Stock Price Prediction via Day Trading Principles

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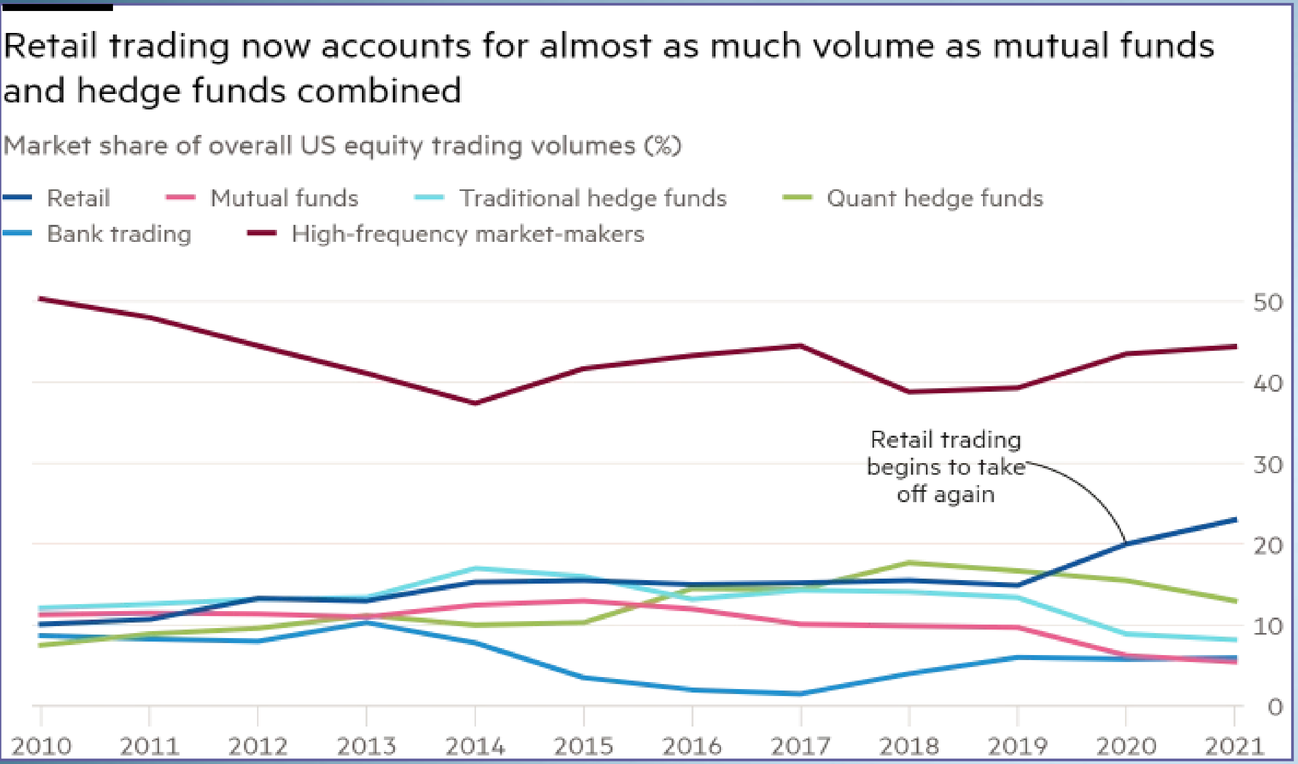
Presentation Roadmap

- Background Information
- Data Collection and Dataset Configuration
- Feature Engineering
- Exploratory Data Analysis
- Modeling
- Conclusion and Recommendations
- Improvements and Next Steps

