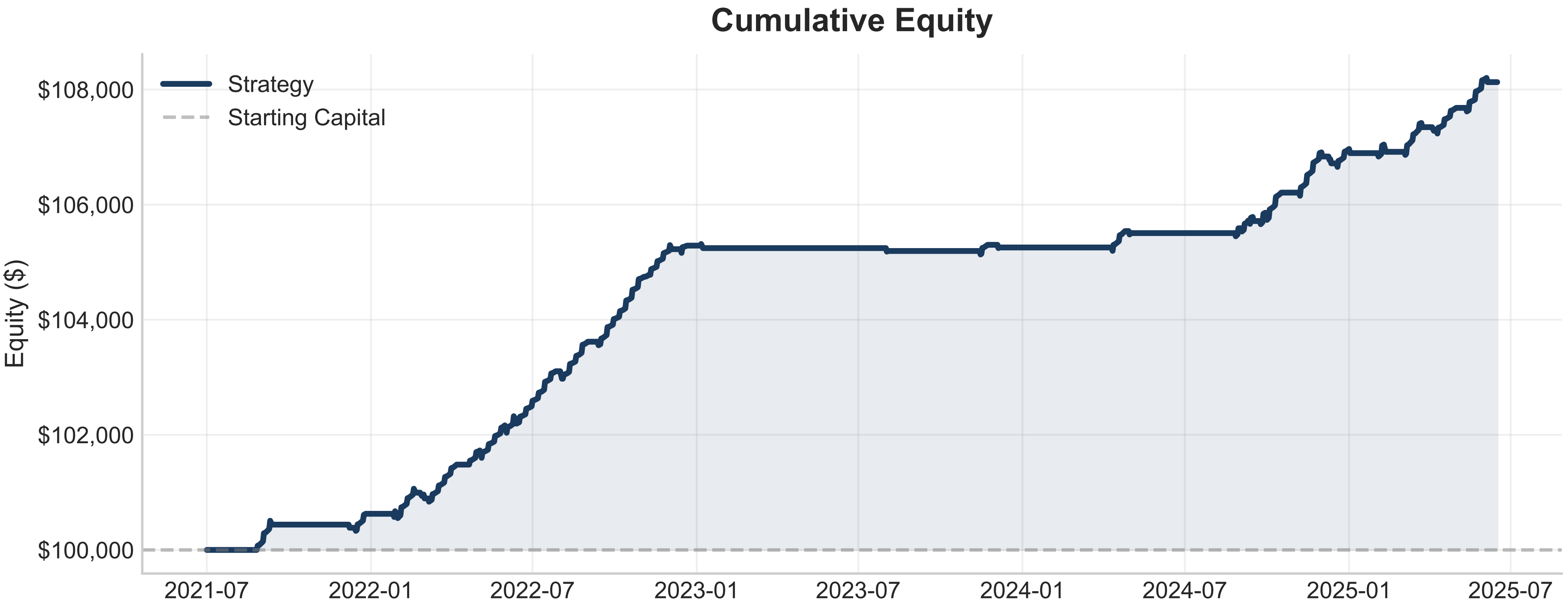
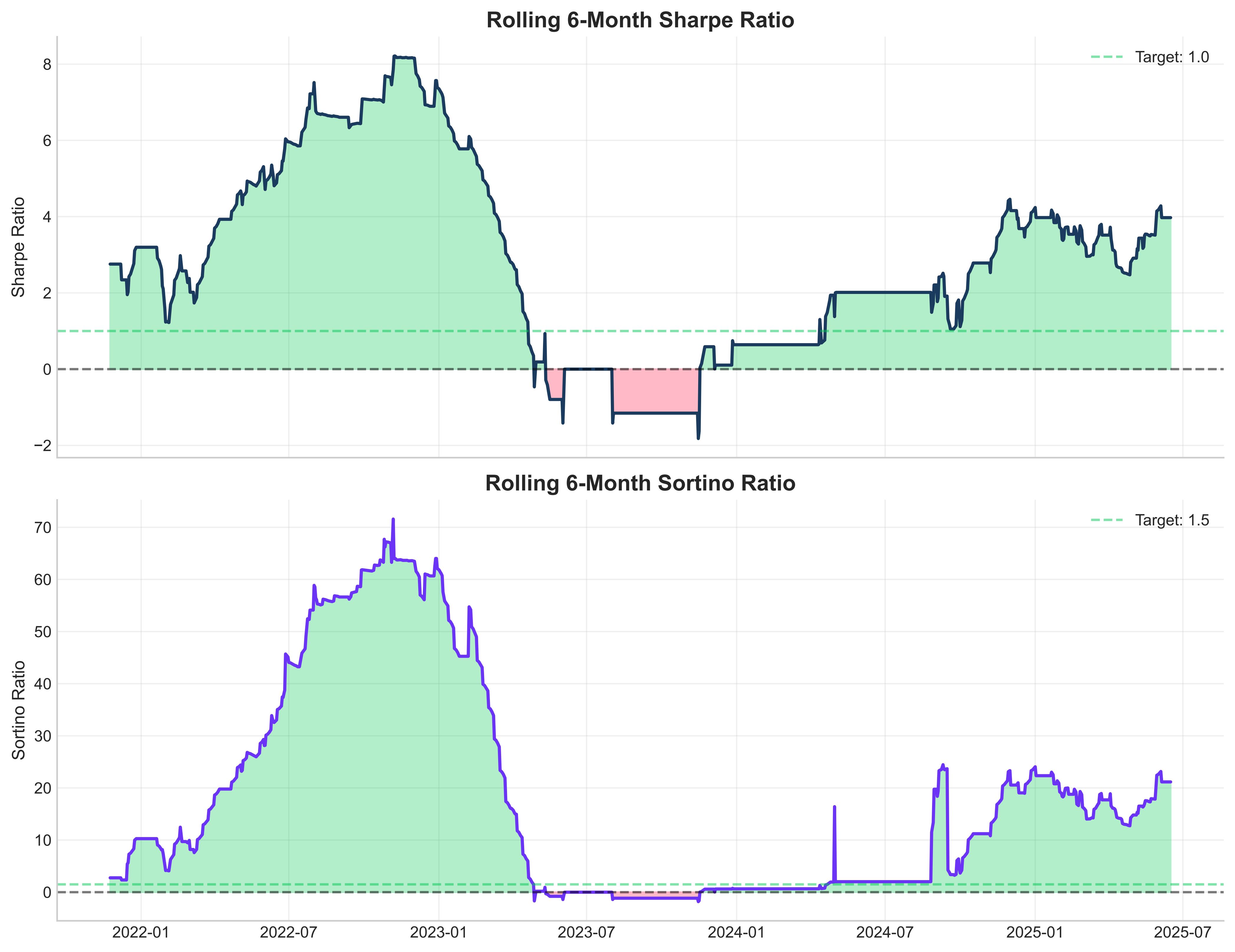
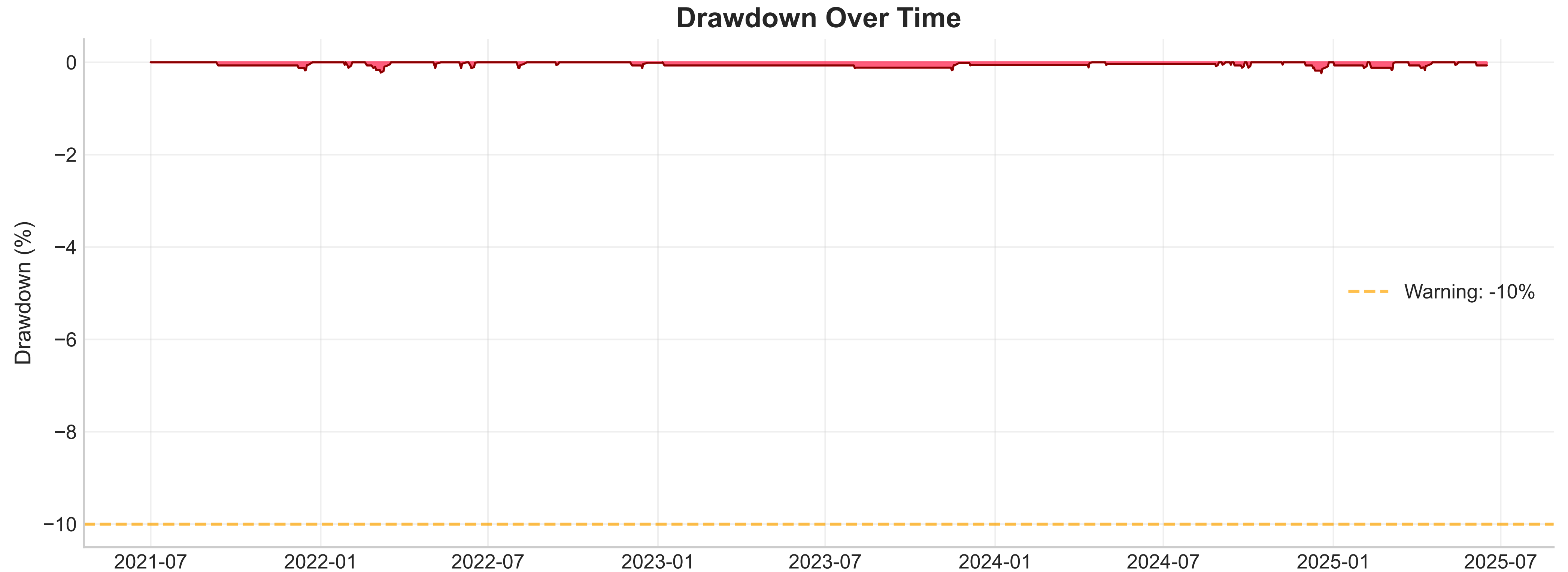
AUDUSD

