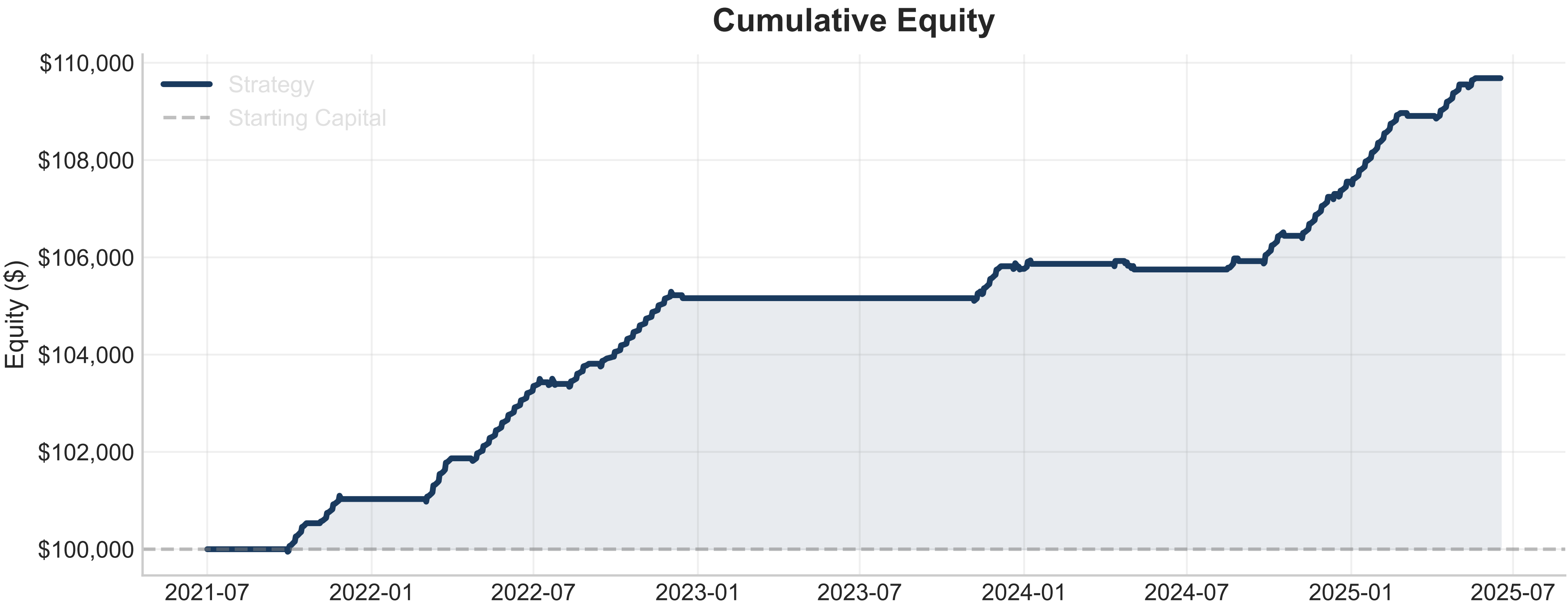
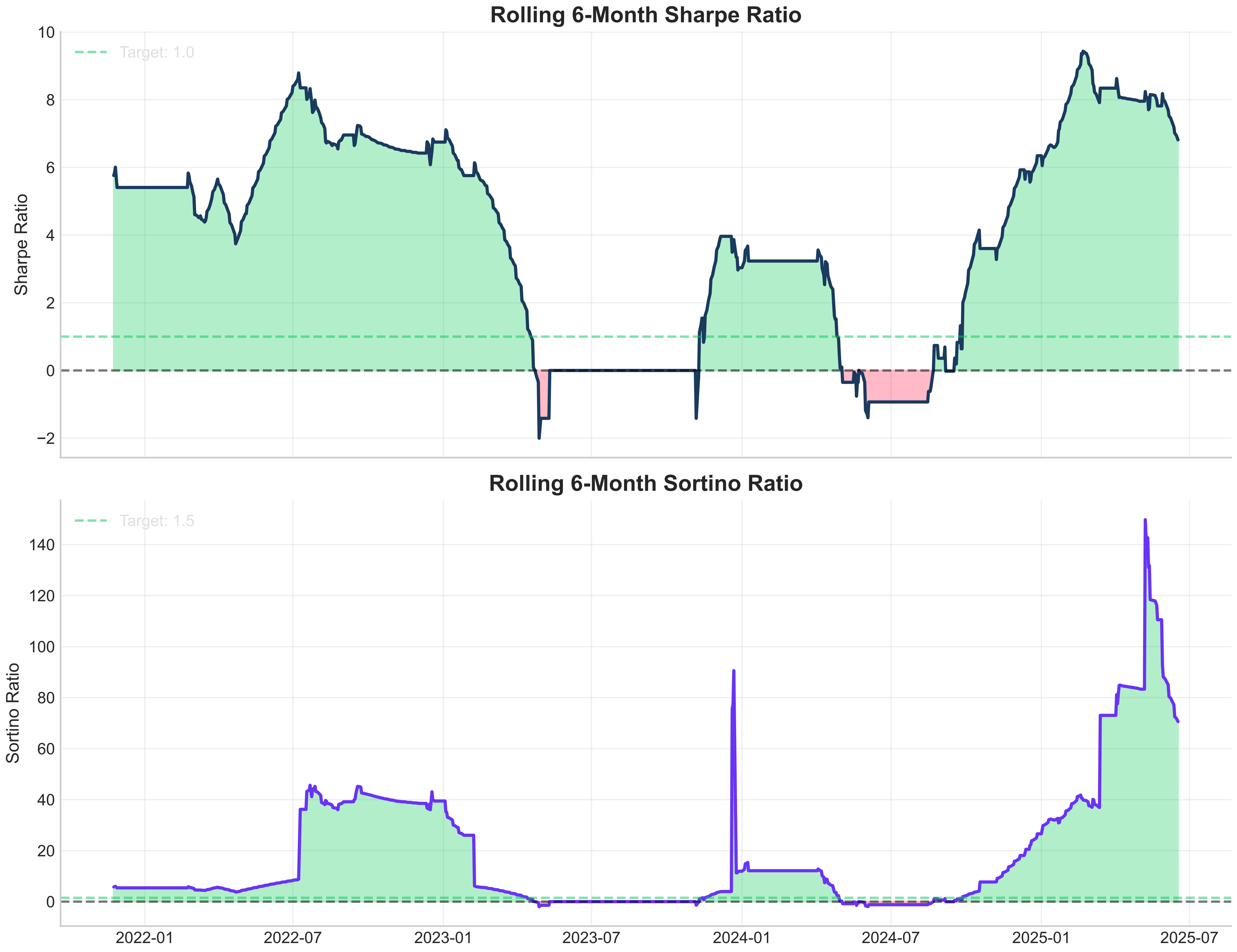
GBPUSD

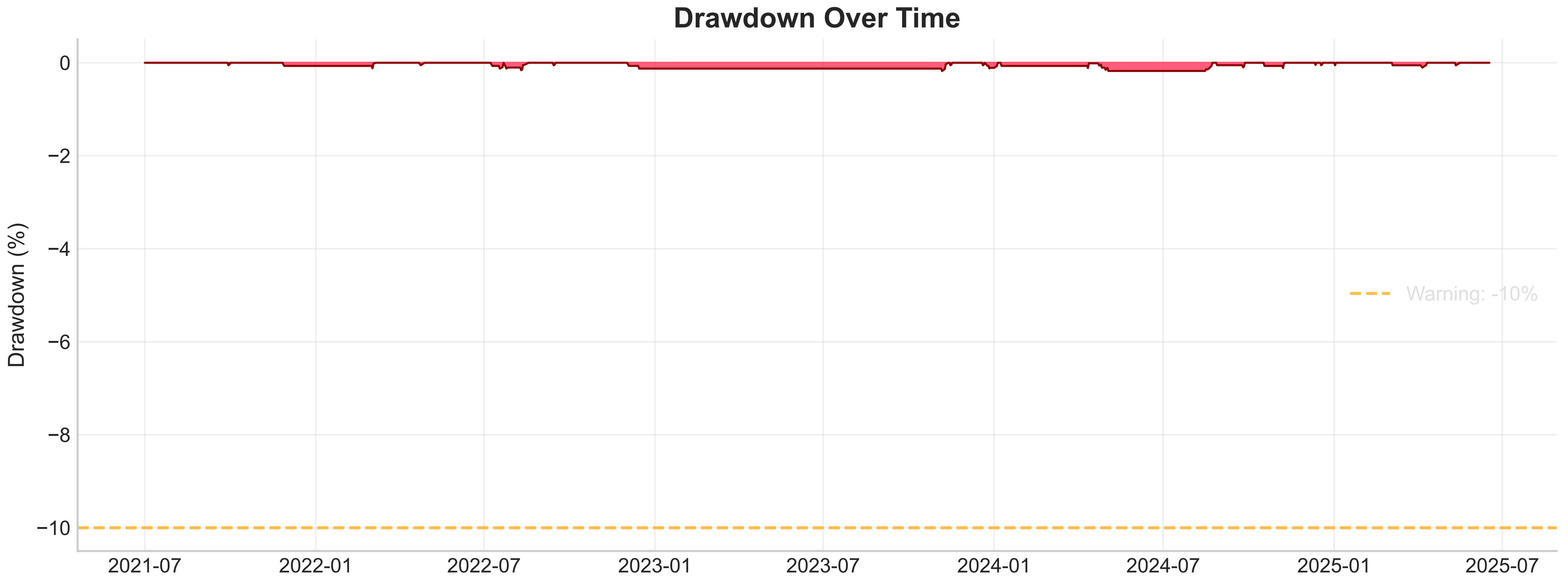
Scientific Options Framework v4.9 — Performance Report