Background Information

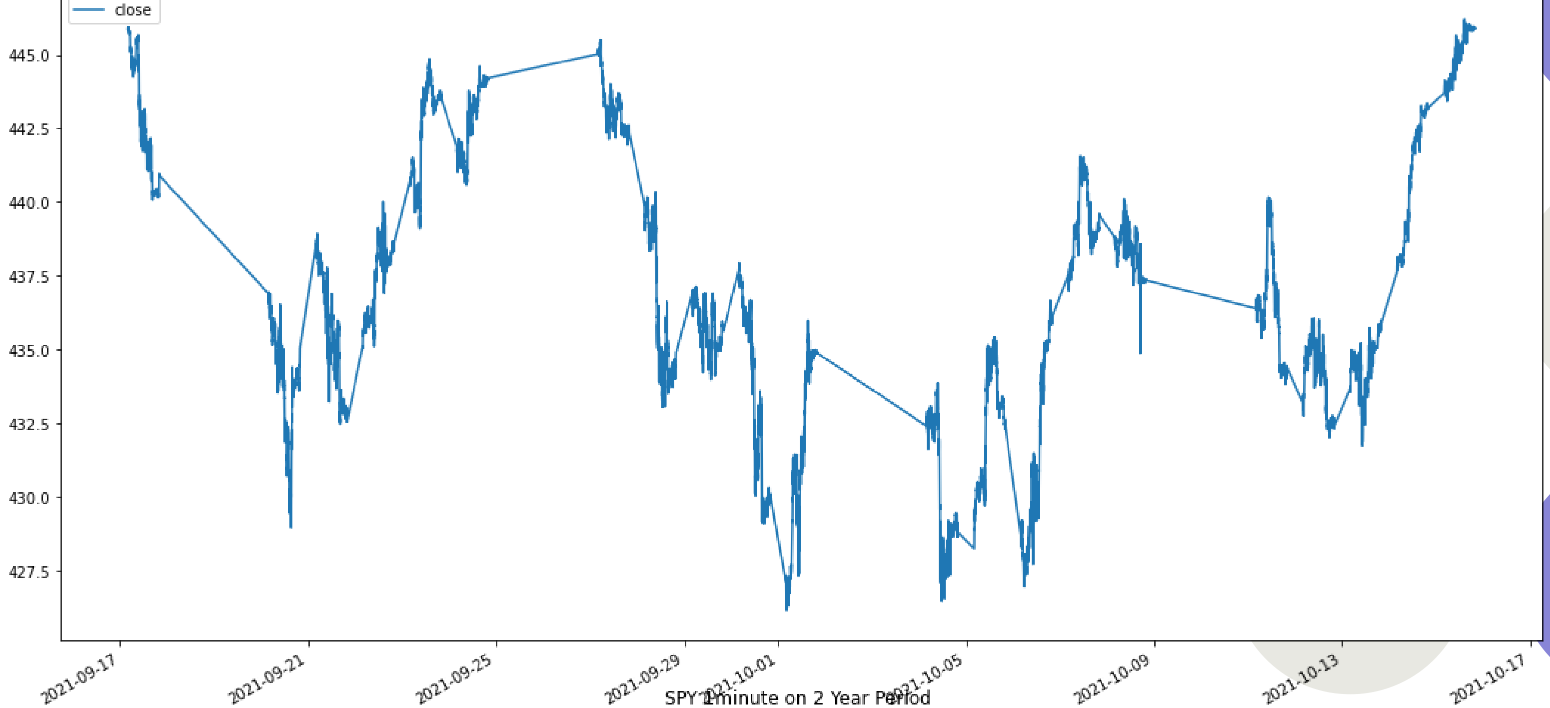


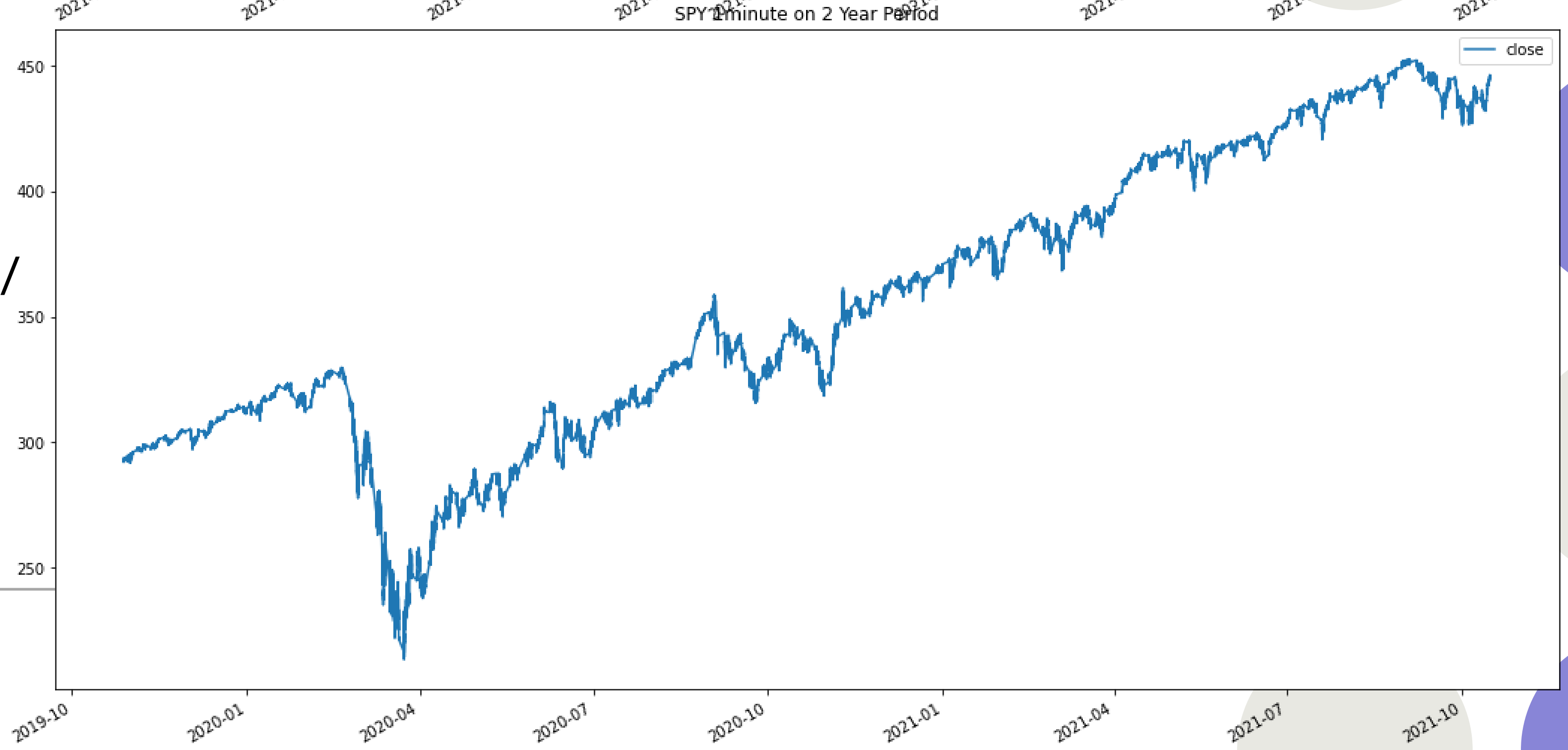
Source: Bloomberg Intelligence

Data Collection & Dataset Configuration

- Data collected via AlphaVantage free API using extended intraday data.

