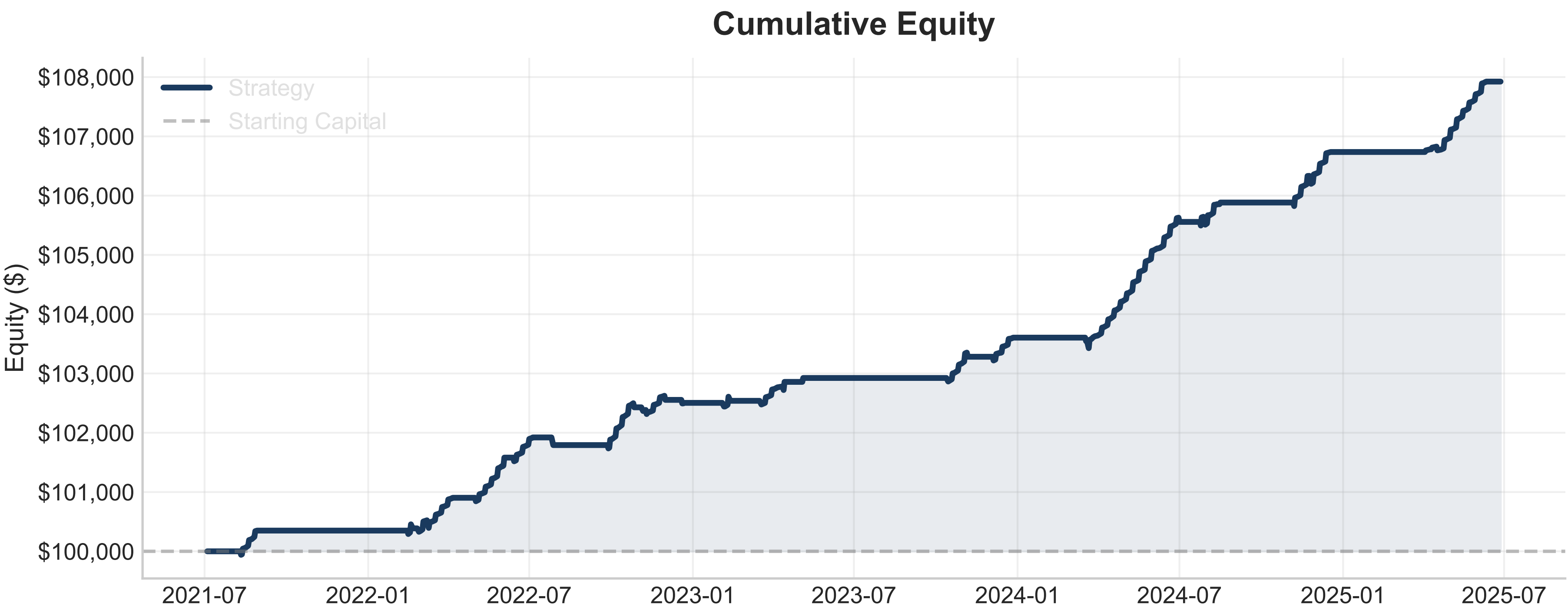
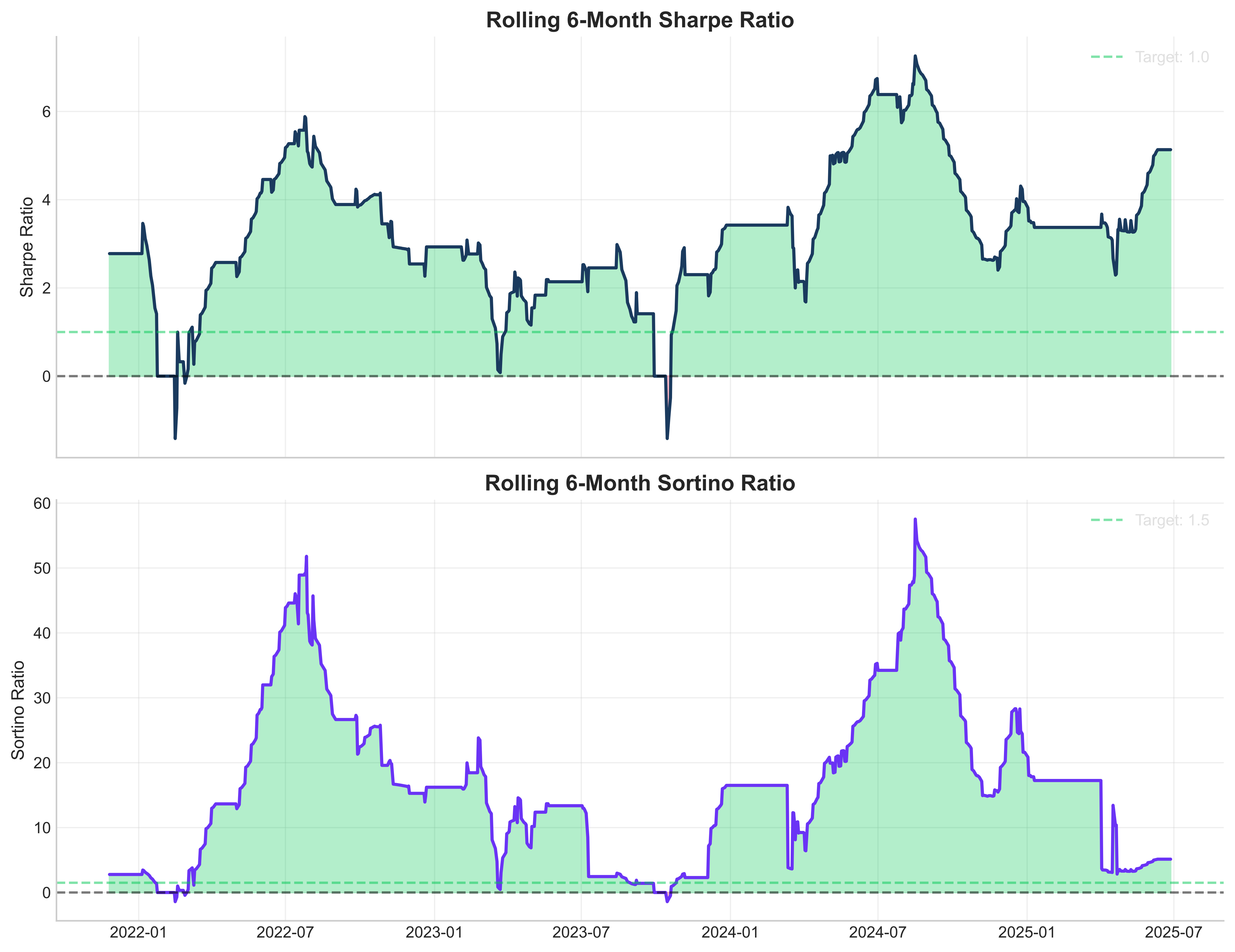
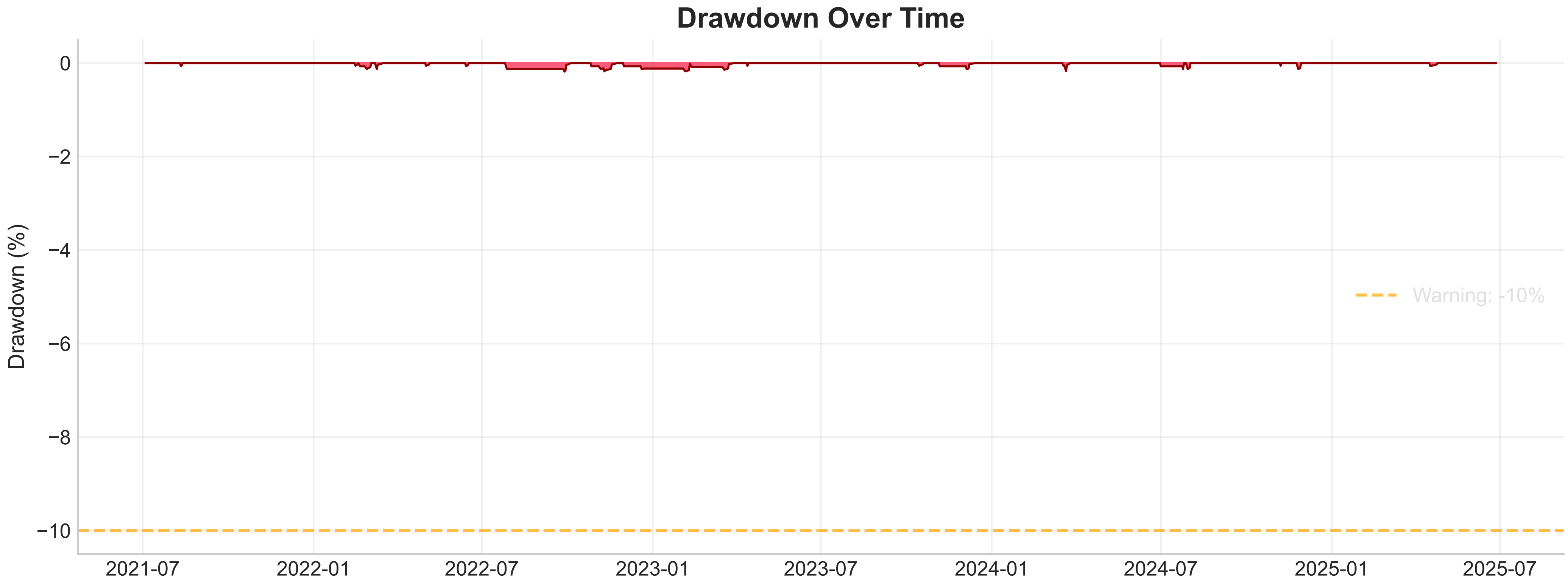
XAUUSD