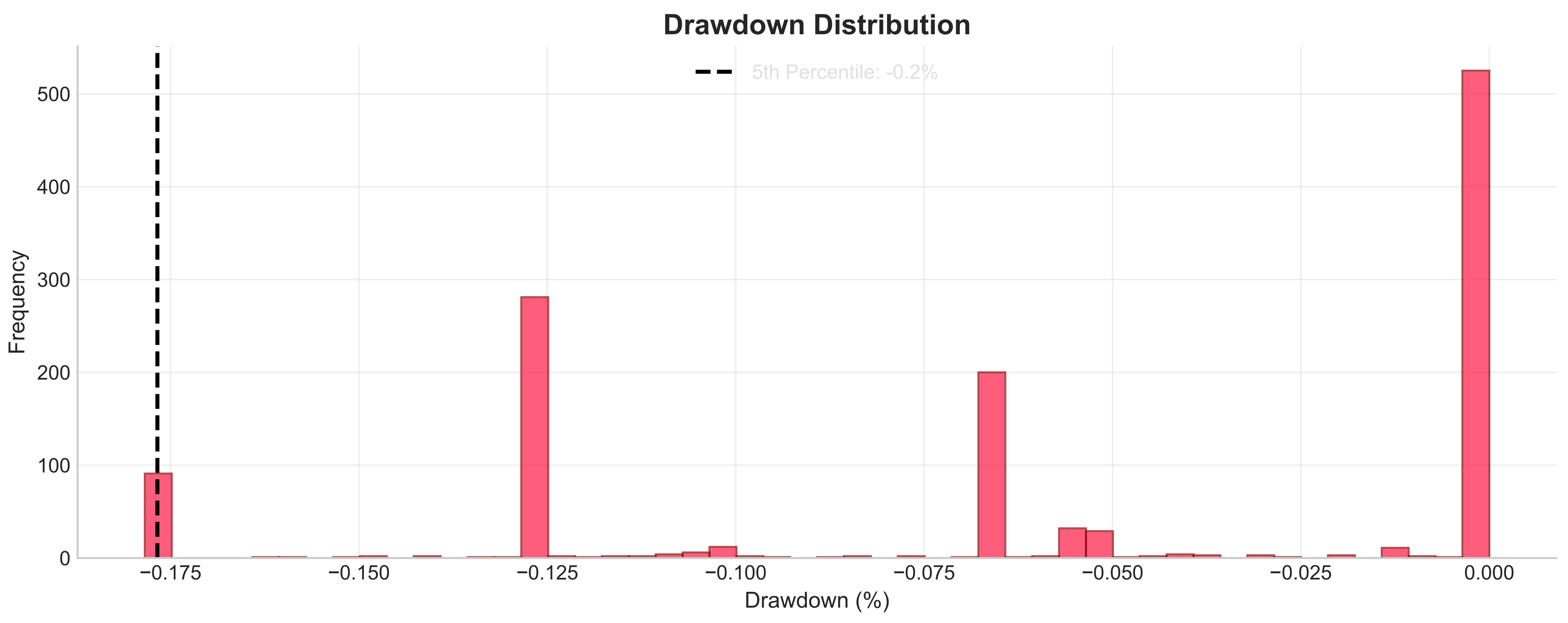


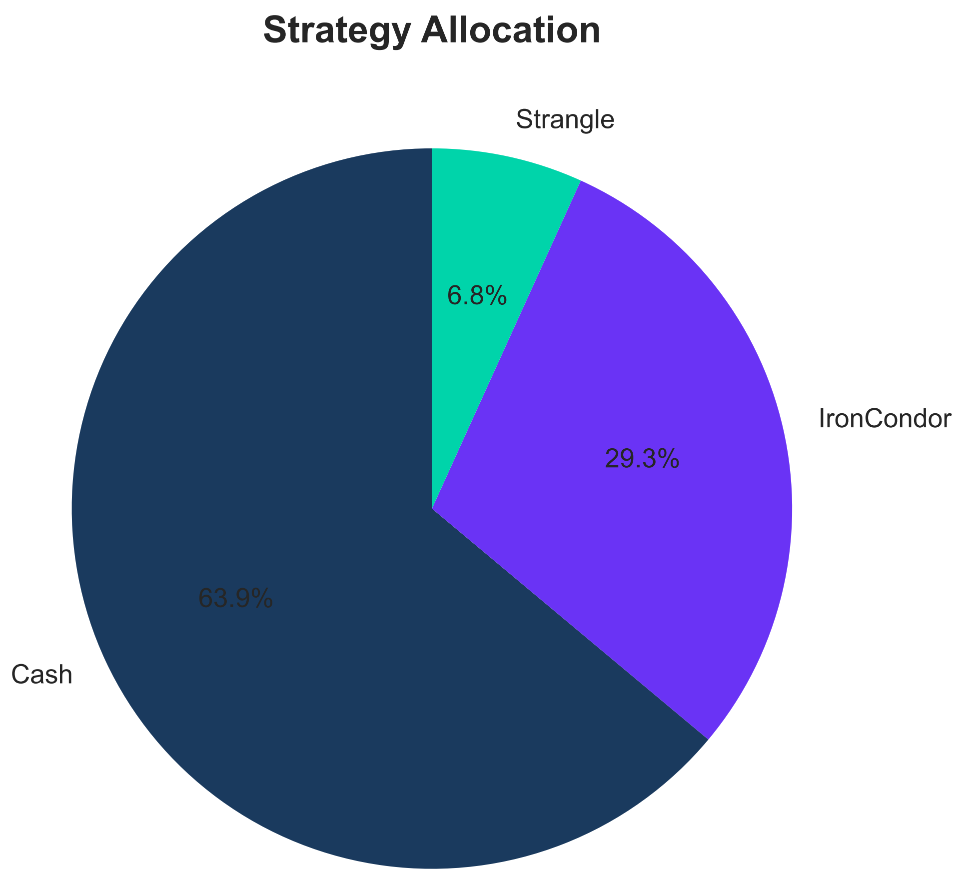
Sharpe Ratio	4.617 □	Sortino Ratio	15.762
Total Return	+9.68%	CAGR	+1.90%
Max Drawdown	-0.18%	Win Rate	92.1%
ML OOS AUC	0.4841	Sharpe p-value	0.0000

