1 Results

Trading with Sentiment Indicators for Sugar and Cotton
Note: Most output in accompanying Jupyter Notebook.

(a) My selected assets are the commodities SUGAR and COTTON. The downloaded data features 186 observations for Sugar and 120 observations for Cotton. Each data set includes 18 features. I was able to generate best returns using the second trading strategy which featured both volume of news (RVT) and Bull-Bear ratio (BBr).

1.1 Baseline Models

I used 2 benchmarks. I compared each result against the cumulative returns of a simple buy-and-hold strategy over the trading period. I also used the dual-moving average crossover strategy based on price.

The short-term moving average is given as:

$$MA(s)_t = \sum_{i=t-s}^{t} C_i/s \tag{1}$$

where C_i is the close price at time i.

The long-term moving average is given as:

$$MA(l)_t = \sum_{i=t-l}^{t} C_i/l \tag{2}$$

where C_i is the close price at time i and $t > l > s$.

(a) For Sugar, the DMA strategy yielded total returns of \$2.59 for the Long Only Strategy and \$3.33 for the Long-Short strategy.

(b) For Cotton it yielded total returns of \$1.26 for LO and \$.85 for LS.

The rolling window returns are visible in Figure 1 and Figure 8 - LS outperformed LO here by a margin of \$1.09 to \$0.88 when looking at mean returns for Sugar, while for Cotton LO outperformed LS, but both were negative. I have included the Cotton price and accompanying moving averages below for reference.

1.2 Trading Strategy 1 - Simple Bull-Bear Signal Analysis

Using the bull bear sentiment indicators you can see in Figure 9 that sentiment scores for Sugar were very volatile. I designed a simple trading strategy on these sentiment scores where I go long when bull sentiment is greater than bear sentiment, and vice versa.

1. Daily Trading: You can see in Figure 11 that trading on only the sentiment indicators alone did not outperform the EMA Trading Strategy in Figure 7. In fact, the LS Mean and Total Returns were slightly negative, while the Long Only strategy based on Bull sentiment was slightly positive. This means that there was a bit too much pessimism in the market relative to the performance.
2. A 3 month rolling window analysis (Figure 10) shows that the tail end of the windows yielded poor results particularly for Long Short. The mean returns for LO and LS were \$0.14 and \$-0.38, respectively for Sugar.

Overall, as I can see in summary results (Figures 5 and 4, this strategy did not yield better returns and therefore indicates that the news alone is not always to be trusted when making investment decisions.

