

The EV Futures

Brian Matsiko



Business Problem



EU and California recently rolled out plans to phase internal combustion cars by 2035.



Currently there are four publicly traded fully electric vehicle manufacturing companies.



Goal of this project is to analyze the current stock and forecast futures of the four companies.



Evaluate whether the greater world are onboard with the new future of only electric vehicles



Data Overview

Source

Stocking trading information was sourced from the yahoo API.

Entire trading history was included in this project.

Background

TSLA is the only company based in North America and the other three companies are based out of China.

TSLA has been trading for 12 years

NIO has traded for 3 years

Both LI and XPEV have only been trading for a year

Exploratory Data Analysis



Feature Correlations With Price Close

TSLA

Correlation of Close



LI

Correlation of Close



NIO

Correlation of Close



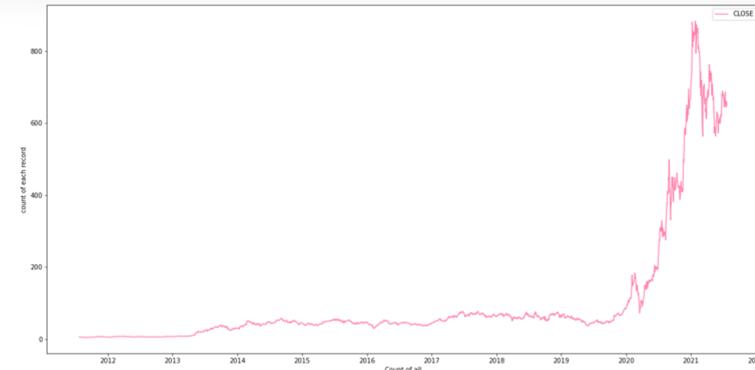
XPEV

Correlation of Close

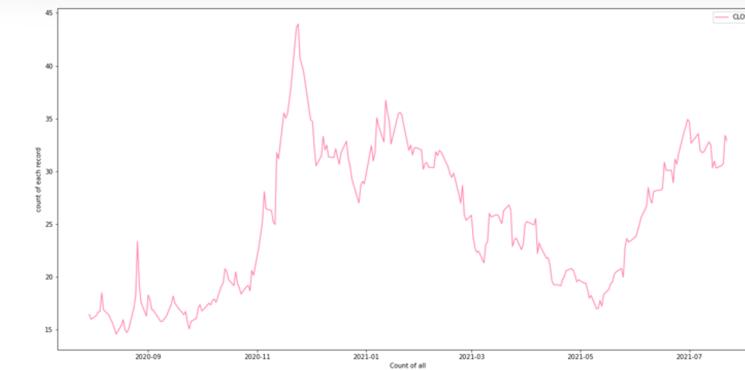


Stock Trading Trends

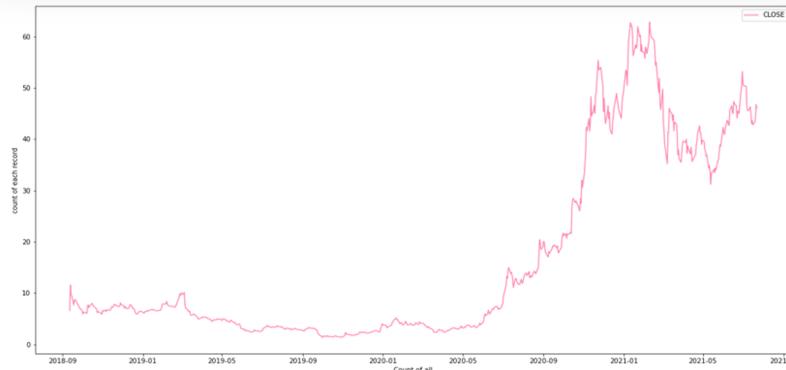
TSLA