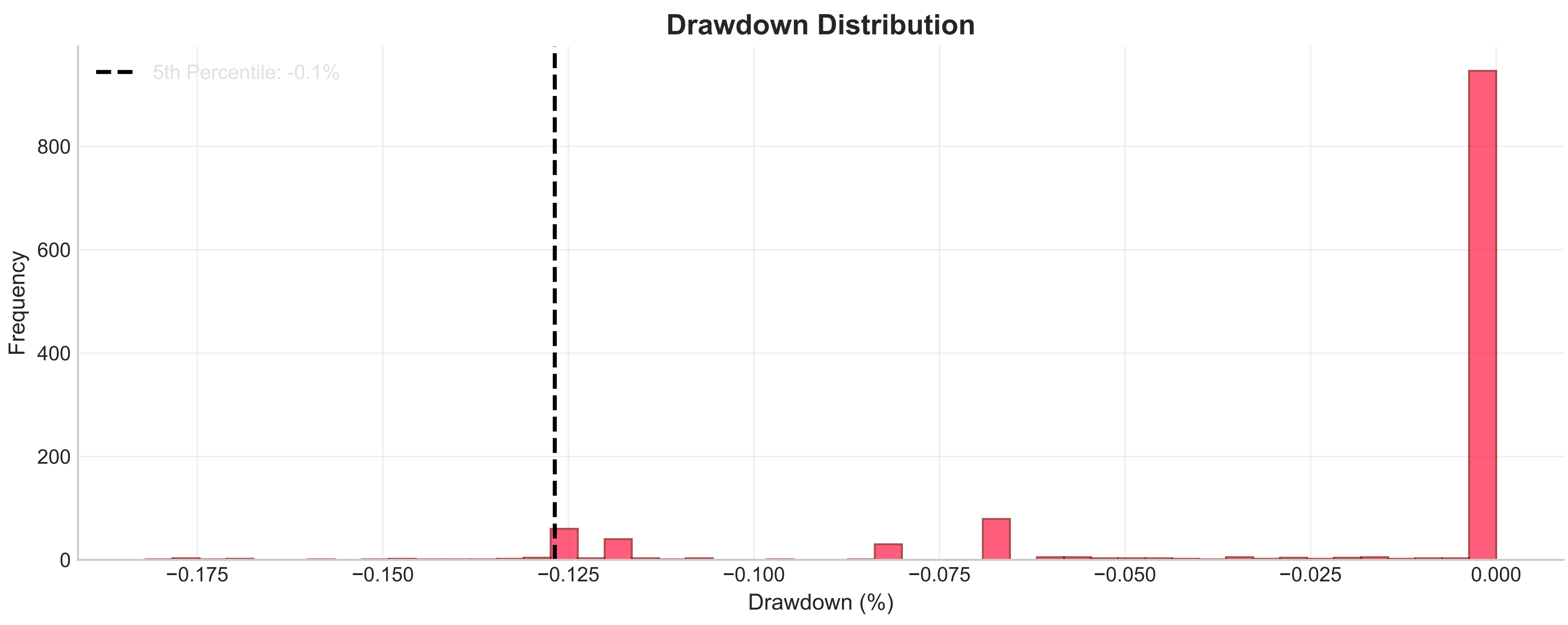
Scientific Options Framework v4.9 — Performance Report

