UChicago FinMath
Project Lab – Exponential Tech

Deception And Truth
Data Research

EXPONENTIAL

Sebastian, Aria

2024.08.29

Outline

1. Data Processing
2. Strategy Execution
3. Back-Testing

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Data Processing

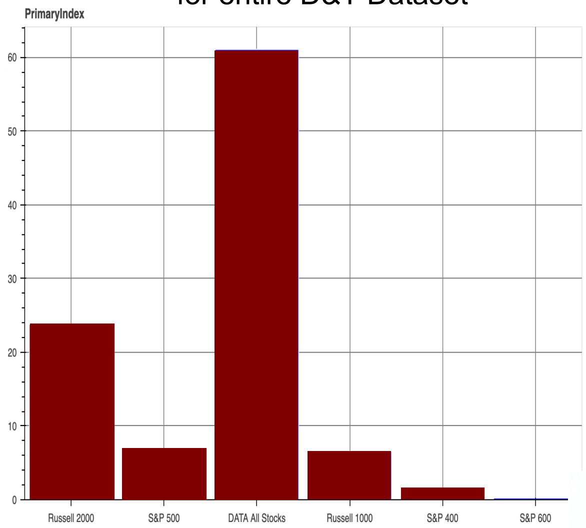
- D&T Data:

- Exclude all records for fiscal years before 2008
- Remove earnings filing revisions
- Exclude filings after 2022

- EOD OCHLV Data:

- adjusted for dividends and splits
- Source: Nasdaq Data Link

Distribution of primary stock index
for entire D&T Dataset



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Strategy Execution

Entry Criteria

lookback & cross-sectional percentile ranking

Exceed cutoff threshold & match filing date

Exit Criteria

fixed holding period

falls below cutoffs/surpasses lookback period

Portfolio Weighting

Equal-weighted, rebalanced monthly

Backtest Settings

- Primary Index

- Scoring Source
- Lookback Period

- Holding Days
- Cutoff Threshold

- Execution Lag
- Dollar Neutral

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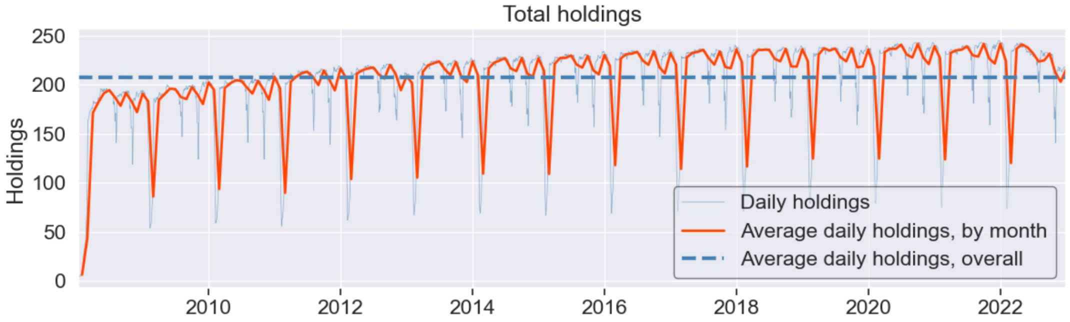
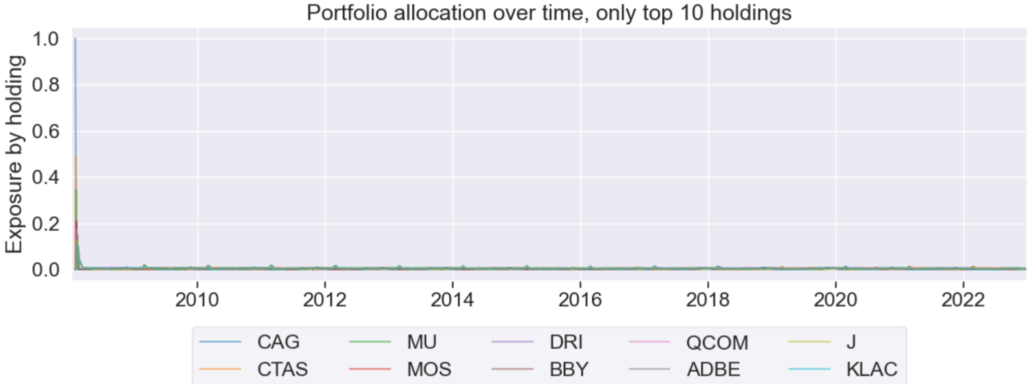
Strategy Execution