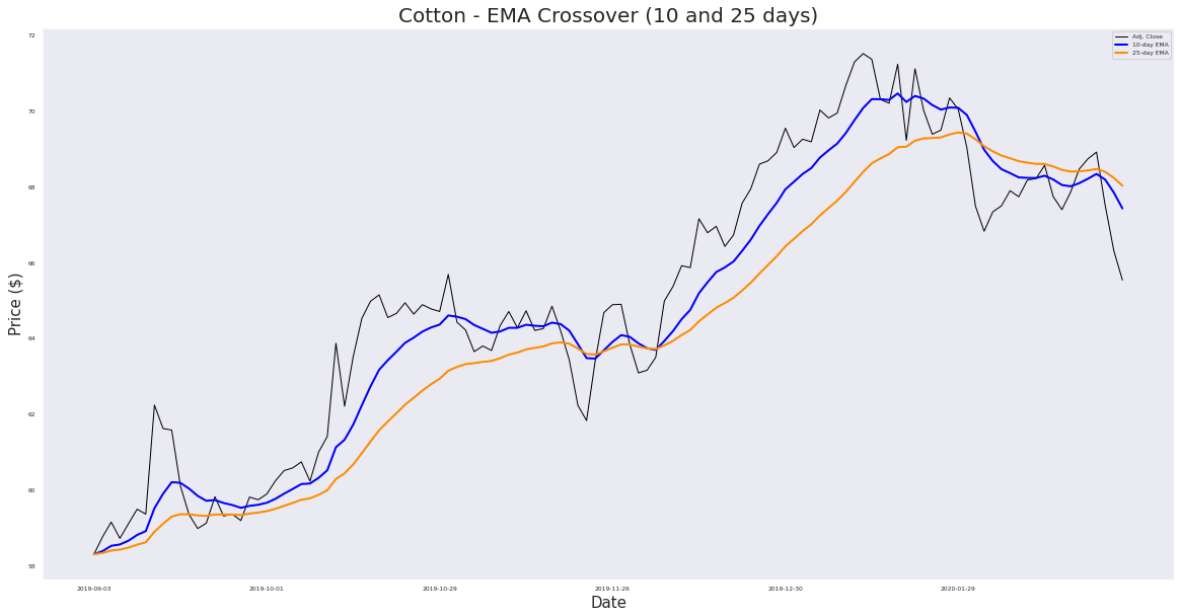

Figure 1: Cotton Close Price and Moving Averages

1.3 Trading Strategy 2 - Averaging BBr and RVT and Creating Signals

The second trading strategy was very successful. I used a combination of bull/bear sentiment and news volume and then created a custom threshold signal. The idea being that I should give more weight to sentiments that have a greater volume of text to extract from.

To do this I created a new variable called VolBBrAvg - this is a feature that is simply the average of RVT (Volume of News) and BBr (Bull-Bear Ratio). I then tested several thresholds to create Buy-Sell signals, as follows:

1. Go long at $O_t + 1$ if VolBBr(t) $> .25$ where $O_t + 1$ is the open price at time $t + 1$.
2. Go short at $O_t + 1$ if VolBBr(t) $\leq .25$ where $O_t + 1$ is the open price at time $t + 1$.

The threshold parameter can be tuned (keeping in mind the bias that comes with backtesting). When using a threshold of .25, this strategy yielded excellent results, particularly for cotton where LS returns were greater than 18x the baseline buy-hold strategy, as seen in Figure 2.
When looking at the returns over 3 month windows, you can see that the Long Short and Long Only strategy mirror each other. The big difference is in the first window, where LS strongly outperformed LO as you can see with the purple spike at on the left-hand side of Figure 2.

For sugar, the results were not as optimal - however, when tuning the threshold to .16, maximum cumulative returns were achieved of $2.27. This would indicate that either a lower volume or a lower Bull-Bear ratio improves the outcome - perhaps because Bulls were overoptimistic.