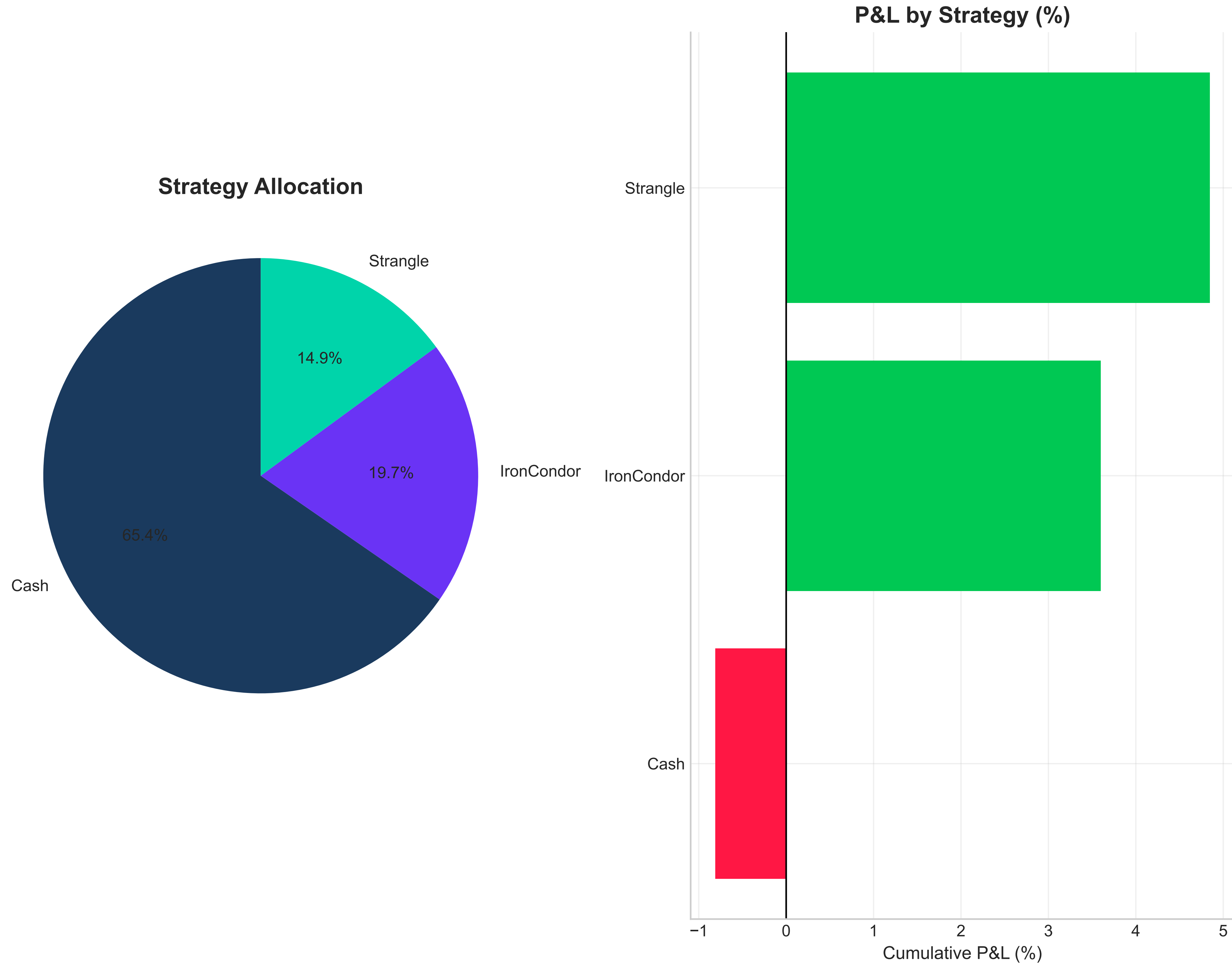


Sharpe Ratio	3.558 □	Sortino Ratio	21.413
Total Return	+7.92%	CAGR	+1.56%
Max Drawdown	-0.18%	Win Rate	91.8%
ML OOS AUC	0.5106	Sharpe p-value	0.0000