Avg holdings by month using rebalance rule



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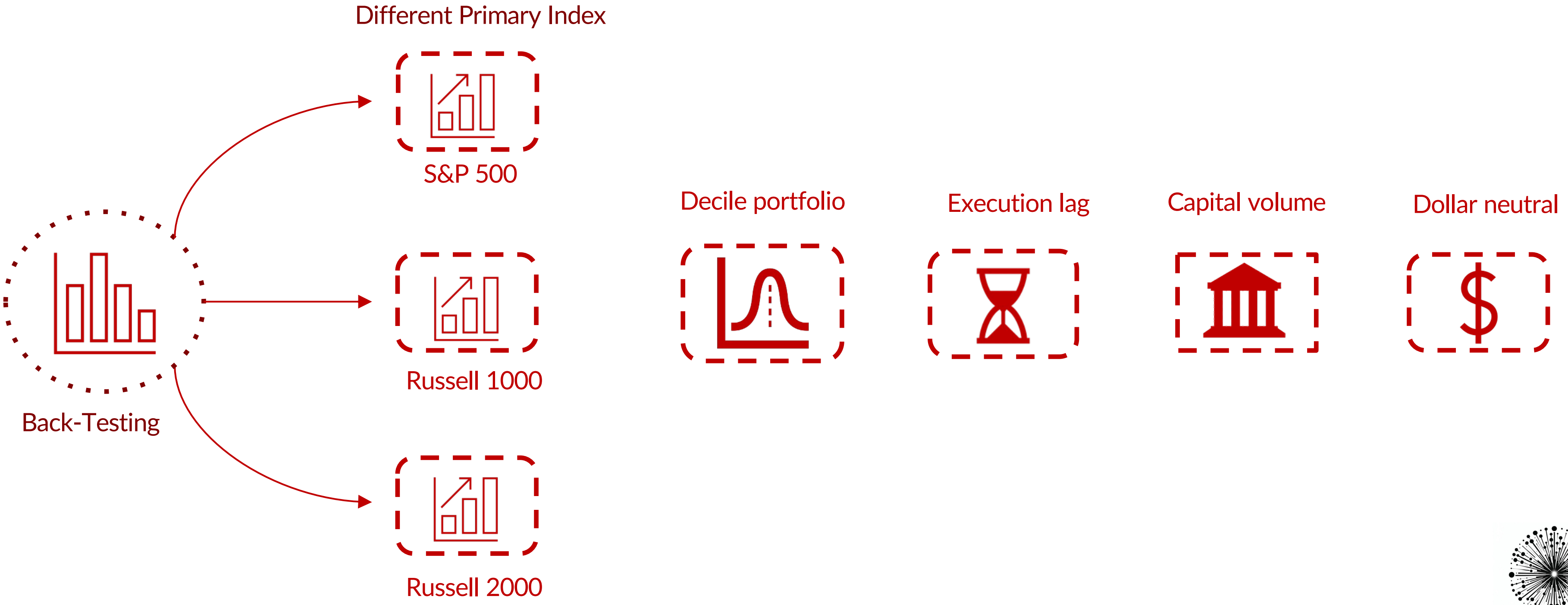
Back-Testing



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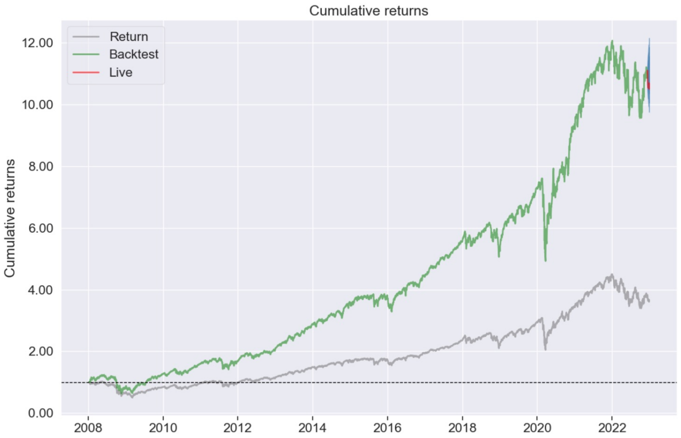
The 250 most truthful companies (according to D.A.T.A Factors) in the S&P 500 and rebalancing daily outperformed the S&P 500 from 2008 through 2023.

Backtest Settings

- Primary Index: S&P 500
- Scoring Source: mdna
- Lookback Period: 60
- Holding Days: 80
- Cutoff Threshold: [0.5,0.5]
- Execution Lag: 0
- Dollar Neutral: False

Net Performance Metrics

Annualized Return	17.63%
Cumulative Return	265.86%
Cumulative Long Return	265.86%
Cumulative Short Return	0.0%
Daily Standard Deviation	0.015
Annualized Sharpe Ratio	0.74
Annualized Sortino Ratio	0.94
Max Drawdown	58.43%
Beta Exposure	1.03
Idiosyncratic Return	86.29%
Daily Turnover Ratio	2.2%
Edge($) Per Share	0.22



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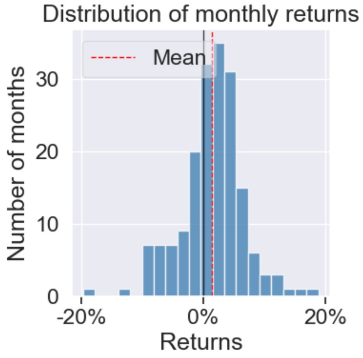
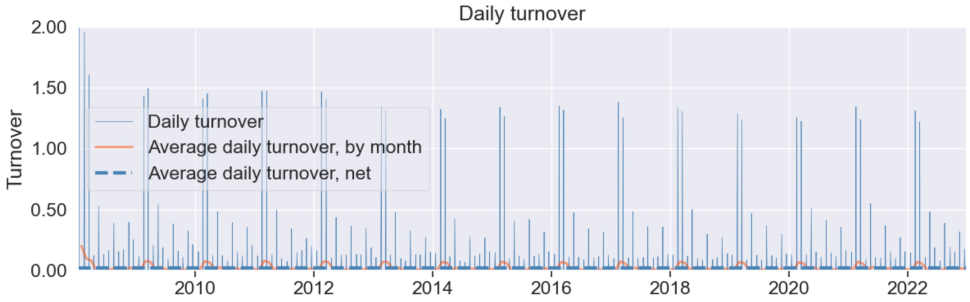
Start date	2008-01-10
End date	2022-12-30
Annual return	17.343%
Cumulative returns	985.275%
Annual volatility	22.578%
Sharpe ratio	0.82
Stability	0.98
Max drawdown	-48.993%
Sortino ratio	1.17
Skew	-0.24
Kurtosis	9.73
Tail ratio	0.93
Daily value at risk	-2.771%
Gross leverage	0.98
Daily turnover	1.958%
Alpha	0.07
Beta	1.04
Avg duration	154 days
Total number of round_trips	20645.00
Win ratio	0.75