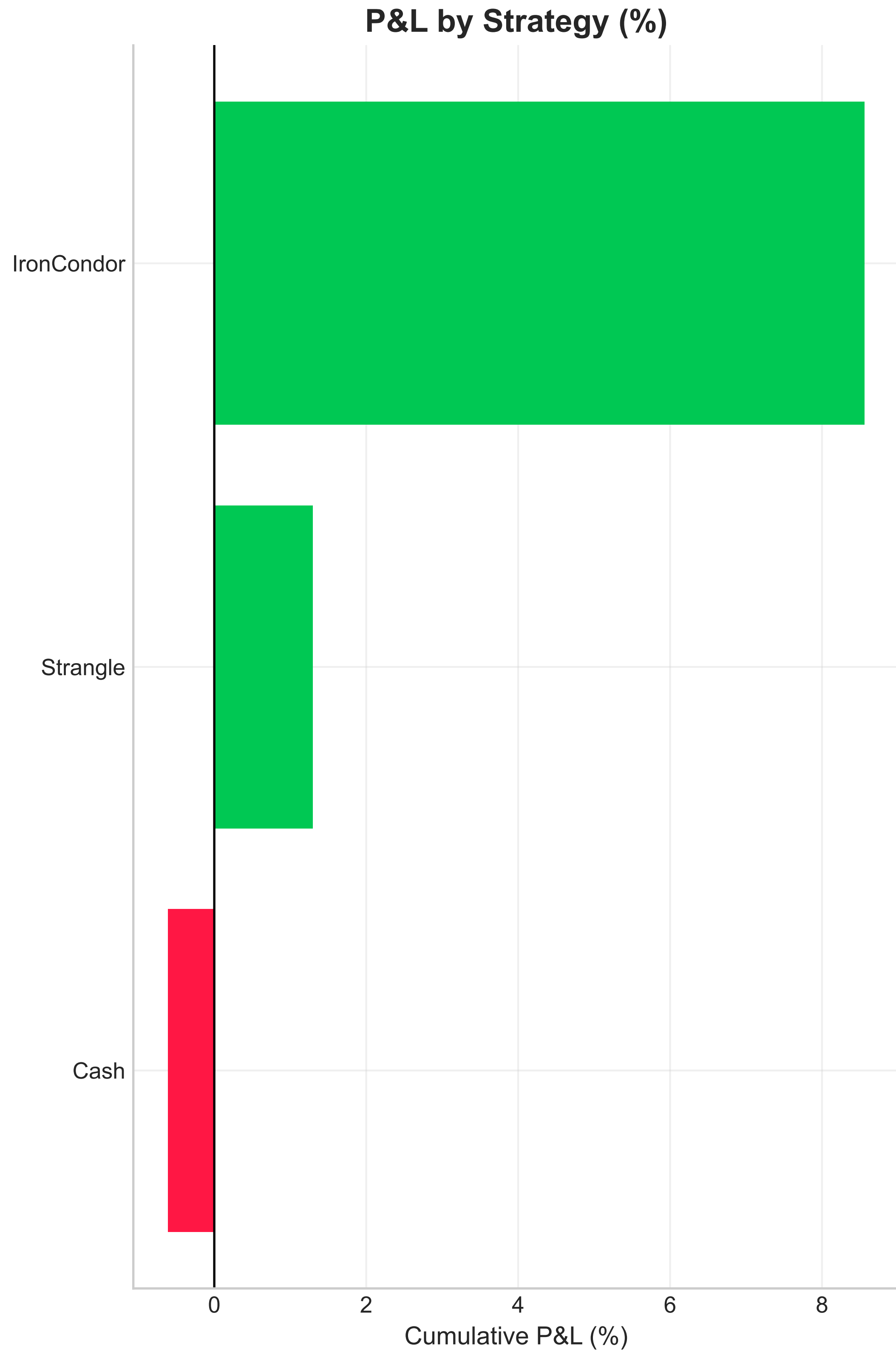


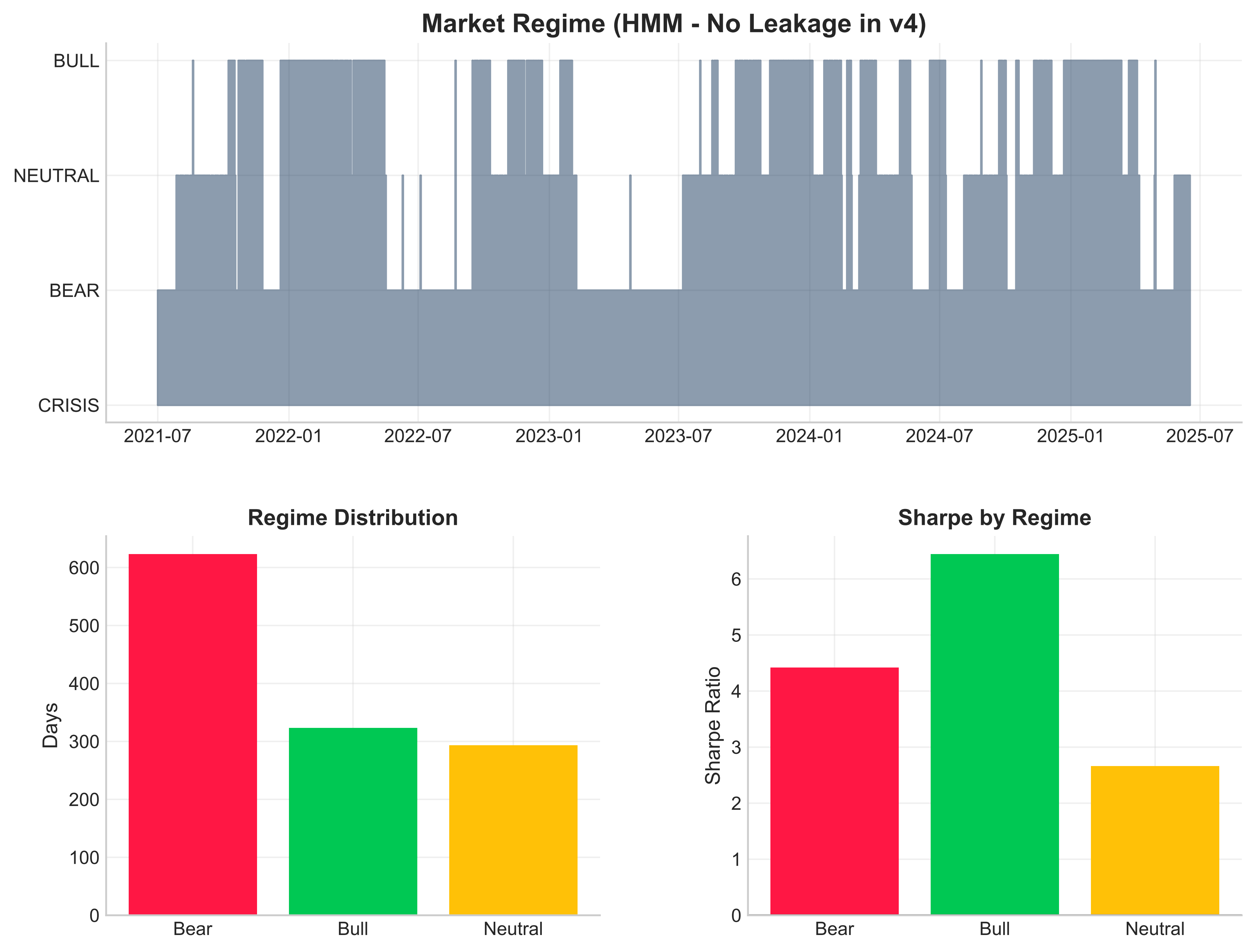
Rolling 6-Month Sharpe Ratio
Target: 1.0
Sharpe Ratio
10
8
6
4
2
0
−2
Rolling 6-Month Sortino Ratio
Target: 1.5
Sortino Ratio
140
120
100
80
60
40
20
0
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07

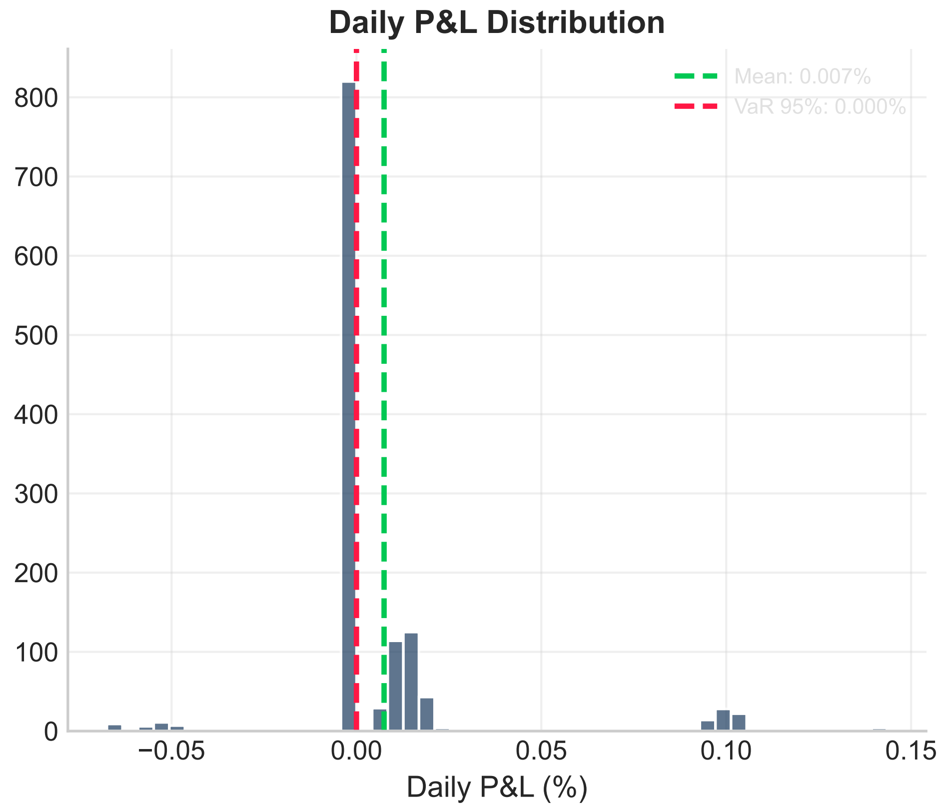

Drawdown Over Time
Drawdown (%)
0
−2
−4
−6
−8
−10
Warning: -10%
2021-07
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07