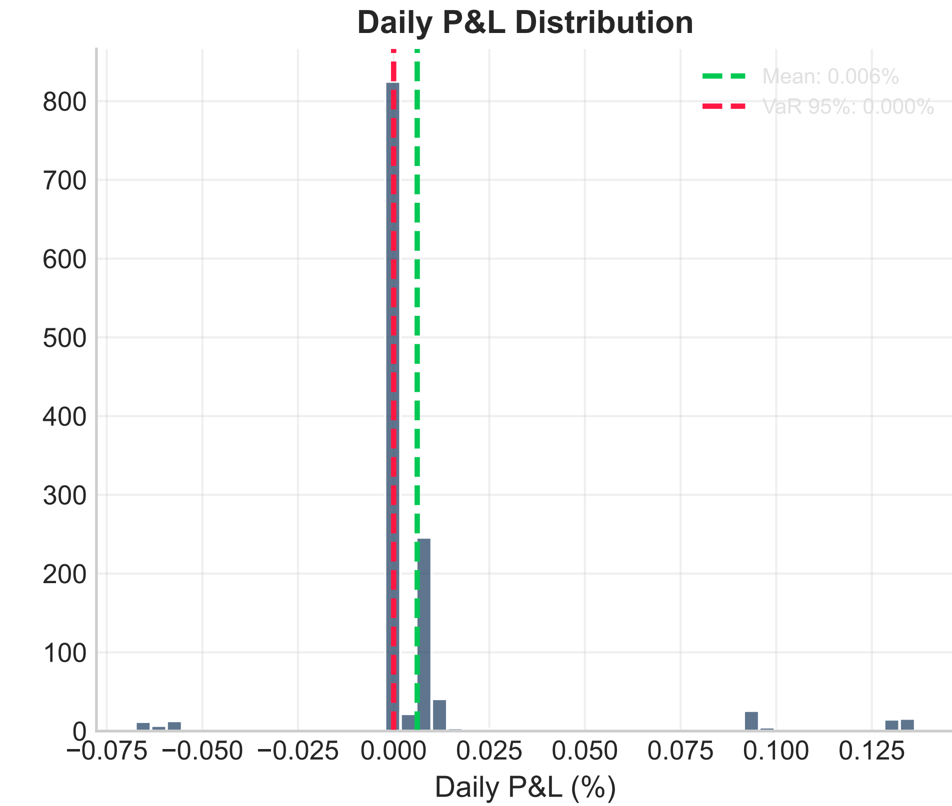

Rolling 6-Month Sharpe Ratio
Target: 1.0
Sharpe Ratio
6
4
2
0
Rolling 6-Month Sortino Ratio
Target: 1.5
Sortino Ratio
60
50
40
30
20
10
0
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07

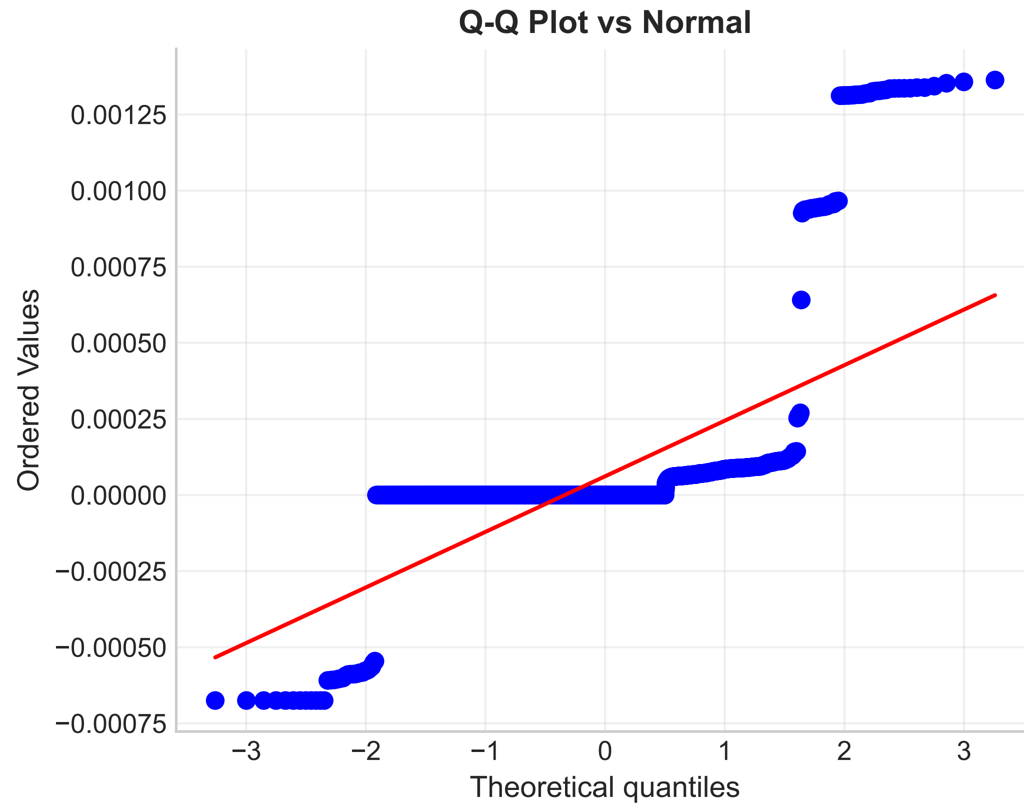

Drawdown Over Time
Drawdown (%)
Warning: -10%
0
−2
−4
−6
−8
−10
2021-07
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07

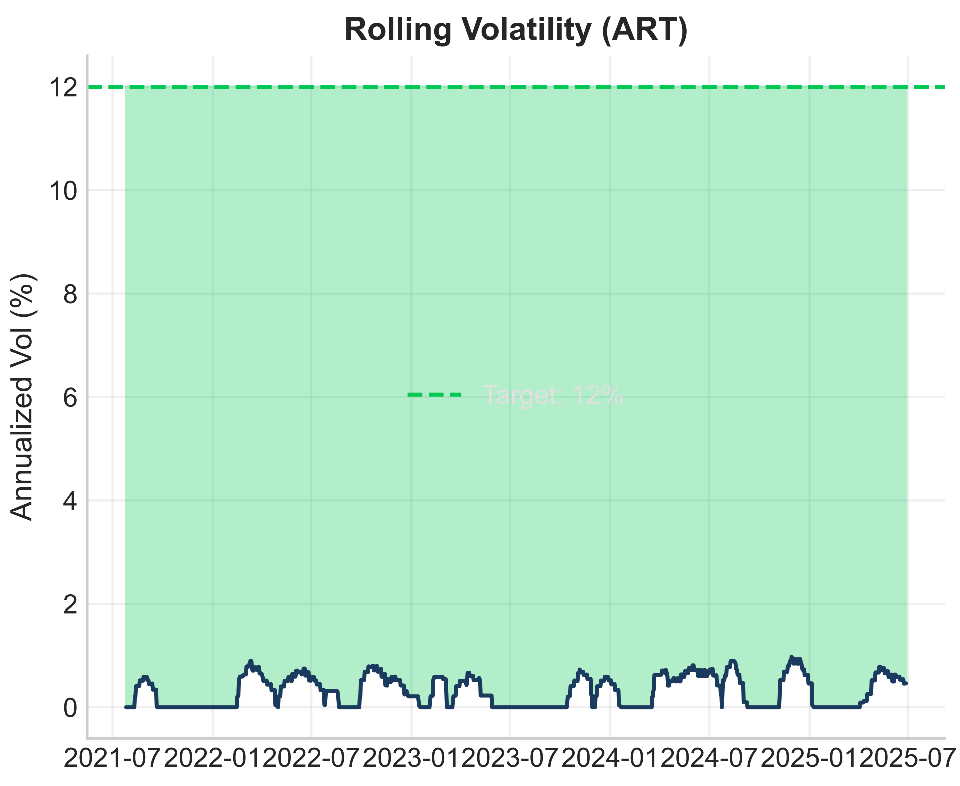

Drawdown Distribution
5th Percentile: -0.1%
Frequency
Drawdown (%)
800
600
400
200
0
−0.175
−0.150
−0.125
−0.100
−0.075
−0.050
−0.025
0.000