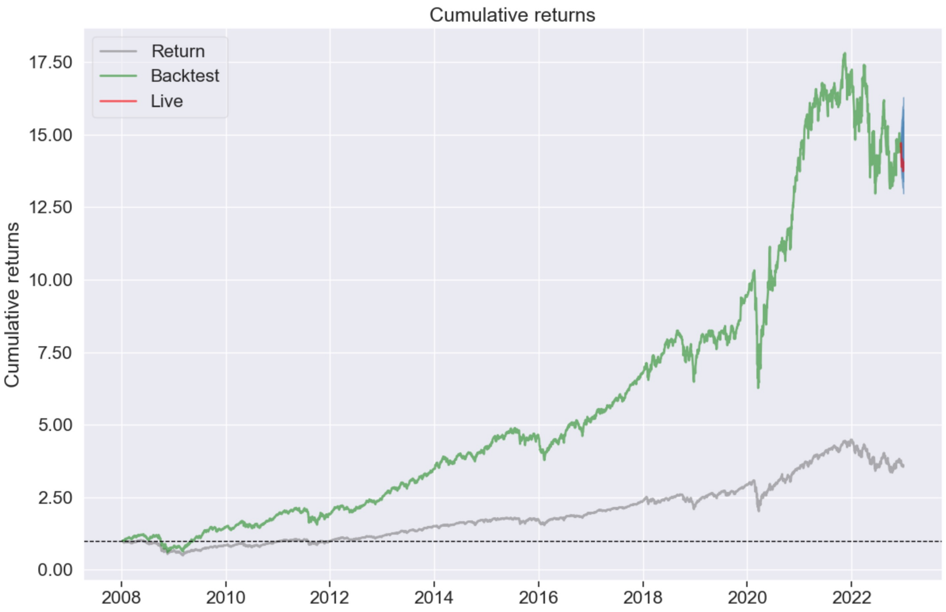


EXPONENTIAL

The 250 most truthful companies (according to D.A.T.A Factors) in the Russell 1000 and rebalancing daily outperformed the Russell 1000 from 2008 through 2023.

Backtest Settings

- Primary Index: Russell 1000
- Scoring Source: mdna
- Lookback Period: 60
- Holding Days: 80
- Cutoff Threshold: [0.25,0.75]
- Execution Lag: 0
- Dollar Neutral: False



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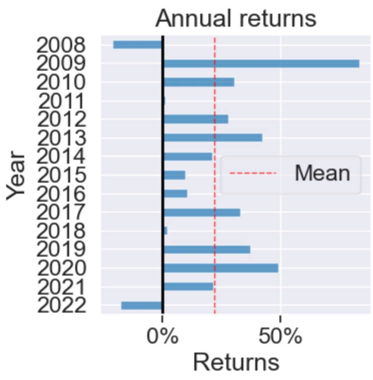
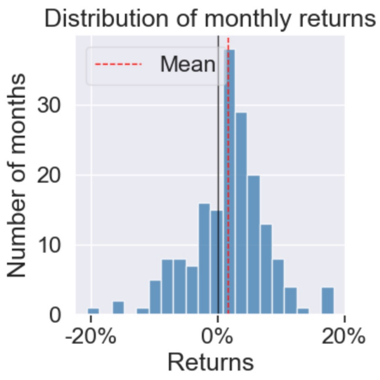
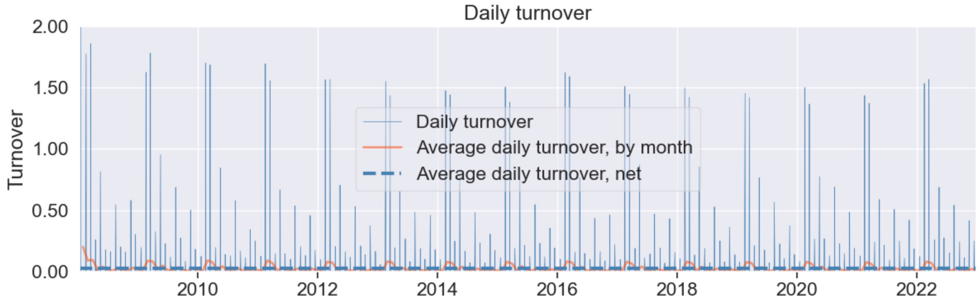
Start date	2008-01-10
End date	2022-12-30
Annual return	19.622%
Cumulative returns	1345.66%
Annual volatility	24.633%
Sharpe ratio	0.85
Stability	0.98
Max drawdown	-50.906%
Sortino ratio	1.21
Skew	-0.40
Kurtosis	8.16
Tail ratio	1.00
Daily value at risk	-3.02%
Gross leverage	0.95
Daily turnover	2.428%
Alpha	0.10
Beta	1.08
Avg duration	136 days
Total number of round_trips	8087.00
Win ratio	0.69





