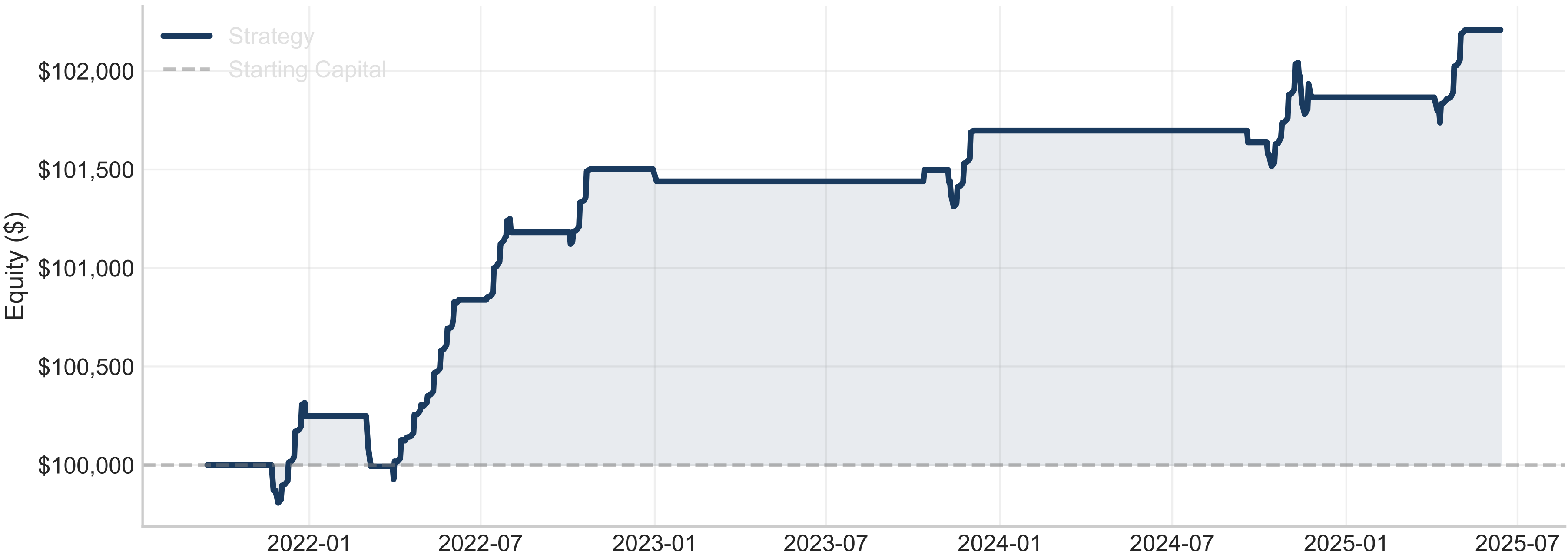
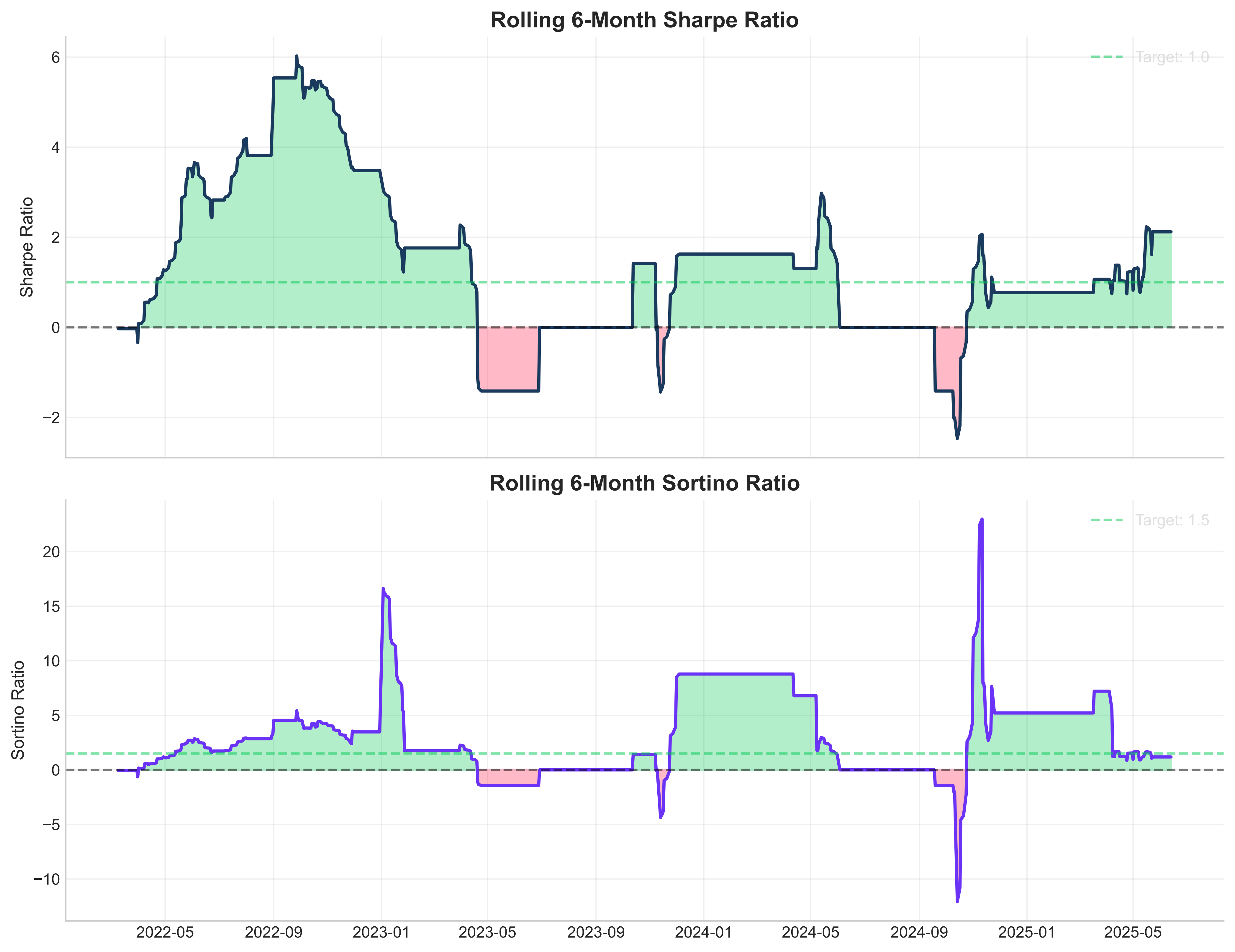
DIESEL

