Learning An Intraday Momentum Trading Strategy

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1 Proposal

This project will involve training an classifier to enhance a trading strategy belonging to the momentum following family of strategies. Momentum strategies attempt to follow the trends of security prices, with the assumption that a security price trending upwards (downwards) will continue to increase (decrease). Our project will attempt to improve upon a simple momentum following strategy by training a classifier that generates buy and sell signals with various features generated from a basket of stock quotes, trade logs, and volatilities.

The strategy will trade only intraday, and will not hold overnight positions. The strategy will be trained and tested on various stocks - US equities and ETFs, using quote and trade tick data. Our metrics for a successful strategy will be profit-and-loss percentage, Sharpe ratio (a risk-adjusted return metric), and maximum draw-down (a risk-management metric). The strategy will be tested on historical data. A successful strategy should have better metrics than the simple momentum following strategy. In order to test the strategy, we will develop the appropriate infrastructure to simulate the market environment.

A simple objective is to develop a successful strategy with positive returns and reasonable risk metrics. However, a more difficult but doable objective is to have better metrics than the entire family of non-learning momentum following strategies.

Because regime shifts happen, and because trading strategies do not tend to work forever, a successful machine learning strategy should be able to adjust to changing market conditions. Thus, as a tough objective, our strategy should successfully involve online learning.