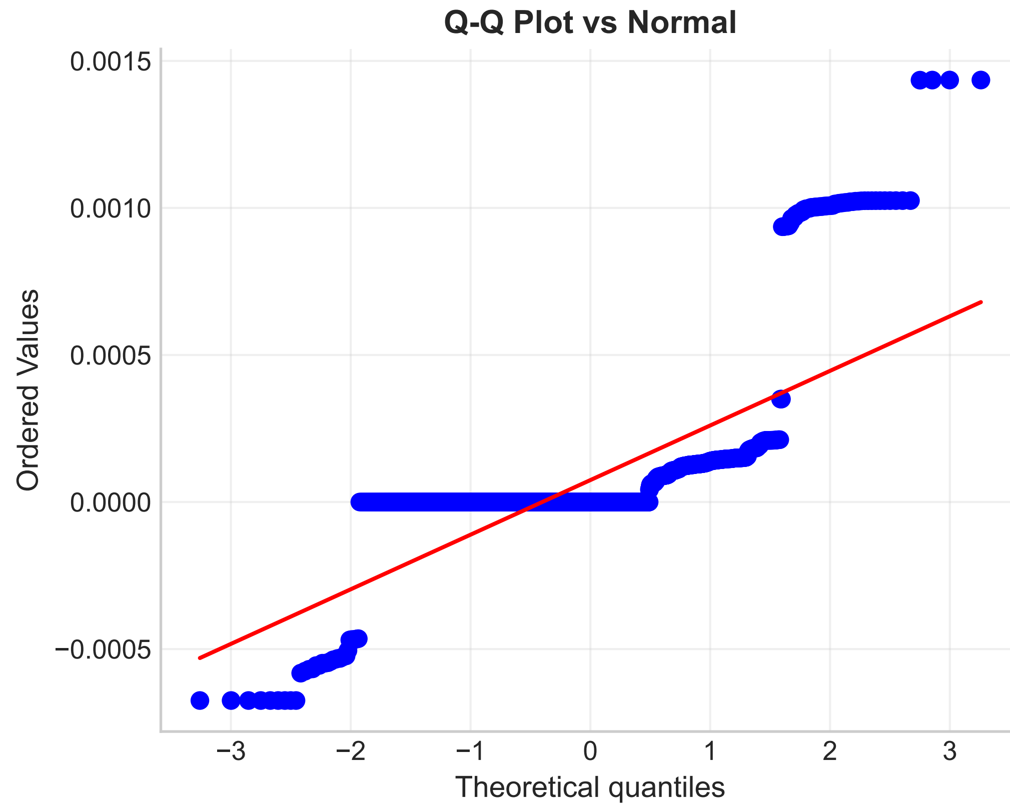

Drawdown Distribution
5th Percentile: -0.2%
Frequency
500
400
300
200
100
0
−0.175
−0.150
−0.125
−0.100
−0.075
−0.050
−0.025
0.000
Drawdown (%)

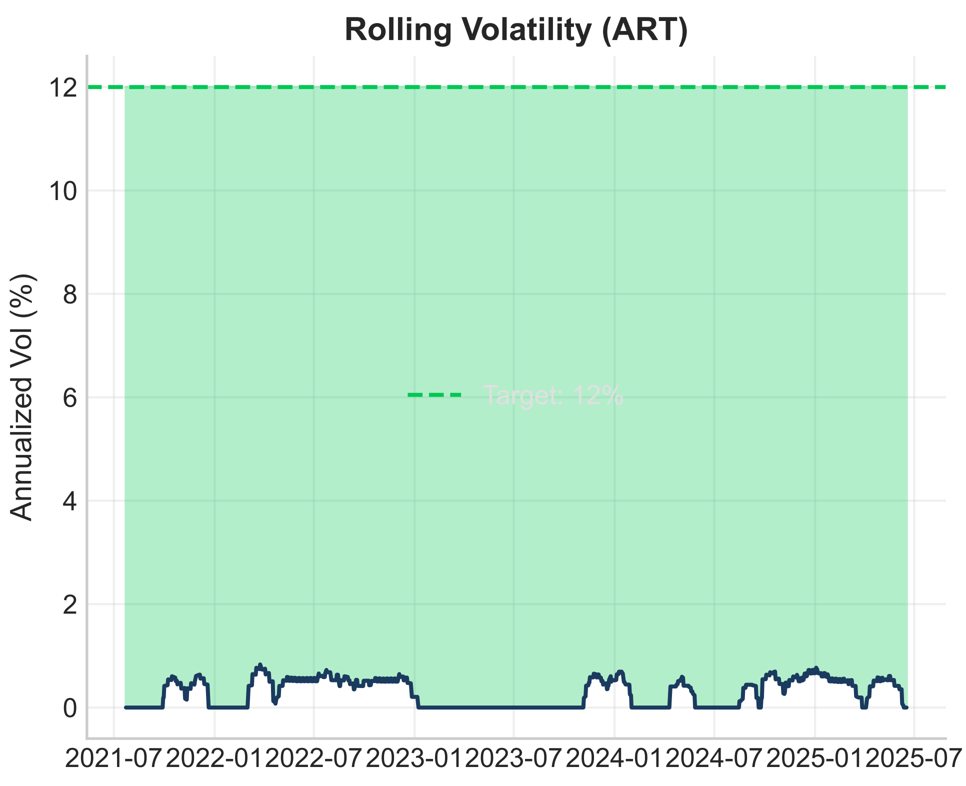

Strategy Allocation
Strangle
6.8%
IronCondor
29.3%
63.9%
Cash


P&L by Strategy (%)
IronCondor
Strangle
Cash
0
2
4
6
8
Cumulative P&L (%)

