

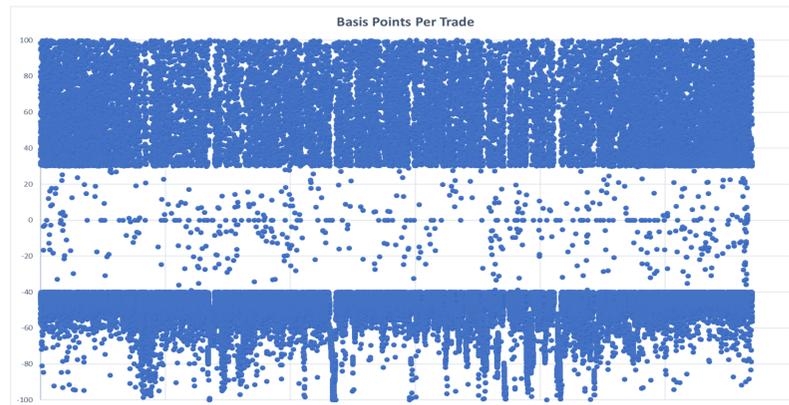
Optimality Conditions for Intraday Equity Trades

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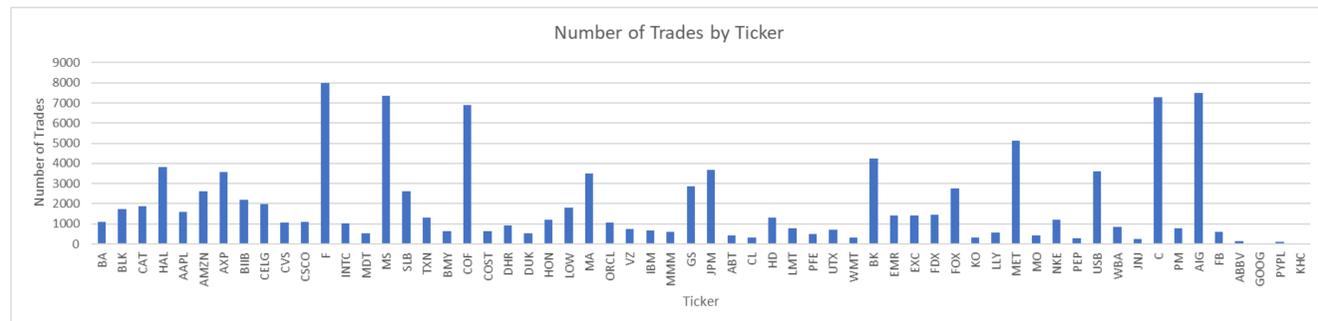
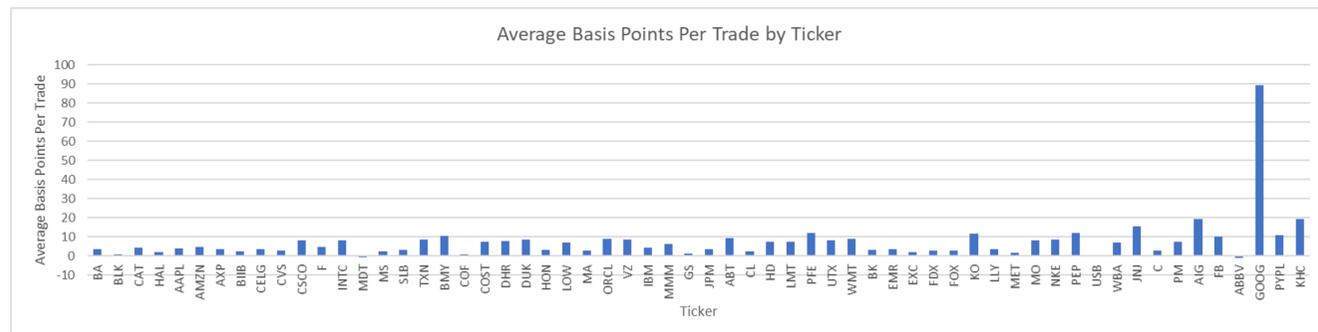
Abstract

Our research endeavors to create a mathematical model to determine the optimal time to enter and subsequently exit an equity position within a singular trading day. Building on the principles of mean reversion and momentum trading we present a model that consistently outperforms the benchmark over a 10 year trading period. Using the S&P 100 stocks from 2006-2016 as a sample size we show that our model delivers an average return of ~5 basis points per trade under ideal trading conditions defined by no slippage and constant transaction costs. Additionally, our model maintains a relatively low standard deviation of returns under calm and highly volatile markets.

Data



Win Rate	32.78%	Average Win	112.30 bp
Loss Rate	67.22%	Average Loss	47.70 bp
Expected Return/Trade	4.75 bp		



Method

- Back test universe includes all S&P 100 stocks from 2006-2016
- Algorithm enters a trade when it detects a sharp downward movement—anticipating a reversion
- Once in a position, algorithm looks to meet upper or lower thresholds to sell security, 35bp and -40bp respectively.
- If price goes above upper threshold and algorithm detects increased momentum then algorithm will hold position until such time that the momentum has dissipated.
- Transaction costs are a constant \$0.07/share round trip
- Algorithm assumes no slippage



Figure 1

Impact

- This research has the potential to build wealth for investors and solves the problem of volatility and uncertainty in stock market returns
- This research also presents the potential for a new investment product that offers risk uncorrelated to the market while delivering consistent returns

Conclusions

- We conclude that our algorithm presents a promising model for delivering consistent returns in the stock market, however there are further lines of inquiry to explore before trading in real time.

Further Lines of Inquiry

- Slippage presents a real risk to our expected returns and we need to build a model to account for this
- Execution time presents a risk to the algorithm as the price of a stock may change between the time the machine decides to trade and when the trade is executed with a broker

References

- Figure 1: Website: Trading Walk. Article, "How To Read Candlestick Charts Like A Pro"