

# Regime-Aware Semiconductor Long/Short Strategy

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# Strategy Overview

- **Goal:** Trade a fixed, liquid semiconductor basket with controlled risk and regime awareness.
- **Core loop:**
  - ① Detect **regime** using slow filters (trend, relative strength, curve proxy).
  - ② Rank semiconductor names by **risk-adjusted momentum**.
  - ③ Set portfolio weights according to regime posture and **volatility-targeted gross**.
- **Data:** Daily bars; rebalances **monthly** by default.
- **Signals only:** SOXX, SPY, IEF, SHY.
- **Trading universe:** 17 semiconductor equities.

## Key parameters (from implementation)

$$L_{MA} = 200, \quad L_{mom} = 126, \quad L_{\sigma, \text{score}} = 60, \quad L_{\sigma, \text{target}} = 20.$$

# Regime Detection (Score 0–3)

Regime score is the sum of three binary conditions:

$$R_t = \mathbb{1}\{\text{SOXX}_t > \text{MA}_{200}(\text{SOXX})_t\} + \mathbb{1}\left\{\frac{\text{SOXX}_t}{\text{SPY}_t} > \text{MA}_{200}\left(\frac{\text{SOXX}}{\text{SPY}}\right)_t\right\} + \mathbb{1}\left\{\frac{\text{IEF}_t}{\text{SHY}_t} > \text{MA}_{200}\left(\frac{\text{IEF}}{\text{SHY}}\right)_t\right\}$$

- **Trend filter:** sector is in long-term uptrend.
- **Relative strength:** semis leading the broad market.
- **Curve proxy:** rising IEF/SHY indicates risk-friendly macro impulse.

## Posture map

$R_t = 3$  bull (net L),  $R_t = 2$  mixed (L/S),  $R_t = 1$  defensive (L/S, lower gross),  
 $R_t = 0$  bear (net S).

# Alpha: Risk-Adjusted Momentum Ranking

For each semiconductor  $i$  (using daily close data):

$$\text{mom}_i = \frac{P_{i,t}}{P_{i,t-126}} - 1, \quad \sigma_i = \text{Std}(r_{i,\tau})_{\tau=t-59}^t,$$

where  $r_{i,\tau}$  are daily returns and  $P_{i,t}$  is closing price of stock  $i$  on the rebalance date  $t$

Cross-sectional score (computed across tradable names on rebalance date):

$$\text{Score}_i = z(\text{mom}_i) - 0.5 z(\sigma_i), \quad z(x_i) = \frac{x_i - \mu(x)}{\text{sd}(x)}.$$

- Rank all tradable semiconductors by Score.
- Select winners/losers depending on regime.
- Tradeability filter: include only symbols with valid price and tradable status on rebalance day.

Selection intensity (fraction of universe  $N$ )

Bull: long top  $\approx 40\%$ ; Mixed: long/short top bottom  $\approx 30\%$ ; Defensive:  
long/short  $\approx 25\%$ ; Bear: short bottom  $\approx 50\%$ .

# Portfolio Construction and Risk Controls

**Volatility targeting** uses realized SOXX volatility (20d):

$$\hat{\sigma}_{\text{ann}} = \text{Std}(r_{\text{SOXX}})_{t-19:t} \sqrt{252}, \quad s_t = \text{clip}\left(\frac{0.10}{\max(\hat{\sigma}_{\text{ann}}, 10^{-3})}, 0.20, 1.30\right).$$

Base gross by regime:

$$G_{\text{base}}(R) = \begin{cases} 1.10 & R = 3 \\ 1.00 & R = 2 \\ 0.80 & R = 1 \\ 0.90 & R = 0 \end{cases} \quad G_t = \min(G_{\text{base}}(R_t) \cdot s_t, 1.30).$$