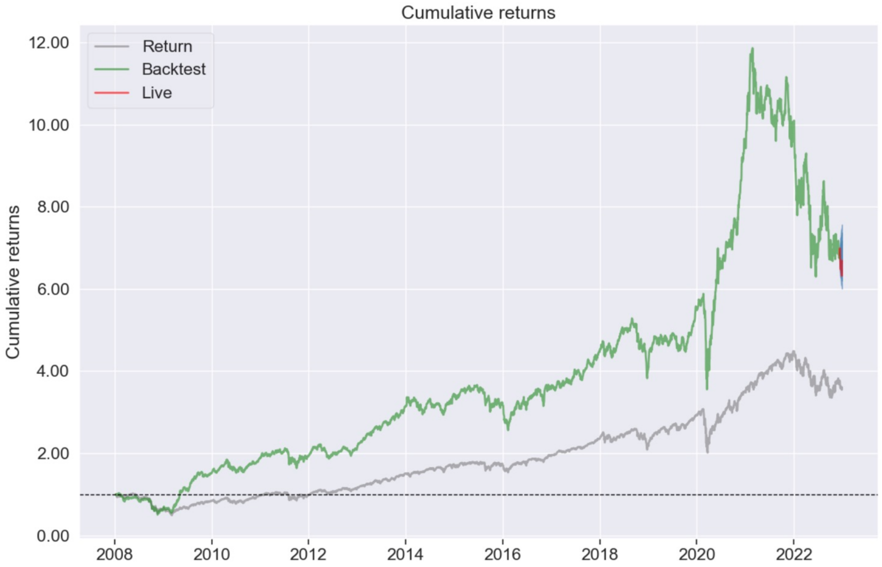


EXPONENTIAL

The 200 most truthful companies (according to D.A.T.A Factors) in the Russell 2000 and rebalancing daily outperformed the Russell 2000 from 2008 through 2023.

Backtest Settings

- Primary Index: Russell 2000
- Scoring Source: mdna
- Lookback Period: 60
- Holding Days: 80
- Cutoff Threshold: [0.875,0125]
- Execution Lag: 0
- Dollar Neutral: False



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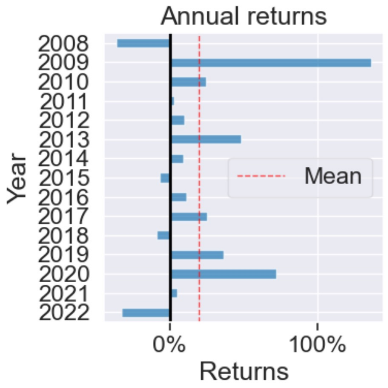
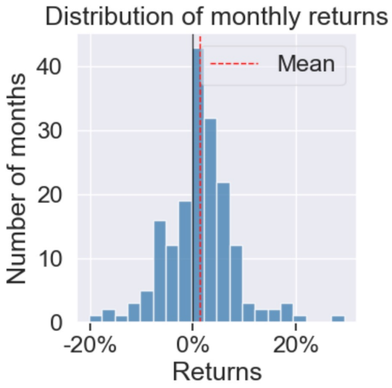
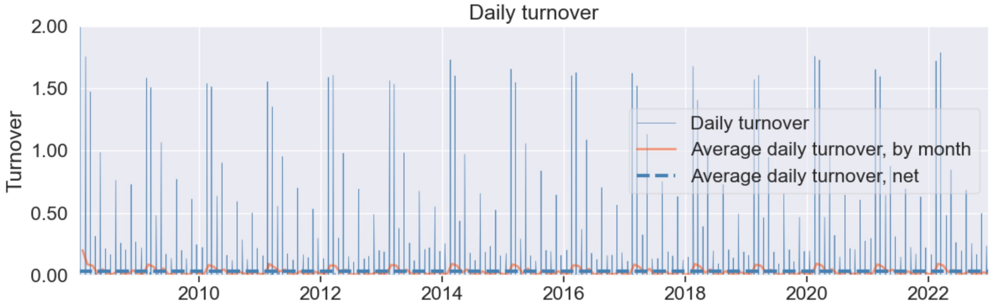
Start date	2008-01-10
End date	2022-12-30
Annual return	13.66%
Cumulative returns	574.6%
Annual volatility	24.045%
Sharpe ratio	0.65
Calmar ratio	0.27
Stability	0.92
Max drawdown	-51.005%
Omega ratio	1.13
Sortino ratio	0.93
Skew	-0.33
Kurtosis	6.41
Tail ratio	1.00
Daily value at risk	-2.967%
Gross leverage	0.90
Daily turnover	2.866%
Alpha	0.05
Beta	0.96
Avg duration	121 days
Total number of round_trips	12466.00
Win ratio	0.61







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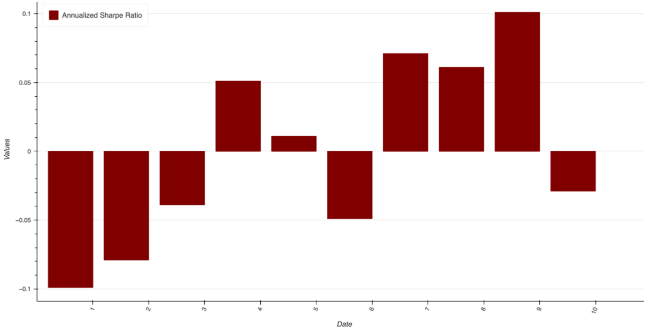
Increasing decile portfolio Sharpe ratio and annualized return demonstrate the effectiveness of the score (S&P500)

S&P500	0.0-0.1	0.1-0.2	0.2-0.3	0.3-0.4	0.4-0.5	0.5-0.6	0.6-0.7	0.7-0.8	0.8-0.9	0.9-1.0
Annualized Return	12.29%	12.94%	14.00%	16.18%	15.25%	13.84%	16.43%	16.72%	18.25%	15.86%
Cumulative Return	462.77%	513.67%	610%	835.68%	729.28%	590.46%	865.83%	902.12%	1116.95%	797.82%
Annualized Volatility	21.83%	22.05%	22.50%	21.91%	22.05%	22.25%	21.70%	22.49%	23.00%	24.98%
Annualized Sharpe Ratio	0.64	0.66	0.7	0.79	0.75	0.69	0.81	0.8	0.84	0.71
Annualized Sortino Ratio	0.91	0.94	0.99	1.14	1.08	0.98	1.16	1.13	1.2	1.01
Max Drawdown	-49.33%	-51.60%	-50.91%	-49.91%	-44.09%	-50.81%	-49.70%	-44.35%	-50.13%	-56.45%
Beta Exposure	1	1	1	1	1.01	1.01	0.99	1.02	1.04	1.11