LI



NIO



XPEV



Machine Learning Process



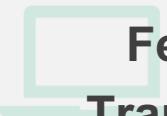
Process Overview

Target And Features



Target

Daily Stock Closing prices



Features and Transformations

Open, low, high, volume

Normalized

Data time series split into train and test -70% to 30%

Modelling



Models

Baseline LSMT model

ARIMA and
SARIMA models



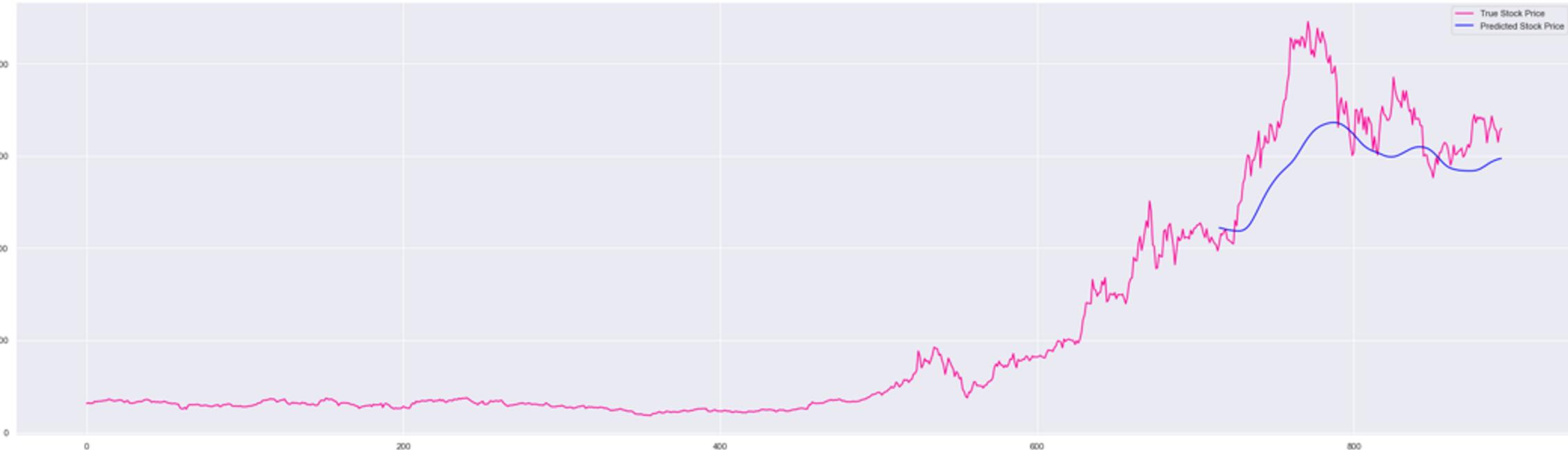
Model Tuning

Facebook prophet

First Simple Models With LSTM

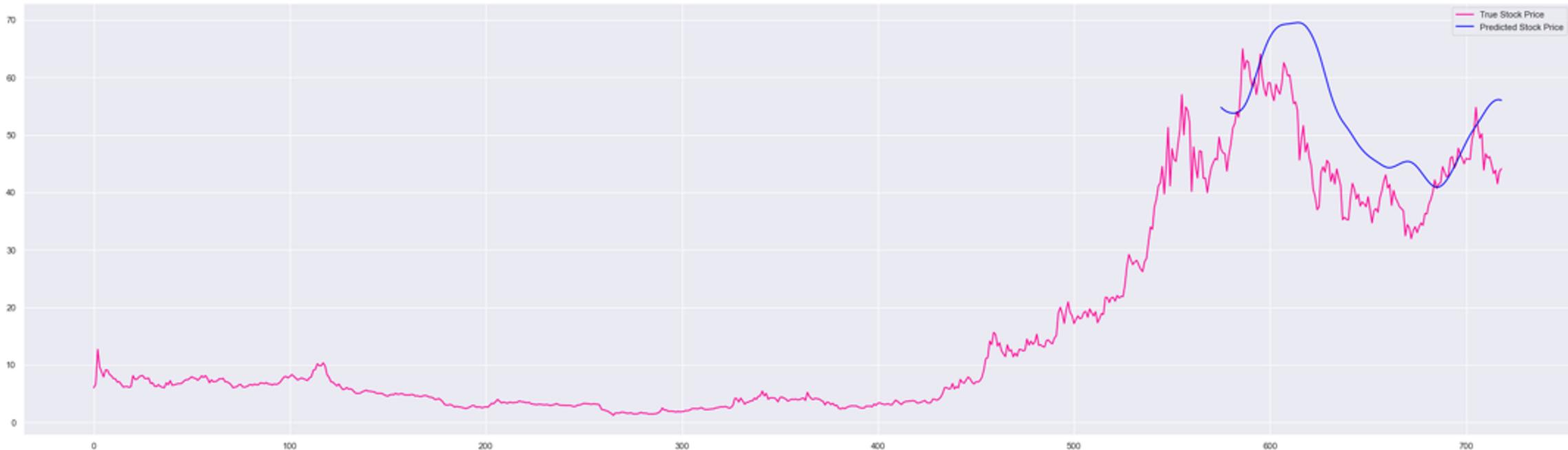


TSLA



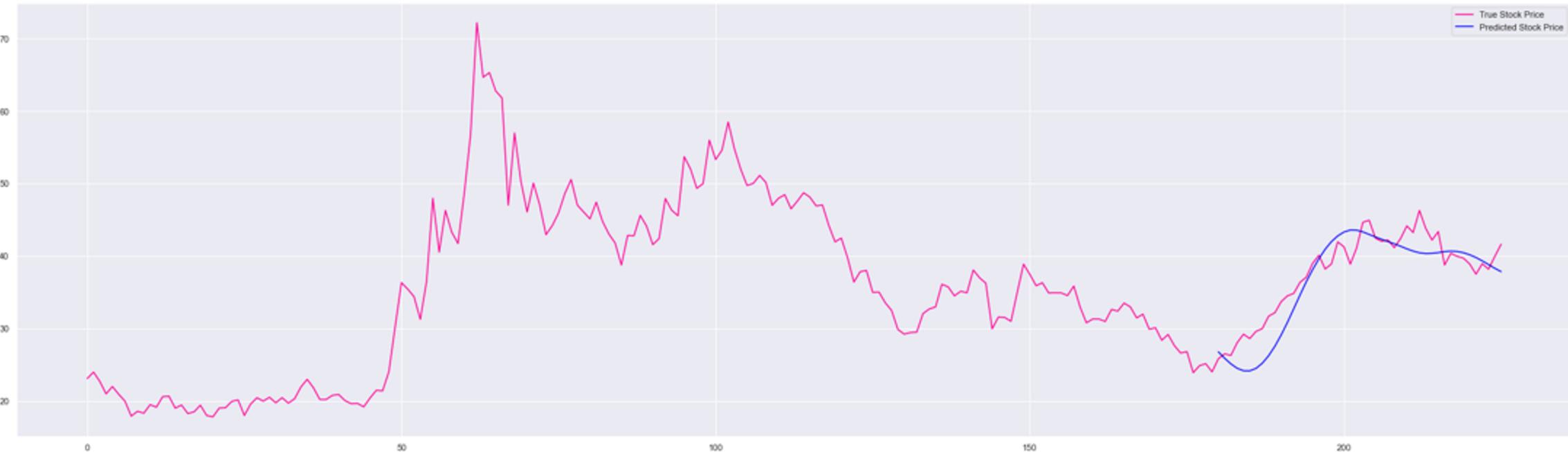
Mean Absolute Error - \$91.2

NIO



Mean Absolute Error - \$8.65

XPEV



Mean Absolute Error - \$2.27

LI



Mean Absolute Error - \$1.72

FB Prophet Models



FB Prophet Sam

Overall the second-best evaluation metrics

horizon	mse	rmse	mae	mape	coverage	initial	period
0 60 days	6573.123872	81.074804	42.635715	0.178347	0.296000	2000 days	90 days
0 60 days	8224.014154	90.686350	52.621288	0.227588	0.294667	2000 days	90 days
0 60 days	6471.169628	80.443580	42.091334	0.182818	0.274667	2000 days	90 days
0 60 days	6535.973672	80.845369	41.374588	0.179531	0.298667	2000 days	90 days