Scientific Options Framework v4.9 — Performance Report

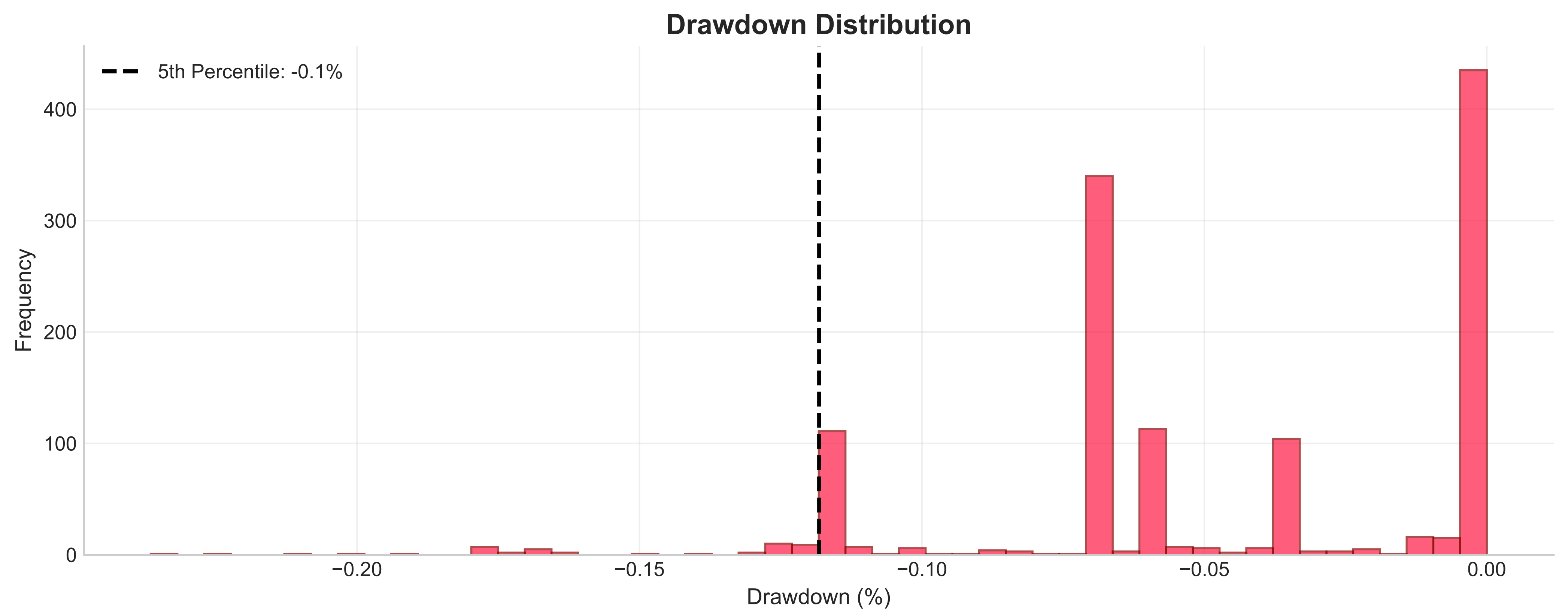


Sharpe Ratio	3.531 □	Sortino Ratio	15.963
Total Return	+8.13%	CAGR	+1.60%
Max Drawdown	-0.24%	Win Rate	88.7%
ML OOS AUC	0.5436	Sharpe p-value	0.0000