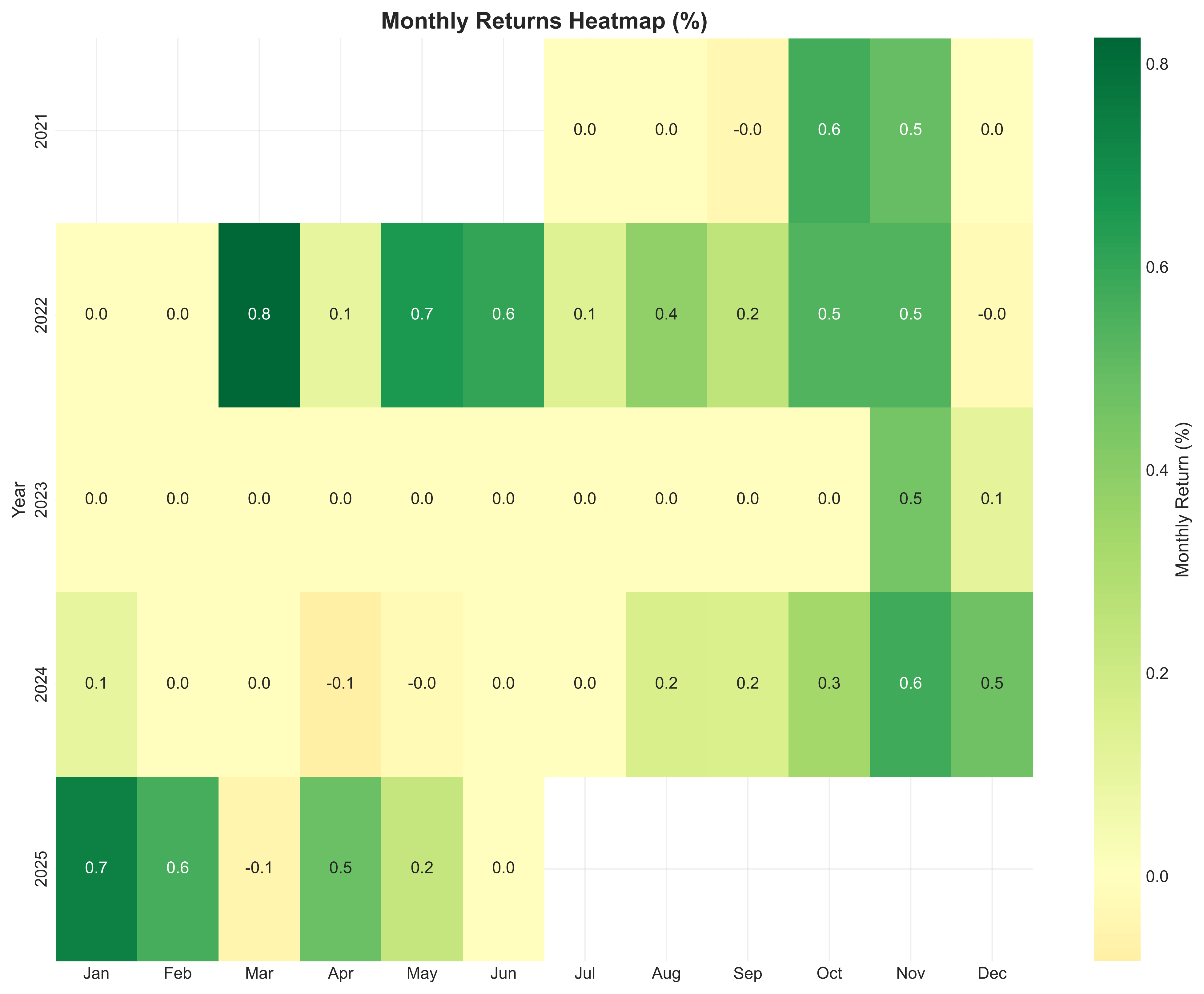

Market Regime (HMM - No Leakage in v4)
BULL
NEUTRAL
BEAR
CRISIS
2021-07
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07
Regime Distribution
Days
0
100
200
300
400
500
600
Bear
Bull
Neutral
Sharpe by Regime
Sharpe Ratio
0
1
2
3
4
5
6
Bear
Bull
Neutral







Metric	Value
VaR 95%	0.000%
ES 95%	-0.002%
Skewness	2.436
Kurtosis	9.333
Omega Ratio	5.950
Profit Factor	5.950



Monthly Returns Heatmap (%)
Year
2021
2022
2023
2024
2025
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
0.0
0.0
-0.0
0.6
0.5
0.0
0.0
0.0
0.8
0.1
0.7
0.6
0.1
0.4
0.2
0.5
0.5
-0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.5
0.1
0.1
0.0
0.0
-0.1
-0.0
0.0
0.0
0.2
0.2
0.3
0.6
0.5
0.7
0.6
-0.1
0.5
0.2
0.0
Monthly Return (%)
0.8
0.6
0.4
0.2
0.0

Top 10 Winners & Losers

Rank	Strategy	P&L (%)
1	IronCondor	+1.5919%
2	IronCondor	+0.7972%
3	IronCondor	+0.6255%
4	IronCondor	+0.5812%
5	IronCondor	+0.5608%
6	IronCondor	+0.4904%
7	IronCondor	+0.4005%
8	IronCondor	+0.3991%
9	IronCondor	+0.3025%
10	IronCondor	+0.2354%
B1	Strangle	-0.0047%
B2	Strangle	-0.0255%
B3	Strangle	-0.0328%
B4	IronCondor	-0.0358%
B5	Strangle	-0.0466%
B6	Strangle	-0.0468%
B7	Strangle	-0.0468%
B8	IronCondor	-0.0523%
B9	IronCondor	-0.0548%
B10	Strangle	-0.0582%

v4.9 Fixes & Improvements Dashboard

Improvement	Metric	Status
1. Robust ML (Lasso Logistic)	OOS AUC: 0.4841	□□
2. HMM Regime (No Leakage v4)	Fixed: Train-only fitting	□
3. Parkinson/GK Vol Estimators	Using High-Low data	□
4. Vol Percentile (renamed)	Accurate nomenclature	□
5. Auto-Regressive Risk Targeting	Realized: 0.4%	□□
6. Weekend Theta WIRED	Avg Adj: 1.9420	□
7. Strategy Leverage Diff	Per-strategy scaling	□
8. OOS AUC Reporting	Test AUC, not train	□

GBPUSD - FINAL SUMMARY (v4.9)

Core Metrics:

- Sharpe Ratio: 4.6170
- Sortino Ratio: 15.7619
- Total Return: +9.68%
- Max Drawdown: -0.18%

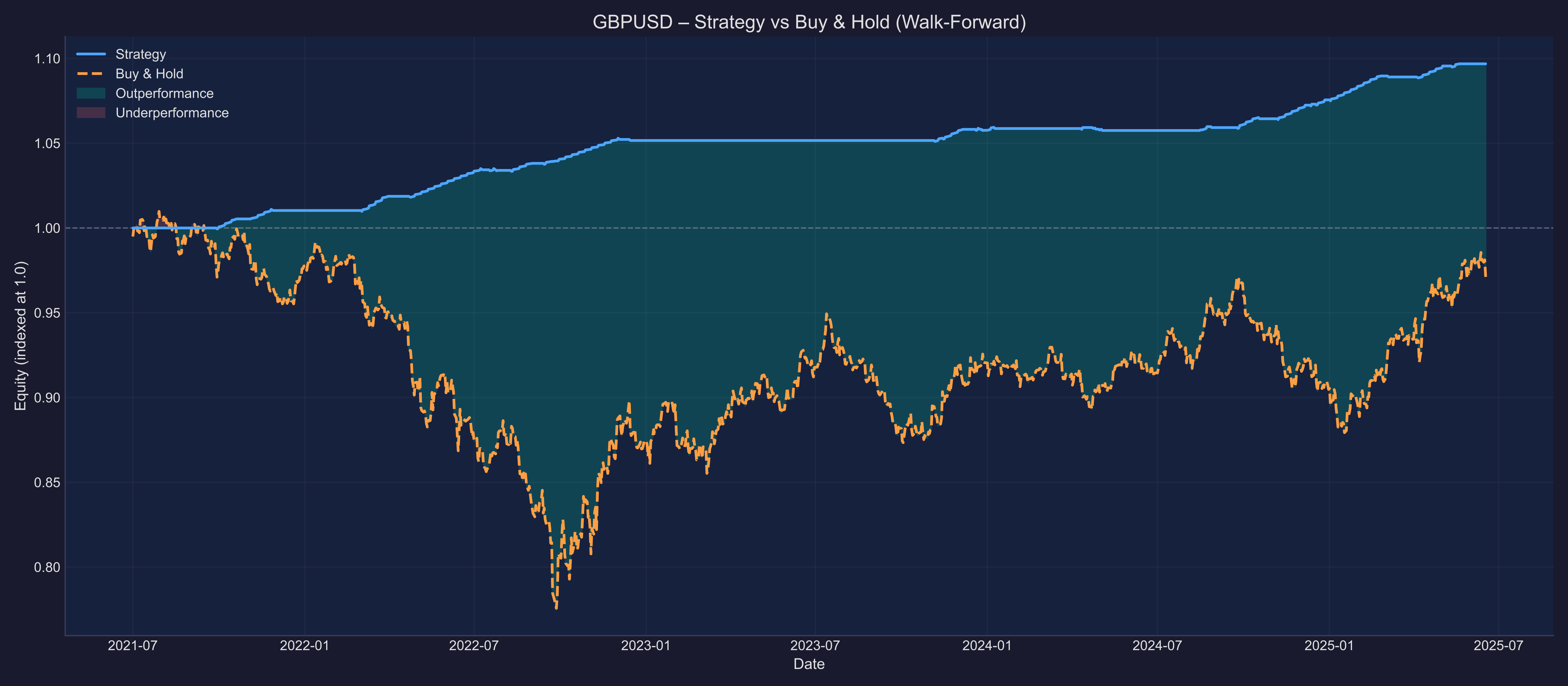
Statistical Significance:

- t-stat: 22.9895
- p-value: 0.000000
- 95% CI: [3.9605, 5.2403]
- Significant: Yes