Sample Metrics represent the model on TSLA stock

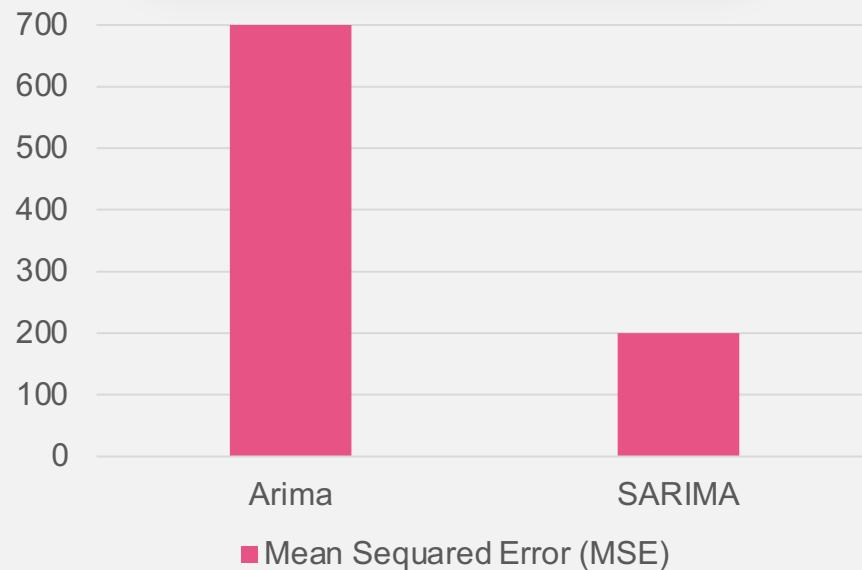
Final Model



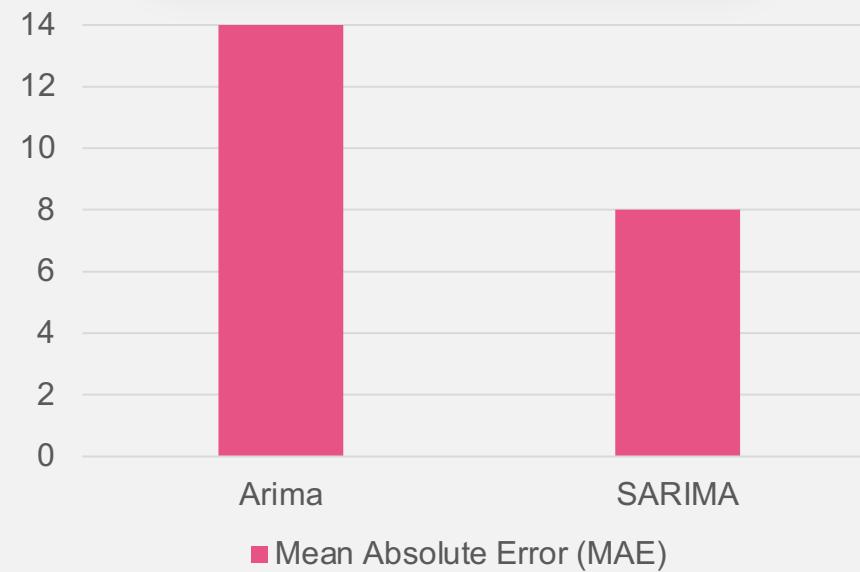
SARIMA