https://www.alphavantage.co/documentation/

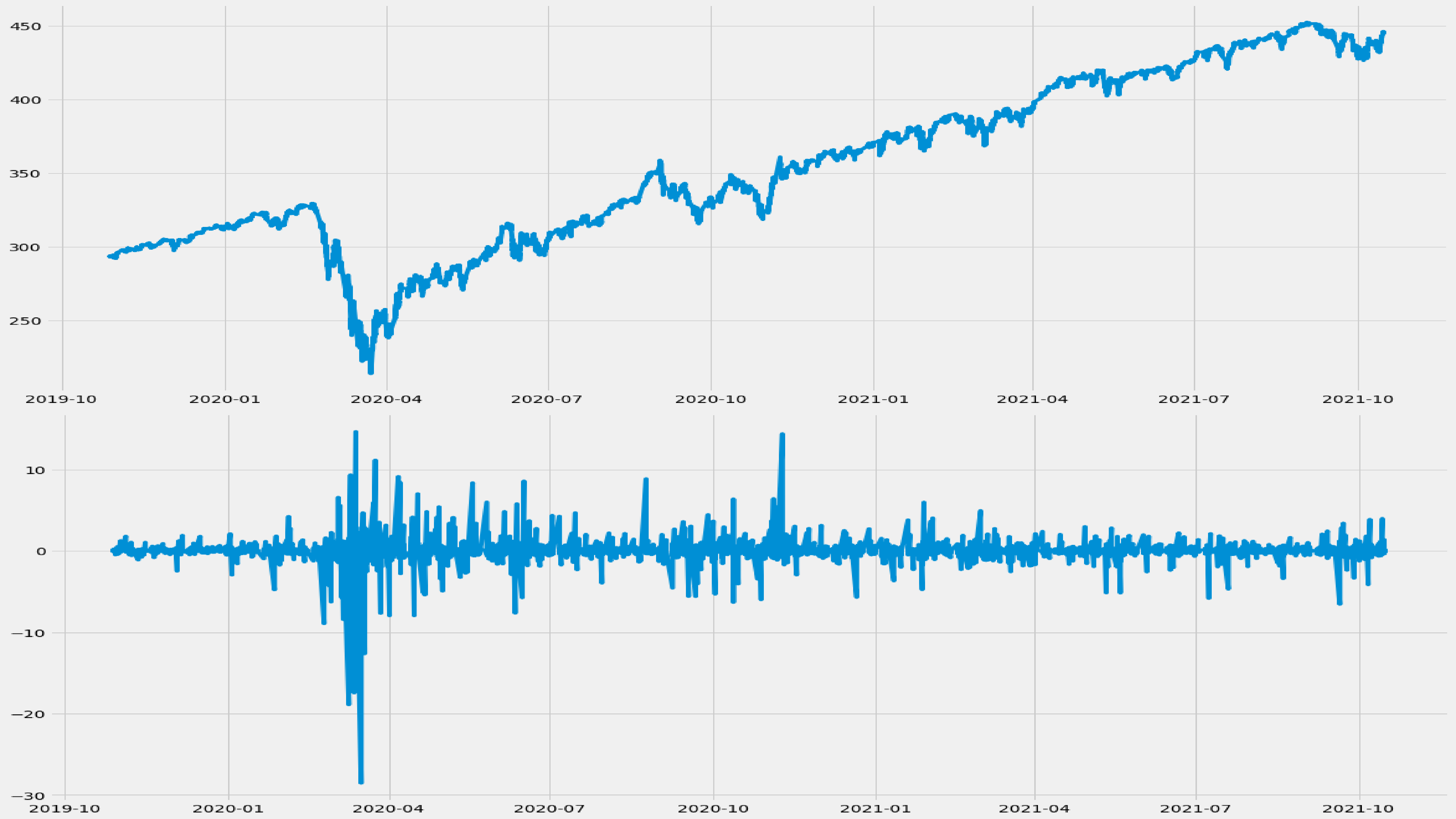


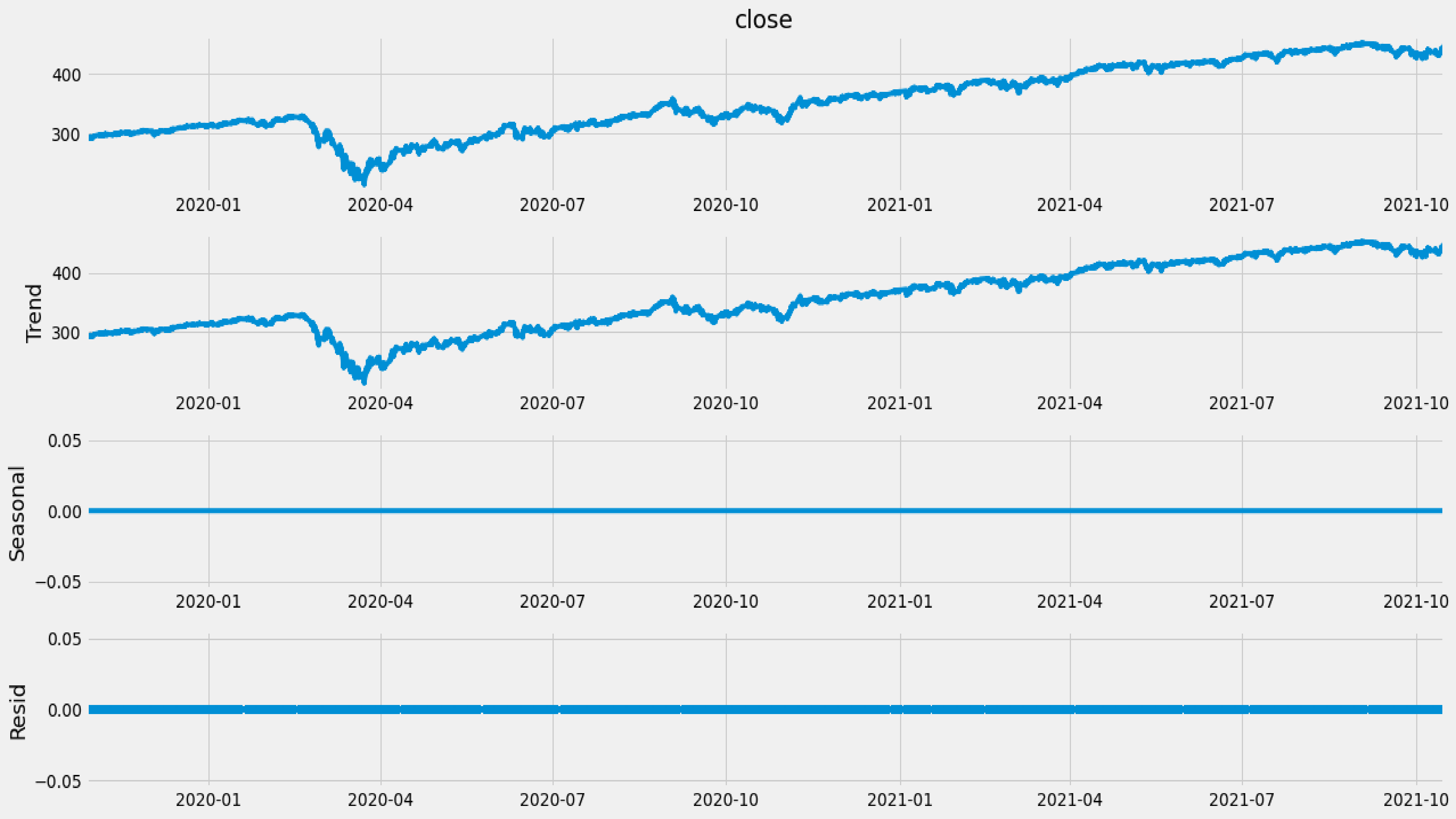


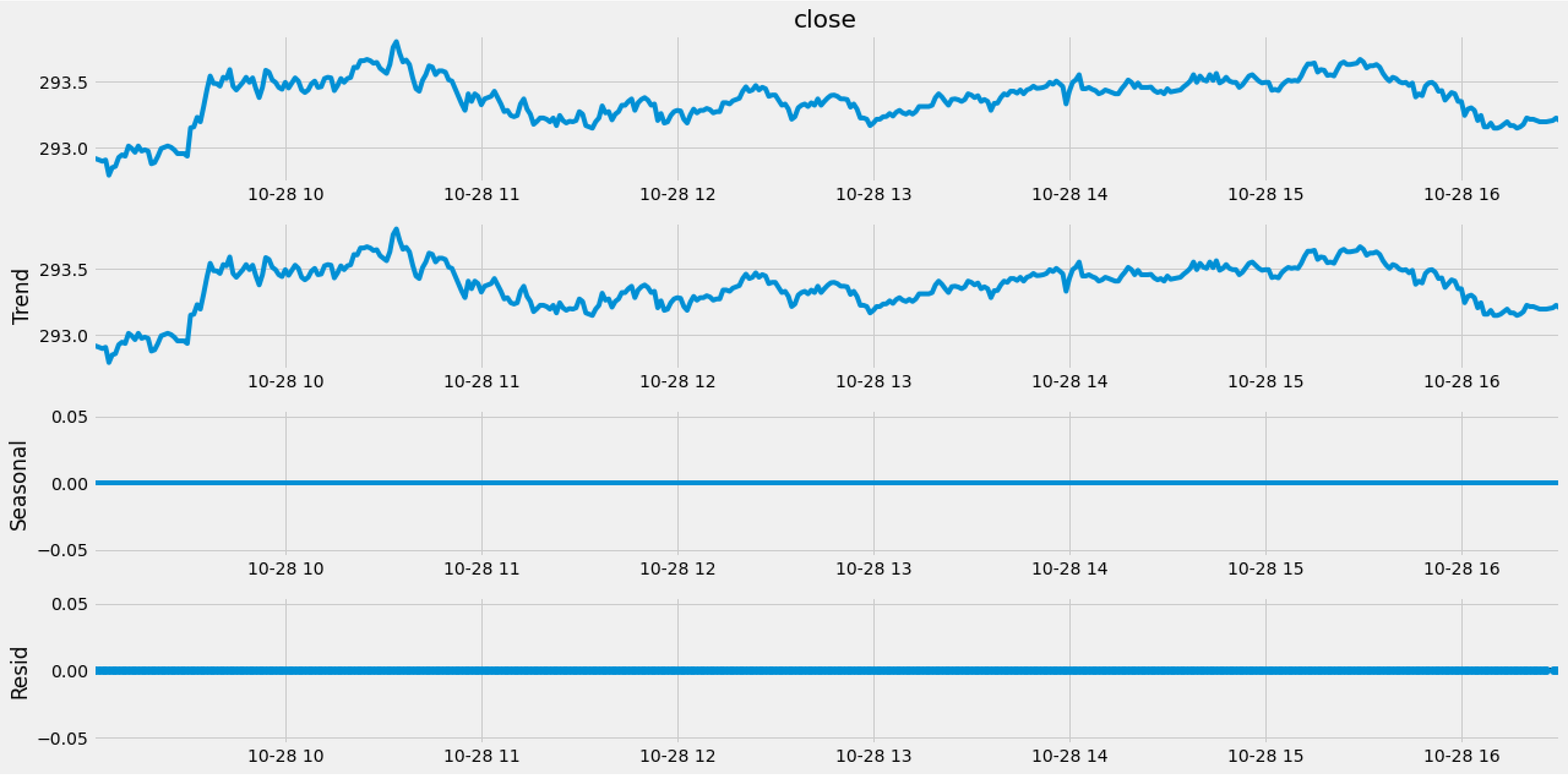
Feature Engineering

- Volume Weighted Average Price (VWAP)