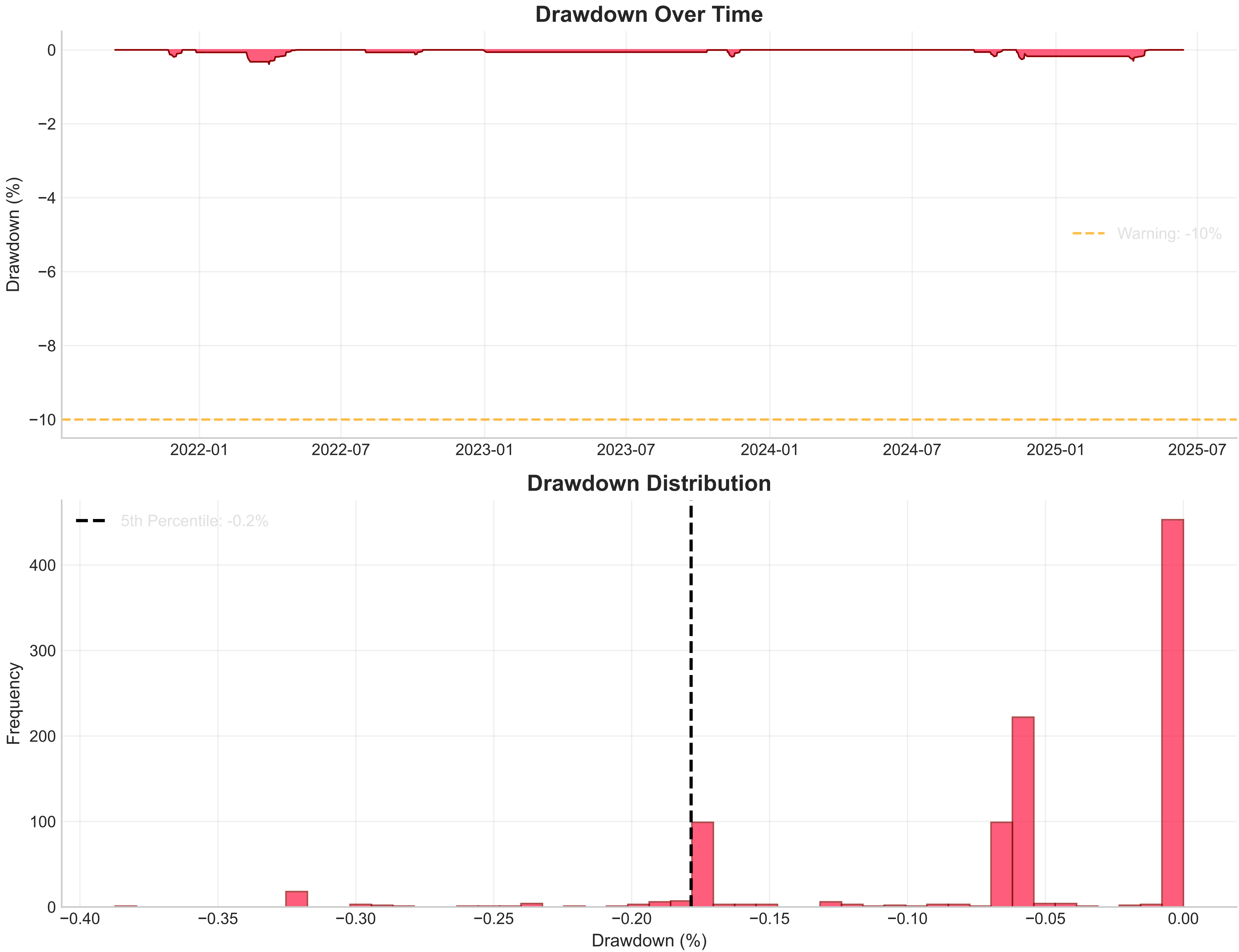
Scientific Options Framework v4.9 — Performance Report