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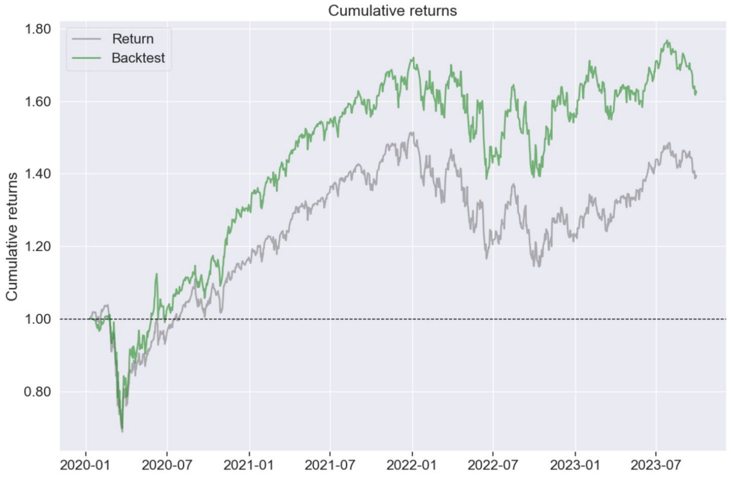
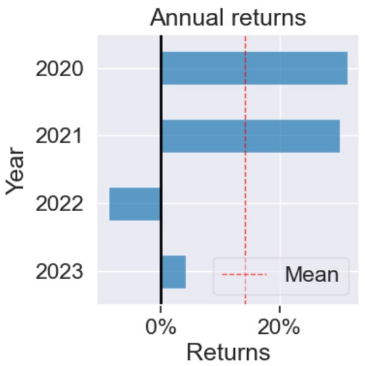
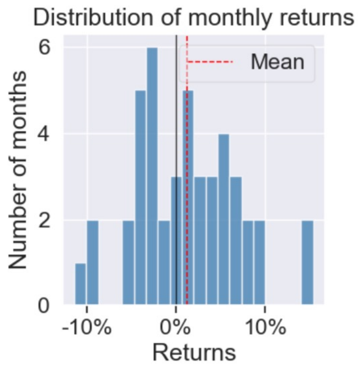
Start date	2020-01-10
End date	2023-09-29
Annual return	13.925%
Cumulative returns	62.377%
Annual volatility	24.317%
Sharpe ratio	0.66
Calmar ratio	0.45
Stability	0.68
Max drawdown	-30.947%
Omega ratio	1.13
Sortino ratio	0.94
Skew	-0.26
Kurtosis	10.60
Tail ratio	0.99
Daily value at risk	-3.0%
Gross leverage	1.00
Daily turnover	2.741%
Avg duration	113 days
Total number of round_trips	3395
Win ratio	0.69

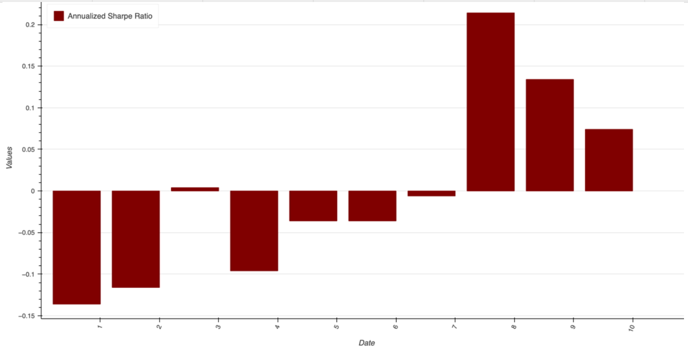






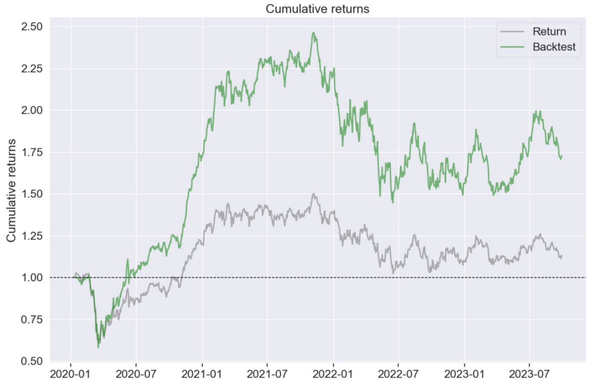
Increasing decile portfolio Sharpe ratio and annualized return demonstrate the effectiveness of the score (Russell 1000)

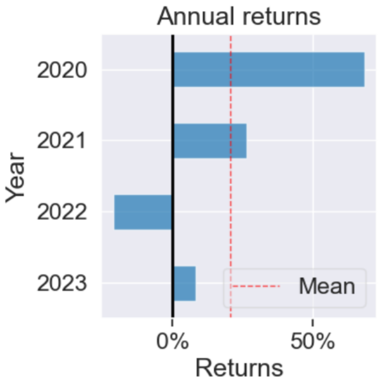
S&P500	0.0-0.1	0.1-0.2	0.2-0.3	0.3-0.4	0.4-0.5	0.5-0.6	0.6-0.7	0.7-0.8	0.8-0.9	0.9-1.0
Annualized Return	11.84%	12.36%	16.27%	12.99%	15.50%	15.19%	0.15767	21.86%	20.77%	17.62%
Cumulative Return	430.39%	468.58%	846.03%	517.46%	757.23%	723.62%	787.09%	1805.63%	1566.19%	1024.03%
Annualized Volatility	25.73%	25.69%	26.72%	26.35%	27.49%	27.21%	26.37%	25.13%	27.04%	25.07%
Annualized Sharpe Ratio	0.56	0.58	0.7	0.6	0.66	0.66	0.69	0.91	0.83	0.77
Annualized Sortino Ratio	0.79	0.83	1	0.84	0.97	0.94	0.98	1.31	1.2	1.12
Max Drawdown	-63.79%	-56.18%	-51.79%	-50.75%	-54.68%	-58.75%	-56.66%	-43.20%	-53.98%	-54.80%
Beta Exposure	1.13	1.14	1.16	1.16	1.09	1.16	1.14	1.09	1.14	1.02