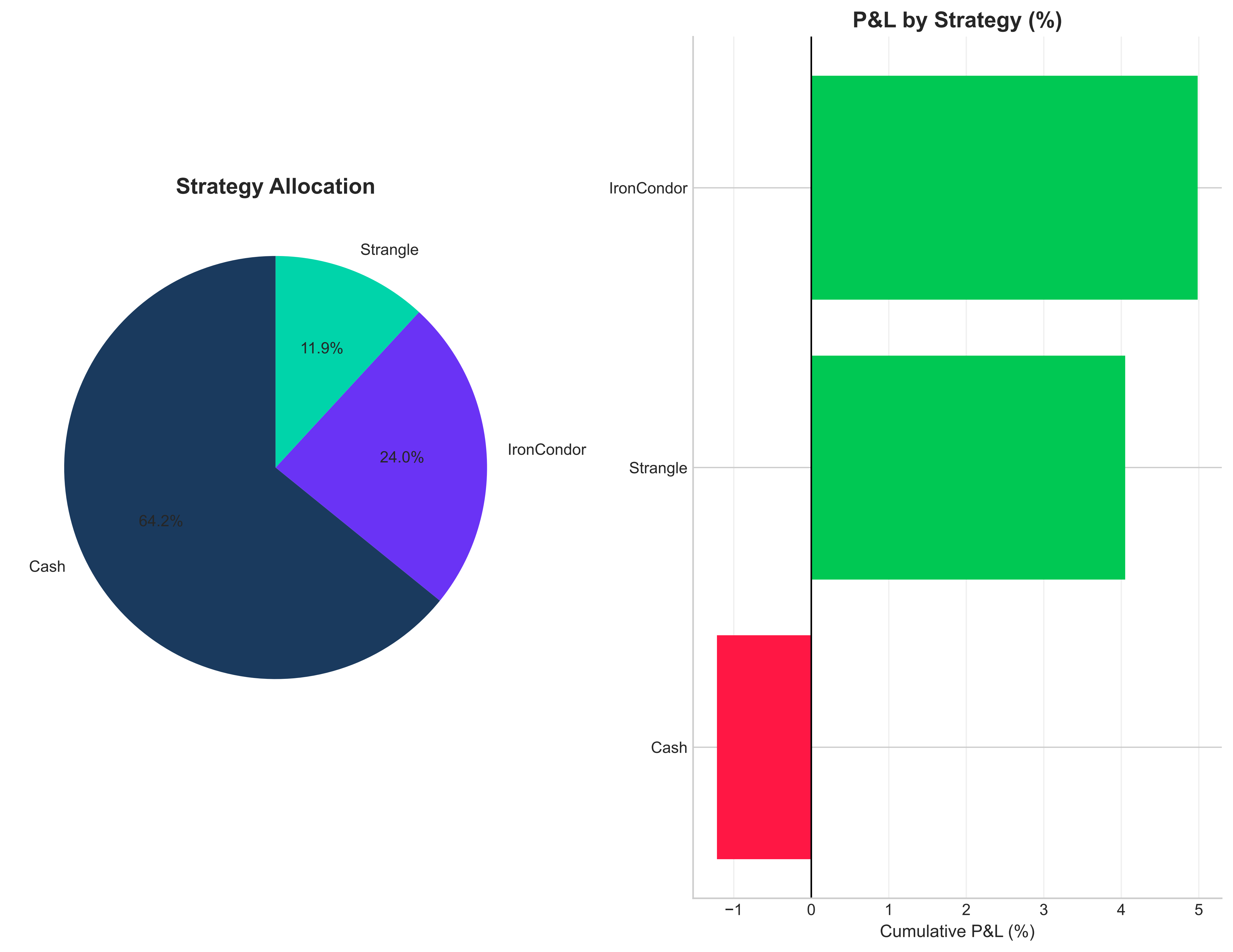

Rolling 6-Month Sharpe Ratio
Target: 1.0
Sharpe Ratio
8
6
4
2
0
−2
Rolling 6-Month Sortino Ratio
Target: 1.5
Sortino Ratio
70
60
50
40
30
20
10
0
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07



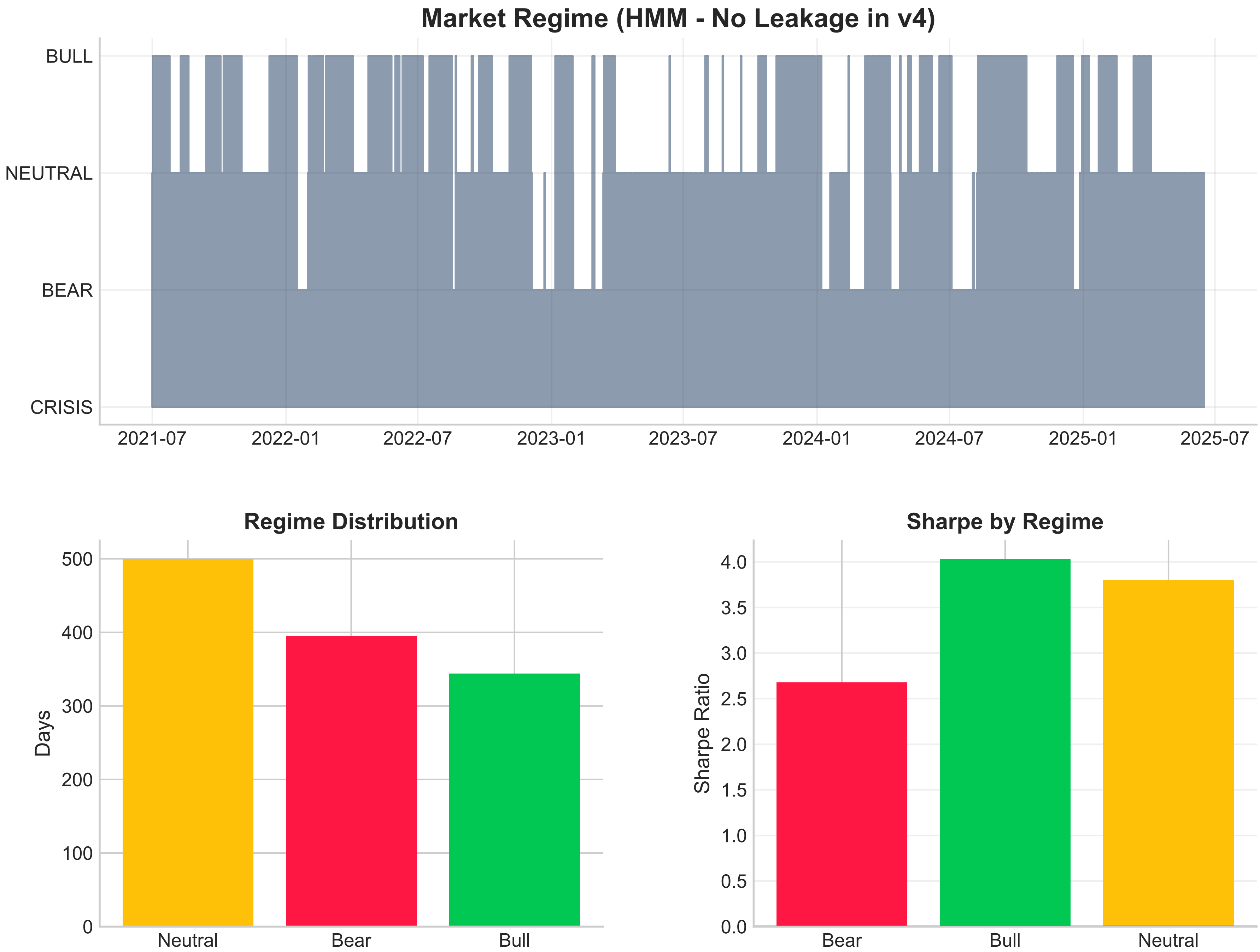
Drawdown Over Time
Drawdown (%)
0
−2
−4
−6
−8
−10
Warning: -10%
2021-07
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07