Cumulative Equity

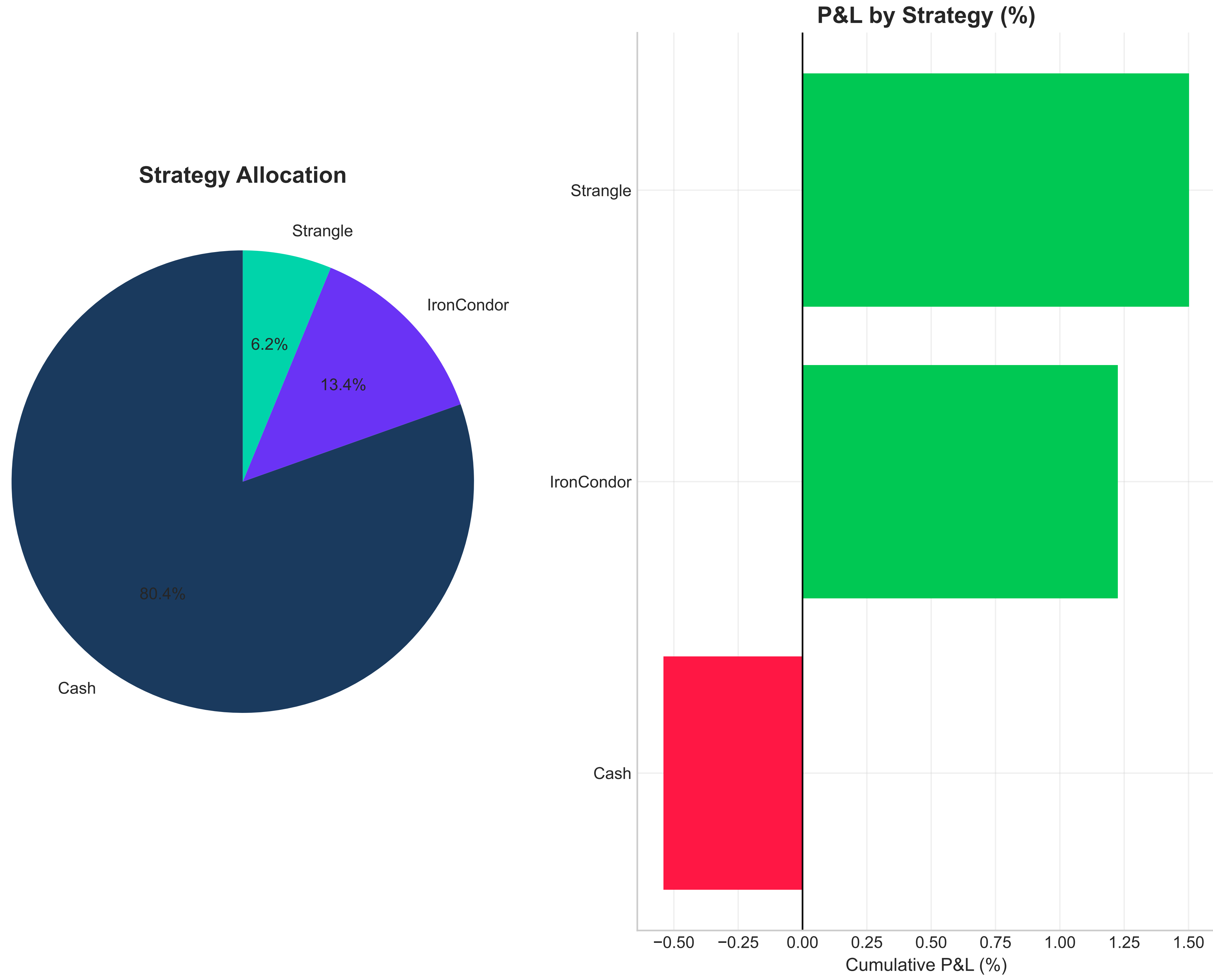


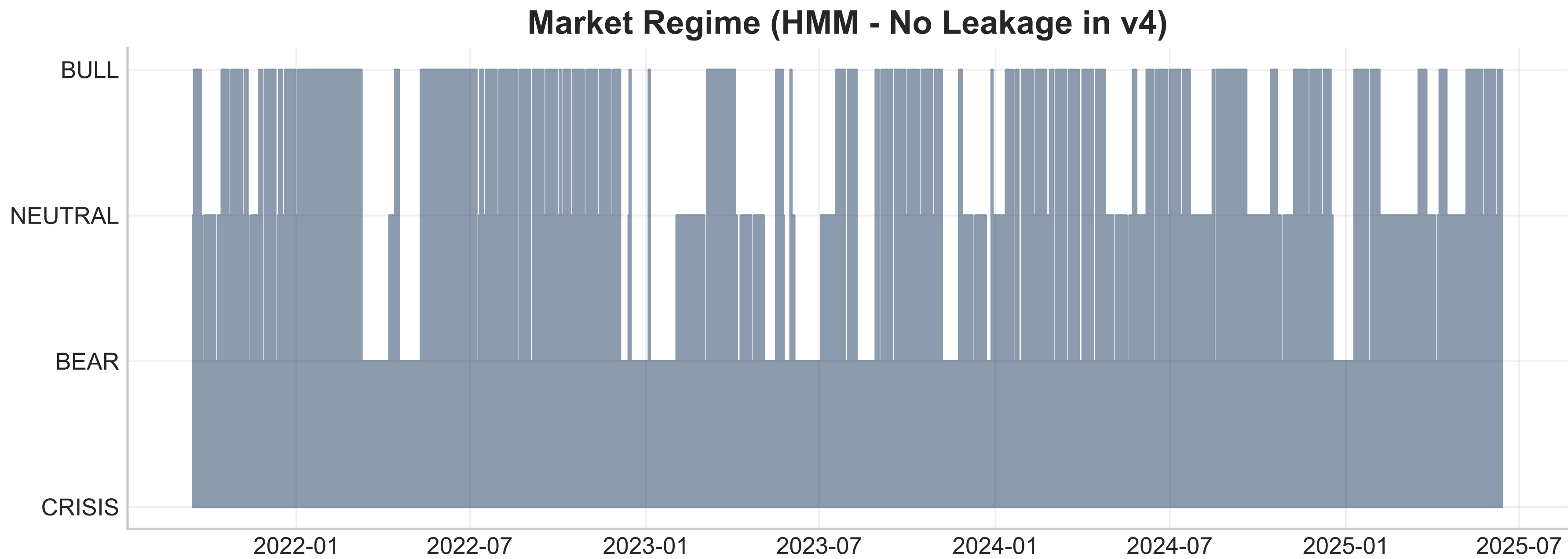
Sharpe Ratio	1.737 □	Sortino Ratio	1.385
Total Return	+2.21%	CAGR	+0.57%
Max Drawdown	-0.39%	Win Rate	84.2%
ML OOS AUC	0.5059	Sharpe p-value	0.0000

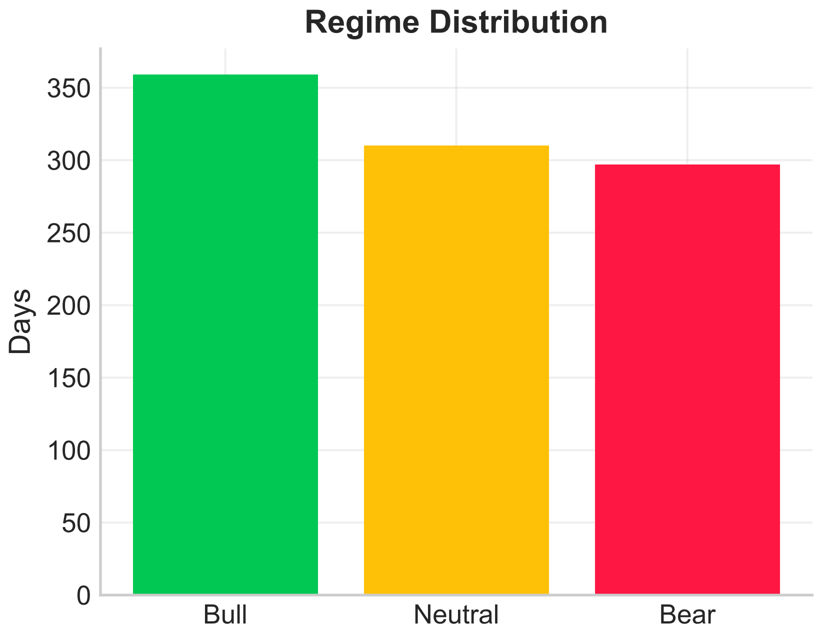

Rolling 6-Month Sharpe Ratio
Target: 1.0
Sharpe Ratio
6
4
2
0
−2
Rolling 6-Month Sortino Ratio
Target: 1.5
Sortino Ratio
20
15
10
5
0
−5
−10
2022-05
2022-09
2023-01
2023-05
2023-09
2024-01
2024-05
2024-09
2025-01
2025-05