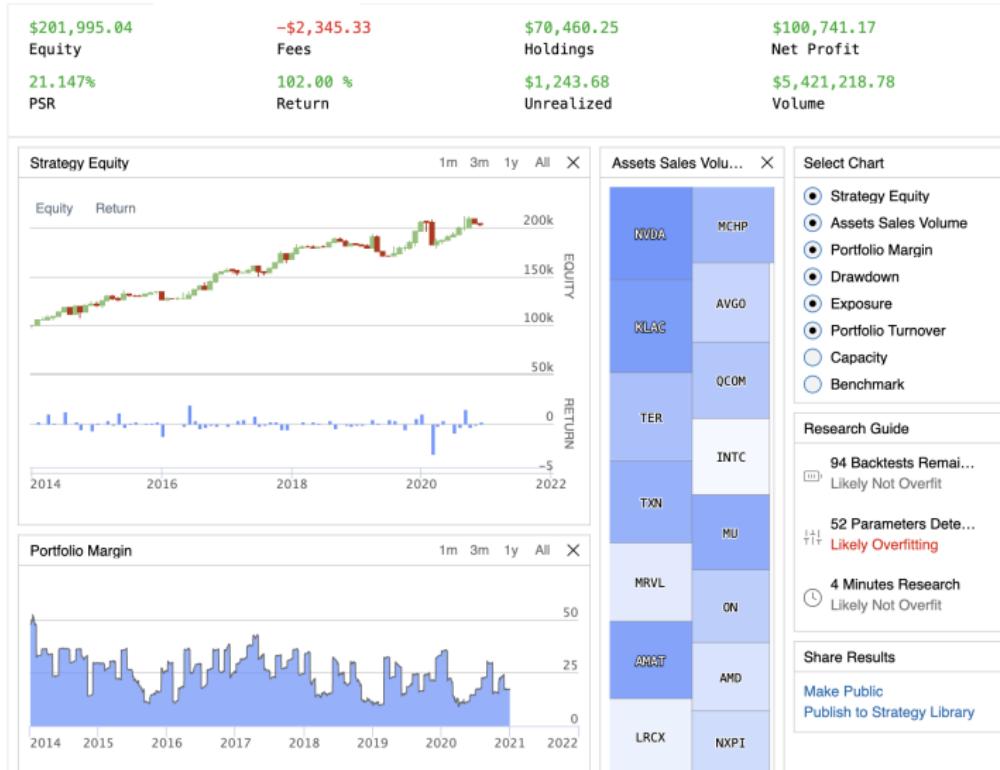
Execution logic at rebalance

Liquidate positions not in the new target set; then `SetHoldings(symbol, weight)` for each target weight.

# Conclusion

- **Regime-aware:** slow filters adjust net exposure (bull → bear).
- **Cross-sectional alpha:** risk-adjusted momentum ranks semiconductor names.
- **Risk-managed gross:** SOXX realized volatility scales exposure toward a 10% annual target.
- **Practical constraints:** tradeability checks, breadth minimums, monthly rebalancing, per-name weight caps.

# 7 year benchmark



# 6 month benchmark

\$141,988.59

Equity

-\$42.09

Fees

\$45,652.88

Holdings

\$34,697.01

Net Profit

96.965%

PSR

41.99 %

Return

\$7,281.58

Unrealized

\$246,572.48

Volume

Strategy Equity

1m 3m 1y All X

Equity Return



Drawdown

Select Chart

- Strategy Equity
- Drawdown
- Benchmark
- Portfolio Margin
- Assets Sales Volume
- Portfolio Turnover
- Exposure
- Capacity

Research Guide

49 Backtests Remai...  
Possible Overfitting

52 Parameters Dete...  
Likely Overfitting

1 Hour Research  
Likely Not Overfit

Share Results

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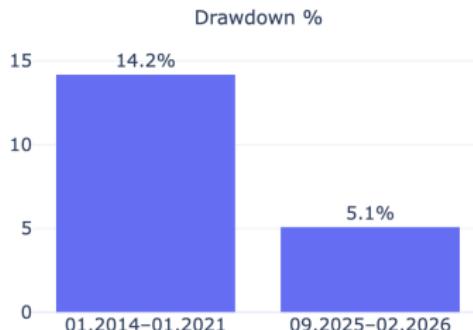
Drawdown

1m 3m 1y All X

Equity Drawdown



# Strategy performance



# Acknowledgement

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