Strategy Allocation
Strangle
14.9%
19.7%
IronCondor
65.4%
Cash
P&L by Strategy (%)
Strangle
IronCondor
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
Neutral
Bull
Bear
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%	-0.002%
Skewness	2.869
Kurtosis	12.095
Omega Ratio	4.638
Profit Factor	4.638


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

Top 10 Winners & Losers

Rank	Strategy	P&L (%)
1	Strangle	+0.6920%
2	Strangle	+0.5661%
3	IronCondor	+0.4452%
4	IronCondor	+0.3881%
5	Strangle	+0.3225%
6	IronCondor	+0.3175%
7	IronCondor	+0.3119%
8	IronCondor	+0.3009%
9	IronCondor	+0.2996%
10	Strangle	+0.2680%
B1	IronCondor	+0.0063%
B2	Strangle	-0.0410%
B3	IronCondor	-0.0411%
B4	IronCondor	-0.0433%
B5	Strangle	-0.0469%
B6	Strangle	-0.0490%
B7	IronCondor	-0.0493%
B8	IronCondor	-0.0530%
B9	IronCondor	-0.0574%
B10	IronCondor	-0.0594%

v4.9 Fixes & Improvements Dashboard

Improvement	Metric	Status
1. Robust ML (Lasso Logistic)	OOS AUC: 0.5106	□□
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: 1.8621	□
7. Strategy Leverage Diff	Per-strategy scaling	□
8. OOS AUC Reporting	Test AUC, not train	□

XAUUSD - FINAL SUMMARY (v4.9)

Core Metrics:

- Sharpe Ratio:	3.5583
- Sortino Ratio:	21.4134
- Total Return:	+7.92%
- Max Drawdown:	-0.18%

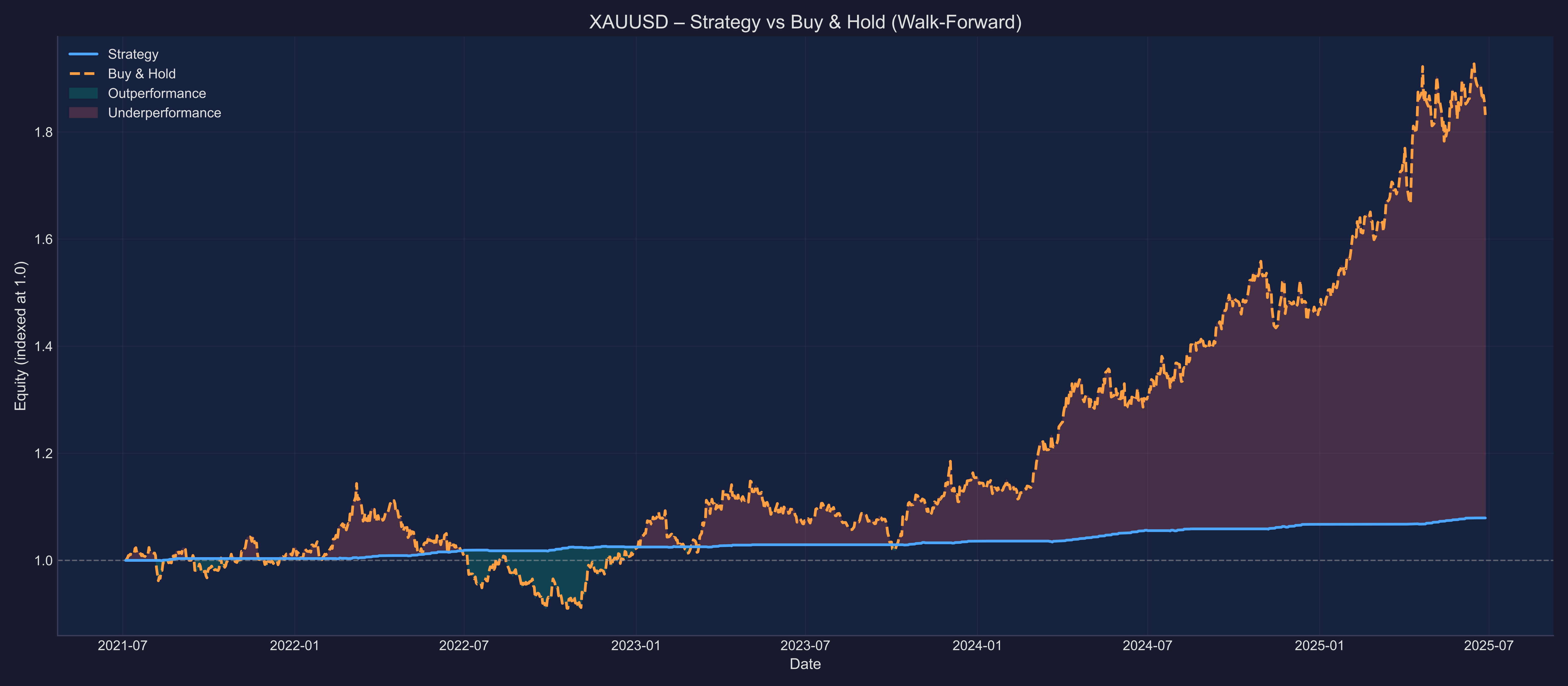
Statistical Significance:

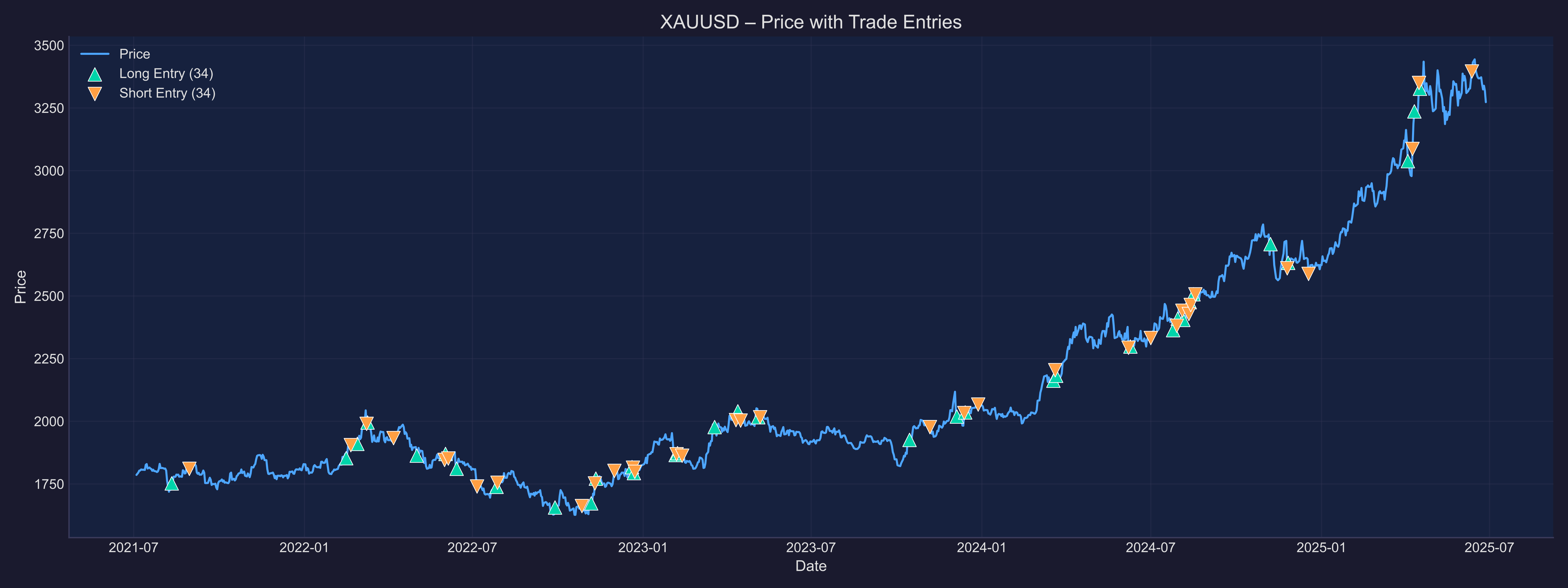
- t-stat:	21.0876
- p-value:	0.000000
- 95% CI:	[2.8881, 4.2039]
- Significant:	Yes

ML Performance (OOS):

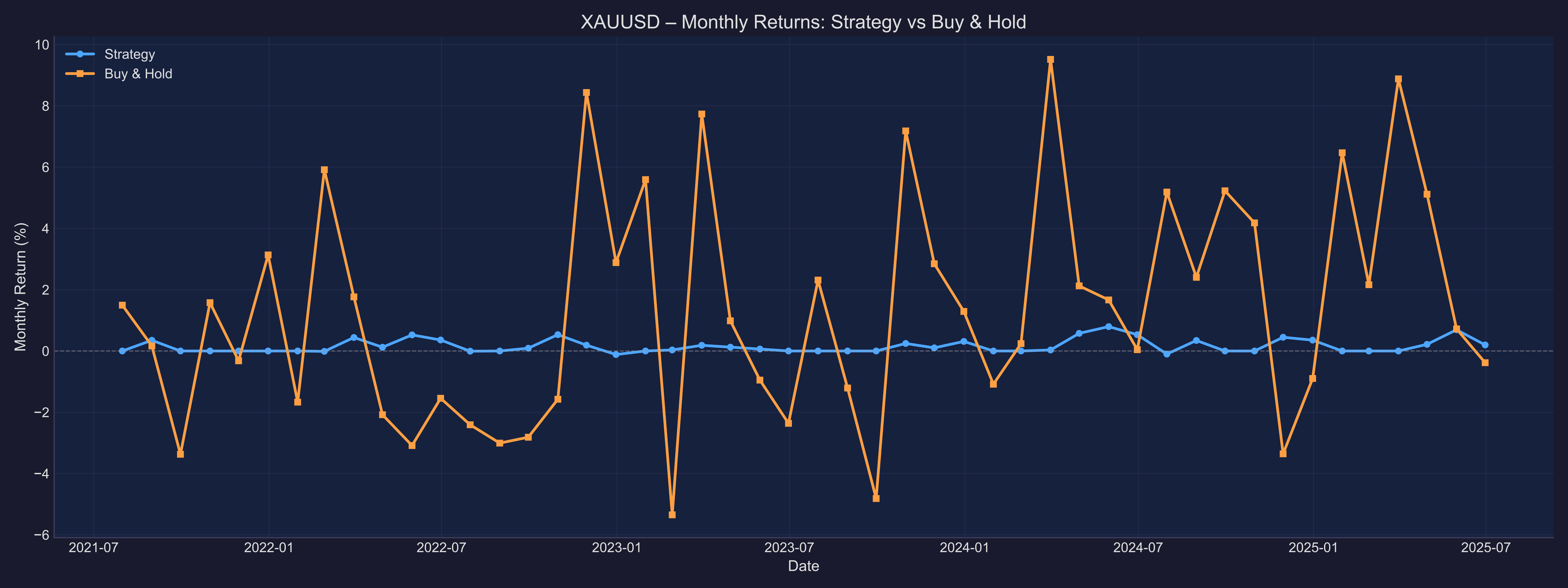
- Global AUC:	0.5106

GRADE: EXCELLENT (Significant)