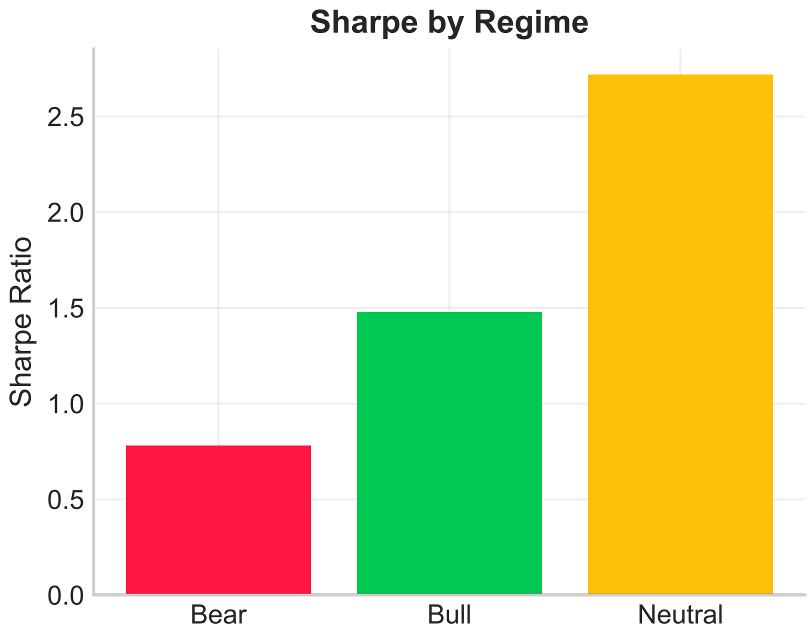


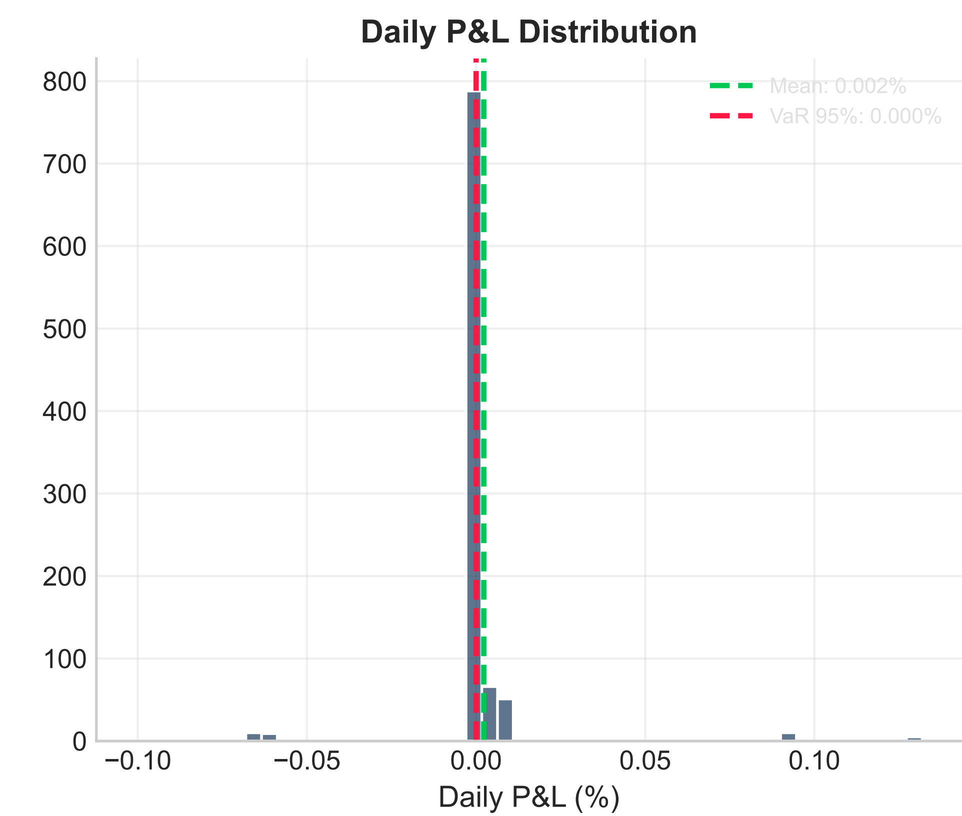
Drawdown Over Time
Drawdown (%)
Warning: -10%
0
−2
−4
−6
−8
−10
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07
Drawdown Distribution
Frequency
5th Percentile: -0.2%
400
300
200
100
0
−0.40
−0.35
−0.30
−0.25
−0.20
−0.15
−0.10
−0.05
0.00
Drawdown (%)

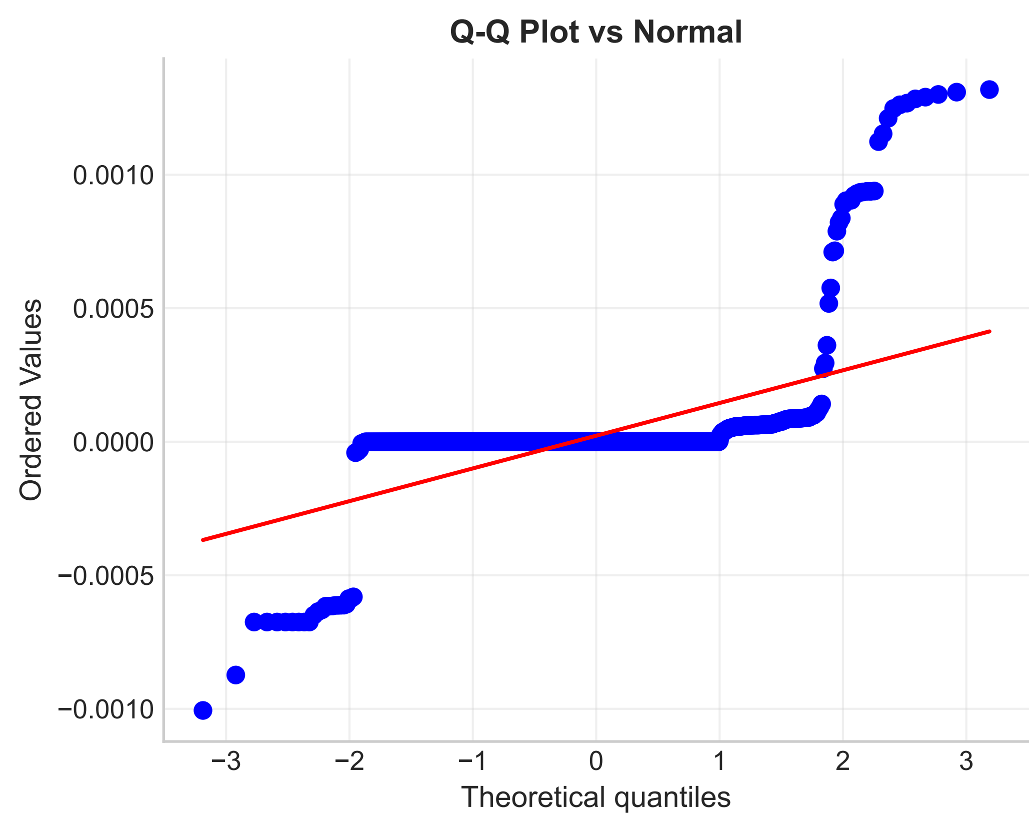

Strategy Allocation
Strangle
IronCondor
6.2%
13.4%
80.4%
Cash
P&L by Strategy (%)
Strangle
IronCondor
Cash
−0.50 −0.25 0.00 0.25 0.50 0.75 1.00 1.25 1.50
Cumulative P&L (%)