- VWAP 1st, 2nd, and 3rd Standard Deviation
- 9 and 20 Exponential Moving Averages (EMA)
- Crossing of the 9 and 20 EMAs

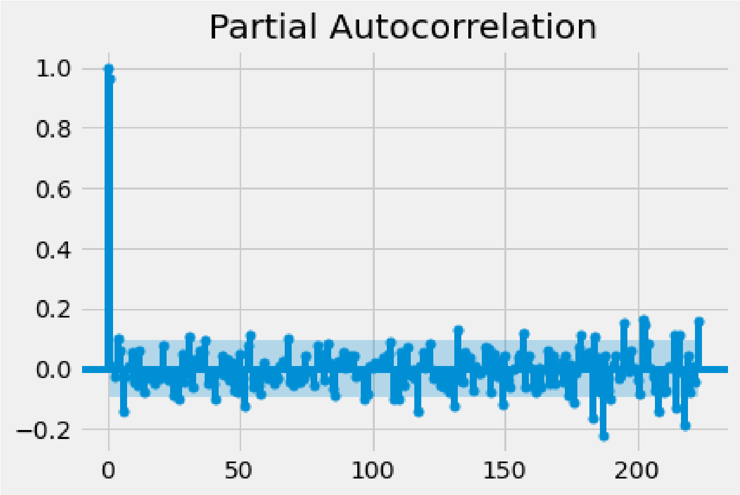
Exploratory Data Analysis