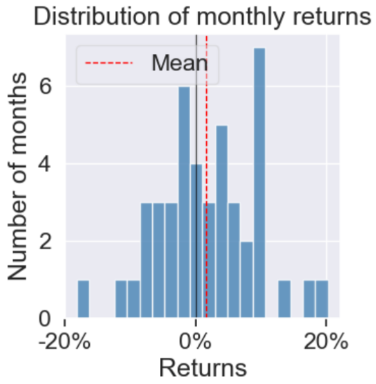


EXPONENTIAL

Start date	2020-01-10
End date	2023-09-29
Annual return	17.368%
Cumulative returns	81.387%
Annual volatility	29.477%
Sharpe ratio	0.69
Calmar ratio	0.43
Stability	0.43
Max drawdown	-40.774%
Omega ratio	1.14
Sortino ratio	0.99
Skew	-0.32
Kurtosis	8.02
Tail ratio	1.10
Daily value at risk	-3.633%
Gross leverage	1.00
Daily turnover	2.576%
Avg duration	129 days
Total number of round_trips	3260
Win ratio	0.64

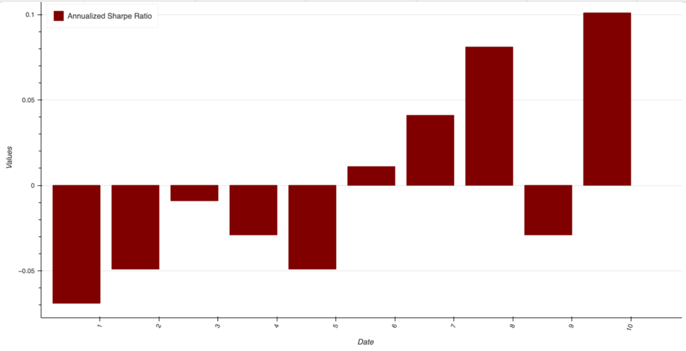






Increasing decile portfolio Sharpe ratio and annualized return demonstrate the effectiveness of the score (Russell 2000)

S&P500	0.0-0.1	0.1-0.2	0.2-0.3	0.3-0.4	0.4-0.5	0.5-0.6	0.6-0.7	0.7-0.8	0.8-0.9	0.9-1.0
Annualized Return	9.67%	10.36%	11.49%	11.22%	10.70%	11.96%	13.96%	16.85%	11.36%	13.99%
Cumulative Return	296.03%	334.78%	406.19%	388.36%	354.98%	438.56%	601.32%	919.24%	397.02%	604.56%
Annualized Volatility	24.54%	25.05%	25.14%	25.60%	25.73%	24.97%	27.88%	30.33%	26.20%	23.91%
Annualized Sharpe Ratio	0.5	0.52	0.56	0.54	0.52	0.58	0.61	0.65	0.54	0.67
Annualized Sortino Ratio	0.71	0.74	0.81	0.78	0.74	0.82	0.92	1.08	0.77	0.93
Max Drawdown	-52.05%	-50.97%	-47.67%	-51.85%	-57.08%	-46.91%	-53.73%	-58.37%	-50.76%	-47.12%
Beta Exposure	1.02	1.04	1.04	1.07	1.08	1.04	1.08	1.05	1.07	0.94



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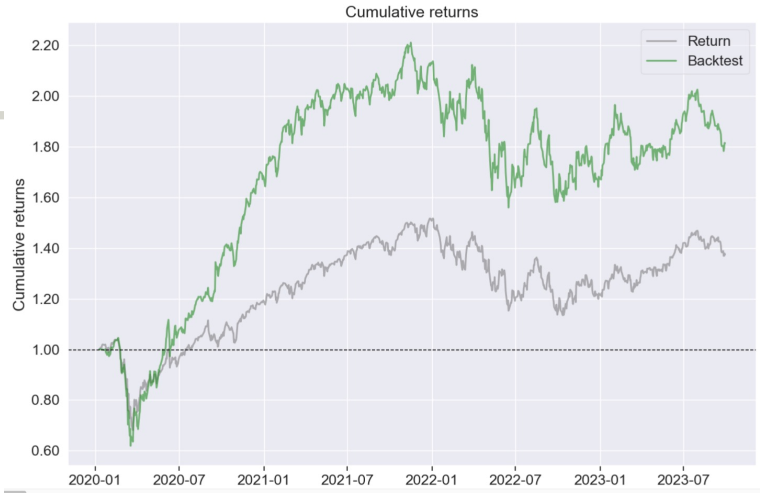
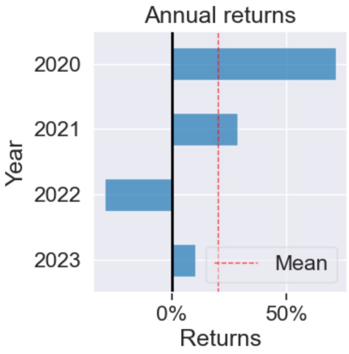
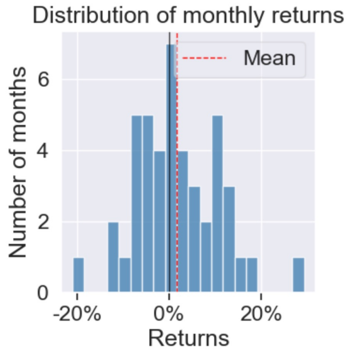
Start date	2020-01-10
End date	2023-09-29
Annual return	15.805%
Cumulative returns	72.565%
Annual volatility	32.891%
Sharpe ratio	0.61
Calmar ratio	0.37
Stability	0.26
Max drawdown	-42.56%
Omega ratio	1.11
Sortino ratio	0.86
Skew	-0.50
Kurtosis	4.70
Tail ratio	1.05
Daily value at risk	-4.064%
Gross leverage	1.00
Daily turnover	2.932%
Avg duration	128 days
Total number of round_trips	10717
Win ratio	0.56