Overall Had the best evaluation metrics

MSE



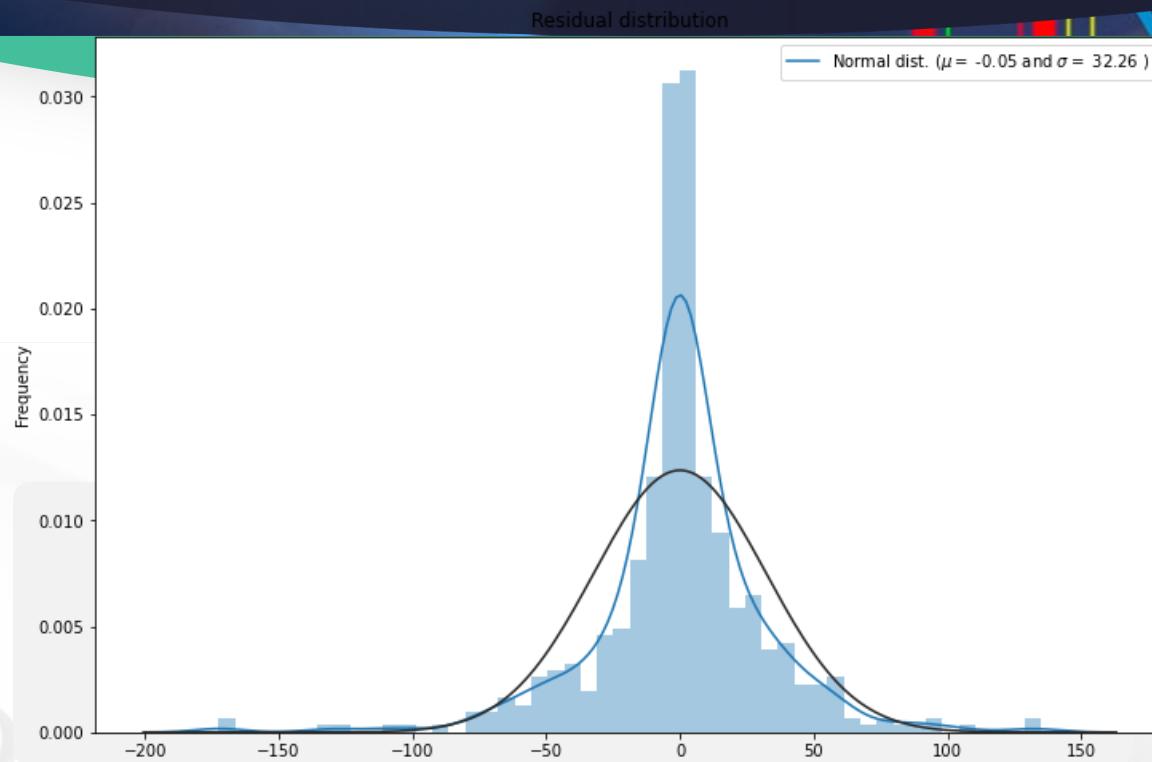
MAE



Sample Metrics represent the model on TSLA stock

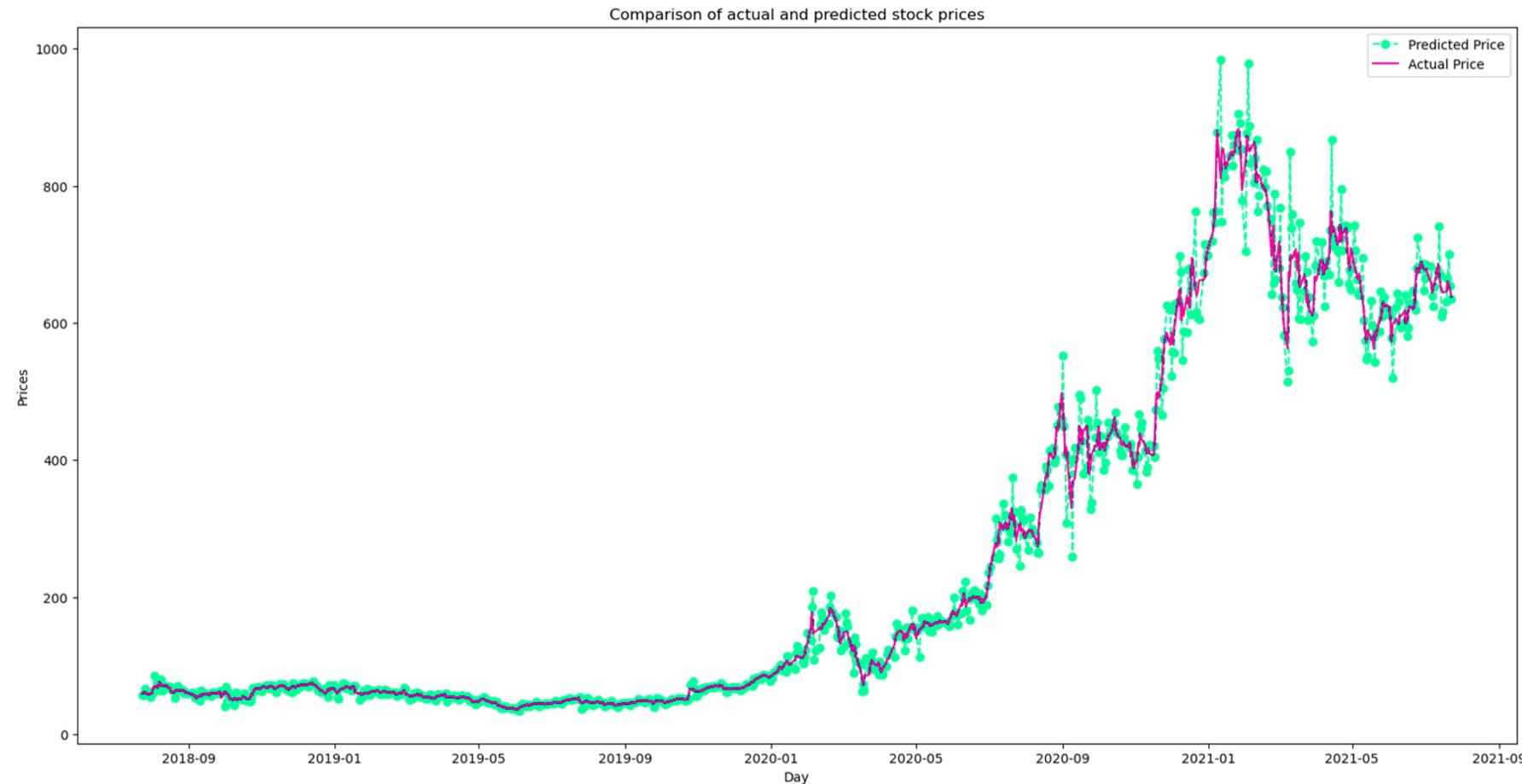