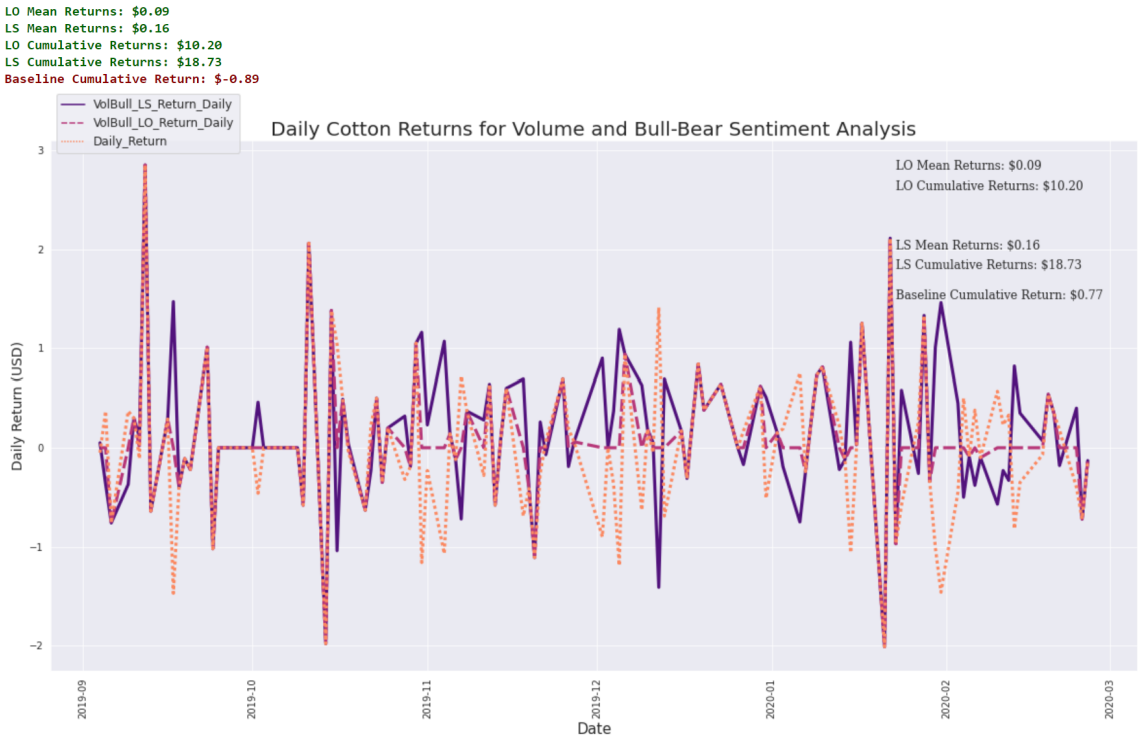

Figure 2: 18x Returns for Bull-Bear VolBBR Threshold Trading Strategy for Cotton

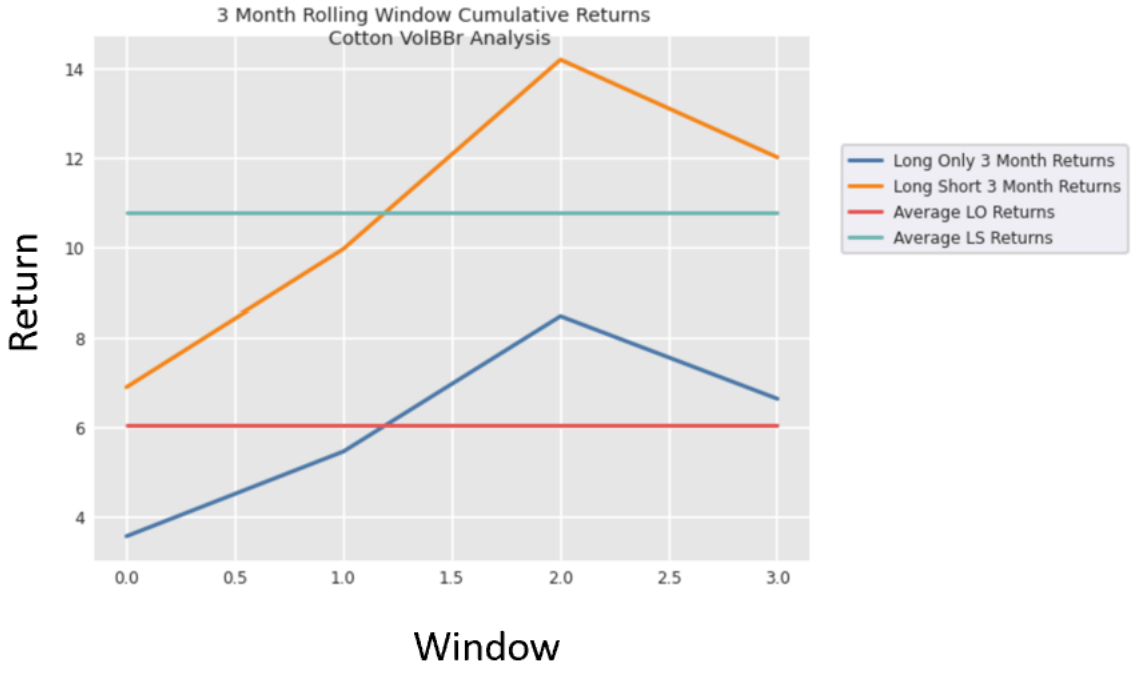

Figure 3: Rolling Window Analysis - Cumulative Returns for Cotton

1.4 Summary of Results

You can see the summary of results below in Figures 4 and 5. Overall, the average of the Bull-Bear ratio and RVT (news colume) proved to be the most successful strategy for Cotton. For Sugar (Figure 13), it did not outperform the Dual Moving Average benchmark but still outperformed a simple buy-hold strategy. The simple Bull-Bear signalling strategy did not yield great results, which tells us that sentiment analysis alone (without incorporating news volume) may not be the best indicator of future price changes.

