TEMA crossover on Tesla

> **Strategy evaluated** · **Nivel de evidencia** Histórico · Development · Sample 2013-01-03 14:30:00+00:00 to 2018-12-31 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`	1509	1509
Periods per year `annualization`	252	252
Annual risk-free rate `risk_free_annual`	0%	0%
Cumulative return `total_return`	-72.454%	37.2073%
Annualized compound return (CAGR) `cagr`	-19.3711%	5.42454%
Annualized arithmetic return `annual_return_arithmetic`	-8.06096%	6.81981%
Annualized volatility `annual_volatility`	51.8395%	17.5111%
Sharpe `sharpe`	-0.1554984	0.389457
Sortino `sortino`	-0.2196725	0.5454104
Maximum drawdown `max_drawdown`	-90.1873%	-21.1862%
Periods to the maximum drawdown trough `max_drawdown_underwater_periods`	1363	185
Periods from the previous peak to recovery `max_drawdown_recovery_periods`	N/A	444
Calmar `calmar`	-0.2147872	0.2560409
Share of positive periods `positive_period_rate`	49.9006%	51.7561%
Alias for the share of positive periods `hit_rate`	49.9006%	51.7561%

Absolute performance · Strategy and benchmark		
Metric	**Strategy**	**Benchmark**
Skewness `skewness`	0.1039149	-0.3761469
Excess kurtosis `excess_kurtosis`	5.819087	5.346668

Active performance · Strategy versus benchmark	
Field	**Value**
Observations `n_obs`	1509
Periods per year `annualization`	252
Annual risk-free rate `risk_free_annual`	0%
Annualized active return `active_return_annual`	-14.8808%
Annualized tracking error `tracking_error_annual`	54.9436%
Information ratio `information_ratio`	-0.2708373
Correlation with the benchmark `correlation`	-0.01367412
Beta `beta`	-0.04048064
Annualized regression alpha `regression_alpha_annual`	-7.78489%
Annualized Jensen alpha `jensen_alpha_annual`	-7.78489%
Strategy Sharpe ratio `strategy_sharpe`	-0.1554984
Benchmark Sharpe ratio `benchmark_sharpe`	0.389457

Statistical uncertainty

Strategy · Mean excess return · HAC	
Field	**Value**
Status `status`	evaluated
Observations `n_obs`	1509
Lags `lags`	7
Weighting kernel `kernel`	bartlett
Estimate per period `estimate`	-0.0319879%
Annualized estimate `annualized_estimate`	-8.06096%
Standard error `standard_error`	0.0865074%
Annualized standard error `annualized_standard_error`	21.7999%

Strategy · Mean excess return · HAC	
Field	**Value**
t-statistic `t_stat`	-0.3697711
Two-sided p-value (normal) `p_value_two_sided_normal`	0.7115531

Strategy · Sharpe ratio interval · block bootstrap	
Field	**Value**
Observations `n_obs`	1509
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`	-0.1554984
Standard error `standard_error`	0.4310334
Lower interval bound `ci_lower`	-1.009776
Upper interval bound `ci_upper`	0.6972148

Benchmark · No uncertainty estimate supplied.

Active performance · Mean active return · HAC	
Field	**Value**
Status `status`	evaluated
Observations `n_obs`	1509
Lags `lags`	7
Weighting kernel `kernel`	bartlett
Estimate per period `estimate`	-0.0590507%

Active performance · Mean active return · HAC	
Field	**Value**
Annualized estimate `annualized_estimate`	-14.8808%
Standard error `standard_error`	0.0886772%
Annualized standard error `annualized_standard_error`	22.3467%
t-statistic `t_stat`	-0.6659059
Two-sided p-value (normal) `p_value_two_sided_normal`	0.5054712

Active performance · Information ratio interval · block bootstrap	
Field	**Value**
Observations `n_obs`	1509
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`	-0.2708373
Standard error `standard_error`	0.4143877
Lower interval bound `ci_lower`	-1.102063
Upper interval bound `ci_upper`	0.5533243

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`	`3e0132cdc6f07e927a231f07812fe3dca80f58055def6d1a27e759404620db1b`
Block length `uncertainty.blockLength`	11
Replications `uncertainty.repetitions`	1000
Seed `uncertainty.seed`	20261117

Monte Carlo

Observed path

Field	Value
Terminal wealth (multiple) `terminalWealth`	0.2754601
Cumulative return `totalReturn`	-72.454%
Maximum drawdown magnitude `maximumDrawdown`	90.1873%
Longest stretch below the peak (periods) `longestUnderwaterStreakPeriods`	1408
Share of periods below the peak `timeUnderWaterFraction`	98.3433%
Longest losing streak (periods) `longestLosingStreak`	10
Ruin threshold reached `ruined`	Yes