SARIMA Residual plot

No patterns observed on fitted model



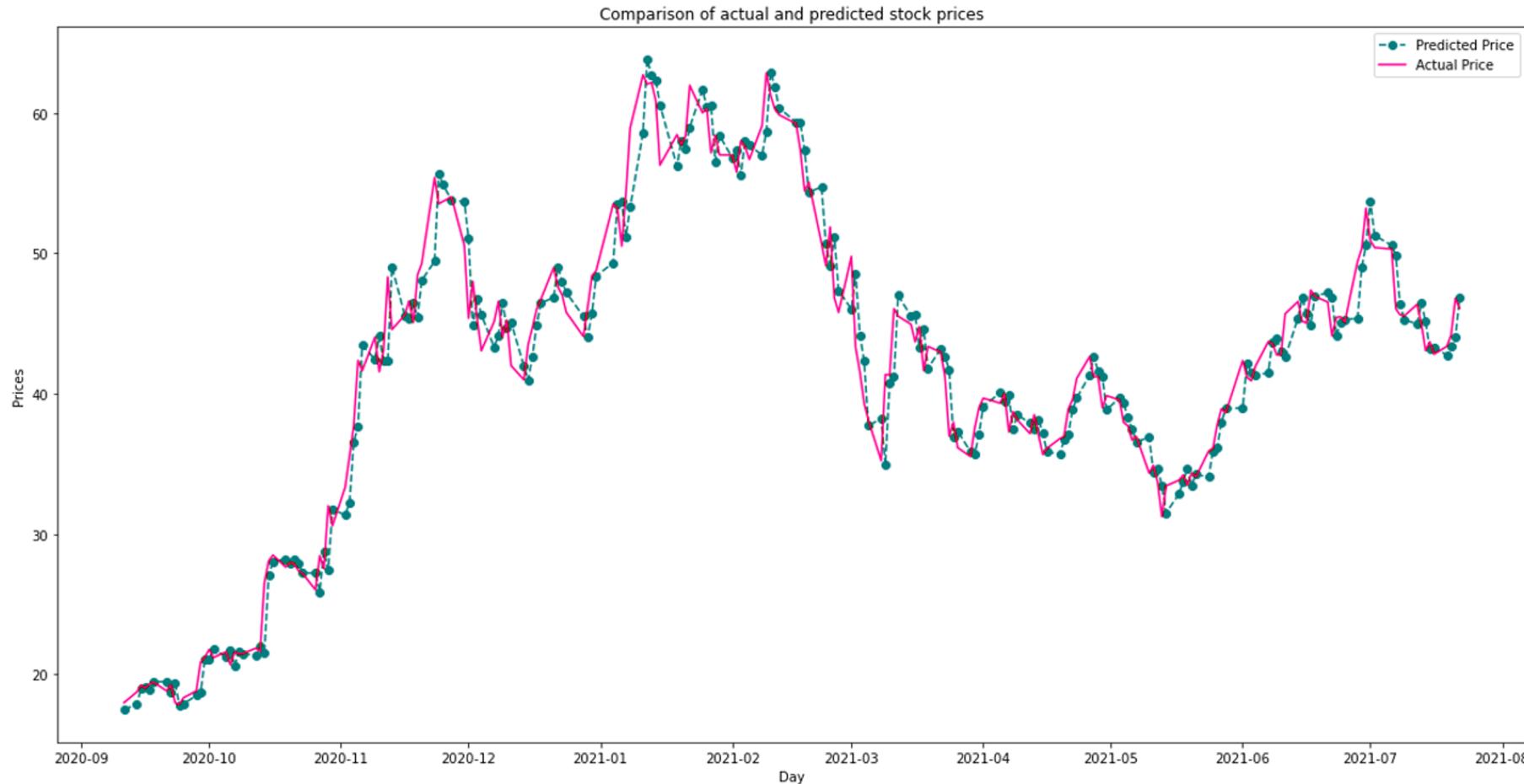
Sample Metrics represent the model on TSLA stock