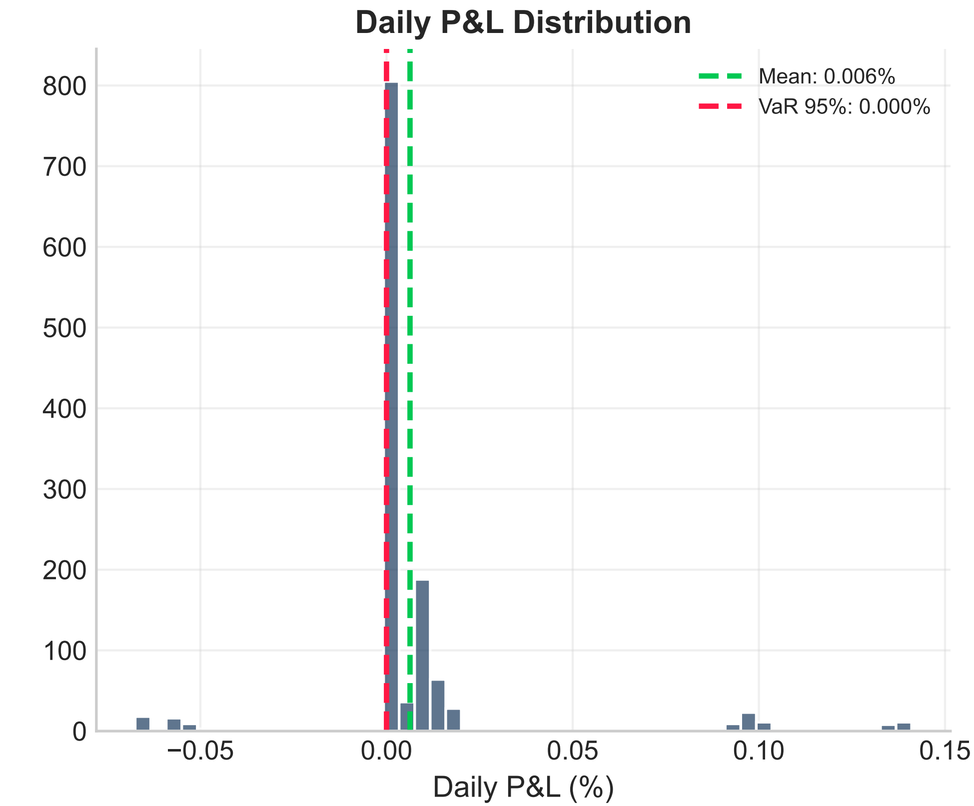


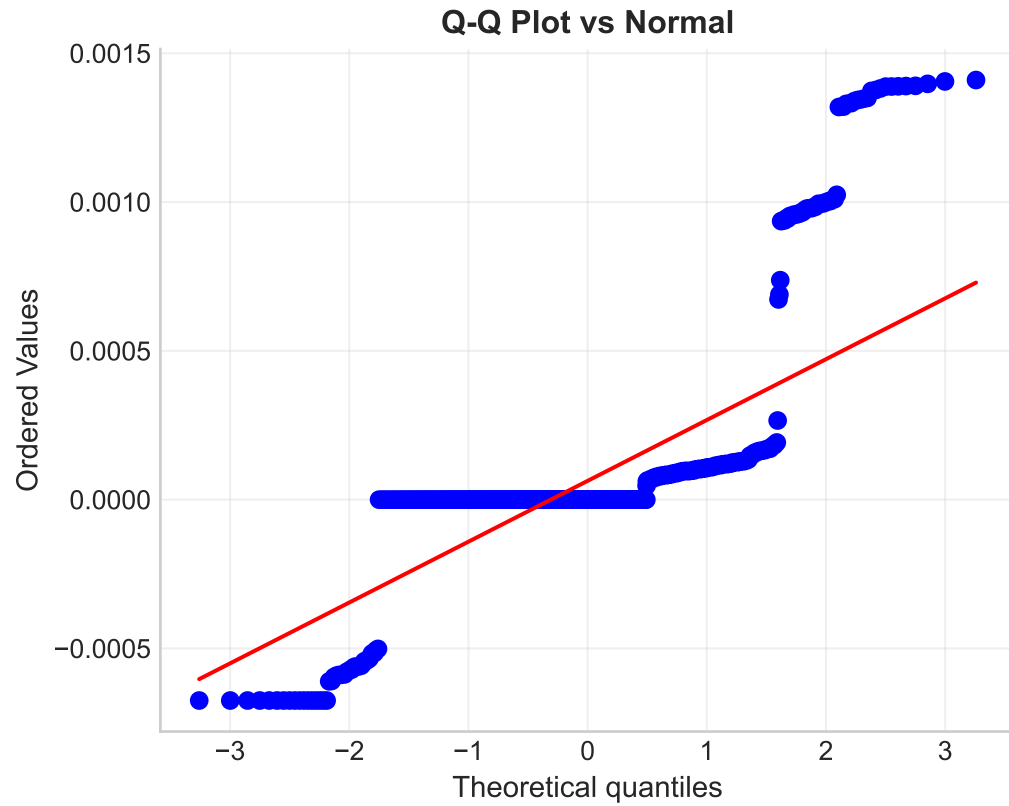
Drawdown Distribution
5th Percentile: -0.1%
Frequency
0
100
200
300
400
−0.20
−0.15
−0.10
−0.05
0.00
Drawdown (%)

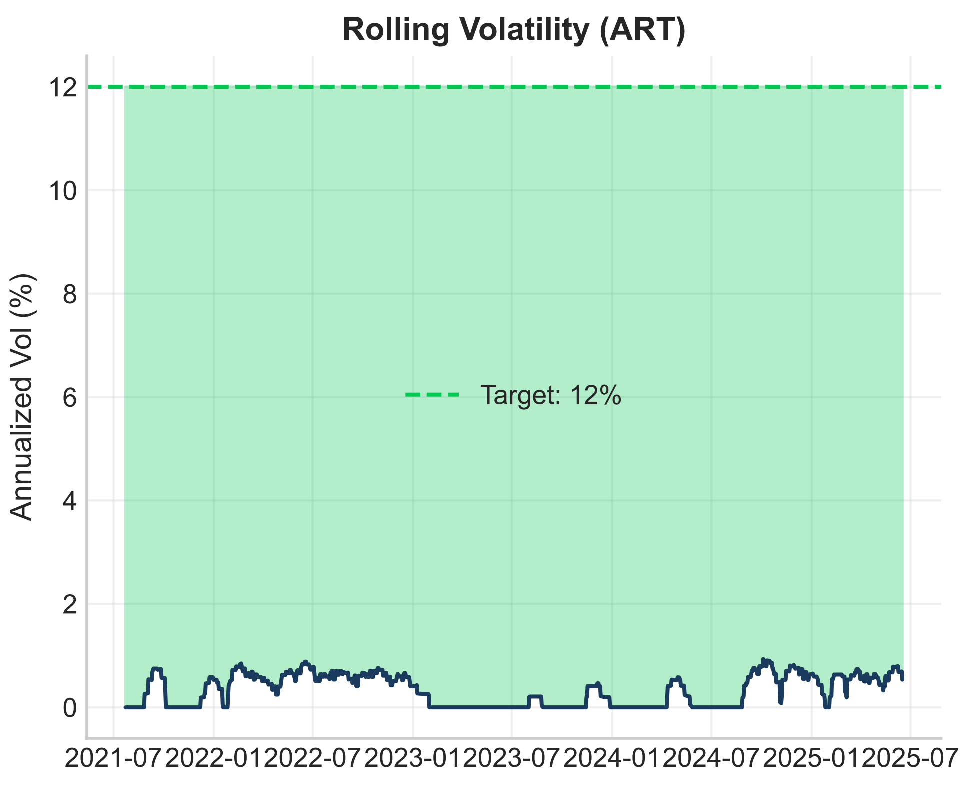


Strategy Allocation
Strangle
11.9%
IronCondor
24.0%
64.2%
Cash
P&L by Strategy (%)
IronCondor
Strangle
Cash
−1
0
1
2
3
4
5
Cumulative P&L (%)


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
Neutral
Bear
Bull
Sharpe by Regime
Sharpe Ratio
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Bear
Bull
Neutral







Metric	Value
VaR 95%	0.000%
ES 95%	-0.003%
Skewness	2.357
Kurtosis	9.851
Omega Ratio	3.660
Profit Factor	3.660


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

Top 10 Winners & Losers

Rank	Strategy	P&L (%)
1	IronCondor	+0.5512%
2	IronCondor	+0.4910%
3	IronCondor	+0.4564%
4	Strangle	+0.3592%
5	IronCondor	+0.3197%
6	IronCondor	+0.2909%
7	IronCondor	+0.2528%
8	IronCondor	+0.2347%
9	IronCondor	+0.2231%
10	Strangle	+0.1916%
B1	IronCondor	-0.0321%
B2	IronCondor	-0.0324%
B3	IronCondor	-0.0333%
B4	IronCondor	-0.0446%
B5	IronCondor	-0.0478%
B6	Strangle	-0.0507%
B7	Strangle	-0.0537%
B8	IronCondor	-0.0540%
B9	IronCondor	-0.0589%
B10	IronCondor	-0.0596%

v4.9 Fixes & Improvements Dashboard

Improvement	Metric	Status
1. Robust ML (Lasso Logistic)	OOS AUC: 0.5436	□
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: 0.5%	□□
6. Weekend Theta WIRED	Avg Adj: 1.9903	□
7. Strategy Leverage Diff	Per-strategy scaling	□
8. OOS AUC Reporting	Test AUC, not train	□

