Prospectus: Regime-Adaptive 50-Stock Strategy

1. General Investment Philosophy

Markets move through bull, neutral, and bear regimes. This strategy was designed to beat the S&P 500 buy-and-hold benchmark by dynamically adapting exposure based on market regimes. It leverages Hidden Markov Models (HMMs) for regime detection, momentum and mean-reversion signals for stock selection, volatility targeting for risk control, and systematic portfolio construction.

2. Methods/Rules Employed

• Regime Detection: 3-state Gaussian HMM on SPY returns & volatility, with SMA200 upgrade/degrade override.
• Signals:
  - Momentum: 12-1 and 6-month lookbacks.
  - Mean Reversion: RSI14 and Bollinger-Z oversold score.
  - Bear/Neutral regimes use a mix of contrarian longs and shorts.
• Portfolio Construction:
  - Equal-weight long/short sleeves.
  - Weekly rebalance with smoothing.
  - Net tilt and beta adjusted by regime & macro safety valve.
• Risk Management:
  - EWMA volatility targeting (~15% annualized).
  - Transaction costs, borrow costs, and management fees modeled.

3. Securities

The portfolio invests in 50 S&P 500 names across technology, healthcare, financials, consumer, and energy sectors. Longs favored momentum leaders (AAPL, MSFT, NVDA, etc.). Shorts were only permitted if the stock price was below its 200-day SMA. Weekly rebalancing adjusted exposures based on regime signals.

4. Performance Evaluation

Backtest (2010–2025)

• CAGR: Strategy 5.3% vs SPY 13.7%
• Sharpe Ratio: Strategy 0.48 vs SPY 0.83
• Max Drawdown: Strategy –58.6% vs SPY –33.7%
• Total Return: 1.23x vs SPY 6.44x

The strategy underperformed SPY in returns and Sharpe ratio, while experiencing significantly deeper drawdowns, failing to meet its design objectives.

Monte Carlo Simulations

• Median CAGR: ~5.2%
• Sharpe: ~0.47, skewed negative
• Max Drawdown Distribution: frequent –40% to –70% outcomes
• Forward Fan Chart: median equity path declined over 5 years

Both historical backtest and Monte Carlo results suggest persistent underperformance and elevated downside risk compared to SPY buy-and-hold.

5. Management Recommendation

• Not commercially viable in current form: underperformed SPY, higher risk, lower reward.
• Research Value:
  - Regime framework adds structure but delivered no alpha.
  - Signals inconsistent in sideways regimes.
  - Volatility targeting reduced noise but could not rescue returns.
• Future Directions:
  - Explore factor tilts, alternative data sources, and broader asset classes.
  - Improve regime detection robustness.
  - Apply learnings in research and strategy development rather than product launch.