NVIDIA Directional Timing Strategy: Should We Launch This Fund?

ML-Based Active Management Evaluation

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The Big Question

Can Machine Learning Beat Buy-and-Hold for NVIDIA?

Predicting Direction

Can we accurately predict the next-day directional movement of NVIDIA stock?

Value Creation vs. Destruction

Does this timing strategy genuinely create alpha or inadvertently destroy value?

ETF Viability

Should this strategy be launched as an active Exchange-Traded Fund (ETF)?

Research Journey: 3 Checkpoints

Checkpoint A: Baseline Model

Initial model development revealed a significant class imbalance problem, affecting predictive accuracy.

Checkpoint B: Feature Enhancement

After refining features, the strategy only captured 23% of the target buy-and-hold returns.

Checkpoint C: Rigorous Validation

Comprehensive testing indicated a failure across all established viability criteria.

Our Trading Strategy

- **Model:** XGBoost gradient boosting classifier, chosen for its robustness and performance in financial time series.
- **Features:** 9 distinct features, including key technical indicators and broader macroeconomic contextual data.
- **Trading Rule:** A binary decision rule: if the model predicts an "UP" day, 100% allocation to NVDA; if "DOWN", 100% allocation to T-Bills.
- **Rebalancing:** Daily portfolio rebalancing to adhere strictly to the model's signals.

How We Tested It

Rigorous validation prevents false positives and ensures strategy robustness.

Historical Test

Period: 2020-2024. Application of the strategy to real, observed market data to gauge past performance.

Monte Carlo Simulation

500 scenarios. Generation of synthetic price paths to assess performance across a wide range of potential market conditions.

Walk-Forward Analysis

14 folds. Continuous re-optimization and testing to evaluate strategy adaptability to changing market regimes.

Historical	+231%	+999%	FAIL
Monte Carlo Win Rate	38.8%	-	FAIL
Walk-Forward Win Rate	14.3%	-	FAIL
Sharpe Ratio	-0.058	-	FAIL

Strategy Performance

23%

Returns Captured

Only a fraction of the buy-and-hold returns were captured.

48%

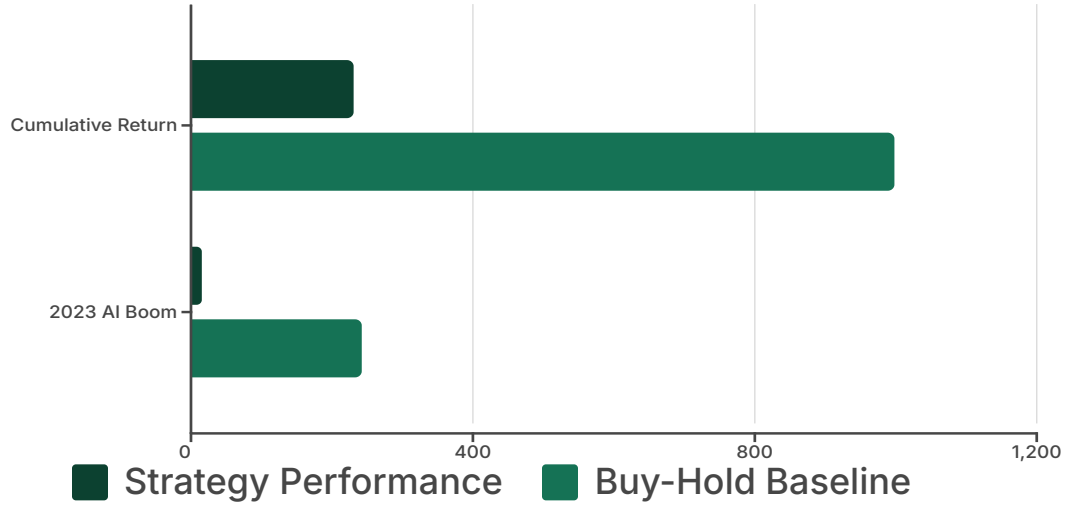
Cash Allocation

The strategy remained in cash for nearly half of the testing period.

16%

AI Boom Returns

Vastly underperformed during the 2023 AI rally (+16% vs +242% for buy-hold).



The comparative performance clearly demonstrates the significant underperformance of the timing strategy against a simple buy-and-hold approach.

Why Did It Fail?

Regime Adaptation Failure

The model, potentially overfitted to historical crashes, failed to adapt to the buoyant market conditions of the recent AI boom.

Binary Switching Too Extreme

An all-or-nothing approach meant missing substantial rallies was more detrimental than the benefit gained from avoiding downturns.

Fundamental Asymmetry

For high-growth stocks like NVIDIA, the opportunity cost of being out of the market significantly outweighs the benefits of defensive positioning.

Management Recommendation

DO NOT LAUNCH THIS FUND

Business Decision: NO

The strategy does not demonstrate a viable edge or consistent alpha generation.

Personal Investment: $0

I would not personally invest any capital into a fund utilising this strategy.

Employment: Researcher Only

My role should remain in research, not as a fund manager overseeing this strategy.

Wealth Building: Passive

For long-term wealth accumulation, passive investment strategies are recommended over this active approach.

Lessons Learned

- **Beyond Backtesting**

  Backtesting alone is insufficient; comprehensive validation (Monte Carlo, Walk-forward) is critical for robustness.

- **Market Timing for Growth Stocks**

  For high-growth equities, market timing strategies are prone to destroying value rather than creating it.

- **Simplicity vs. Complexity**

  Often, simpler investment strategies yield more favourable and consistent results than overly complex ones.

- **Value of Negative Results**

  Scientifically, negative results are as valuable as positive ones, guiding future research and preventing capital misallocation.

- **Scientific Integrity**

  Maintaining scientific integrity and objective evaluation must always supersede commercial pressures.

Final Takeaway

For NVIDIA Investors: BUY AND HOLD