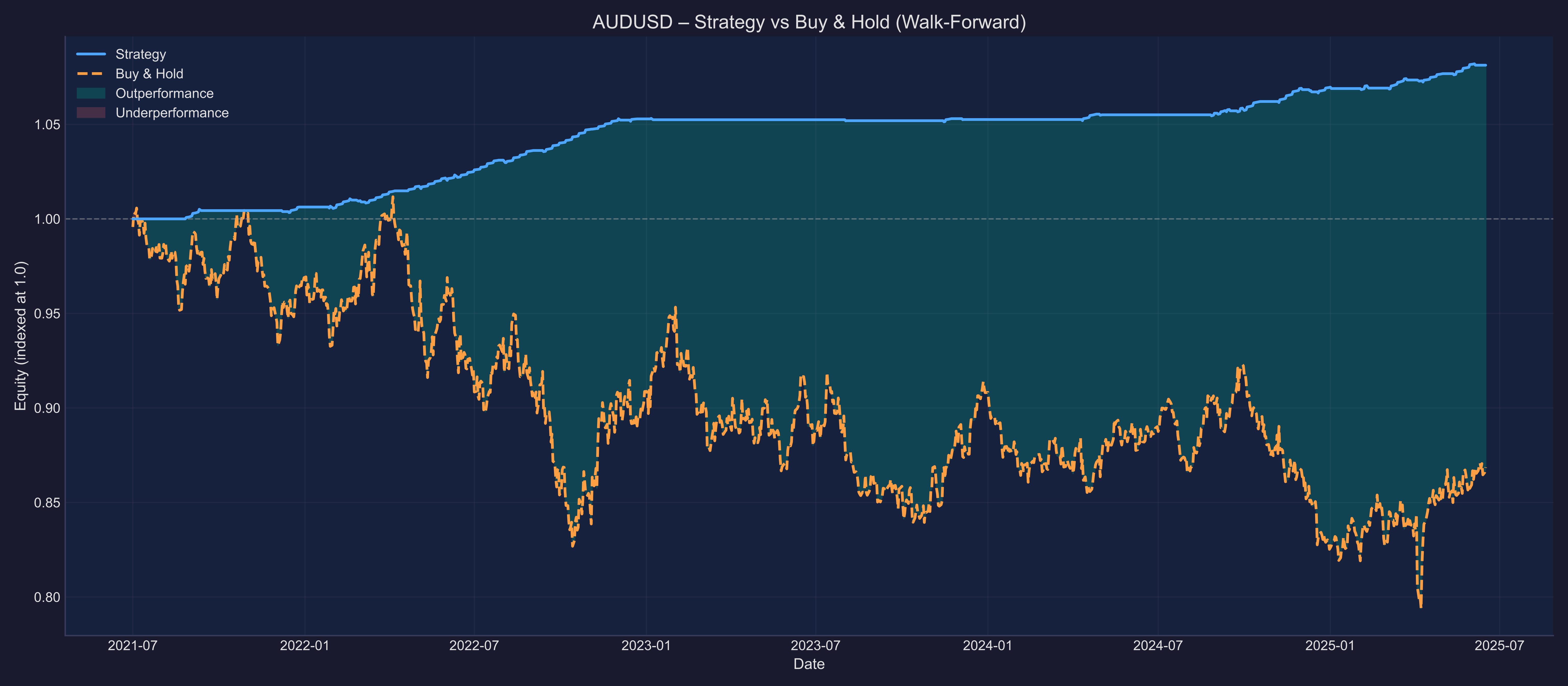
AUDUSD - FINAL SUMMARY (v4.9)

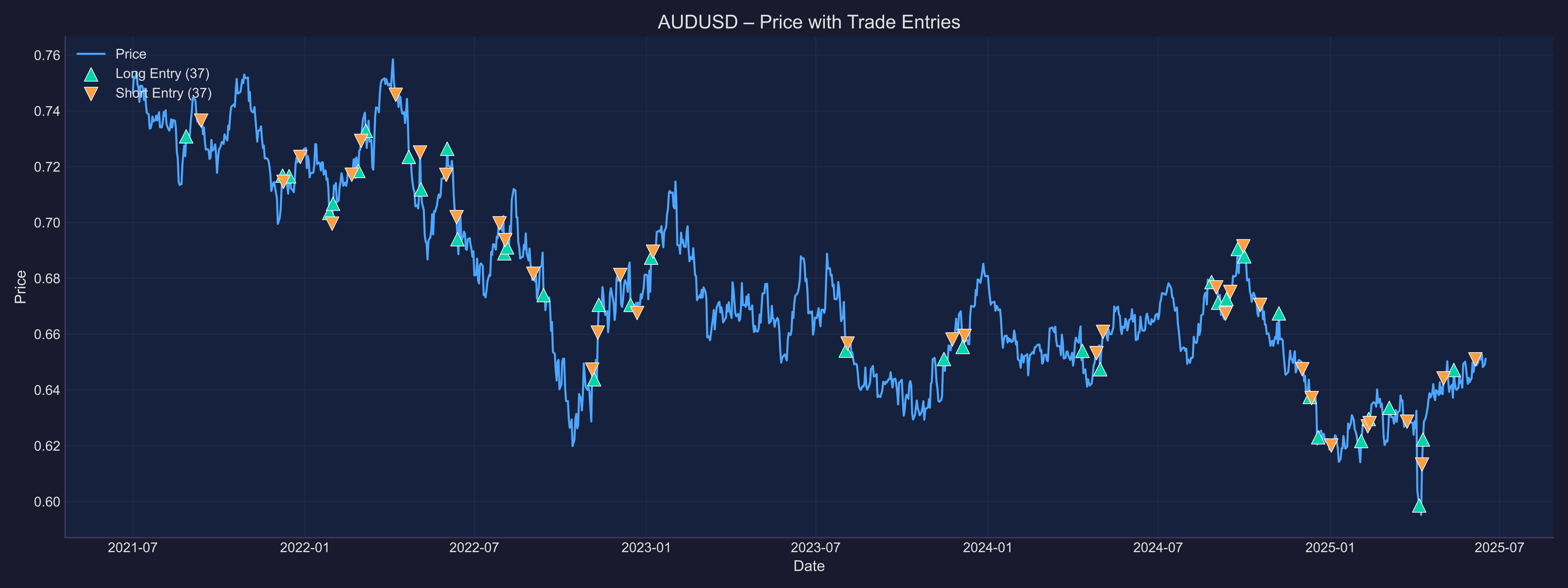
Core Metrics:
- Sharpe Ratio: 3.5312
- Sortino Ratio: 15.9628
- Total Return: +8.13%
- Max Drawdown: -0.24%

Statistical Significance:
- t-stat: 22.8785
- p-value: 0.000000
- 95% CI: [2.7969, 4.2109]
- Significant: Yes

