Validation of Technical Analysis In Quantitative Investment Strategies

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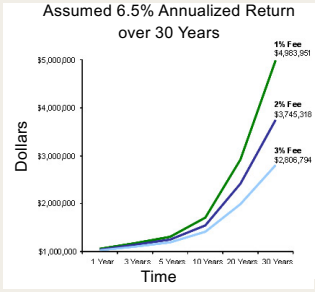
Motivation

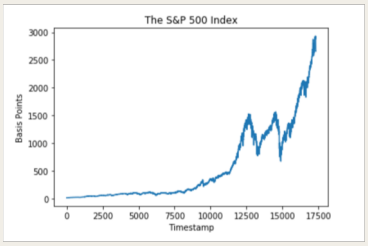
Over a standard investment horizon, even small management fees can become quite costly. Hence, **can a quantitative strategy outperform a traditional *Buy and Hold* strategy?** If so, management fees could be eliminated with an investment engine. Our goal is to define a pipeline to analyze several strategies over past price data.



(Performance Management Group: https://tinyurl.com/yapzvw52)

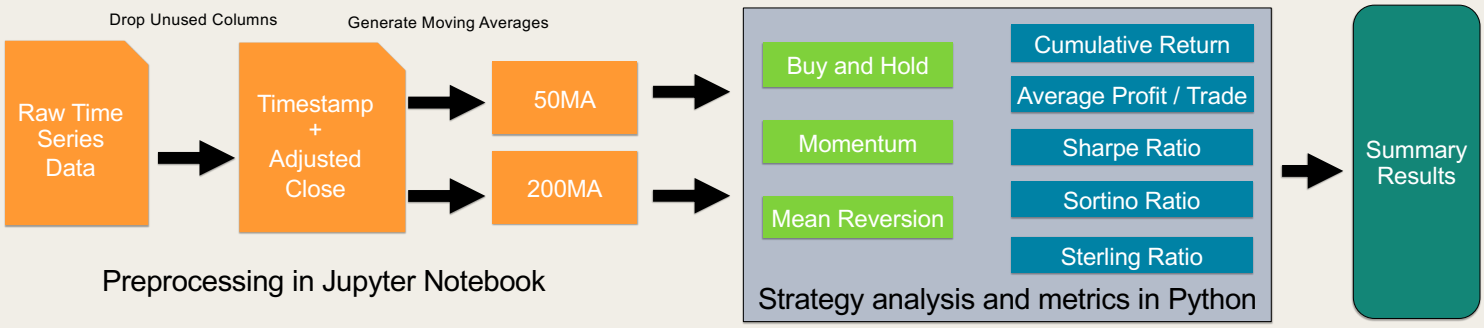
Dataset

The S&P 500 index was chosen because of the length of data available, dating back to 1950. The dataset consists of 17,318 rows with 7 fields and no missing data. The adjusted close field takes in to account splits in a stock price.



(Yahoo Finance: https://tinyurl.com/y8ptbadr)

Data Analysis Pipeline



Strategies Assessed

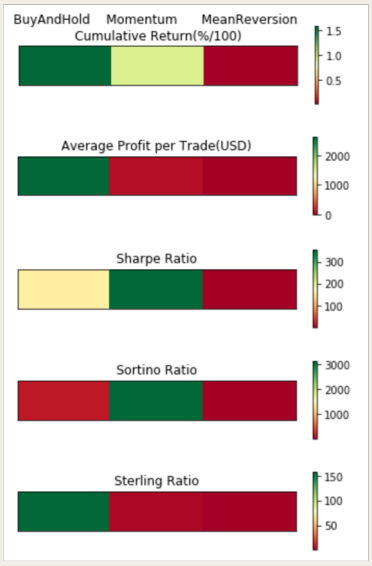
- **Buy and Hold** - When saving for retirement a large majority of individuals will passively invest their savings into the market - sit back and let it grow until the time of retirement.
- **Momentum** - Seeks to exploit market volatility by making short term investments in stocks which are rising in price. Momentum tries to ride a wave of investor sentiment. The strategy can be described as, "buying high and selling higher".
- **Mean Reversion** - Suggests that there is a asymptotic equilibrium for asset prices. If a stock price starts to deviate too far away from it's historical average then a reversion in price is imminent; the stock price eventually reverts to it's original state.

An example Momentum strategy employing 3 moving averages

(DolphinTrader: https://tinyurl.com/y9ayydru)

Results

Overall, the *Buy and Hold* strategy generated the most returns, but had an overall higher exposure to risk because it held through downturns in the market. Though generating a lower average return, the *Momentum* strategy has a lower exposure to risk because it deallocates during downtrending periods. In all metrics, the *Mean Reversion* strategy performed poorly. However, both *Momentum* and *Mean Reversion* are parameterized strategies, so selecting different moving average periods could generate vastly different results.



Performance metric descriptions available at https://tinyurl.com/ybjd4w39 (aiSource)

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