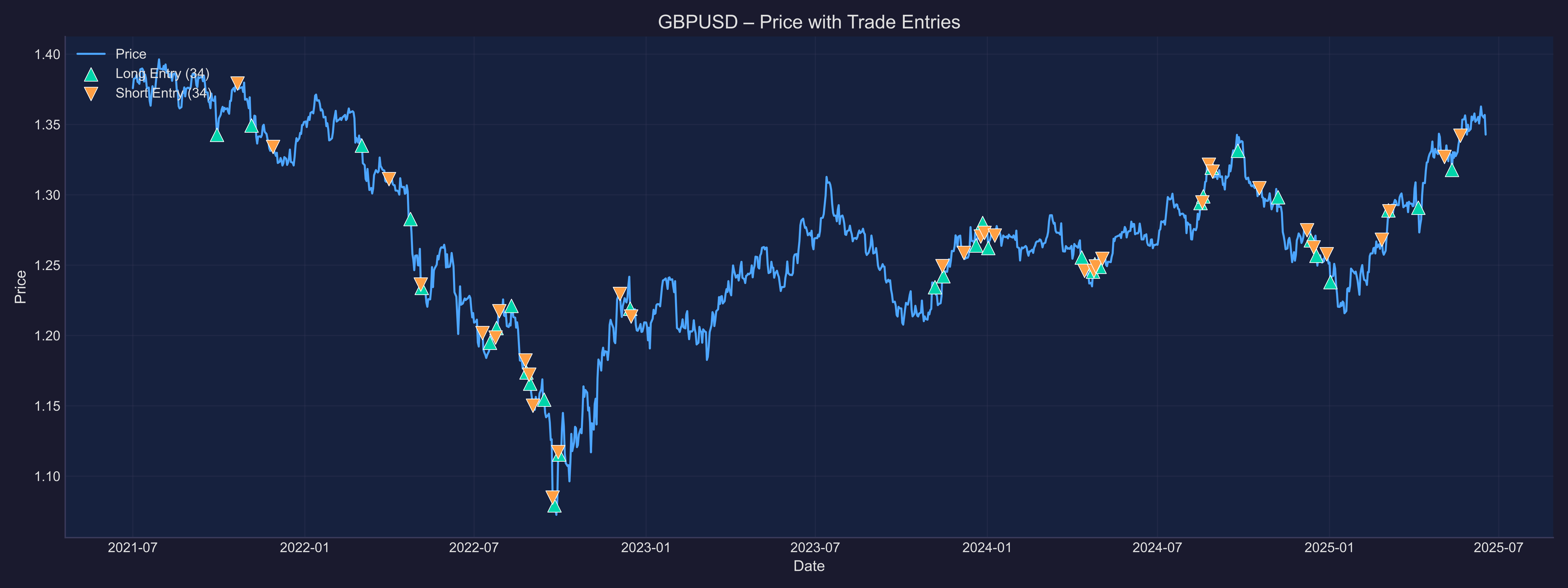
ML Performance (OOS):

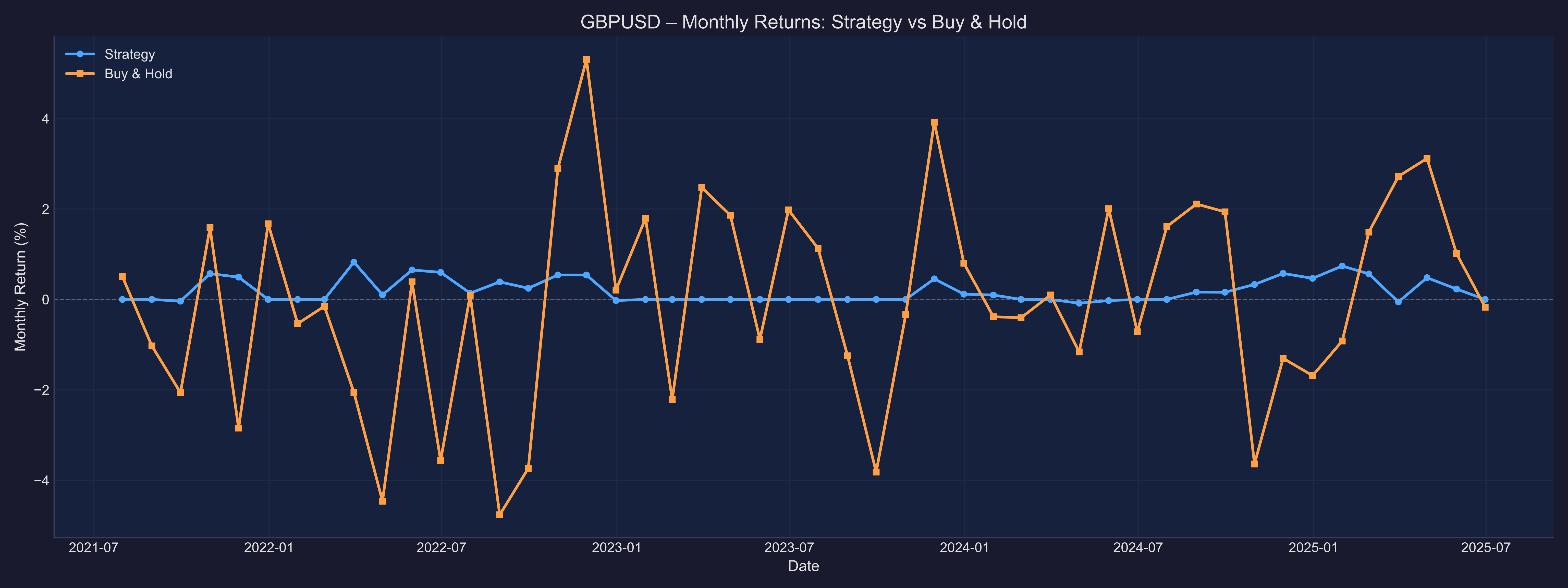
- Global AUC: 0.4841

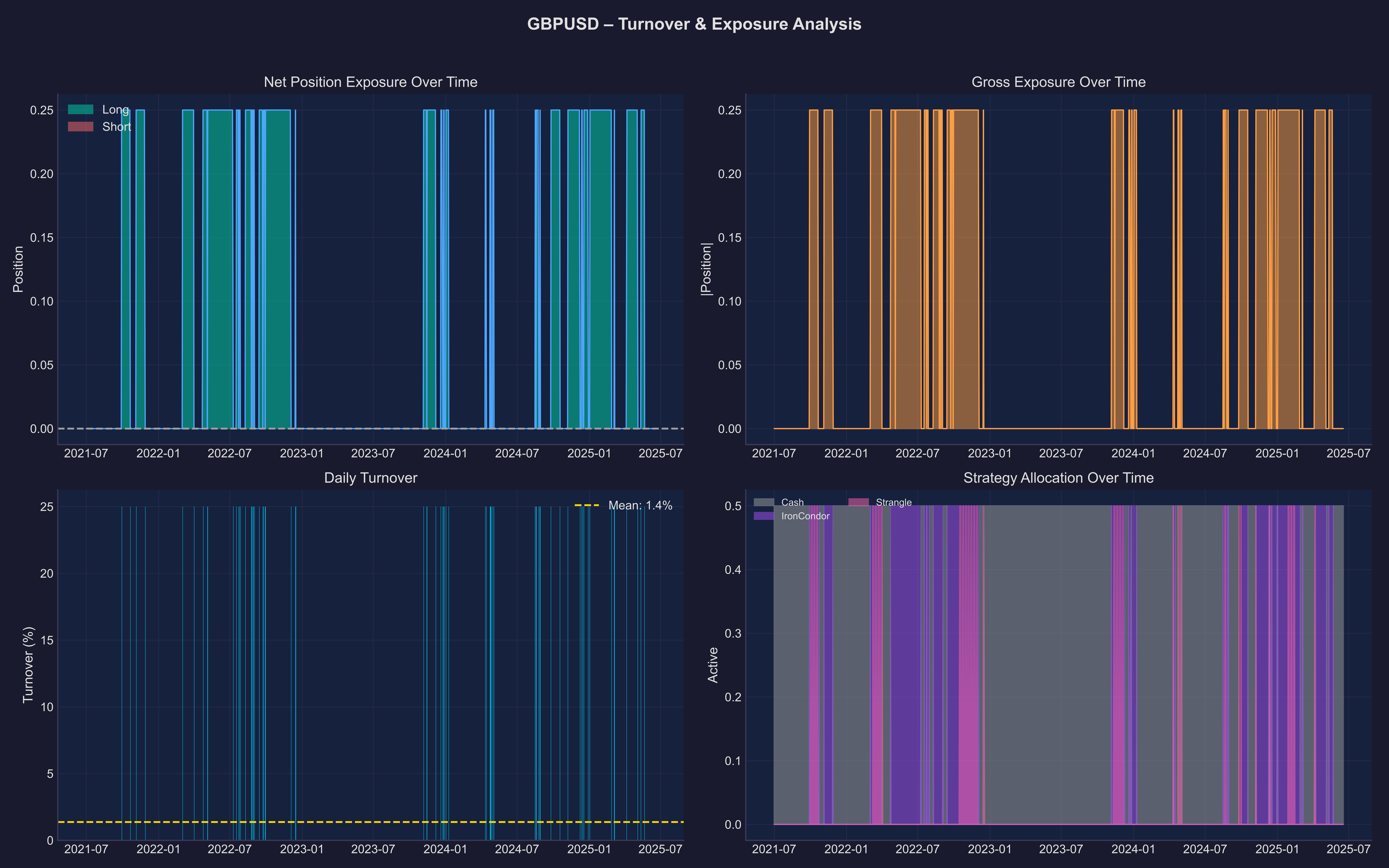
GRADE: EXCELLENT (Significant)