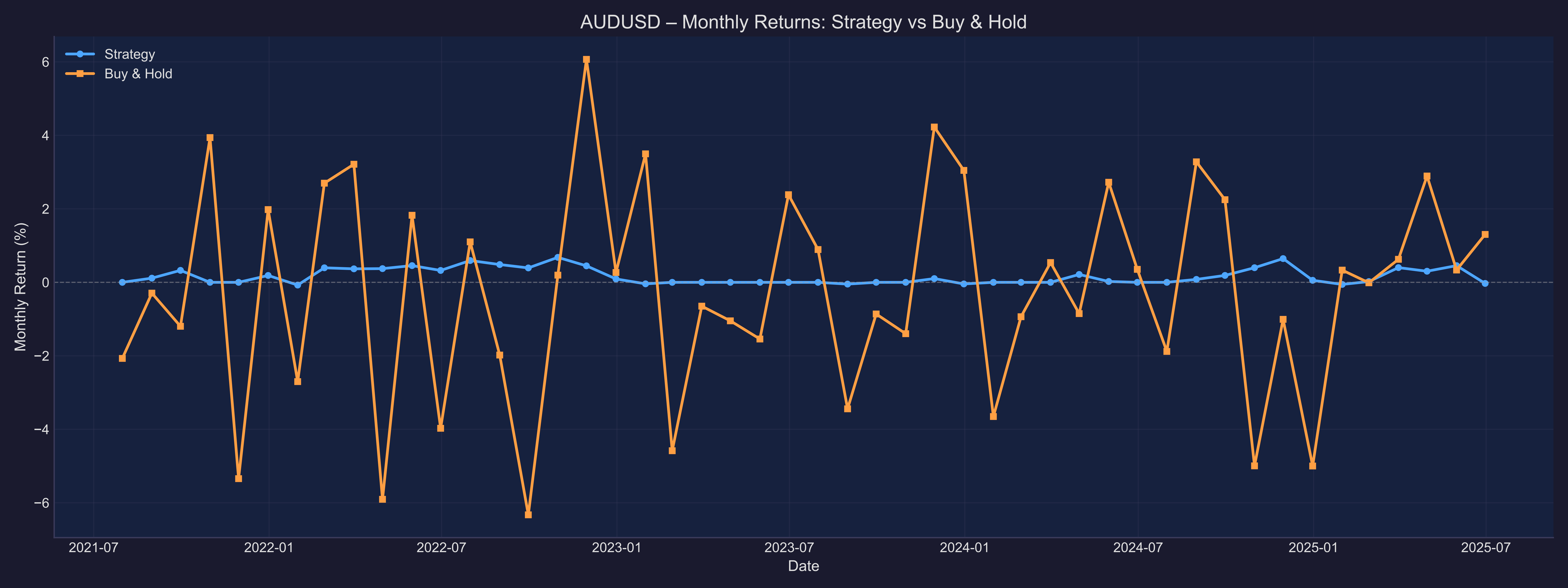
ML Performance (OOS):
- Global AUC: 0.5436

GRADE: EXCELLENT (Significant)

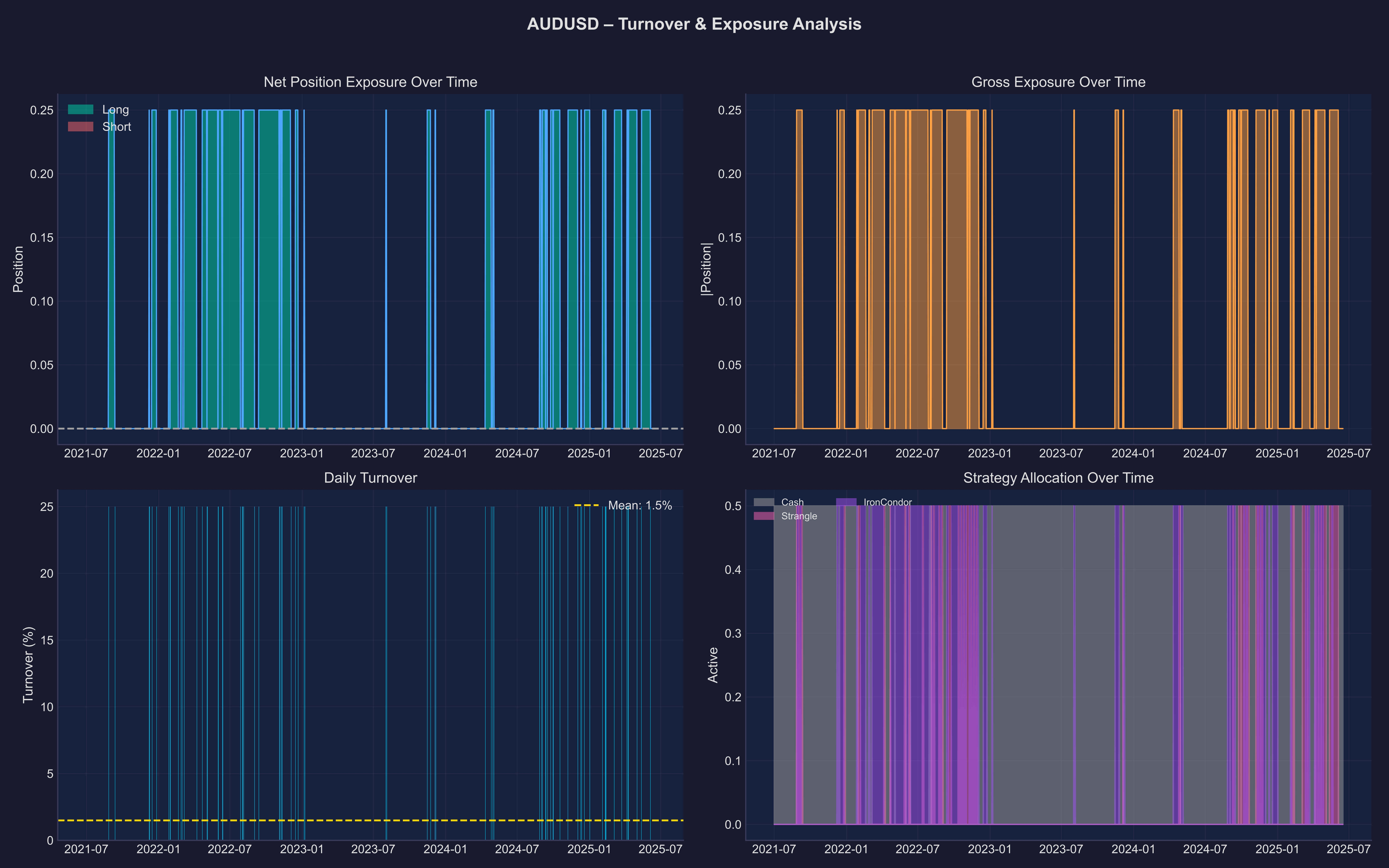

AUDUSD – Strategy vs Buy & Hold (Walk-Forward)
Strategy
Buy & Hold
Outperformance
Underperformance
1.05
1.00
0.95
0.90
0.85
0.80
Equity (indexed at 1.0)
2021-07
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07
Date



