14	5% = 3 · 50% = 5 · 95% = 8
Probability of reaching the ruin threshold `ruinProbability`		0%		

Return-order permutation				
Metric	**Minimum**	**Mean**	**Maximum**	**Quantiles**
Maximum drawdown magnitude `maximumDrawdown`	4.35925%	7.64599%	12.8912%	5% = 5.37433% · 50% = 7.5411% · 95% = 10.3015%
Longest stretch below the peak (periods) `longestUnderwaterStreakPeriods`	67	254.108	331	5% = 133.95 · 50% = 268 · 95% = 329
Share of periods below the peak `timeUnderWaterFraction`	77.3414%	94.0668%	100%	5% = 85.8006% · 50% = 94.864% · 95% = 99.6979%
Longest losing streak (periods) `longestLosingStreak`	2	3.159	7	5% = 2 · 50% = 3 · 95% = 5
Probability of reaching the ruin threshold `ruinProbability`		0%		

Simulation settings and bindings	
Field	**Value**
`simulationSchemaVersion`	strateva-simulation-evidence/v2
`engineVersion`	0.9.0
`kernelVersion`	1.1.0
`observationCount`	331
`strategyTraceHash`	`c3b3bd9a659f7c1716e8d2ec977484b7fb5e03361cbe6f6c19b9b885be027545`
`contentHash`	`881c7c70b70067fe41e19b714521db89527c5a7208635525a4f315b58ad167d2`
Replications `configuration.repetitions`	1000
Seed `configuration.seed`	20261117
Block length `configuration.blockLength`	7
Initial wealth `configuration.initialWealth`	1
Ruin threshold (share of initial wealth) `configuration.ruinWealthFraction`	50%
`configuration.quantiles`	5% · 50% · 95%
`classic.method`	CIRCULAR_MOVING_BLOCK_BOOTSTRAP
`classic.sampling`	WITH_REPLACEMENT
`permuted.method`	FISHER_YATES_RETURN_ORDER_PERMUTATION
`permuted.sampling`	WITHOUT_REPLACEMENT
Terminal wealth invariant `permuted.terminalWealthInvariant`	Yes
Terminal wealth (multiple) `permuted.terminalWealth`	0.9615603

Provenance and traceability

Evidence and input hashes	
Field	**Value**
`bundleSchemaVersion`	strateva-evidence-bundle/v3

Evidence and input hashes	
Field	**Value**
`artifactId`	`urn:strateva:strategy-trace:c3b3bd9a659f7c1716e8d2ec977484b7fb5e03361cbe6f6c19b9b885be027545`
`engineVersion`	0.9.0
`kernelVersion`	1.1.0
`generatedAt`	2026-11-17T17:05:26Z
`contentHash`	`d5adeb0786f2a1fa0d16e5c4f9468be8b657e9c9dbe0740953d7d592439e1e79`
Strategy return series hash `inputHashes.strategyReturns`	829fd8a0359463342c6726caa2aca33d7ee566a57a2baae204858d8f794a05cd
Benchmark return series hash `inputHashes.benchmarkReturns`	N/A
`lineage`	strategyTrace:c3b3bd9a659f7c1716e8d2ec977484b7fb5e03361cbe6f6c19b9b885be027545 · scope:833fa6825ab7fdda9c4f220ec1cb8c66ab9cbf71f49f2b4cc0daf38eb79cede3 · artifact:ff48fc80f19f9dbdf429878863d042eeff8d2e1d19525c22c17e2a47fa500630 · data:ecb1495f6fbcdff9b13d3c71d68c2ffa651e95588733c9e284f2bd43eaec6a57

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

Evidence signature · No evidence supplied.

StrategyTrace · Identity, frequency, conventions and benchmark	
Field	**Value**
`traceSchemaVersion`	strateva-strategy-trace/v1
`engagementId`	eng-6167c69e
`runId`	simple-moving-average-crossover-evidence
`generatedAt`	2026-11-17T17:05:26Z
`scopeContentHash`	`833fa6825ab7fdda9c4f220ec1cb8c66ab9cbf71f49f2b4cc0daf38eb79cede3`
`artifactContentHash`	`ff48fc80f19f9dbdf429878863d042eeff8d2e1d19525c22c17e2a47fa500630`
`dataContentHash`	`ecb1495f6fbcdff9b13d3c71d68c2ffa651e95588733c9e284f2bd43eaec6a57`
`frequency.barInterval`	1d
Periods per year `frequency.periodsPerYear`	252
`frequency.calendar`	NYSE
`frequency.sourceTimezone`	America/New_York

StrategyTrace · Identity, frequency, conventions and benchmark	
Field	**Value**
`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`	NONE
`benchmark.symbol`	N/A
`contentHash`	`c3b3bd9a659f7c1716e8d2ec977484b7fb5e03361cbe6f6c19b9b885be027545`

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.