Hybrid Algorithmic Trading in High-Volatility Emerging Markets: Ensemble Machine Learning, the Triple Barrier Method, and Macroeconomic Context

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Abstract

Introduction/Objective: Trading systems that use fixed rules often do not work well in changing market conditions, where things can quickly shift and volatility is not steady. This paper looks at Hybrid-AlgoNet, a system that uses four technical features. RSI MACD histogram, ATR and relative volume. With two types of classifiers, Random Forest and XGBoost. It also uses the Triple Barrier method to label data.

The system is tested on daily stock market data from the NIFTY 50 index from January 2020 to December 2025.

* The XGBoost classifier reaches 46.55% accuracy in predicting market movements.

* The Random Forest classifier reaches 44.83% accuracy.

Both are better than the 33.3% accuracy of a guess.

However, when we look at the returns the trading strategy does not do better than holding the stock. In fact, it does worse with a Sharpe ratio of -1.02 compared to 0.55 for holding the stock.

We think the reason for this is that the system uses stop-losses that are adjusted for volatility, but the market keeps going up because of money flowing in from local institutions.

This means we need to find ways to manage risk that adapts to the economic situation

Index Terms

Trading; Ensemble Learning; XGBoost; Triple Barrier Method; NIFTY 50; Emerging Markets; Sharpe Ratio; Financial Machine Learning.