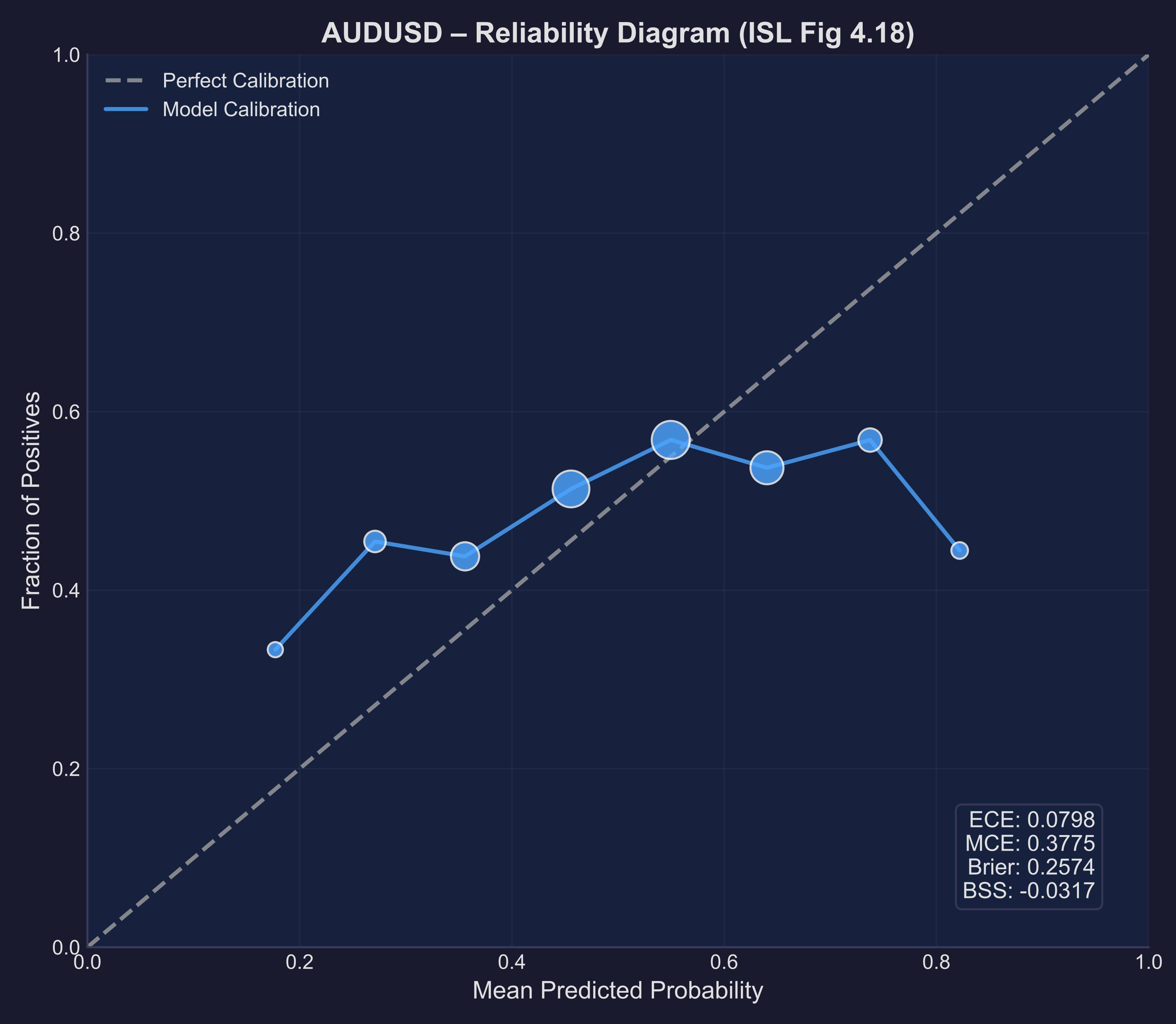
AUDUSD – Price with Trade Entries
Price
Long Entry (37)
Short Entry (37)
0.76
0.74
0.72
0.70
0.68
0.66
0.64
0.62
0.60
Price
2021-07
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07
Date