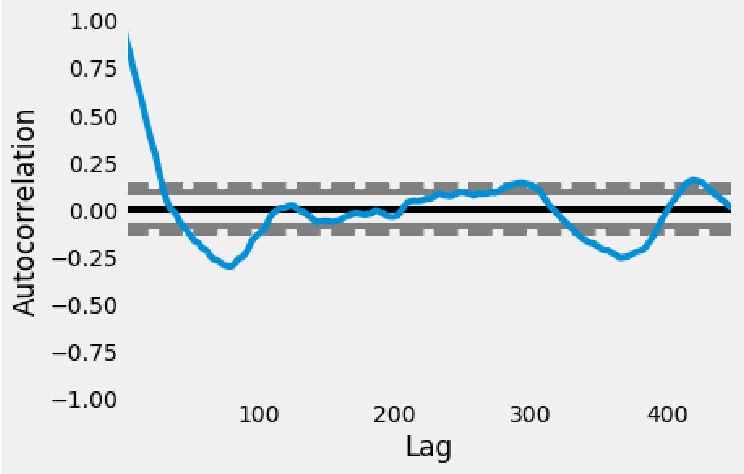

450
400
350
300
250
2019-10
2020-01
2020-04
2020-07
2020-10
2021-01
2021-04
2021-07
2021-10
10
0
−10
−20
−30
2019-10
2020-01
2020-04
2020-07
2020-10
2021-01
2021-04
2021-07
2021-10