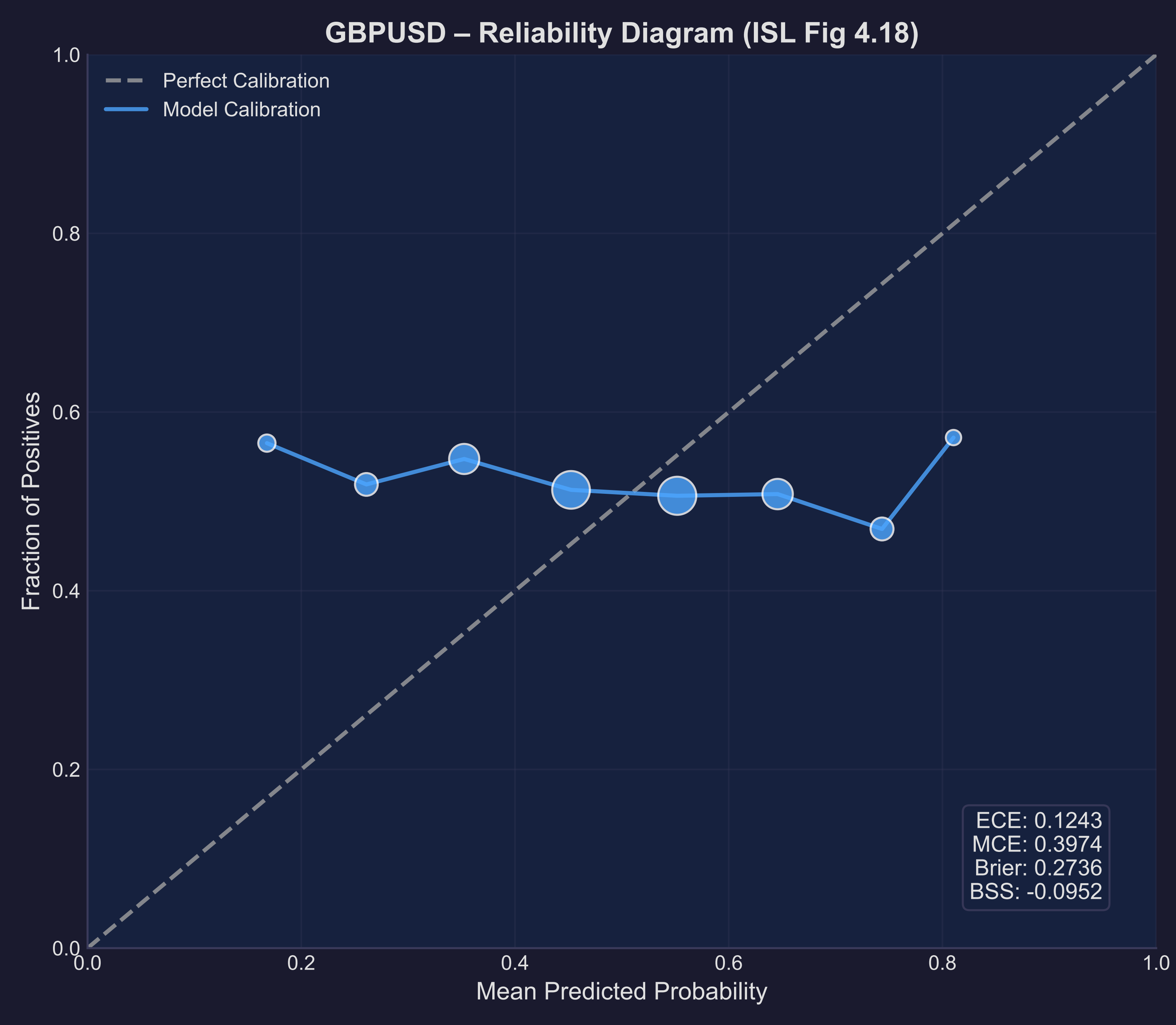


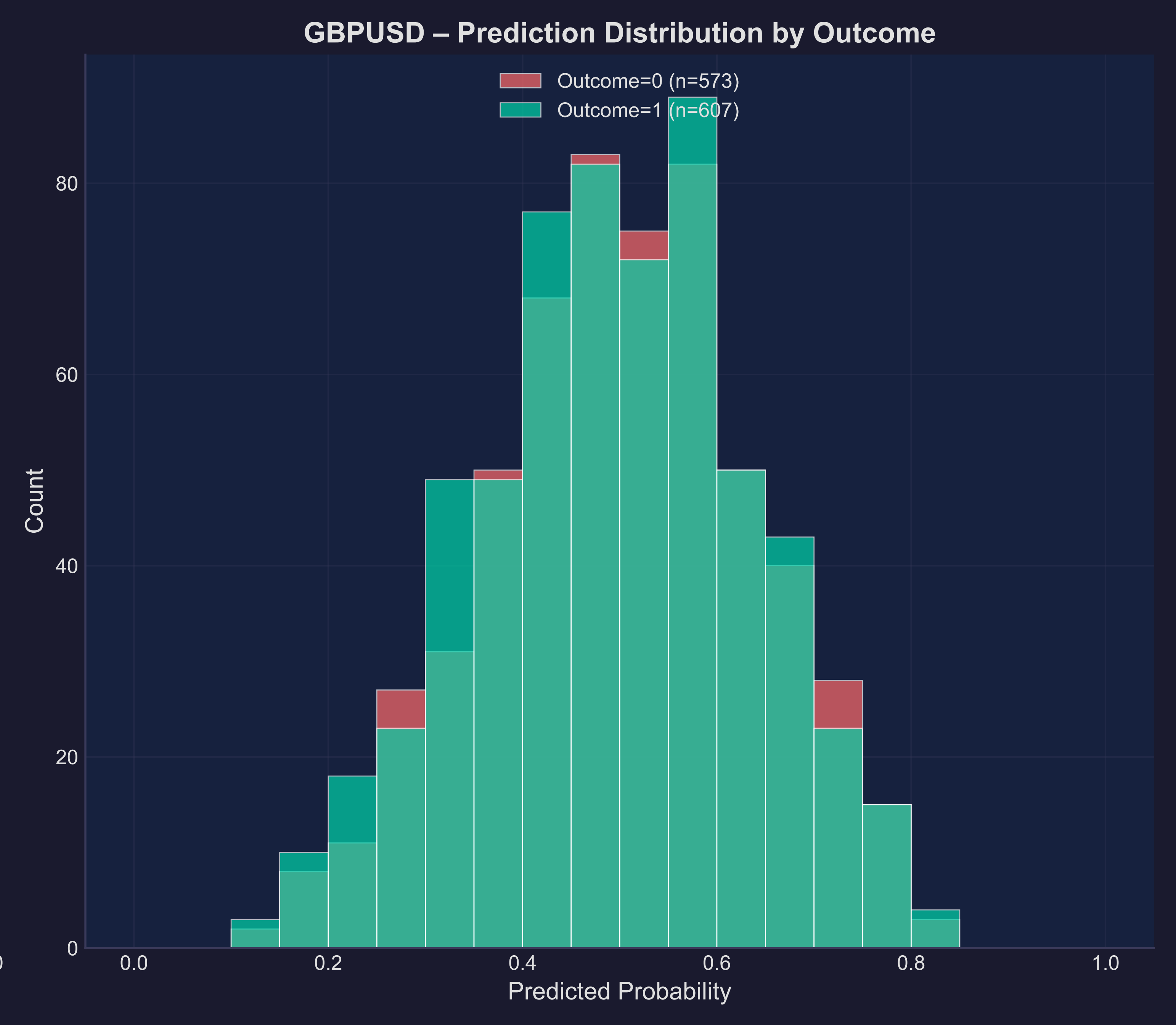
GBPUSD – Strategy vs Buy & Hold (Walk-Forward)
Strategy
Buy & Hold
Outperformance
Underperformance
Equity (indexed at 1.0)
1.10
1.05
1.00
0.95
0.90
0.85
0.80
2021-07
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07
Date