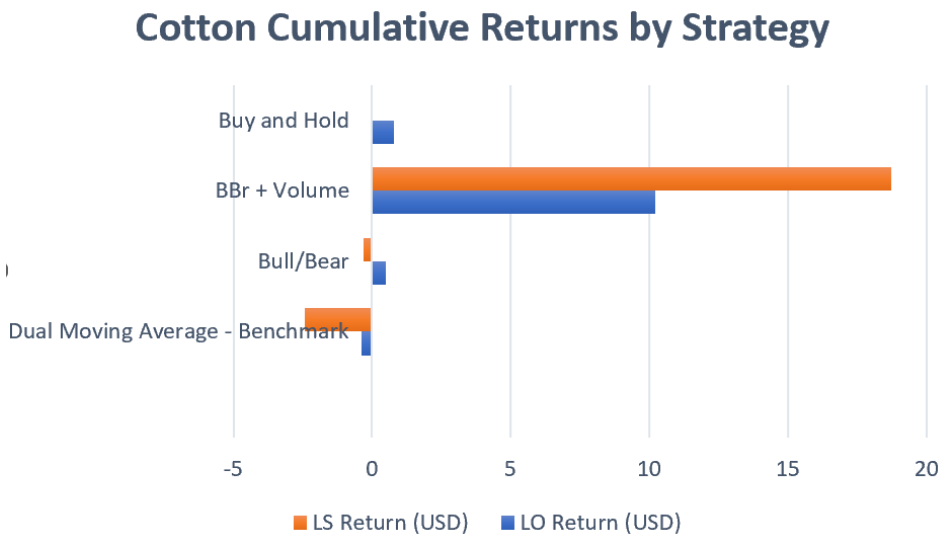

Figure 4: Summary of Cotton Returns

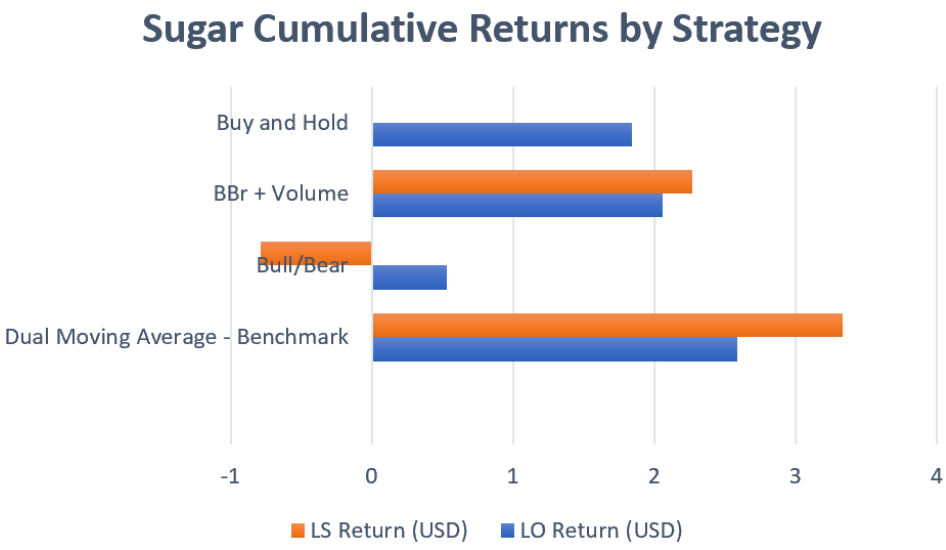

Figure 5: Summary of Sugar Returns

2 Appendix: Exercise 1 Additional Figures

Below I include figures for Sugar - however the same figures for Cotton are included in the accompanying Jupyter Notebook