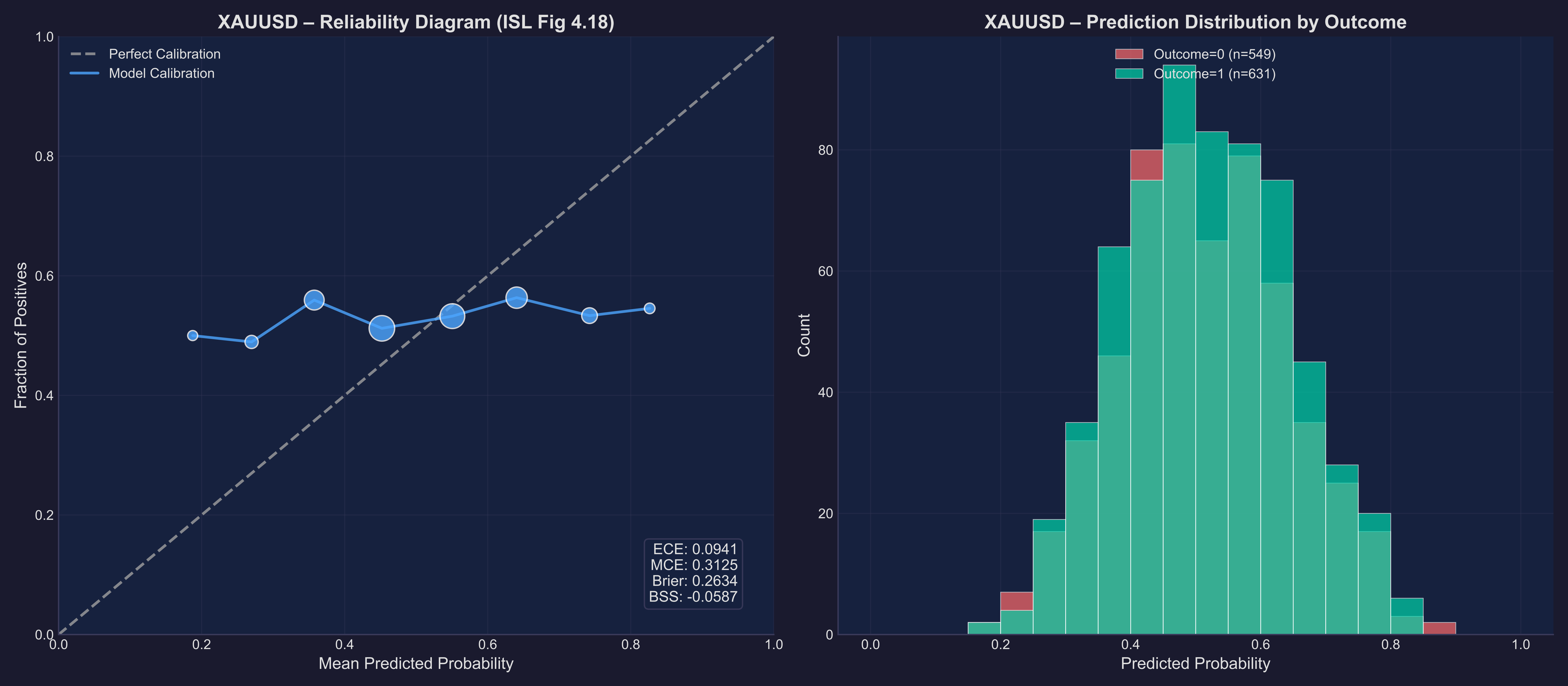

XAUUSD – Strategy vs Buy & Hold (Walk-Forward)
Strategy
Buy & Hold
Outperformance
Underperformance
Equity (indexed at 1.0)
1.0
1.2
1.4
1.6
1.8
Date
2021-07
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07



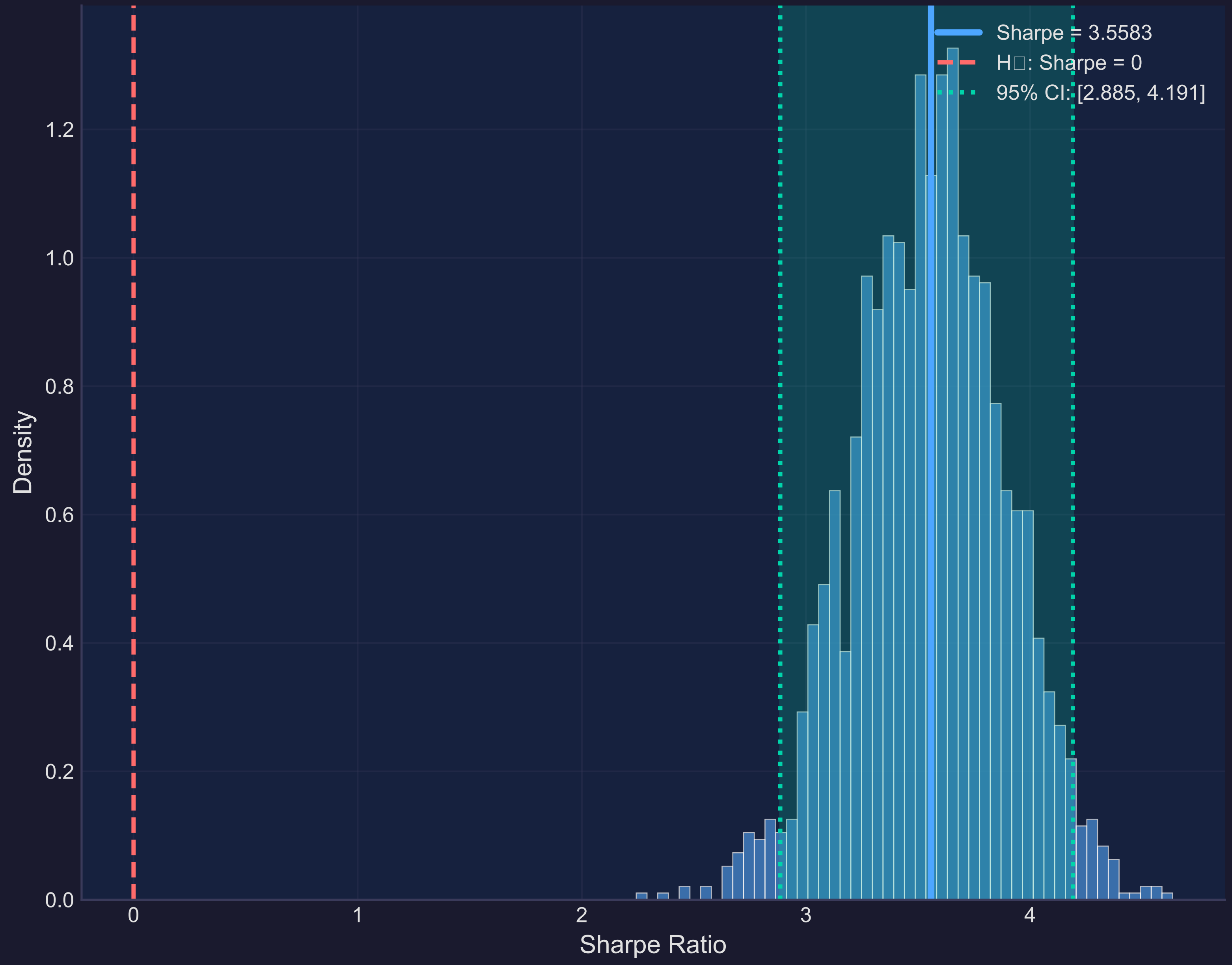
XAUUSD – Price with Trade Entries
Price
Long Entry (34)
Short Entry (34)
3500
3250
3000
2750
2500
2250
2000
1750
Price
2021-07
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07
Date


