
CUATS CODING CHALLENGE 2025

Team:

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STRATEGY

Dynamically-weighted Momentum Asset allocation

Parameters:

- ROC period p
- Assets count M

- Momentum Asset Allocation Strategy

- Assign a momentum score (Rate of Change) to each asset class in the universe over a fixed period p

$$ROC_t^i = \frac{Price_t^i - Price_{t-p}^i}{Price_{t-p}^i}$$

- Select the top-performing M Assets based on their momentum scores

- Dynamically weighting assets allocation based on normalised ROC during the fixed period

- Assets with higher momentum receive a larger portion of the capital

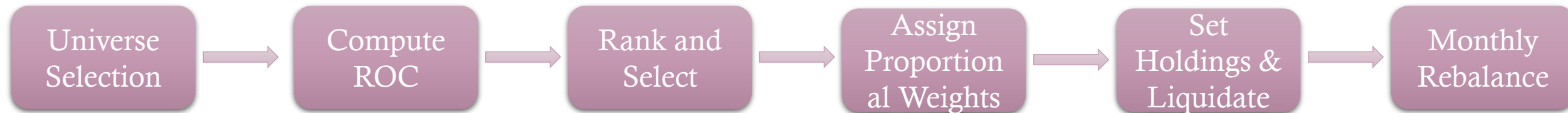
$$w_i = \frac{ROC^i}{\sum_i^M ROC^i}$$

IMPLEMENTATION

Parameters:

- ROC period p
- Assets count M
- Universe

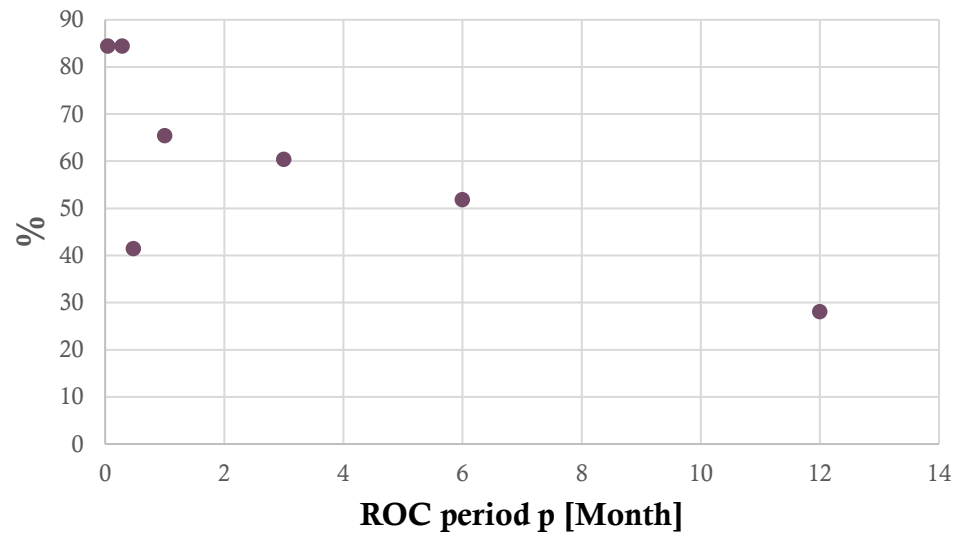
1. Universe Selection: **SPY, EFA, IEF, VNQ, GSG**.
2. ROC Calculation over the past **6-day** period
3. Selecting the top **3 assets** with highest momentum scores
4. Assigning weights to selected assets by momentum score proportions
5. Set holdings (long only) and liquidate unselected assets
6. Monthly Rebalance



PARAMETER TUNING

ROC period p

5-year Return in %
01.2020 till today



Profit from Short term Anomaly!

Limitations:
limited number of assets



RESELECTING UNIVERSE

THE MOST LIQUID ASSETS

Parameters:

- ROC period p
- Assets count M
- Universe

1. Universe Selection:

SPY, EFA, IEF, VNQ, GSG, **QQQ**, **IWM**, **AAPL**, **MSFT**, **TSLA**, **AMZN**, **NVDA**, **META**, **BABA**

2. ROC Calculation over the past **3-day** period

3. Selecting the top **5 assets** with highest momentum scores

4. Assigning weights to selected assets by momentum score proportions

5. Set holdings (long only) and liquidate unselected assets

6. Monthly Rebalance

Universe
Selection



Compute
ROC



Rank and
Select



Assign
Proportion
al Weights



Set
Holdings &
Liquidate



Monthly
Rebalance

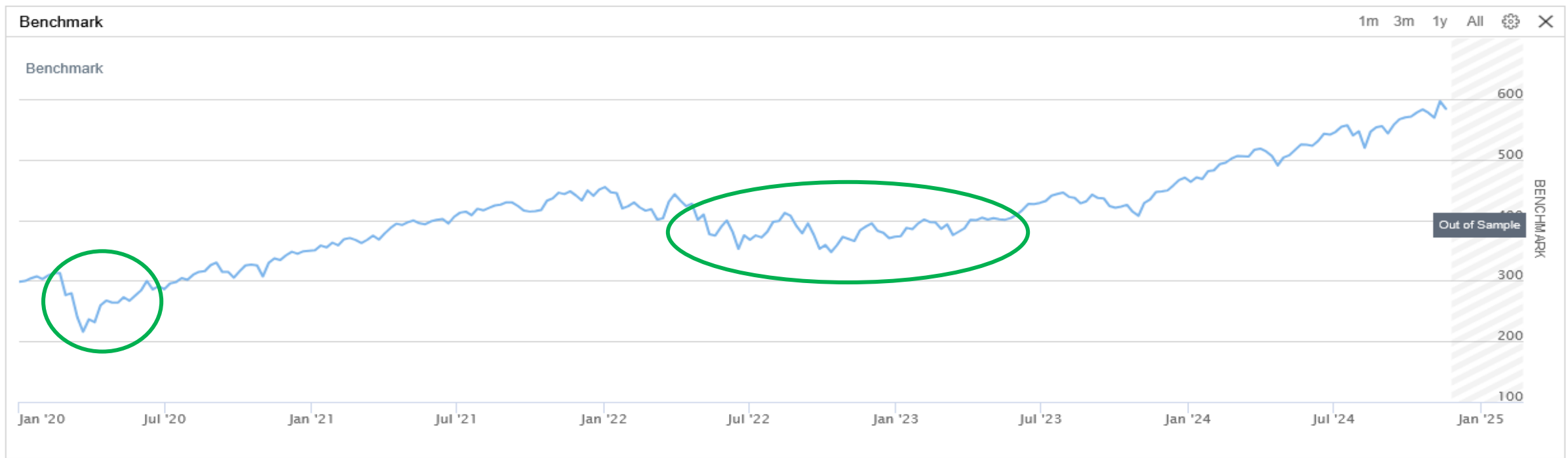
BACKTESTING RESULTS

\$184,456.90	-\$716.46	\$96,029.10	\$89,810.52	21.371%	84.46 %	-\$5,297.99	\$7,395,606.32
Equity	Fees	Holdings	Net Profit	PSR	Return	Unrealized	Volume



Asset Universe
Expansion

\$622,628.31	-\$1,517.15	\$40,707.16	\$525,835.13	54.690%	522.63 %	-\$3,183.23	\$25,105,148.47
Equity	Fees	Holdings	Net Profit	PSR	Return	Unrealized	Volume



METRICS COMPARISON

Parameter Set	SPY, EFA, IEF, VNQ, GSG (ROC of 6 days, long 3 top performing assets)	SPY, EFA, IEF, VNQ, GSG, QQQ, IWM, AAPL, MSFT, TSLA, AMZN, NVDA, META, BABA (ROC of 3 days, long 5 top performing assets)
Sharpe Ratio	0.542	1.125
Compounding Annual Return	13.316 %	45.266 %
Max Drawdown	34.9 %	38.3 %
Beta	0.386	0.886
Alpha	0.038	0.24

LONG/SHORT STRATEGIES

THE MOST LIQUID ASSETS

Parameters:

- Universe
- ROC period p
- Assets count M_L, M_S
- Long/short Proportion
- Stop-loss level for short positions

1. Universe Selection:

SPY, EFA, IEF, VNQ, GSG, **QQQ, IWM, AAPL, MSFT, TSLA, AMZN, NVDA, META, BABA**

2. ROC Calculation over the past **3-day** period

3. Selecting the top **5 assets** with highest momentum scores; the bottom **2 assets** with lowest momentum scores

4. Assigning weights to selected assets by momentum score proportions for both long and short assets

5. Set holdings (capital allocation: long **$90 \pm 1\%$** , short **$10 \pm 1\%$**) and liquidate unselected assets

6. Risk Management: stop-loss for short positions when price rises above average

7. Monthly Rebalance

Universe
Selection



Compute
ROC



Rank and
Select



Assign
Proportion
al Weights



Set
Holdings &
Liquidate



Monthly
Rebalance



METRICS COMPARISON

Parameter Set	SPY, EFA, IEF, VNQ, GSG (ROC of 6 days, long 3 top performing assets)	SPY, EFA, IEF, VNQ, GSG, QQQ, IWM, AAPL, MSFT, TSLA, AMZN, NVDA, META, BABA (ROC of 3 days, long 5 top performing assets)	SPY, EFA, IEF, VNQ, GSG, QQQ, IWM, AAPL, MSFT, TSLA, AMZN, NVDA, META, BABA (ROC of 3 days, long 5 short 2)
Sharpe Ratio	0.542	1.125	1.118
Compounding Annual Return	13.316 %	45.266 %	42.756 %
Max Drawdown	34.9 %	38.3 %	34.8 %
Beta	0.386	0.886	0.893
Alpha	0.038	0.24	0.216

To optimise long/short strategy, should reconsider universe selection that includes negatively correlated assets!

TAKEAWAYS

- Deployed a Dynamically-weighted Momentum Asset allocation Strategy
 - Effective in capturing short-term movement opportunities, fast reaction
 - A broader range of assets (increased market exposure) improves returns
 - Long/short strategies preferred for portfolios with negatively correlated assets
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