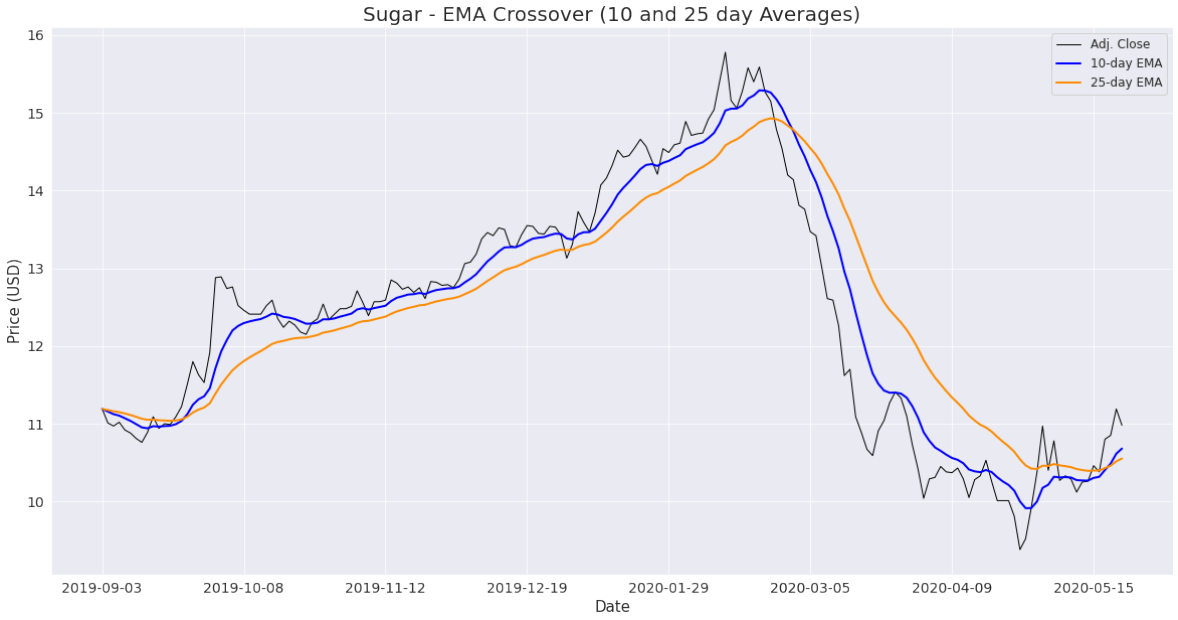

Figure 6: Sugar Price alongside 10 and 25 Day Moving Averages

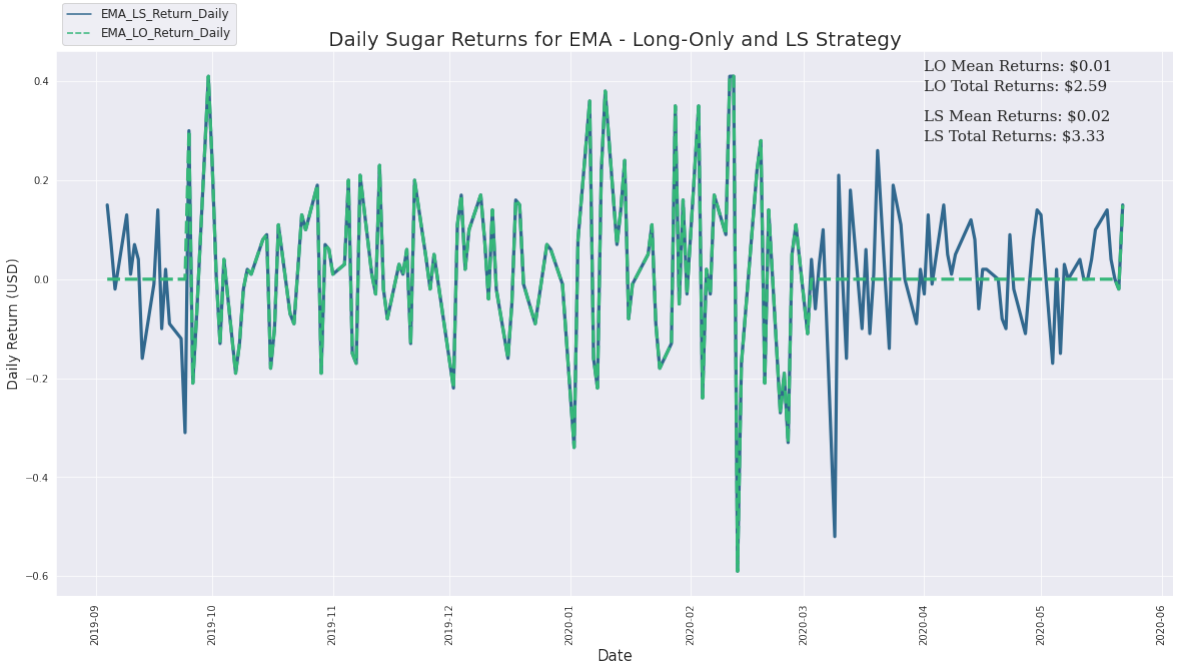

Figure 7: EMA Trading Strategy for Sugar - LO (Green) and LS (Blue) with 10 and 25 Day EMA