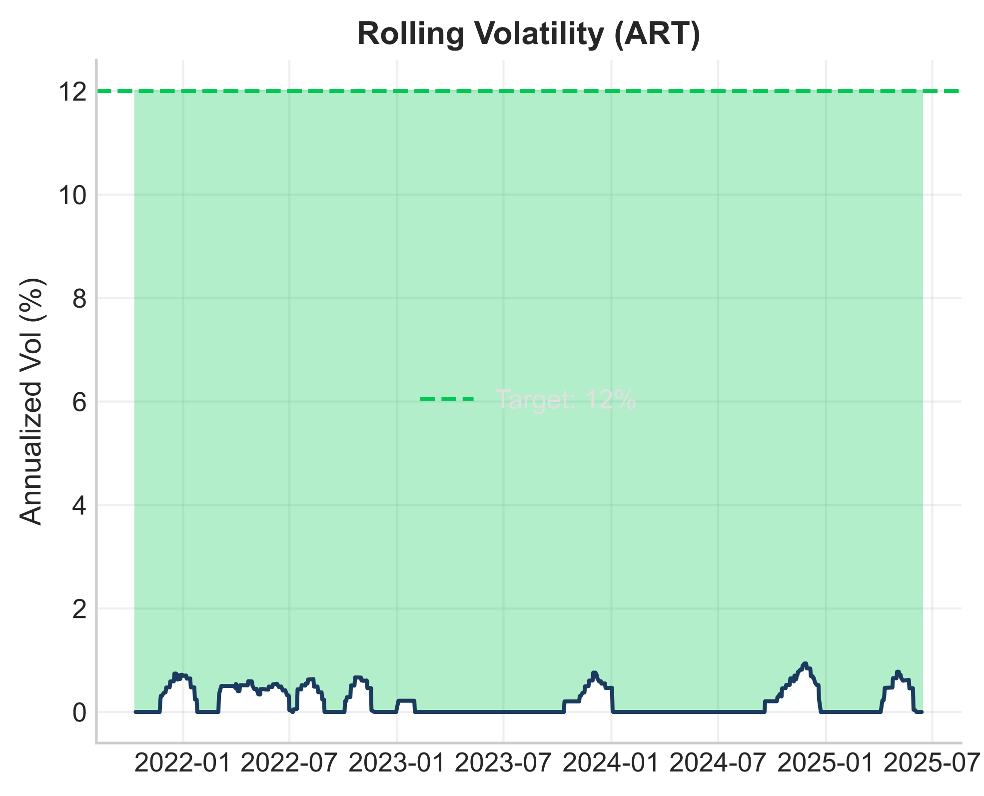

Market Regime (HMM - No Leakage in v4)
BULL
NEUTRAL
BEAR
CRISIS
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07


Regime Distribution
Days
0
50
100
150
200
250
300
350
Bull
Neutral
Bear


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







Metric	Value
VaR 95%	0.000%
ES 95%	-0.002%
Skewness	2.696
Kurtosis	20.015
Omega Ratio	2.369
Profit Factor	2.369


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
-0.2
0.4
0.0
0.0
-0.3
0.4
0.4
0.1
0.4
-0.1
0.0
0.3
0.0
0.0
-0.1
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.1
0.1
0.1
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
-0.1
0.1
0.1
0.0
0.0
0.0
0.0
0.2
0.2
0.0
Monthly Return (%)
0.4
0.3
0.2
0.1
0.0
−0.1
−0.2
−0.3

Top 10 Winners & Losers

Rank	Strategy	P&L (%)
1	IronCondor	+0.6948%
2	Strangle	+0.3424%
3	IronCondor	+0.1782%
4	IronCondor	+0.1547%
5	Strangle	+0.1486%
6	Strangle	+0.1445%
7	Strangle	+0.1444%
8	Strangle	+0.1443%
9	Strangle	+0.1424%
10	Strangle	+0.1405%
B1	IronCondor	-0.0539%
B2	IronCondor	-0.0550%
B3	Strangle	-0.0581%
B4	Strangle	-0.0587%
B5	IronCondor	-0.0612%
B6	IronCondor	-0.0613%
B7	IronCondor	-0.0615%
B8	Strangle	-0.0642%
B9	IronCondor	-0.0873%
B10	IronCondor	-0.1006%

v4.9 Fixes & Improvements Dashboard

Improvement	Metric	Status
1. Robust ML (Lasso Logistic)	OOS AUC: 0.5059	□□
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: 0.3%	□□
6. Weekend Theta WIRED	Avg Adj: 1.4688	□
7. Strategy Leverage Diff	Per-strategy scaling	□
8. OOS AUC Reporting	Test AUC, not train	□

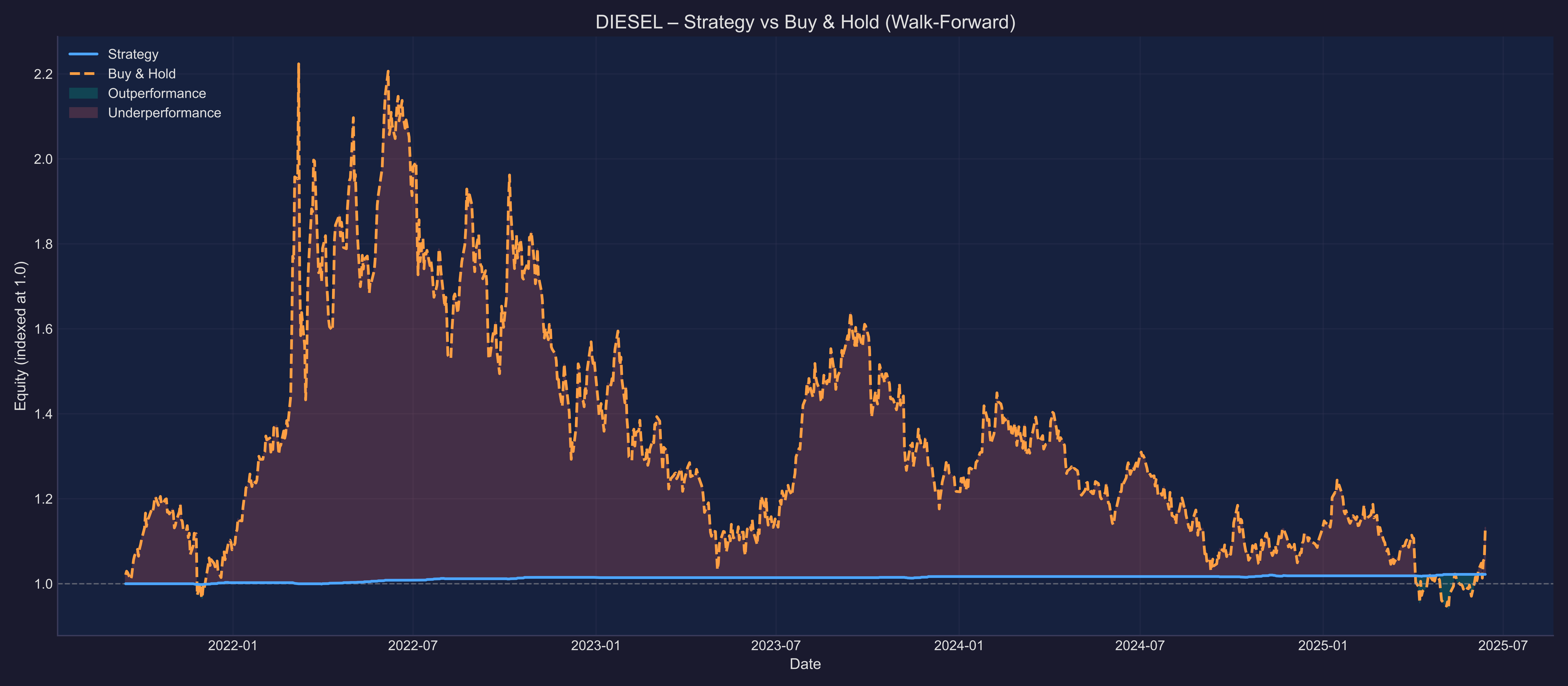
DIESEL - FINAL SUMMARY (v4.9)