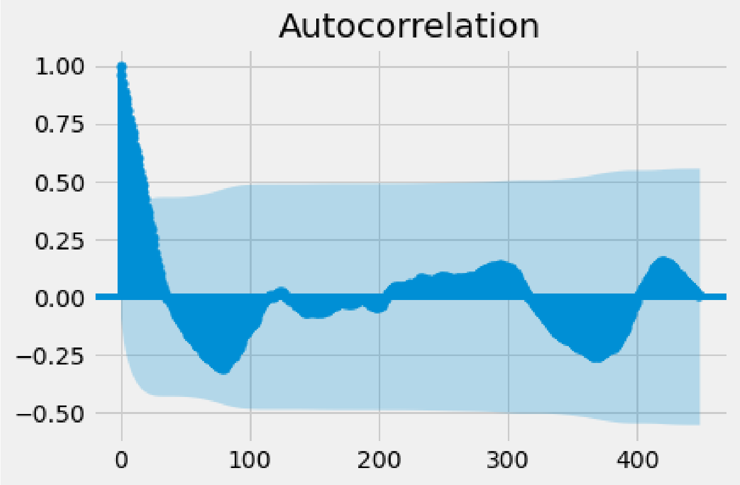

close
Trend
Seasonal
Resid
400
300
0.05
0.00
−0.05
2020-01
2020-04
2020-07
2020-10
2021-01
2021-04
2021-07
2021-10

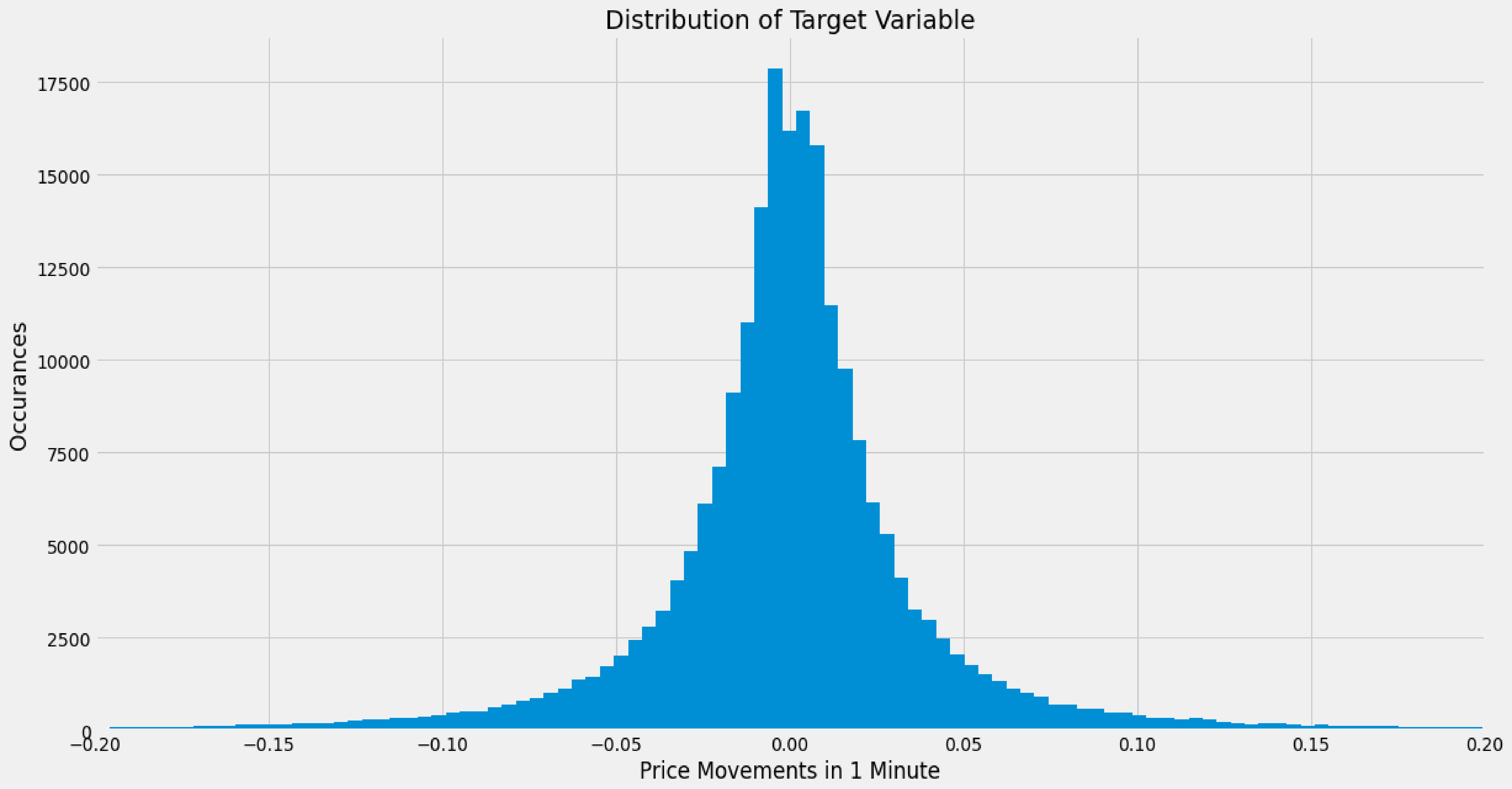


close
293.5
293.0
10-28 10
10-28 11
10-28 12
10-28 13
10-28 14
10-28 15
10-28 16
Trend
Seasonal
0.05
0.00
−0.05
Resid


Partial Autocorrelation
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
0
50
100
150
200