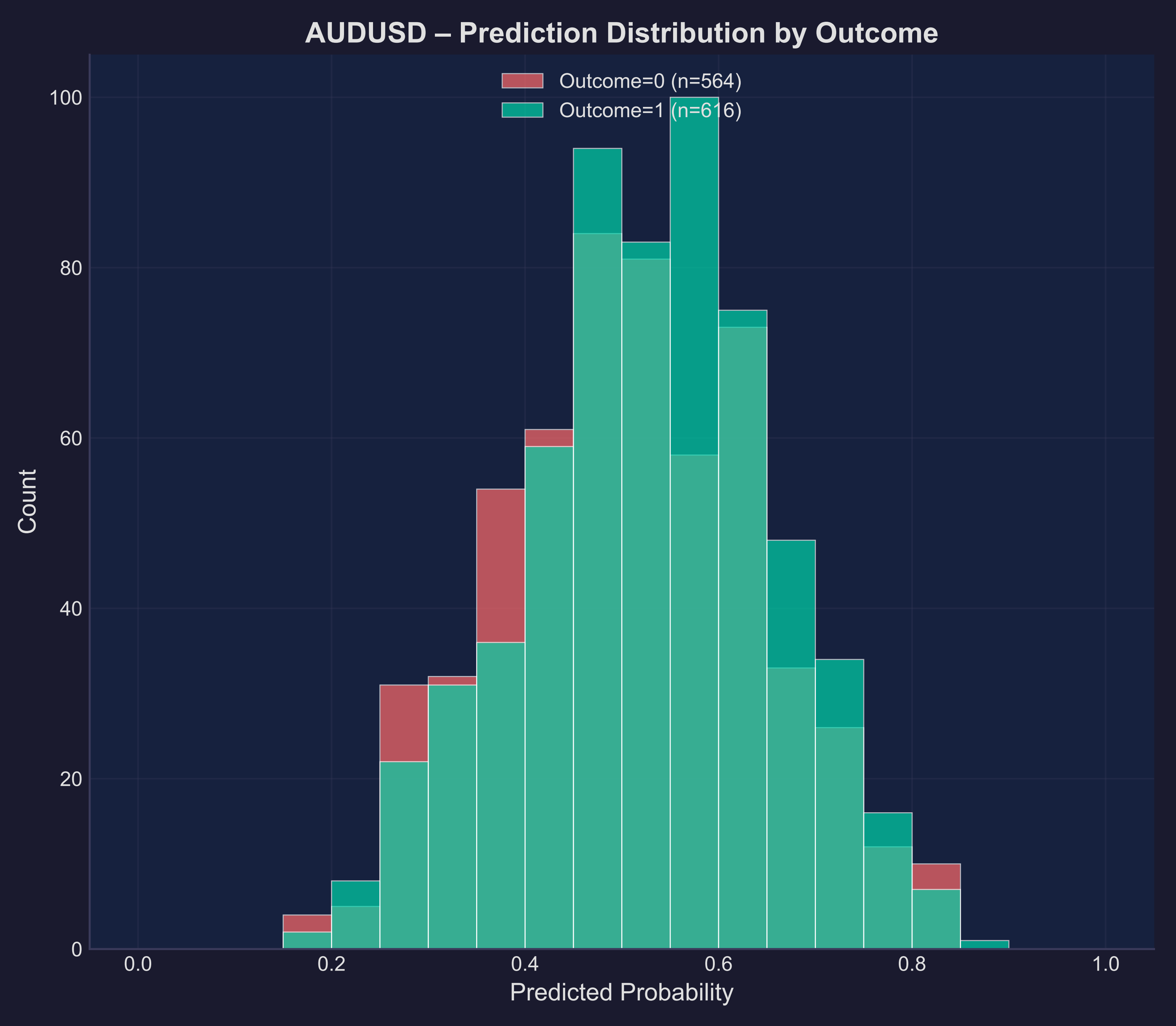


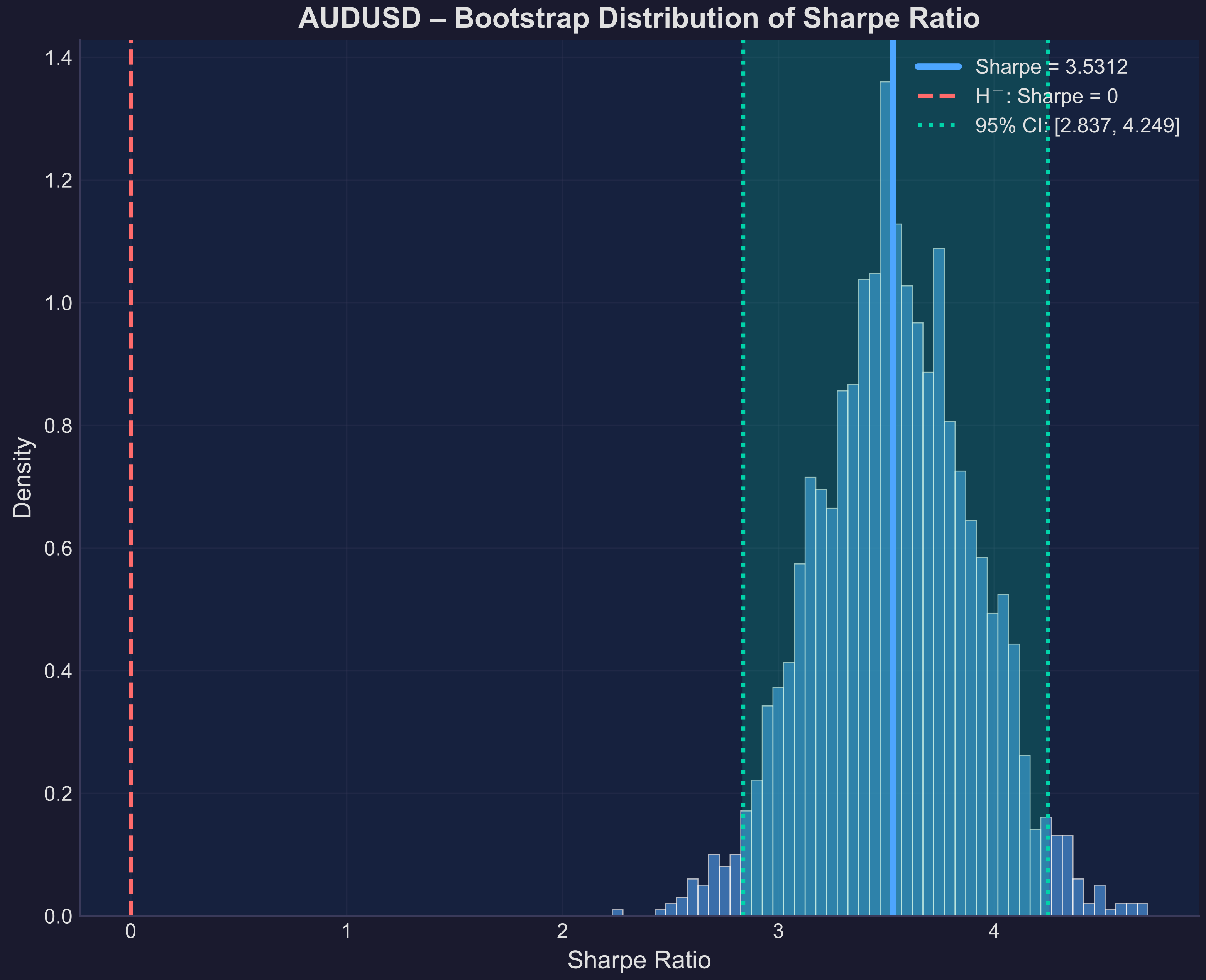
AUDUSD – Monthly Returns: Strategy vs Buy & Hold
Strategy
Buy & Hold
Monthly Return (%)
6
4
2
0
−2
−4
−6
2021-07
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07
Date



AUDUSD – Turnover & Exposure Analysis
Net Position Exposure Over Time
Long
Short
Position
Gross Exposure Over Time
|Position|
Daily Turnover
Mean: 1.5%
Turnover (%)
Strategy Allocation Over Time
Cash
Strangle
IronCondor
Active


AUDUSD – Reliability Diagram (ISL Fig 4.18)
Perfect Calibration
Model Calibration
ECE: 0.0798
MCE: 0.3775
Brier: 0.2574
BSS: -0.0317
Fraction of Positives
Mean Predicted Probability


AUDUSD – Prediction Distribution by Outcome
Outcome=0 (n=564)
Outcome=1 (n=616)
Count
Predicted Probability



AUDUSD – Sharpe Ratio T-Test Results

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SHARPE RATIO STATISTICAL SIGNIFICANCE TEST

Sample Size (n):             1,239 days

Point Estimate:
  Sharpe Ratio:              3.5312
  Standard Error:            0.1543

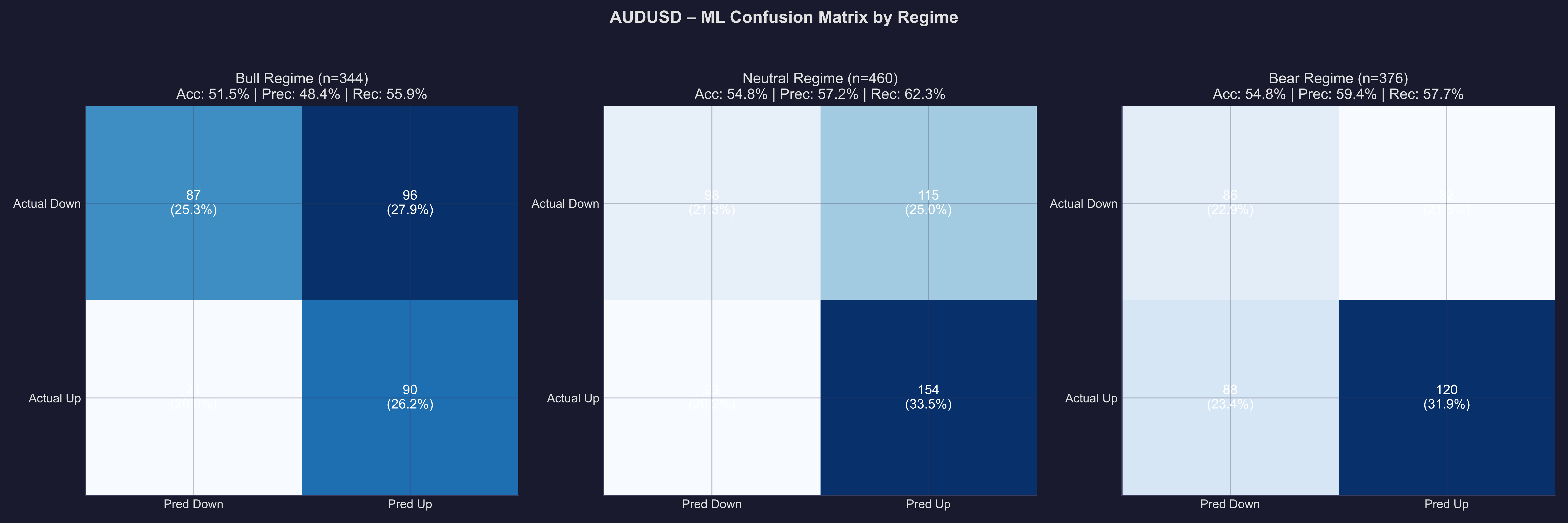
T-Test (H₀: Sharpe = 0):
  t-statistic:               22.8785
  p-value:                   0.000000
  Degrees of freedom:        1238

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

Confidence Intervals:
  Analytical 95% CI:         [3.2287, 3.8337]
  Bootstrap 95% CI:          [2.8369, 4.2491]

Bootstrap Statistics:
  Mean:                      3.5391
  Median:                    3.5337
  Std Error:                 0.3622
```

AUDUSD – ML Lift Curve: Return by Prediction Bucket
Mean Next-Day Return (bps)
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
−10.0
2
4
6
8
10
ML Probability Decile (1=Lowest, 10=Highest)
AUDUSD – Hit Rate by Prediction Bucket
Random (50%)
Actual Up-Day Rate (%)
70
60
50
40
30
20
10
0
2
4
6
8
10
ML Probability Decile


AUDUSD – ML Confusion Matrix by Regime
Bull Regime (n=344)
Acc: 51.5% | Prec: 48.4% | Rec: 55.9%
Neutral Regime (n=460)
Acc: 54.8% | Prec: 57.2% | Rec: 62.3%
Bear Regime (n=376)
Acc: 54.8% | Prec: 59.4% | Rec: 57.7%
Actual Down
Actual Up
Pred Down
Pred Up
87
(25.3%)
96
(27.9%)
90
(26.2%)
98
(21.3%)
115
(25.0%)
154
(33.5%)
86
(22.9%)
88
(23.4%)
120
(31.9%)