DCC-GARCH minimum variance with prior fitting

Counterfactual · **Nivel de evidencia** Histórico · Development · Sample 2020-01-06 14:30:00+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. 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`	1256	1256
Periods per year `annualization`	252	252
Annual risk-free rate `risk_free_annual`	0%	0%
Cumulative return `total_return`	253.059%	511.38%
Annualized compound return (CAGR) `cagr`	28.8007%	43.8014%
Annualized arithmetic return `annual_return_arithmetic`	29.7168%	41.9709%
Annualized volatility `annual_volatility`	29.6226%	33.4787%
Sharpe `sharpe`	1.00318	1.253658
Sortino `sortino`	1.447368	1.800323
Maximum drawdown `max_drawdown`	-49.5745%	-49.4699%
Periods to the maximum drawdown trough `max_drawdown_underwater_periods`	225	282
Periods from the previous peak to recovery `max_drawdown_recovery_periods`	400	410
Calmar `calmar`	0.5809583	0.8854154
Share of positive periods `positive_period_rate`	55.7325%	56.6083%
Alias for the share of positive periods `hit_rate`	55.7325%	56.6083%

Absolute performance · Strategy and benchmark		
Metric	**Strategy**	**Benchmark**
Skewness `skewness`	-0.1827213	-0.2820137
Excess kurtosis `excess_kurtosis`	4.937747	2.254697

Active performance · Strategy versus benchmark	
Field	**Value**
Observations `n_obs`	1256
Periods per year `annualization`	252
Annual risk-free rate `risk_free_annual`	0%
Annualized active return `active_return_annual`	-12.2541%
Annualized tracking error `tracking_error_annual`	18.5379%
Information ratio `information_ratio`	-0.6610314
Correlation with the benchmark `correlation`	0.8342371
Beta `beta`	0.7381479
Annualized regression alpha `regression_alpha_annual`	-1.26395%
Annualized Jensen alpha `jensen_alpha_annual`	-1.26395%
Strategy Sharpe ratio `strategy_sharpe`	1.00318
Benchmark Sharpe ratio `benchmark_sharpe`	1.253658

Statistical uncertainty

Strategy · Mean excess return · HAC	
Field	**Value**
Status `status`	evaluated
Observations `n_obs`	1256
Lags `lags`	7
Weighting kernel `kernel`	bartlett
Estimate per period `estimate`	0.117924%
Annualized estimate `annualized_estimate`	29.7168%
Standard error `standard_error`	0.0502371%
Annualized standard error `annualized_standard_error`	12.6597%

Strategy · Mean excess return · HAC	
Field	**Value**
t-statistic `t_stat`	2.347345
Two-sided p-value (normal) `p_value_two_sided_normal`	0.01890773

Strategy · Sharpe ratio interval · block bootstrap	
Field	**Value**
Observations `n_obs`	1256
Block length `block_length`	11
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
Replications with no defined estimate `undefined_repetitions`	0
Status `status`	evaluated
Point estimate `point_estimate`	1.00318
Standard error `standard_error`	0.4586093
Lower interval bound `ci_lower`	0.05613653
Upper interval bound `ci_upper`	1.891433

Benchmark · No uncertainty estimate supplied.

Active performance · Mean active return · HAC	
Field	**Value**
Status `status`	evaluated
Observations `n_obs`	1256
Lags `lags`	7
Weighting kernel `kernel`	bartlett
Estimate per period `estimate`	-0.0486275%

Active performance · Mean active return · HAC	
Field	**Value**
Annualized estimate `annualized_estimate`	-12.2541%
Standard error `standard_error`	0.0318463%
Annualized standard error `annualized_standard_error`	8.02526%
t-statistic `t_stat`	-1.526944
Two-sided p-value (normal) `p_value_two_sided_normal`	0.1267749

Active performance · Information ratio interval · block bootstrap	
Field	**Value**
Observations `n_obs`	1256
Block length `block_length`	11
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
Replications with no defined estimate `undefined_repetitions`	0
Status `status`	evaluated
Point estimate `point_estimate`	-0.6610314
Standard error `standard_error`	0.4327018
Lower interval bound `ci_lower`	-1.448611
Upper interval bound `ci_upper`	0.2120924

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**
Periods per year `annualization`	252
Annualization method `annualizationMethod`	declared by StrategyTrace.frequency.periodsPerYear
Annual risk-free rate `riskFreeAnnual`	0%
`allowPositional`	No
`timezone`	UTC
`calendar`	XNYS
Confidence level `uncertainty.confidence`	95%
`uncertainty.hacLagPolicy.kind`	sample-size-bartlett-v1
`uncertainty.timeBasis.kind`	session-grid
Expected calendar hash `uncertainty.timeBasis.expectedEndsHash`	`7267e99724086a126ad7007f1af3b6ac4b5a15d26393f8d01a0227047049cccb`
Block length `uncertainty.blockLength`	11
Replications `uncertainty.repetitions`	1000
Seed `uncertainty.seed`	20261117