SARIMA TSLA Actual Vs Predicted Stock Prices



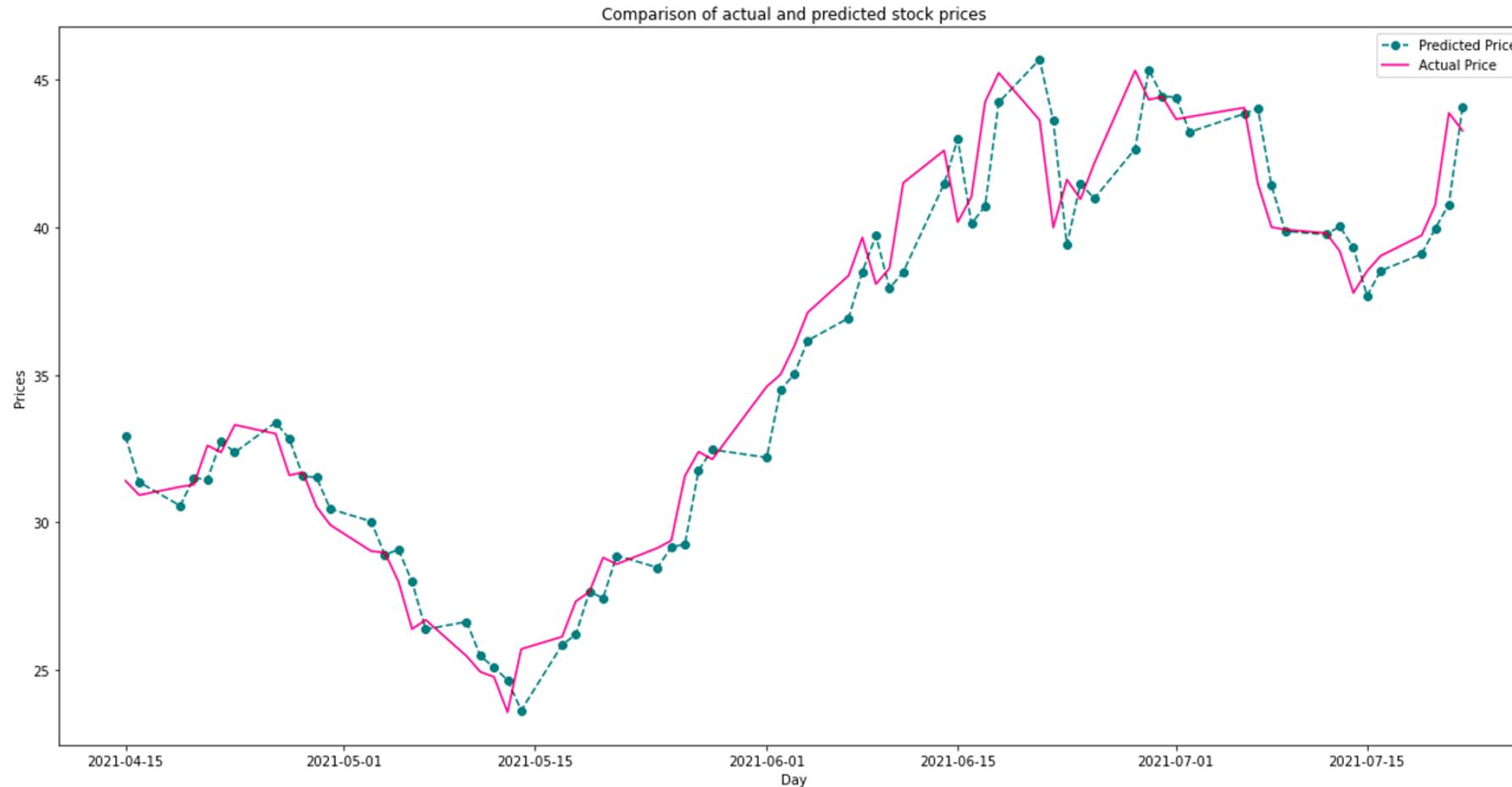
MAE – \$7.88

SARIMA NIO Actual Vs Predicted Stock Prices