Core Metrics:
- Sharpe Ratio: 1.7374
- Sortino Ratio: 1.3855
- Total Return: +2.21%
- Max Drawdown: -0.39%

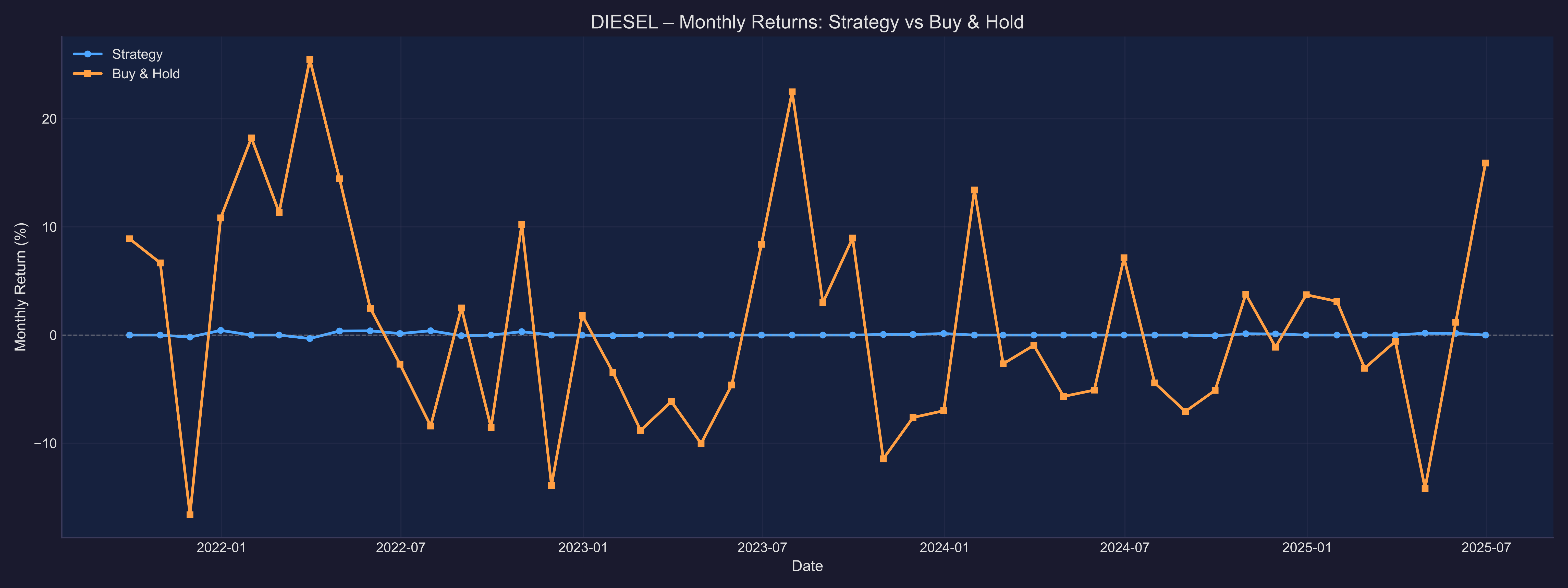
Statistical Significance:
- t-stat: 15.0534
- p-value: 0.000000
- 95% CI: [0.8022, 2.5736]
- Significant: Yes

ML Performance (OOS):
- Global AUC: 0.5059

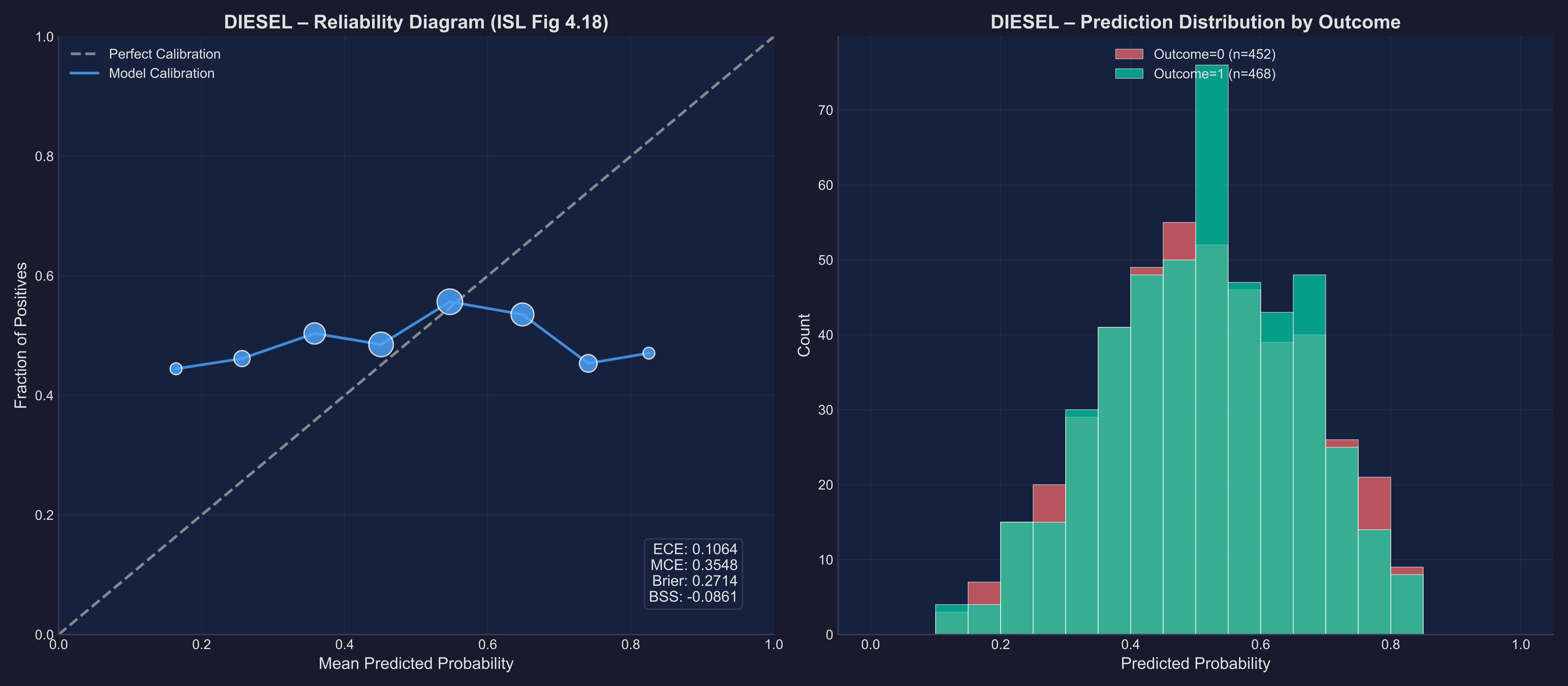
GRADE: EXCELLENT (Significant)