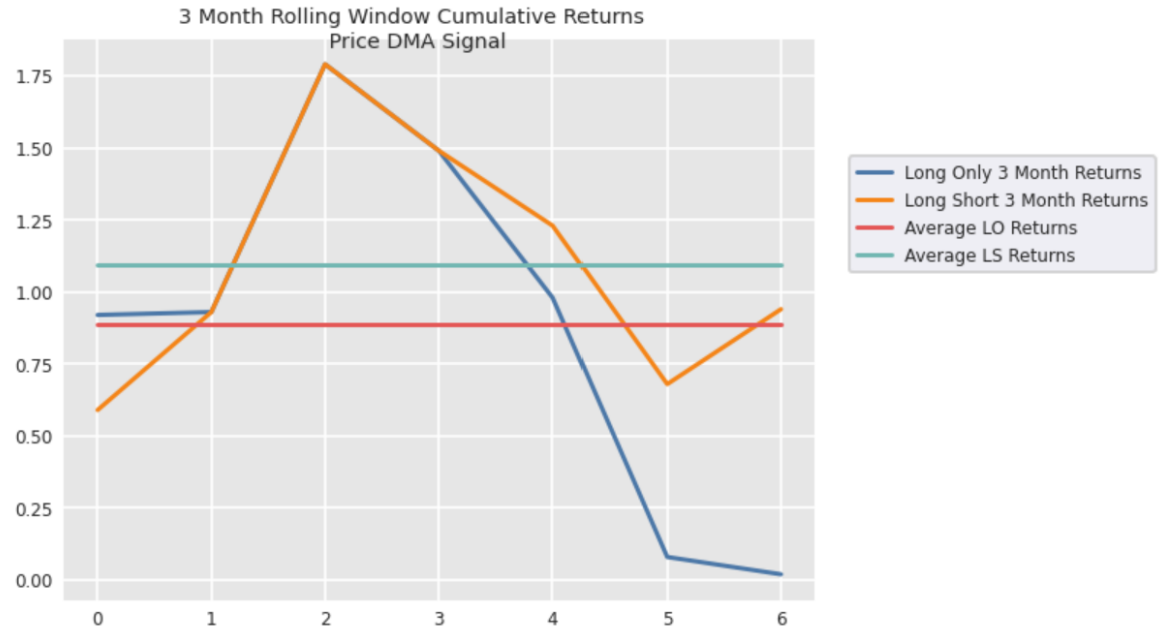

Figure 8: Rolling Window Returns for Dual MA Price Strategy - Sugar

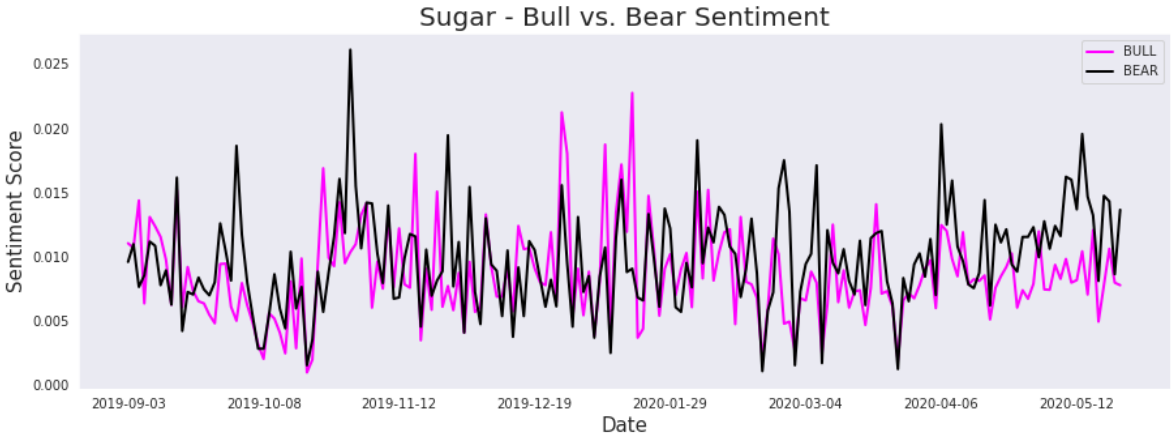

Figure 9: Bull-Bear Sentiment Values

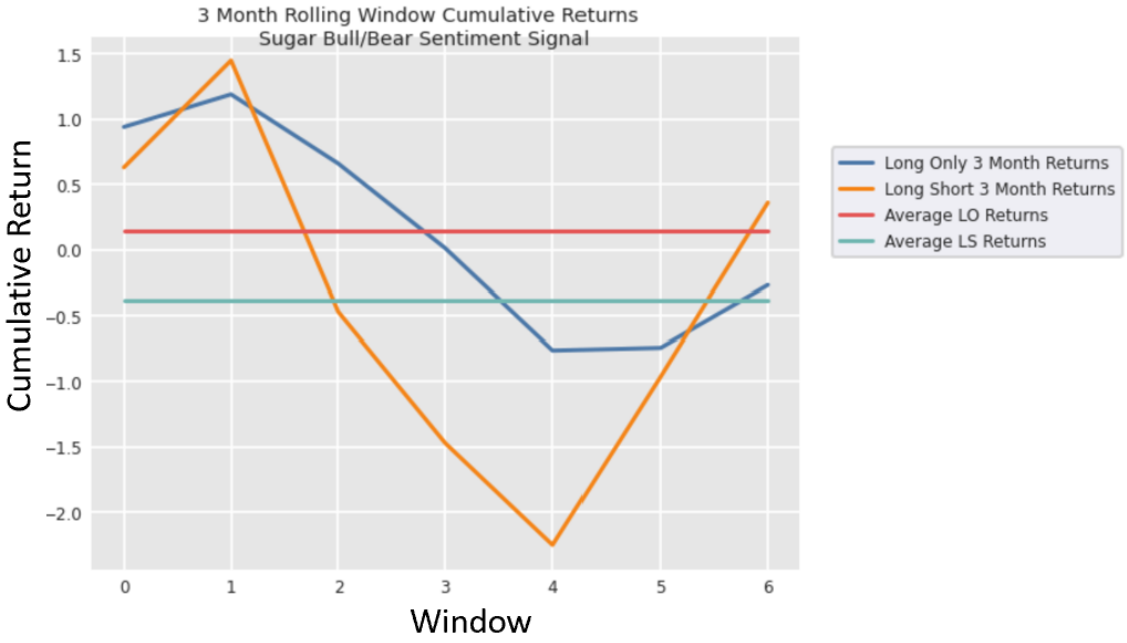

Figure 10: Rolling Window Returns for Bull-Bear Sentiment Trading Strategy for Sugar