XAUUSD – Monthly Returns: Strategy vs Buy & Hold
Strategy
Buy & Hold
Monthly Return (%)
10
8
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


XAUUSD – 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
Strangle
IronCondor
Active


XAUUSD – Reliability Diagram (ISL Fig 4.18)
Perfect Calibration
Model Calibration
ECE: 0.0941
MCE: 0.3125
Brier: 0.2634
BSS: -0.0587
Fraction of Positives
Mean Predicted Probability
XAUUSD – Prediction Distribution by Outcome
Outcome=0 (n=549)
Outcome=1 (n=631)
Count
Predicted Probability

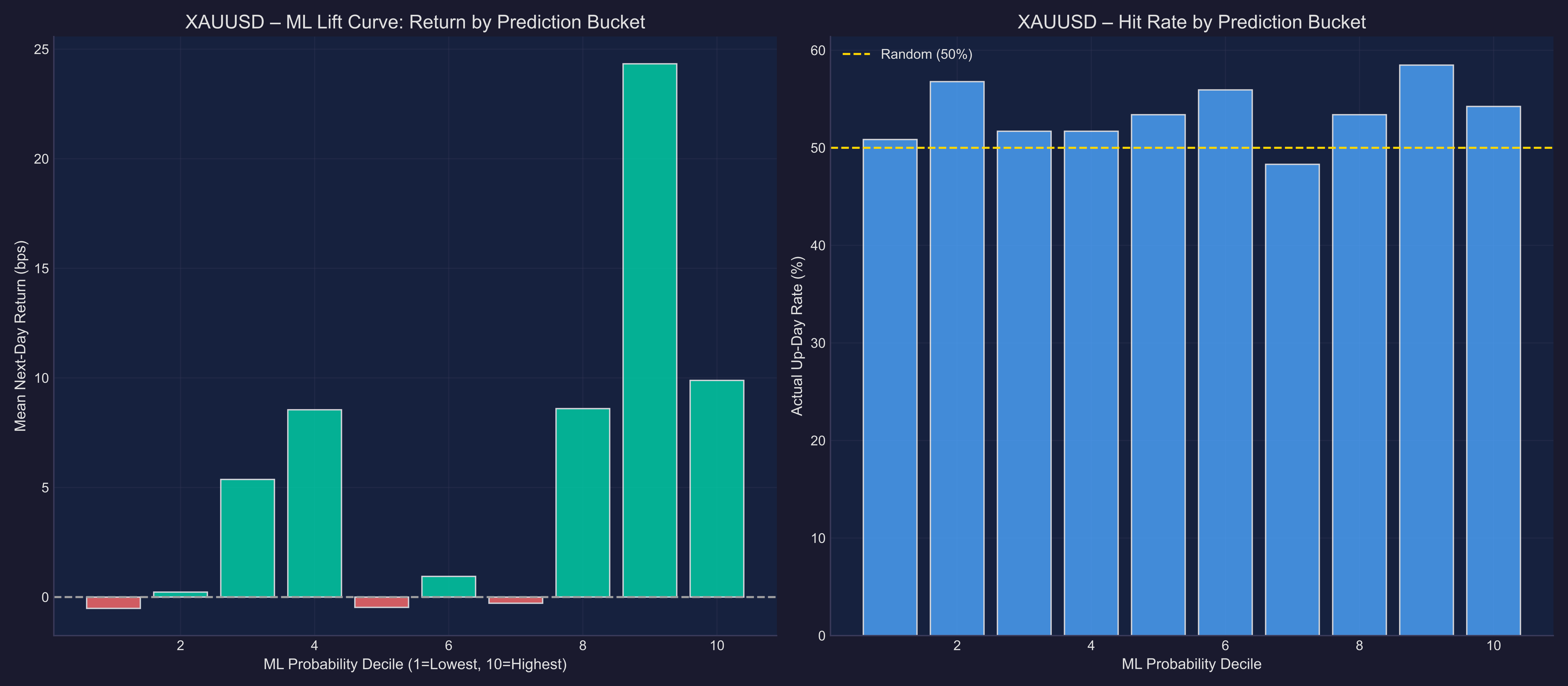
XAUUSD – Bootstrap Distribution of Sharpe Ratio



XAUUSD – Sharpe Ratio T-Test Results

SHARPE RATIO STATISTICAL SIGNIFICANCE TEST

Sample Size (n):	1,239 days
Point Estimate:	
Sharpe Ratio:	3.5583
Standard Error:	0.1687
T-Test (H_0: Sharpe = 0):	
t-statistic:	21.0876
p-value:	0.000000
Degrees of freedom:	1238
Significance:	
At $\alpha = 0.05$:	✓ Yes
At $\alpha = 0.01$:	✓ Yes
Confidence Intervals:	
Analytical 95% CI:	[3.2276, 3.8891]
Bootstrap 95% CI:	[2.8854, 4.1908]
Bootstrap Statistics:	
Mean:	3.5503
Median:	3.5620
Std Error:	0.3346


XAUUSD – ML Lift Curve: Return by Prediction Bucket
Mean Next-Day Return (bps)
ML Probability Decile (1=Lowest, 10=Highest)
0
5
10
15
20
25
2
4
6
8
10
XAUUSD – Hit Rate by Prediction Bucket
Random (50%)
Actual Up-Day Rate (%)
ML Probability Decile
0
10
20
30
40
50
60
2
4
6
8
10

XAUUSD – ML Confusion Matrix by Regime