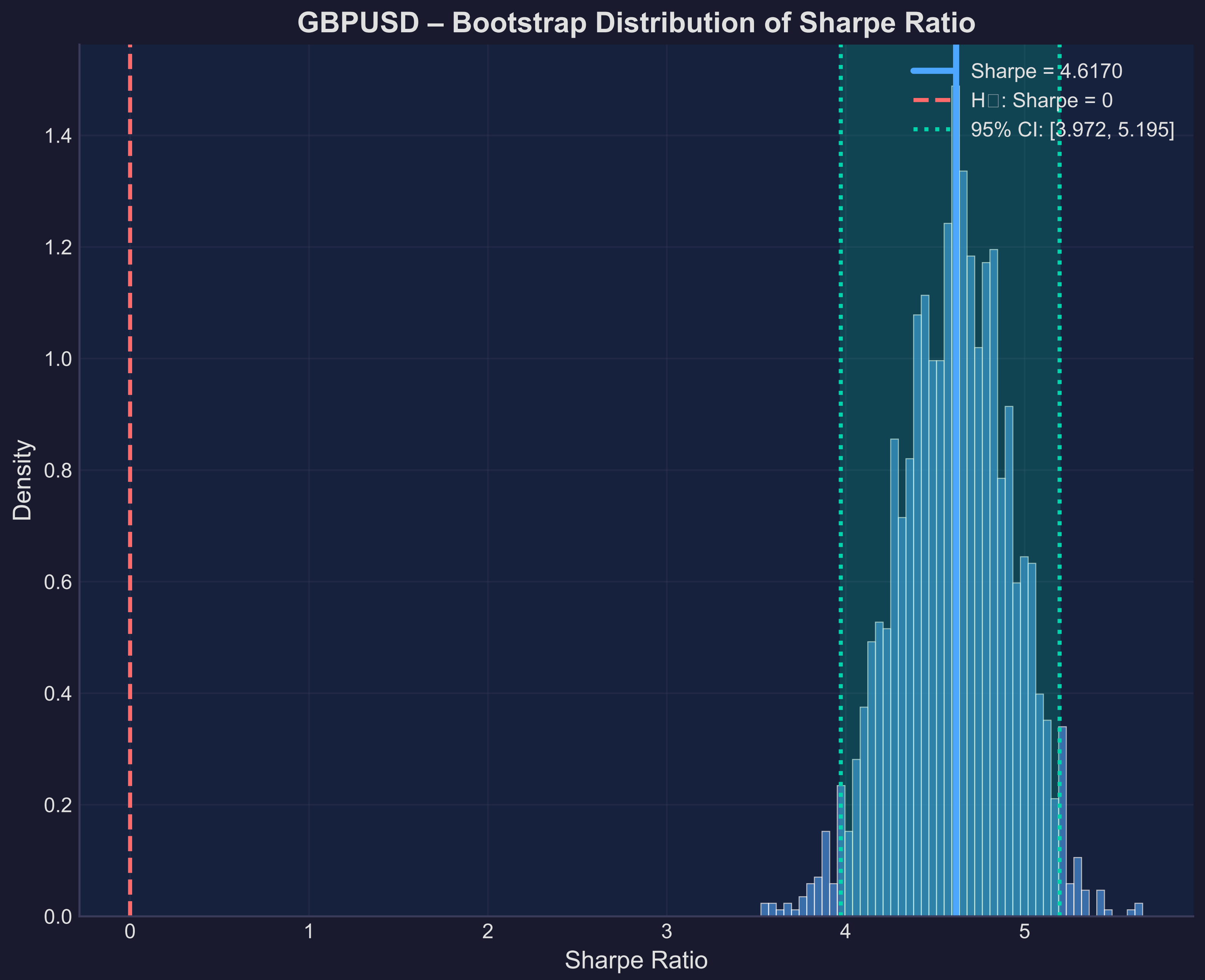

GBPUSD – Price with Trade Entries
Price
Long Entry (34)
Short Entry (34)
1.40
1.35
1.30
1.25
1.20
1.15
1.10
Price
2021-07
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07
Date


GBPUSD – Monthly Returns: Strategy vs Buy & Hold
Strategy
Buy & Hold
Monthly Return (%)
4
2
0
−2
−4
2021-07
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07
Date


GBPUSD – Turnover & Exposure Analysis
Net Position Exposure Over Time
Long
Short
Position
Gross Exposure Over Time
|Position|
Daily Turnover
Mean: 1.4%
Turnover (%)
Strategy Allocation Over Time
Cash
IronCondor
Strangle
Active
2021-07
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07


GBPUSD – Reliability Diagram (ISL Fig 4.18)
Perfect Calibration
Model Calibration
Fraction of Positives
Mean Predicted Probability
ECE: 0.1243
MCE: 0.3974
Brier: 0.2736
BSS: -0.0952

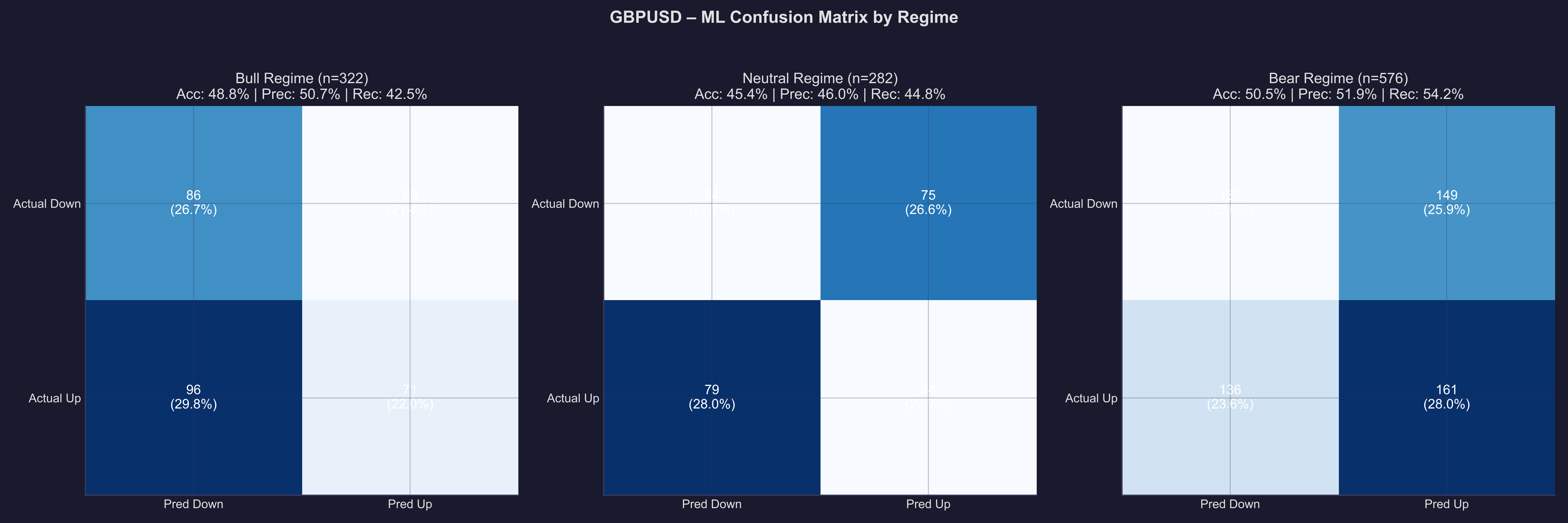

GBPUSD – Prediction Distribution by Outcome
Outcome=0 (n=573)
Outcome=1 (n=607)
Count
Predicted Probability



GBPUSD – Sharpe Ratio T-Test Results

```
SHARPE RATIO STATISTICAL SIGNIFICANCE TEST

Sample Size (n):            1,239 days

Point Estimate:
  Sharpe Ratio:             4.6170
  Standard Error:           0.2008

T-Test (H₀: Sharpe = 0):
  t-statistic:              22.9895
  p-value:                  0.000000
  Degrees of freedom:       1238

Significance:
  At α = 0.05:              ✓ Yes
  At α = 0.01:              ✓ Yes

Confidence Intervals:
  Analytical 95% CI:        [4.2233, 5.0106]
  Bootstrap 95% CI:         [3.9723, 5.1954]

Bootstrap Statistics:
  Mean:                     4.6074
  Median:                   4.6188
  Std Error:                0.3145
```


GBPUSD – ML Lift Curve: Return by Prediction Bucket
Mean Next-Day Return (bps)
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
2
4
6
8
10
ML Probability Decile (1=Lowest, 10=Highest)
GBPUSD – Hit Rate by Prediction Bucket
Random (50%)
Actual Up-Day Rate (%)
50
40
30
20
10
0
2
4
6
8
10
ML Probability Decile


GBPUSD – ML Confusion Matrix by Regime
Bull Regime (n=322)
Acc: 48.8% | Prec: 50.7% | Rec: 42.5%
Neutral Regime (n=282)
Acc: 45.4% | Prec: 46.0% | Rec: 44.8%
Bear Regime (n=576)
Acc: 50.5% | Prec: 51.9% | Rec: 54.2%
Actual Down
Actual Up
Pred Down
Pred Up
86
(26.7%)
96
(29.8%)
75
(26.6%)
79
(28.0%)
149
(25.9%)
136
(23.6%)
161
(28.0%)