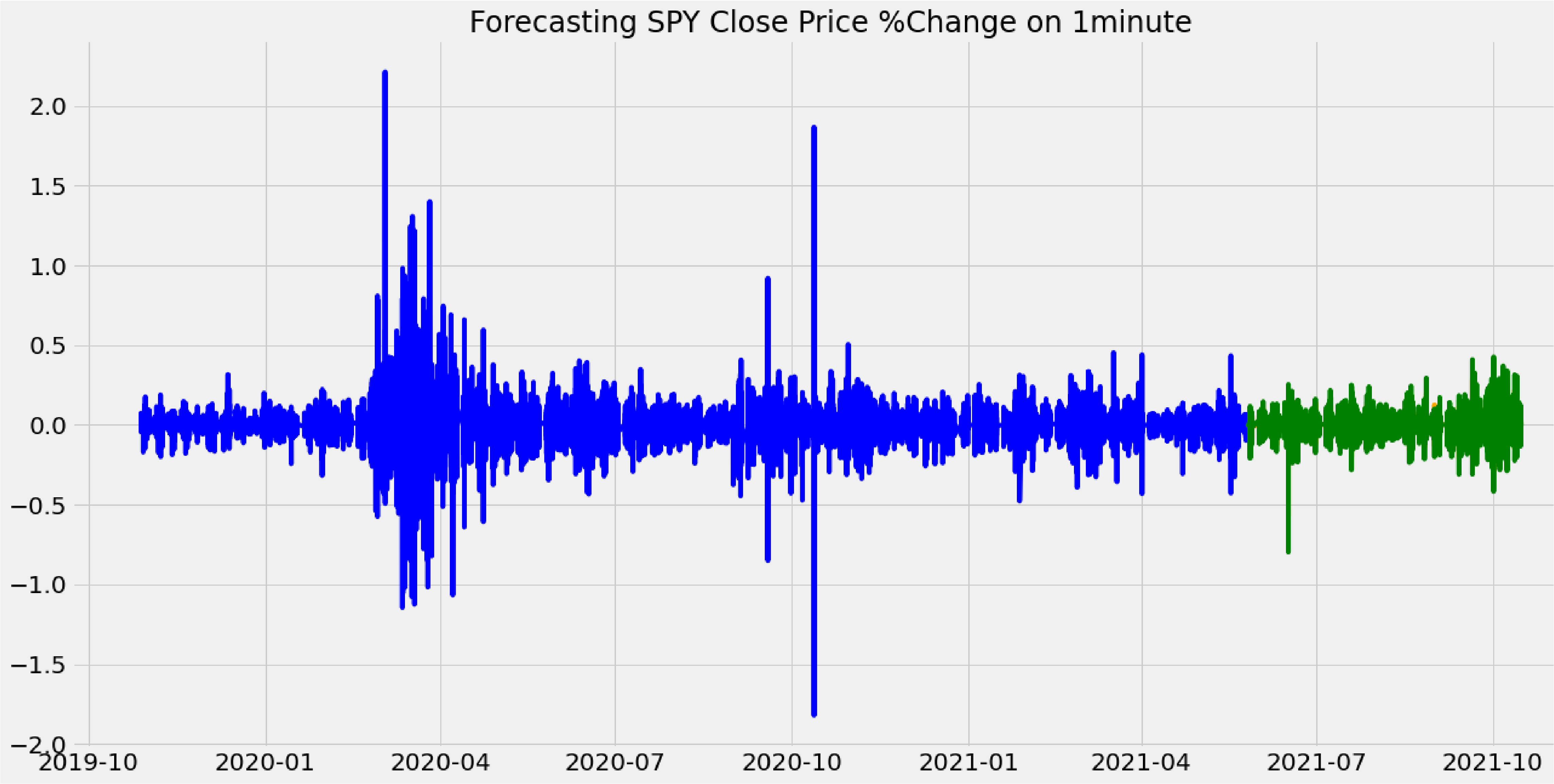

Autocorrelation
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
100
200
300
400
Lag