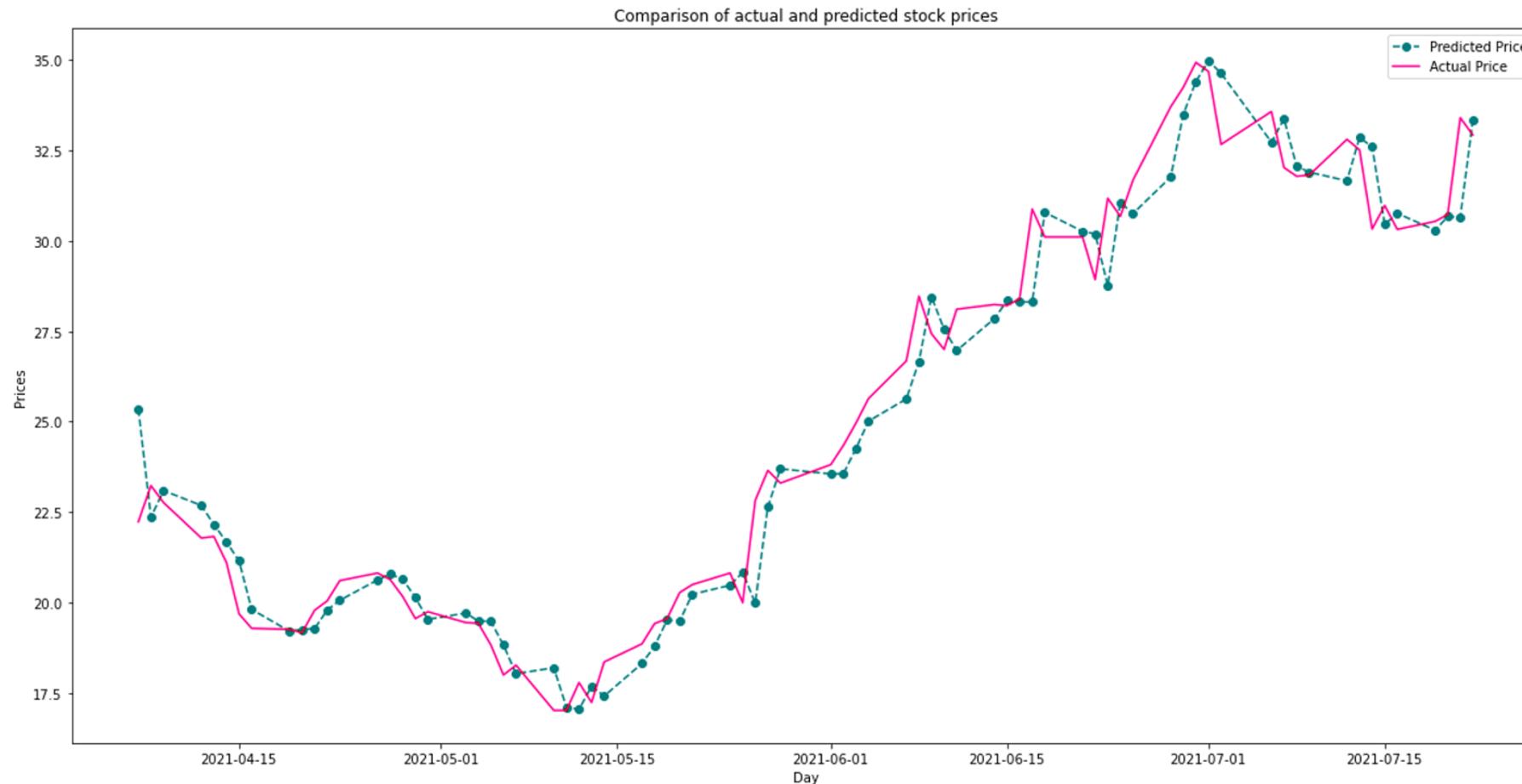
MAE – \$1.60

SARIMA XPEV Actual Vs Predicted Stock Prices



MAE – \$1.99

SARIMA LI Actual Vs Predicted Stock Prices