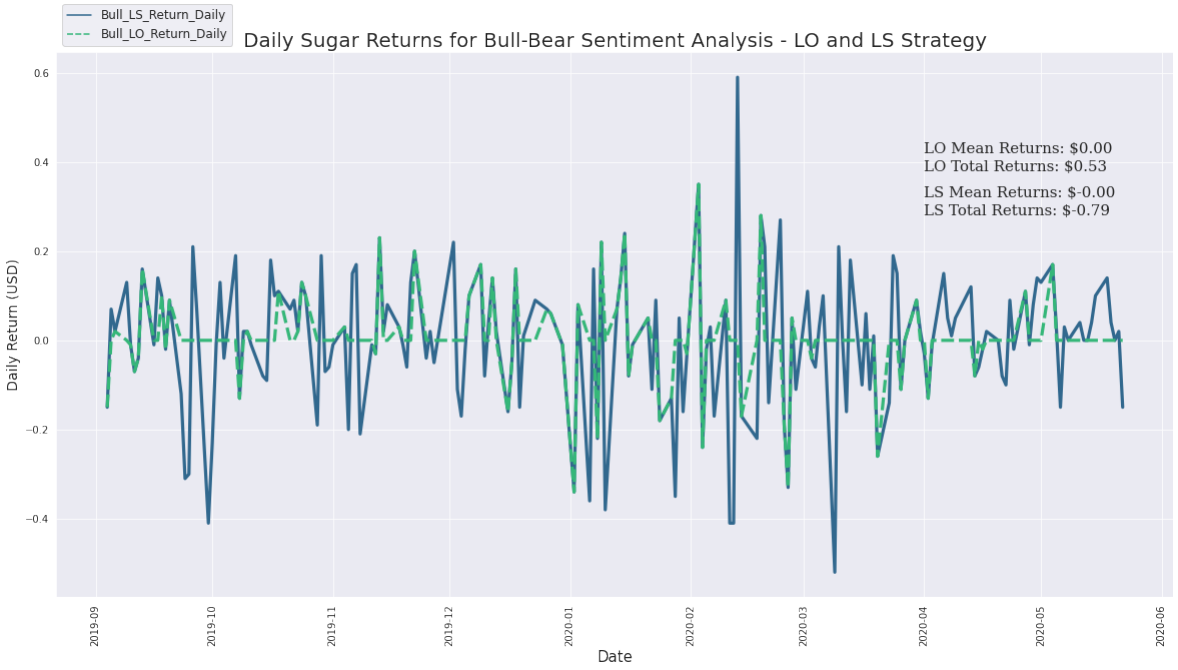

Figure 11: Returns for Bull-Bear Signaling Strategy

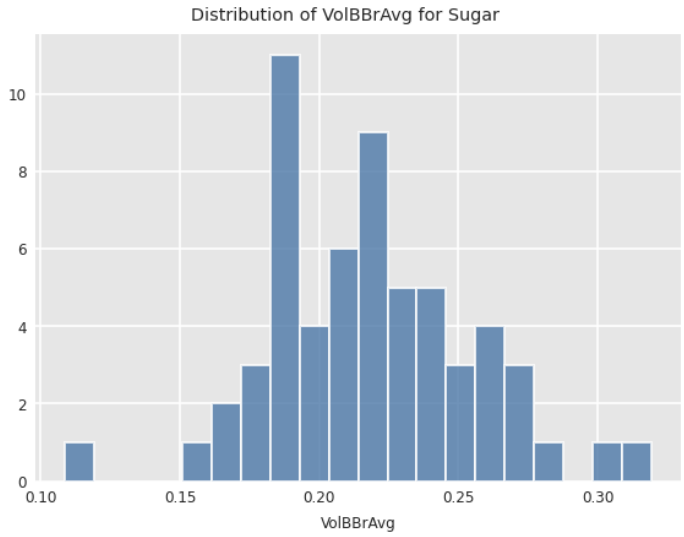