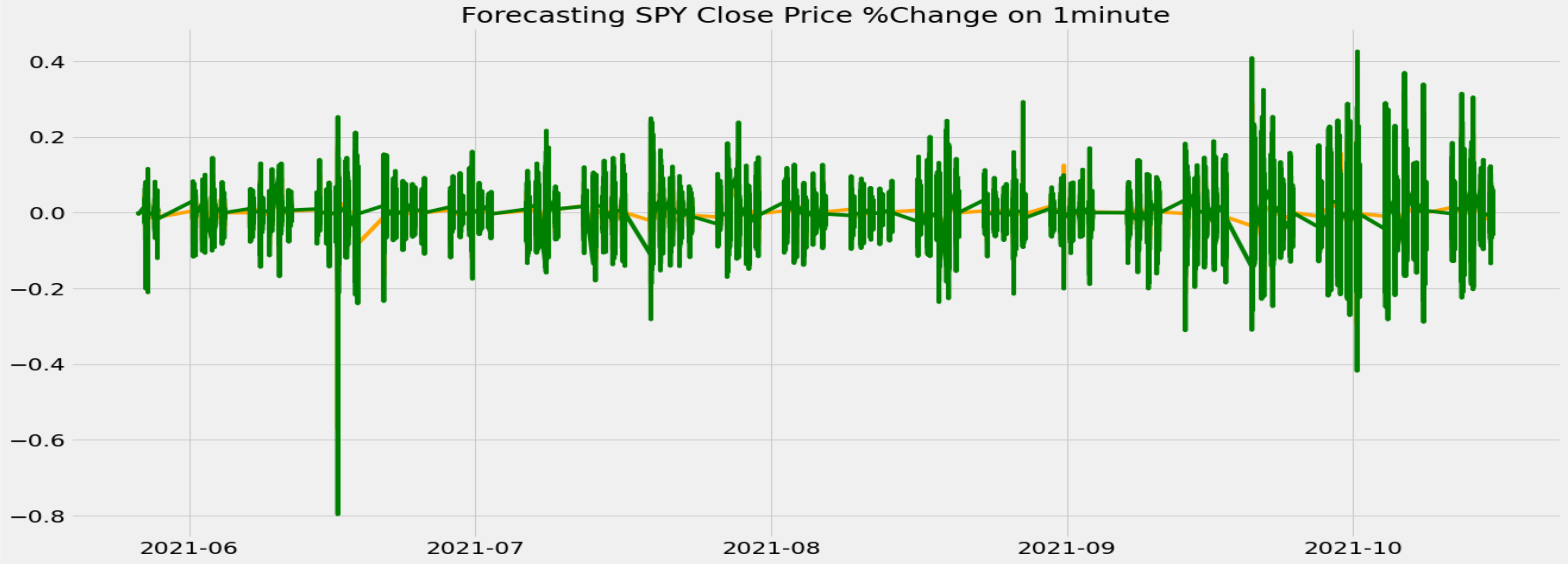

Autocorrelation
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
0
100
200
300
400

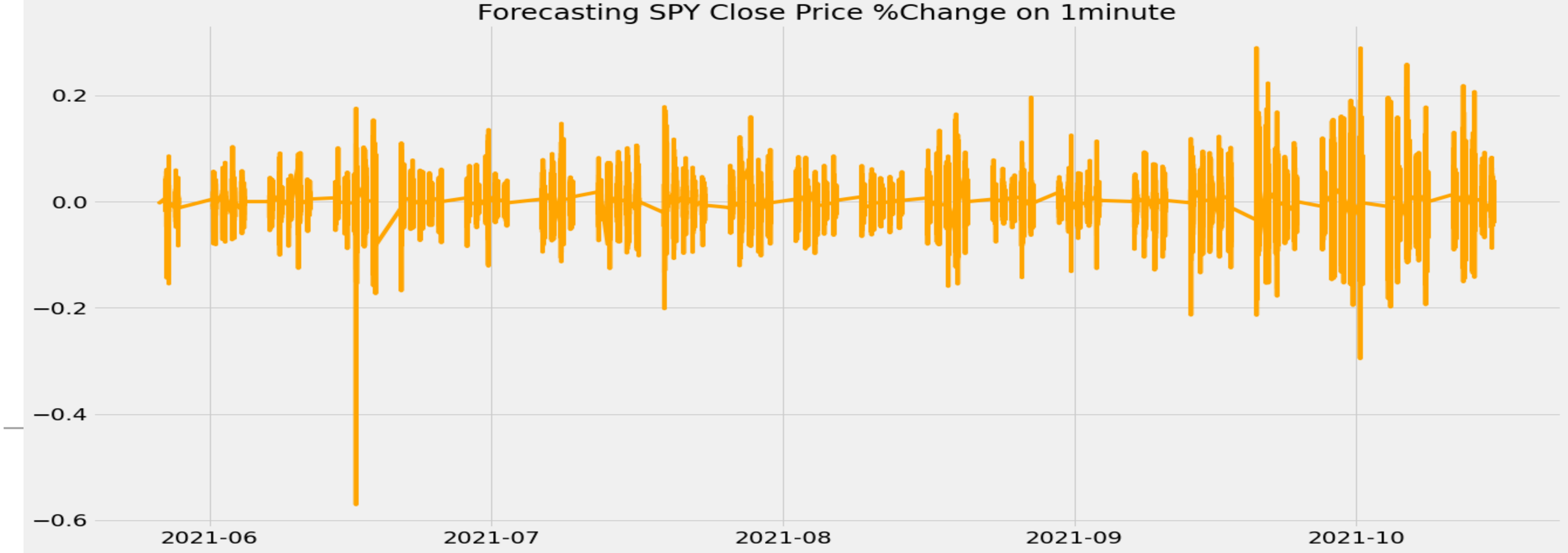


Mean: 0.000095 Standard Deviation: 0.055516

Modeling


Forecasting SPY Close Price %Change on 1minute
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
2019-10
2020-01
2020-04
2020-07
2020-10
2021-01
2021-04
2021-07
2021-10


Forecasting SPY Close Price %Change on 1minute
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
2021-06
2021-07
2021-08
2021-09
2021-10


Forecasting SPY Close Price %Change on 1minute
0.2
0.0
−0.2
−0.4
−0.6
2021-06
2021-07
2021-08
2021-09
2021-10

Conclusion & Recommendations

- Commonly recommended Day Trading Indicators appear to be effective tools in predicting price movements. However, there is clearly a leakage and multicollinearity issue. More modeling is needed to make a concrete solution.

- Algorithmic day trading is best done on a high frequency, therefore the time period of 1 minute is a little long.

- Day Trading is a mix of art and science. This prediction tool is best used as an additional indicator to help inform trading analysis and not relied upon exclusively.

Improvements & Next Steps