Circular block bootstrap

Metric	Minimum	Mean	Maximum	Quantiles
Terminal wealth (multiple) `terminalWealth`	0.003379658	0.6212338	9.364277	5% = 0.03079973 · 50% = 0.2593479 · 95% = 2.703902
Cumulative return `totalReturn`	-99.662%	-37.8766%	836.428%	5% = -96.92% · 50% = -74.0652% · 95% = 170.39%
Maximum drawdown magnitude `maximumDrawdown`	42.1592%	85.4427%	99.7039%	5% = 62.9475% · 50% = 88.6925% · 95% = 98.0793%
Longest stretch below the peak (periods) `longestUnderwaterStreakPeriods`	177	1186.275	1509	5% = 562 · 50% = 1316 · 95% = 1508
Share of periods below the peak `timeUnderWaterFraction`	91.9152%	98.5127%	100%	5% = 95.56% · 50% = 98.9397% · 95% = 99.9337%
Longest losing streak (periods) `longestLosingStreak`	6	9.706	16	5% = 7 · 50% = 9 · 95% = 13
Probability of reaching the ruin threshold `ruinProbability`		85.1%		

Return-order permutation

Metric	Minimum	Mean	Maximum	Quantiles
Maximum drawdown magnitude `maximumDrawdown`	72.7903%	86.4561%	96.9681%	5% = 78.1362% · 50% = 86.7142% · 95% = 93.7241%
Longest stretch below the peak (periods) `longestUnderwaterStreakPeriods`	420	1265.342	1509	5% = 746.9 · 50% = 1363.5 · 95% = 1508
Share of periods below the peak `timeUnderWaterFraction`	95.0961%	98.8437%	100%	5% = 97.0179% · 50% = 99.0722% · 95% = 99.9337%
Longest losing streak (periods) `longestLosingStreak`	6	9.714	18	5% = 7 · 50% = 10 · 95% = 13
Probability of reaching the ruin threshold `ruinProbability`		100%		

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`	1509
`strategyTraceHash`	`7f5d647b6f00fa855603f88371b280b133d0b4616f67d30c8d2ea4fdadb33e2c`
`contentHash`	`8622a878e07f1d80ea0daf39a7a173bd4458ee70b6af59a598db0d1cae48ab13`
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`	0.2754601

Provenance and traceability

Evidence and input hashes	
Field	**Value**
`bundleSchemaVersion`	strateva-evidence-bundle/v3
`artifactId`	`urn:strateva:strategy-trace:7f5d647b6f00fa855603f88371b280b133d0b4616f67d30c8d2ea4fdadb33e2c`
`engineVersion`	0.9.0
`kernelVersion`	1.1.0
`generatedAt`	2026-11-17T15:48:23Z
`contentHash`	`0f0c743240992df6e3e1498679343d34ff8e57d0636fc92357b7072b476301bc`
Strategy return series hash `inputHashes.strategyReturns`	5ae2b73b3d2e2198321fdb84db78c8a84987d28d76ff74a635525c4acdc03f80
Benchmark return series hash `inputHashes.benchmarkReturns`	2001e579a2d71e7c9da9ec34e5aa3b66a483e1ff147f12c345d788ac5f7140d0

Evidence and input hashes	
Field	**Value**
`lineage`	strategyTrace:7f5d647b6f00fa855603f88371b280b133d0b4616f67d30c8d2ea4fdadb33e2c · scope:059b03ea18ddc2839dd358445fd0134d388631ca3447163d65f62f4a2ba698d4 · artifact:e418e1ae2ce759ef4a8e54aeabf4bbbf4b8a0b0ea2e62df0762b209421568b29 · data:7e026319550856f181013e1f1737b77091be085e5f95f3f65f29f6de1c0020f1

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-e418e1ae
`runId`	tema-crossover-development
`generatedAt`	2026-11-17T15:48:23Z
`scopeContentHash`	`059b03ea18ddc2839dd358445fd0134d388631ca3447163d65f62f4a2ba698d4`
`artifactContentHash`	`e418e1ae2ce759ef4a8e54aeabf4bbbf4b8a0b0ea2e62df0762b209421568b29`
`dataContentHash`	`7e026319550856f181013e1f1737b77091be085e5f95f3f65f29f6de1c0020f1`
`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`	URTH
`contentHash`	`7f5d647b6f00fa855603f88371b280b133d0b4616f67d30c8d2ea4fdadb33e2c`

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.