Figure 12: Distribution of VolBBr Feature for Sugar - Used to Select Signal Threshold

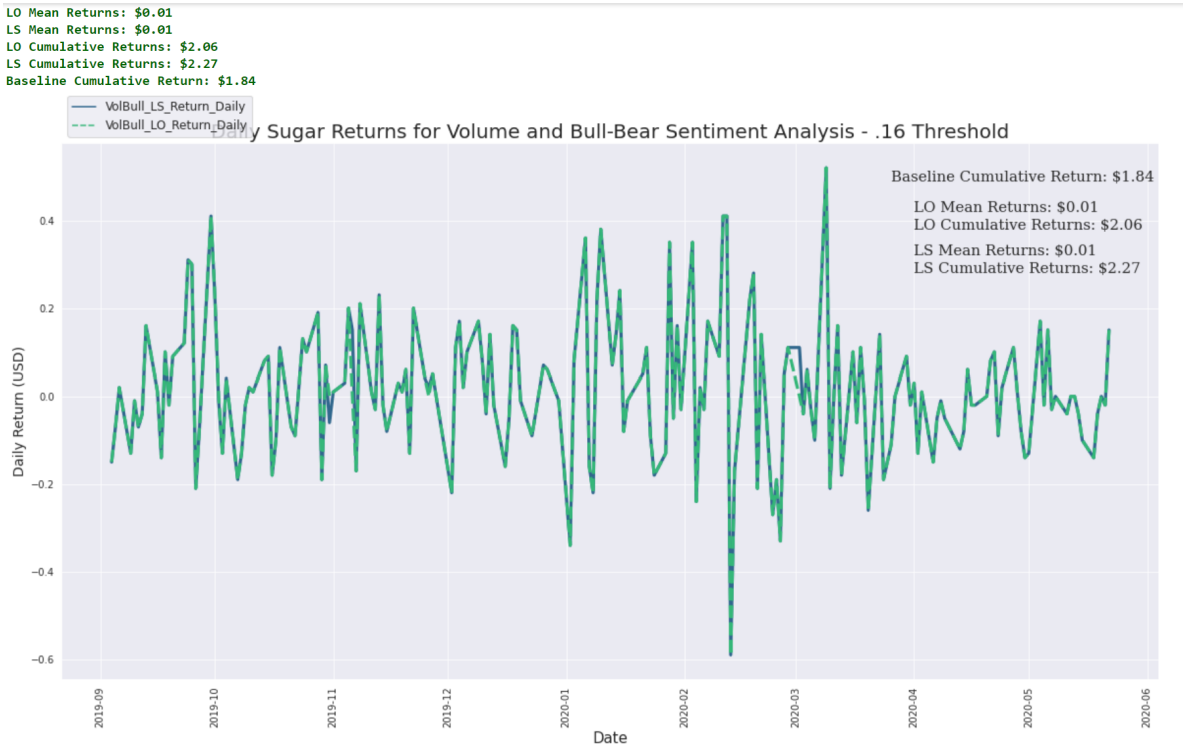

Figure 13: Sugar Returns with VolBBR Strategy