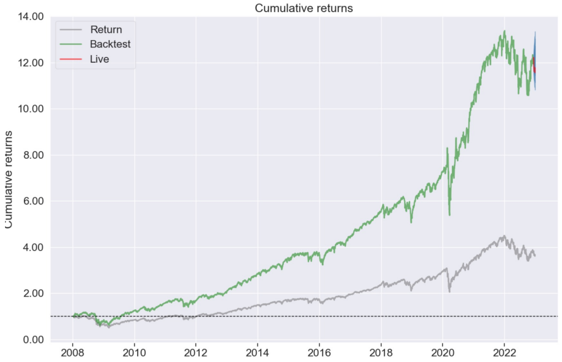


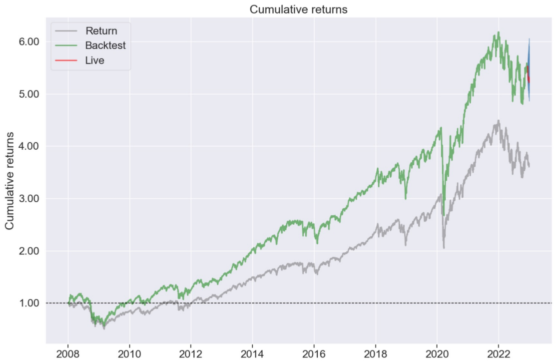




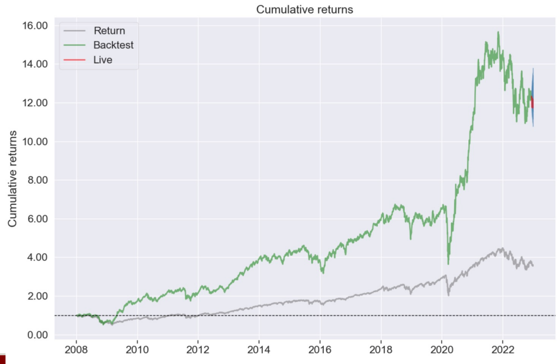
Capital Volume

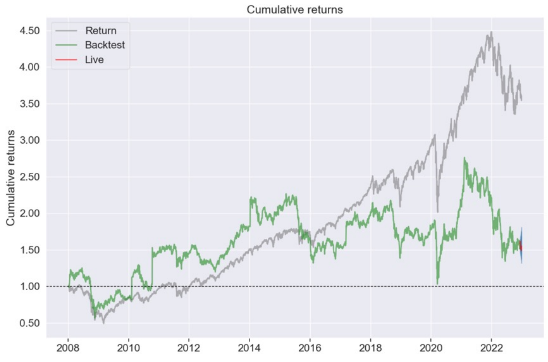
S&P 500





Russell 2000





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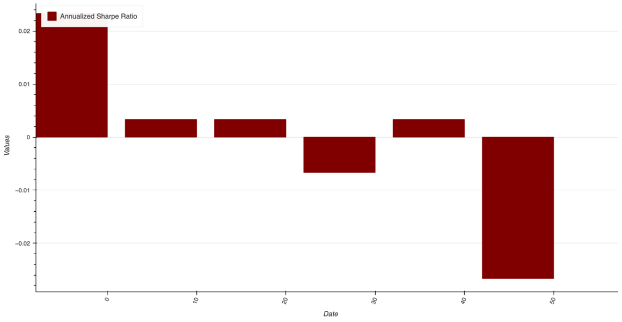
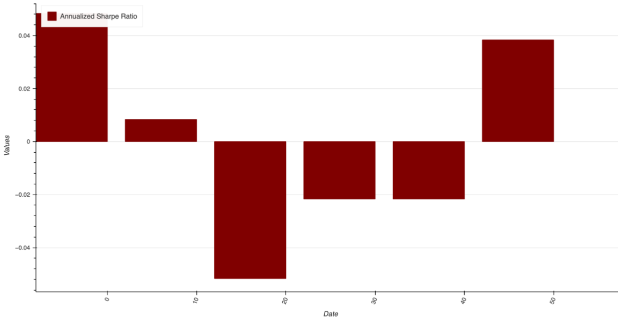
Execution lag shows that the S&P 500 absorbs noise more steadily compared to the Russell 2000