DIESEL – Strategy vs Buy & Hold (Walk-Forward)
Strategy
Buy & Hold
Outperformance
Underperformance
Equity (indexed at 1.0)
Date
2.2
2.0
1.8
1.6
1.4
1.2
1.0
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07

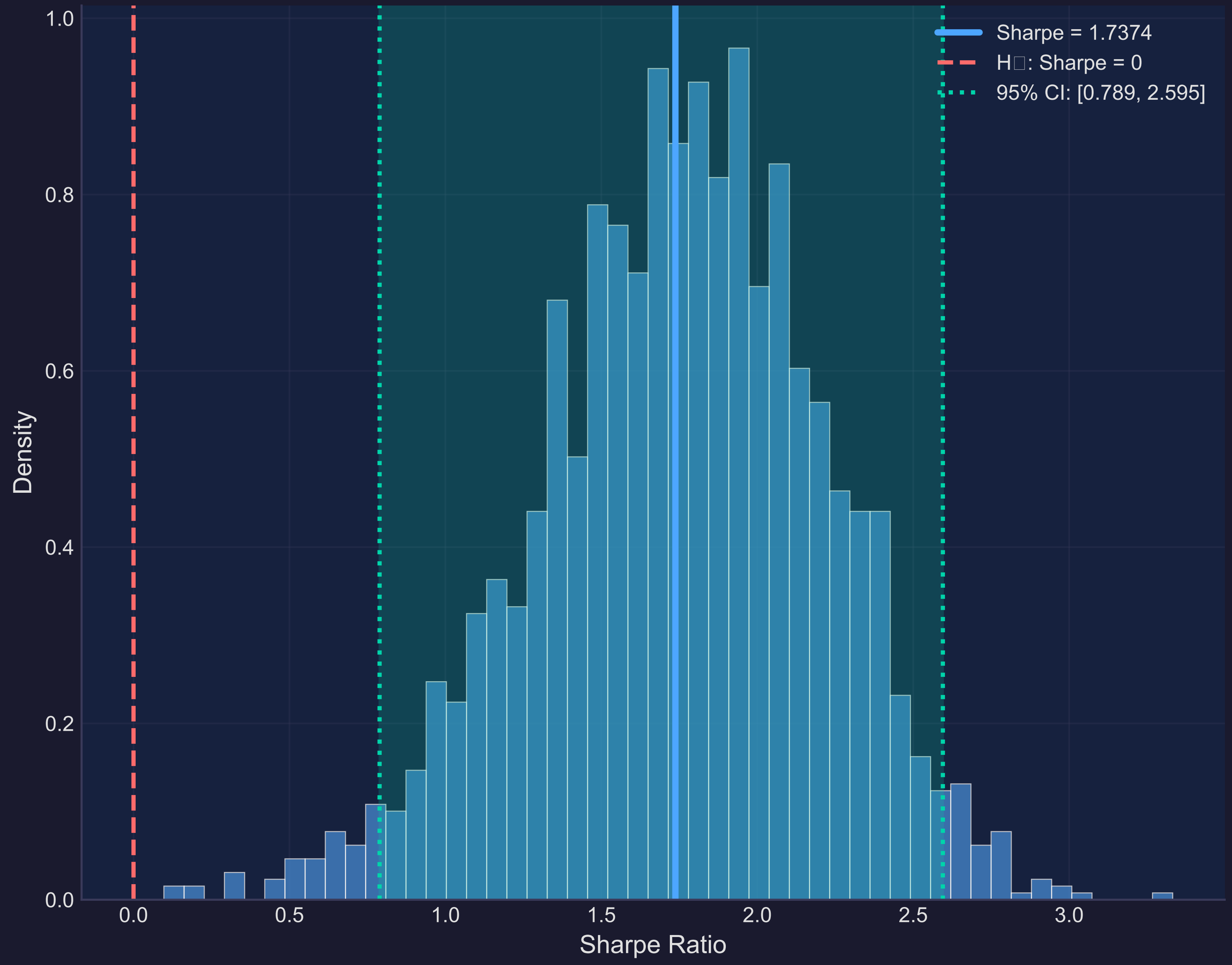
DIESEL – Price with Trade Entries
Price
Long Entry (18)
Short Entry (18)
1400
1300
1200
1100
1000
900
800
700
600
Price
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07
Date


DIESEL – Monthly Returns: Strategy vs Buy & Hold
Strategy
Buy & Hold
Monthly Return (%)
20
10
0
−10
Date
2022-01
2022-07
2023-01
2023-07
2024-01
2024-07
2025-01
2025-07

DIESEL – Turnover & Exposure Analysis
Net Position Exposure Over Time
Long
Short
Position
Gross Exposure Over Time
|Position|
Daily Turnover
Mean: 0.9%
Turnover (%)
Strategy Allocation Over Time
Cash
Strangle
IronCondor
Active