Monte Carlo

Observed path

Field	Value
Terminal wealth (multiple) `terminalWealth`	3.530586
Cumulative return `totalReturn`	253.059%
Maximum drawdown magnitude `maximumDrawdown`	49.5745%
Longest stretch below the peak (periods) `longestUnderwaterStreakPeriods`	399
Share of periods below the peak `timeUnderWaterFraction`	88.1369%
Longest losing streak (periods) `longestLosingStreak`	7
Ruin threshold reached `ruined`	No

Circular block bootstrap

Metric	Minimum	Mean	Maximum	Quantiles
Terminal wealth (multiple) `terminalWealth`	0.3917381	4.466666	34.10835	5% = 1.236787 · 50% = 3.583875 · 95% = 10.19342
Cumulative return `totalReturn`	-60.8262%	346.667%	3310.84%	5% = 23.6787% · 50% = 258.388% · 95% = 919.342%
Maximum drawdown magnitude `maximumDrawdown`	13.1392%	37.372%	80.1212%	5% = 23.6164% · 50% = 36.1429% · 95% = 55.0327%
Longest stretch below the peak (periods) `longestUnderwaterStreakPeriods`	66	375.45	1256	5% = 141 · 50% = 323 · 95% = 783.1
Share of periods below the peak `timeUnderWaterFraction`	77.707%	89.7588%	100%	5% = 82.7229% · 50% = 90.0478% · 95% = 96.0231%
Longest losing streak (periods) `longestLosingStreak`	5	7.443	13	5% = 6 · 50% = 7 · 95% = 9
Probability of reaching the ruin threshold `ruinProbability`		1.7%		

Return-order permutation

Metric	Minimum	Mean	Maximum	Quantiles
Maximum drawdown magnitude `maximumDrawdown`	18.9234%	35.9985%	61.2022%	5% = 25.9124% · 50% = 35.2365% · 95% = 48.7922%
Longest stretch below the peak (periods) `longestUnderwaterStreakPeriods`	114	354.719	892	5% = 182 · 50% = 331 · 95% = 624
Share of periods below the peak `timeUnderWaterFraction`	87.1815%	91.1143%	93.7898%	5% = 89.2516% · 50% = 91.242% · 95% = 92.6752%
Longest losing streak (periods) `longestLosingStreak`	5	8.291	21	5% = 6 · 50% = 8 · 95% = 11
Probability of reaching the ruin threshold `ruinProbability`		0.2%		

Simulation settings and bindings

Field	Value
`simulationSchemaVersion`	strateva-simulation-evidence/v2
`engineVersion`	0.9.0

Simulation settings and bindings	
Field	**Value**
`kernelVersion`	1.1.0
`observationCount`	1256
`strategyTraceHash`	`d3461488eb0f66dffb01fb32846ab224ba733cc8839ee6da676c43aaaee7516a`
`contentHash`	`9279629e7b6c0ff465af744cdf6d2e99ec3b58218a5b63ba517d6dabdcce9e68`
Replications `configuration.repetitions`	1000
Seed `configuration.seed`	20261117
Block length `configuration.blockLength`	11
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`	3.530586

Provenance and traceability

Evidence and input hashes	
Field	**Value**
`bundleSchemaVersion`	strateva-evidence-bundle/v3
`artifactId`	`urn:strateva:strategy-trace:d3461488eb0f66dffb01fb32846ab224ba733cc8839ee6da676c43aaaee7516a`
`engineVersion`	0.9.0
`kernelVersion`	1.1.0
`generatedAt`	2026-11-17T18:25:44Z
`contentHash`	`1384c79a7c3217ed82ef69c4c0cadfbbb0dd23d55d9d9c081dfec3b7982417a9`
Strategy return series hash `inputHashes.strategyReturns`	f59b005bb4aab7f259c70d7a7cd86a077d2c55f4adfcbc6f1340aed92aeed3dd
Benchmark return series hash `inputHashes.benchmarkReturns`	58267292c02371365a982abe6647f111c7f4af6e72f33fba450942d3d4094c17

Evidence and input hashes	
Field	**Value**
`lineage`	strategyTrace:d3461488eb0f66dffb01fb32846ab224ba733cc8839ee6da676c43aaaee7516a · scope:8c492d96f7576162ce53868e9cb4c06183bc629da29e3ed1e0a0fec834e877c7 · artifact:a6e527675a0c22a01c30565bcd7ba77089337199273feef425e57044c866fc44 · data:aef357cc9aa63419fd0696839f6aaea9112cb61c4a2964e80ed3a82f08200525

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-b35eda44
`runId`	dcc-garch-chronological-development
`generatedAt`	2026-11-17T18:25:44Z
`scopeContentHash`	`8c492d96f7576162ce53868e9cb4c06183bc629da29e3ed1e0a0fec834e877c7`
`artifactContentHash`	`a6e527675a0c22a01c30565bcd7ba77089337199273feef425e57044c866fc44`
`dataContentHash`	`aef357cc9aa63419fd0696839f6aaea9112cb61c4a2964e80ed3a82f08200525`
`frequency.barInterval`	1d
Periods per year `frequency.periodsPerYear`	252
`frequency.calendar`	XNYS
`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`	MAG7-EW
`contentHash`	`d3461488eb0f66dffb01fb32846ab224ba733cc8839ee6da676c43aaaee7516a`

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.