Trading Strategy Report

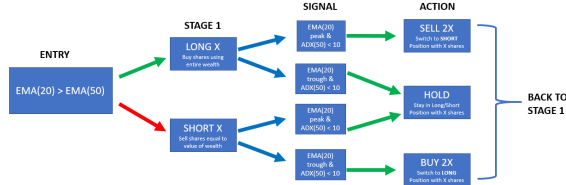Prerana Hiriyur

Overview

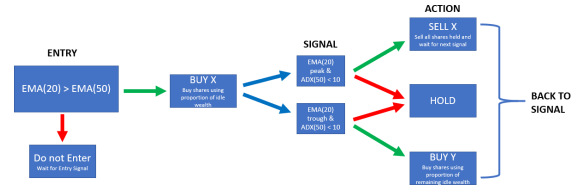Figure 1: Strategy With Short Sale

Figure 2: Strategy Without Short Sale

Trading Conditions and Rules

This strategy is based on the simple ideology of "Buy low, Sell High". When short selling is allowed it means that we hold a "Short Position" where we sell first when we think the price is at its highest and intend to buy back later. When we buy first and hold shares of a stock, we maintain a "Long Position". Here are some of the other conditions affecting the strategy:

- Transaction costs: 0.2% of trade value

- Investment Ratio: 60% of idle wealth at every purchase (when short selling is not allowed)

- When short selling is allowed, entire wealth is invested at entry

The following are the trading rules under 2 major conditions - Short Selling of Stocks is allowed or not allowed.

With Short Selling

- ENTER:

  - Long Position: X shares: Short run average of price > Long run average of price
  - Short Position: X shares: Short run average of price < Long run average of price

- Stay Long/ Switch to Long (i.e Buy $2X$ shares): Smoothed average of price reaches its trough/ lowest and trend is weak

- Stay Short/ Switch to Short (i.e. Sell $2X$ shares): Smoothed average of price reaches its peak/ highest and trend is weak

- SIZE: Invest all wealth at entry: $X = \frac{\text{wealth}}{\text{price on entry day}}$, rounded to closest integer

Without Short Selling

Rules:

- ENTER: Long Position: X shares: Short run average of price > Long run average of price

- Buy X shares: Smoothed average of price reaches its trough/ lowest and trend is weak

- Sell all shares held: Smoothed average of price reaches its peak/ highest and trend is weak

- SIZE: $X = \frac{60\% \text{ of idle/ uninvested wealth}}{\text{price on purchase day}}$, rounded to closest integer

Technical Indicators

The strategy uses Exponential Moving Average (EMA) of periods 20 days and 50 days as short run and long run smoothed average of price respectively. It uses Average Directional Index (ADX) as indicator of trend strength, reading weak trend when ADX < 10.

Performance - Goldman Sachs (ticker: GS)

Detailed below is the performance of the strategy (with and without short selling) when applied on GS using daily data from Yahoo Finance.

Calibration Period - 2011-2015

The charts below show the performance of the two strategies relative to the Naive Filter rule, Buy and Hold on the stock (Figure 3) and SPY Daily returns (Figure 4) during the period used to calibrate the strategy - April 2011 to March 2015.
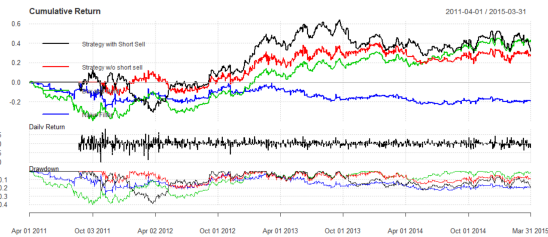
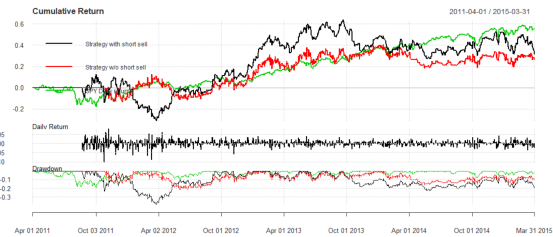

Figure 3: Strategy vs Naive Filter and Buy and Hold

Figure 4: Strategy vs SPY returns

In terms of cumulative returns, this strategy clearly outperforms both these common strategies as well as the market, tracked by SPY returns, at many instances. The strategy is more successful when combined with short selling because it allows the trader to make profits even when the stock itself is losing value. However, even with constraints on short selling, the strategy shows impressive results during the calibration period.

Test Period - 2015-2019

The charts below show the performance of the two strategies relative to the Naive Filter rule, Buy and Hold on the stock (Figure 5) and SPY Daily returns (Figure 6) during the period used to calibrate the strategy - April 2015 to March 2019.
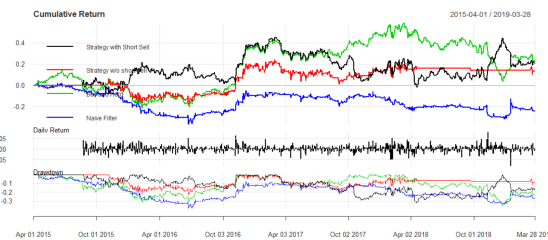

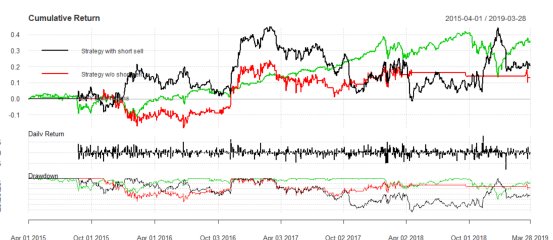Figure 5: Strategy vs Naive Filter and Buy and Hold

Figure 6: Strategy vs SPY returns

The results are less impressive when implemented on the test data. Although the strategy seems to show significant profitability in the first half of the test data, the performance in the second half is clearly undermined by the Buy and Hold strategy as well as the SPY returns that is representative of the stock market.

Conclusion

As indicated by the performance above, one must consider their apetite for risk before applying this trading strategy. WIth higher risk, involved in short selling, come higher returns. The strategy was successful in generating profits beyond Buy and Hold and SPY at many points during the calibration period, however there are still some periods of low or even negative returns that could deter a risk averse investor. Furthermore, the performance is not as impressive during the test period, as it did not outperform the SPY and the simple Buy and Hold strategy towards the second half.