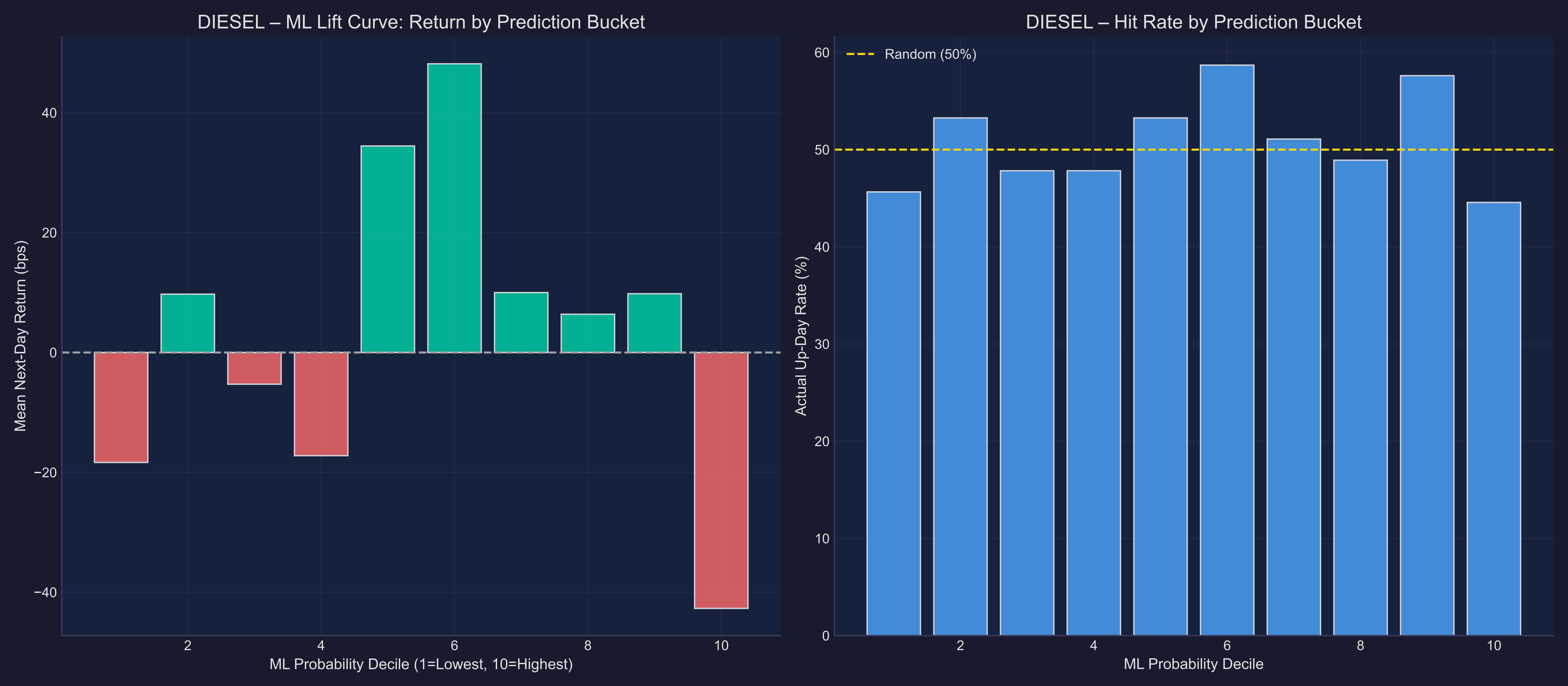

DIESEL – Reliability Diagram (ISL Fig 4.18)
Perfect Calibration
Model Calibration
ECE: 0.1064
MCE: 0.3548
Brier: 0.2714
BSS: -0.0861
Fraction of Positives
Mean Predicted Probability
0.0
0.2
0.4
0.6
0.8
1.0
DIESEL – Prediction Distribution by Outcome
Outcome=0 (n=452)
Outcome=1 (n=468)
Count
Predicted Probability
0
10
20
30
40
50
60
70

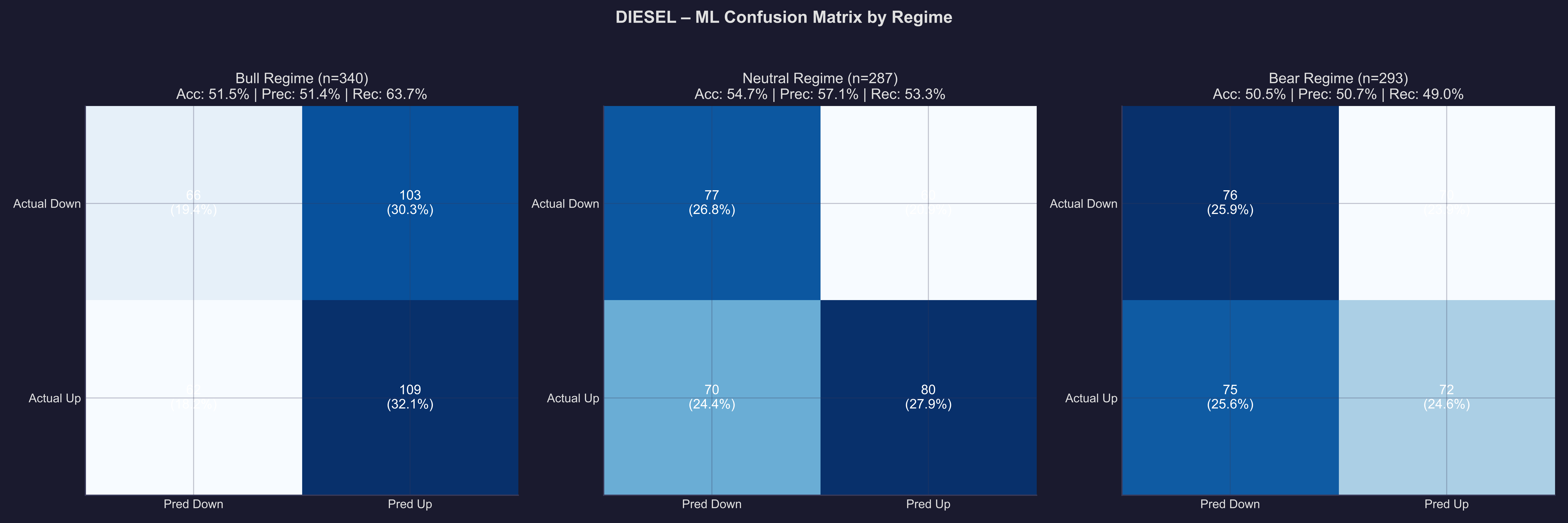
DIESEL – Bootstrap Distribution of Sharpe Ratio



DIESEL – Sharpe Ratio T-Test Results

```
SHARPE RATIO STATISTICAL SIGNIFICANCE TEST

Sample Size (n):            966 days

Point Estimate:
  Sharpe Ratio:             1.7374
  Standard Error:           0.1154

T-Test (H₀: Sharpe = 0):
  t-statistic:              15.0534
  p-value:                  0.000000
  Degrees of freedom:       965

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

Confidence Intervals:
  Analytical 95% CI:        [1.5112, 1.9637]
  Bootstrap 95% CI:         [0.7889, 2.5950]

Bootstrap Statistics:
  Mean:                     1.7479
  Median:                   1.7715
  Std Error:                0.4560
```


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



DIESEL – ML Confusion Matrix by Regime
Bull Regime (n=340)
Acc: 51.5% | Prec: 51.4% | Rec: 63.7%
Actual Down
Actual Up
66
(19.4%)
103
(30.3%)
109
(32.1%)
Pred Down
Pred Up
Neutral Regime (n=287)
Acc: 54.7% | Prec: 57.1% | Rec: 53.3%
Actual Down
Actual Up
77
(26.8%)
70
(24.4%)
80
(27.9%)
Pred Down
Pred Up
Bear Regime (n=293)
Acc: 50.5% | Prec: 50.7% | Rec: 49.0%
Actual Down
Actual Up
76
(25.9%)
75
(25.6%)
72
(24.6%)
Pred Down
Pred Up