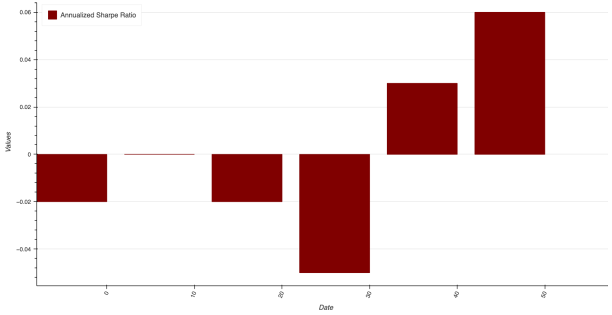
S&P 500



Russell 1000



Russell 2000



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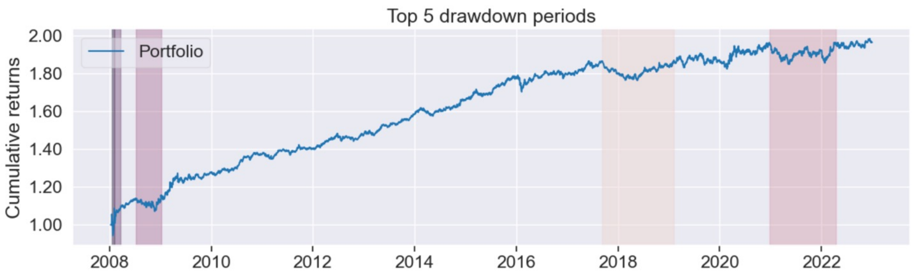
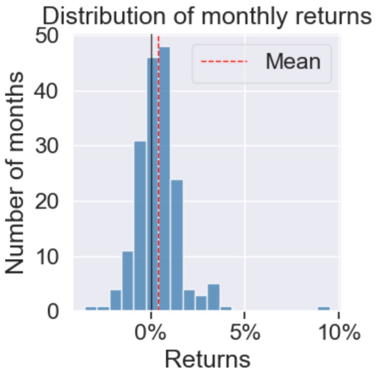
Dollar Neutral: S&P500





Start date	2008-01-10
End date	2022-12-30
Annual return	4.613%
Cumulative returns	96.368%
Annual volatility	6.081%
Sharpe ratio	0.77
Calmar ratio	0.44
Stability	0.91
Max drawdown	-10.563%
Omega ratio	1.17
Sortino ratio	1.13
Skew	-0.35
Kurtosis	71.18
Tail ratio	1.08
Daily value at risk	-0.748%
Gross leverage	1.97
Daily turnover	2.379%
Avg duration	132 days
Total number of Short trades	13484
Short Win ratio	0.76
Total number of Long trades	14383
Long Win ratio	0.77

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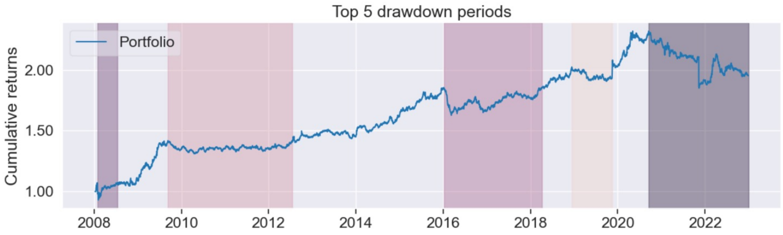
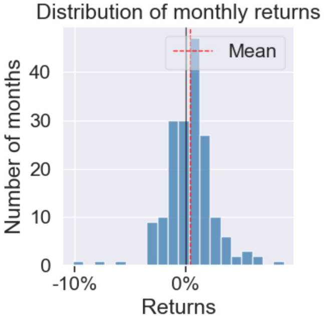
Dollar Neural: russell1000





Start date	2008-01-10
End date	2022-12-30
Annual return	4.572%
Cumulative returns	95.24%
Annual volatility	8.132%
Sharpe ratio	0.59
Calmar ratio	0.23
Stability	0.91
Max drawdown	-20.218%
Sortino ratio	0.83
Skew	-2.51
Kurtosis	89.51
Tail ratio	1.02
Daily value at risk	-1.005%
Gross leverage	1.95
Daily turnover	2.318%
Avg duration	132 days
Total number of Short trades	16778
Short Win ratio	0.71
Total number of Long trades	10301
Long Win ratio	0.73

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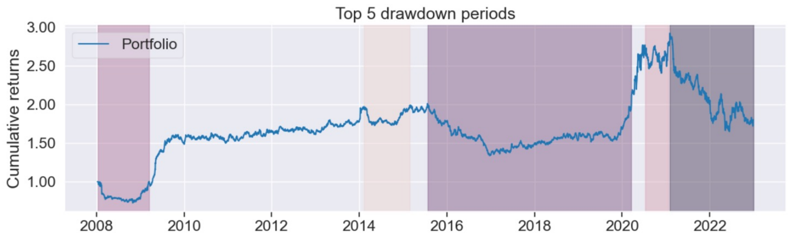
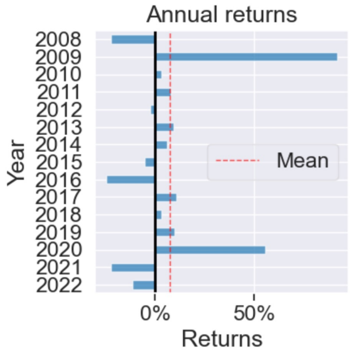
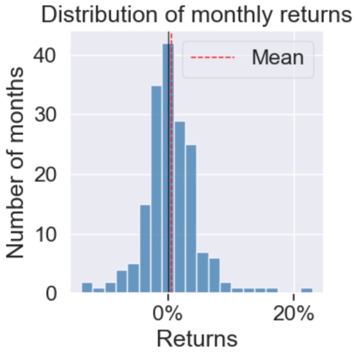
Dollar Neural: russell2000







Start date	2008-01-10
End date	2022-12-30
Annual return	4.028%
Cumulative returns	80.566%
Annual volatility	14.583%
Sharpe ratio	0.34
Calmar ratio	0.09
Stability	0.41
Max drawdown	-43.606%
Omega ratio	1.06
Sortino ratio	0.50
Skew	0.15
Kurtosis	7.32
Tail ratio	1.09
Daily value at risk	-1.817%
Gross leverage	1.86
Daily turnover	2.851%
Avg duration	120 days
Total number of Short trades	11269
Short Win ratio	0.65
Total number of Long trades	10330
Long Win ratio	0.64

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Thank you!

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