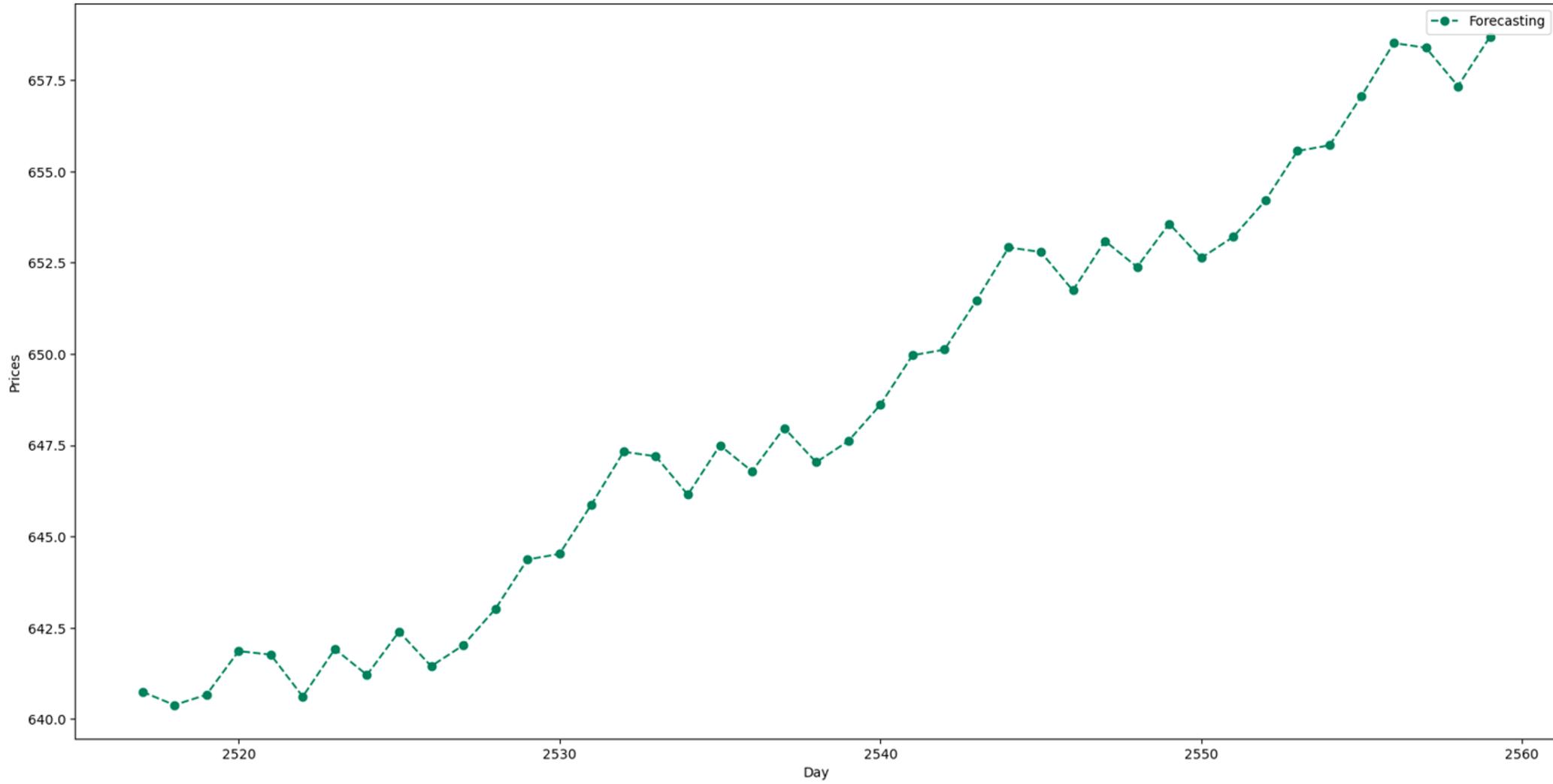


MAE – \$0.97

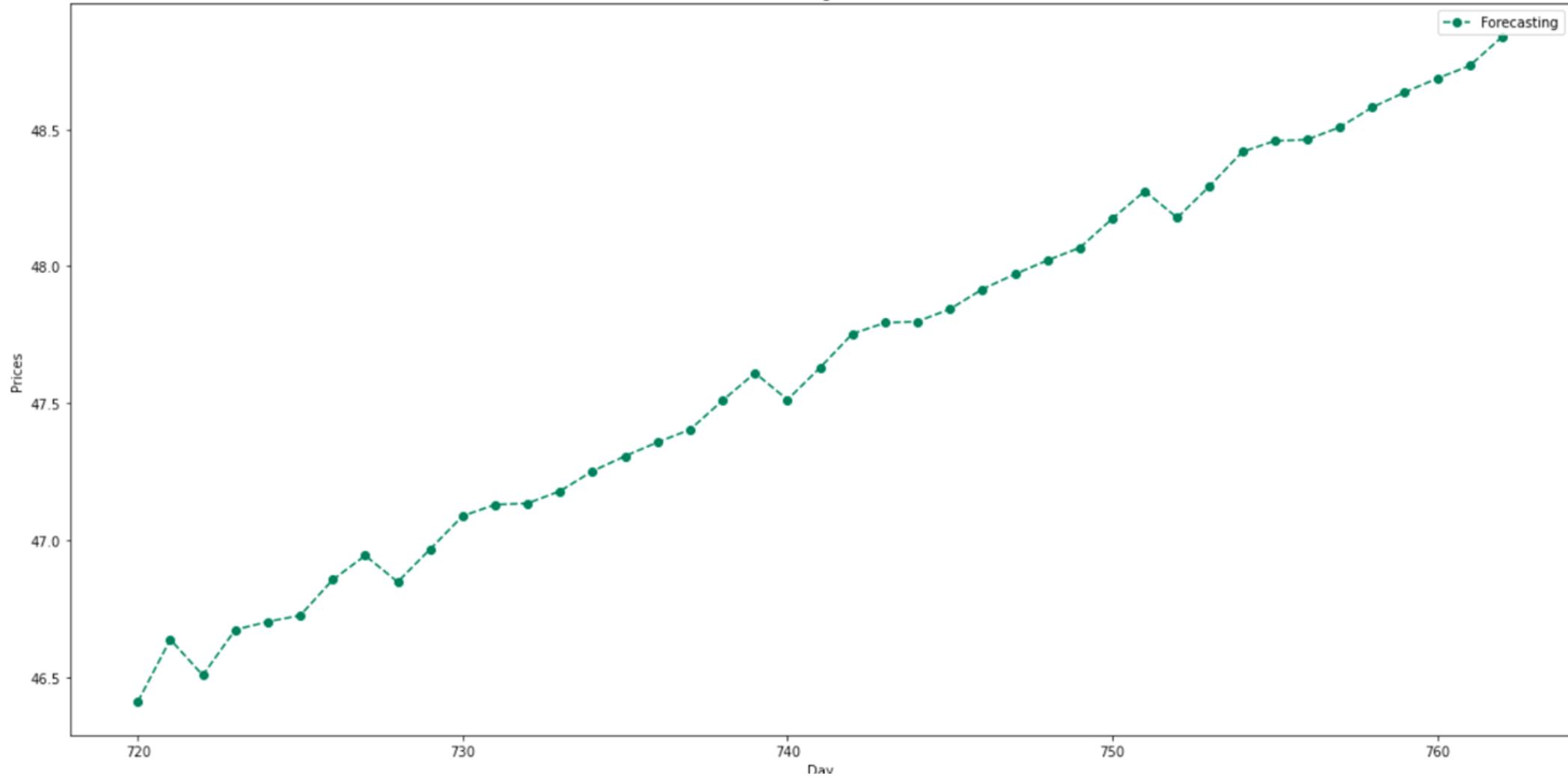
Forecasts



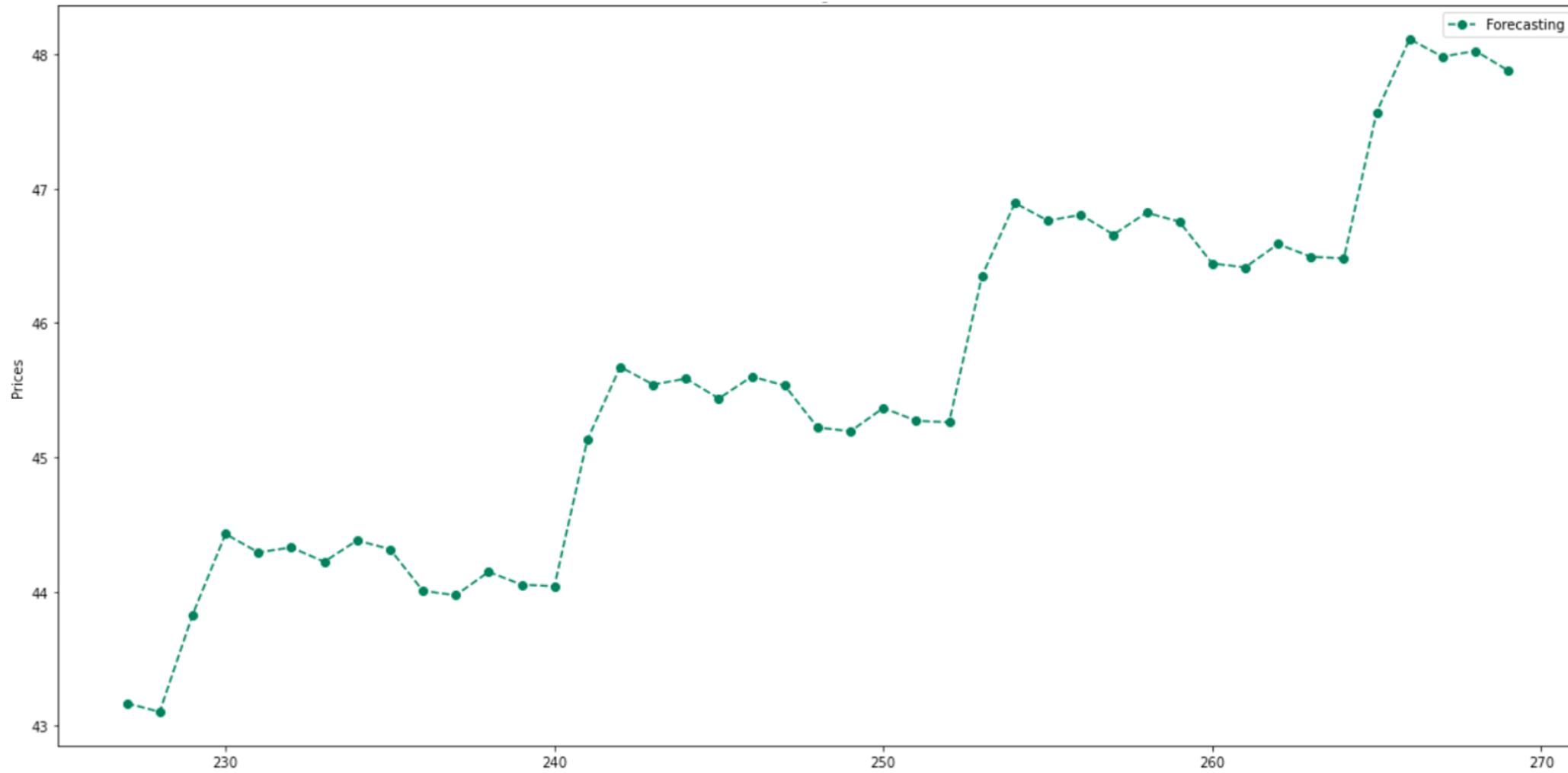
TSLA 42 DAY STOCK FORECAST



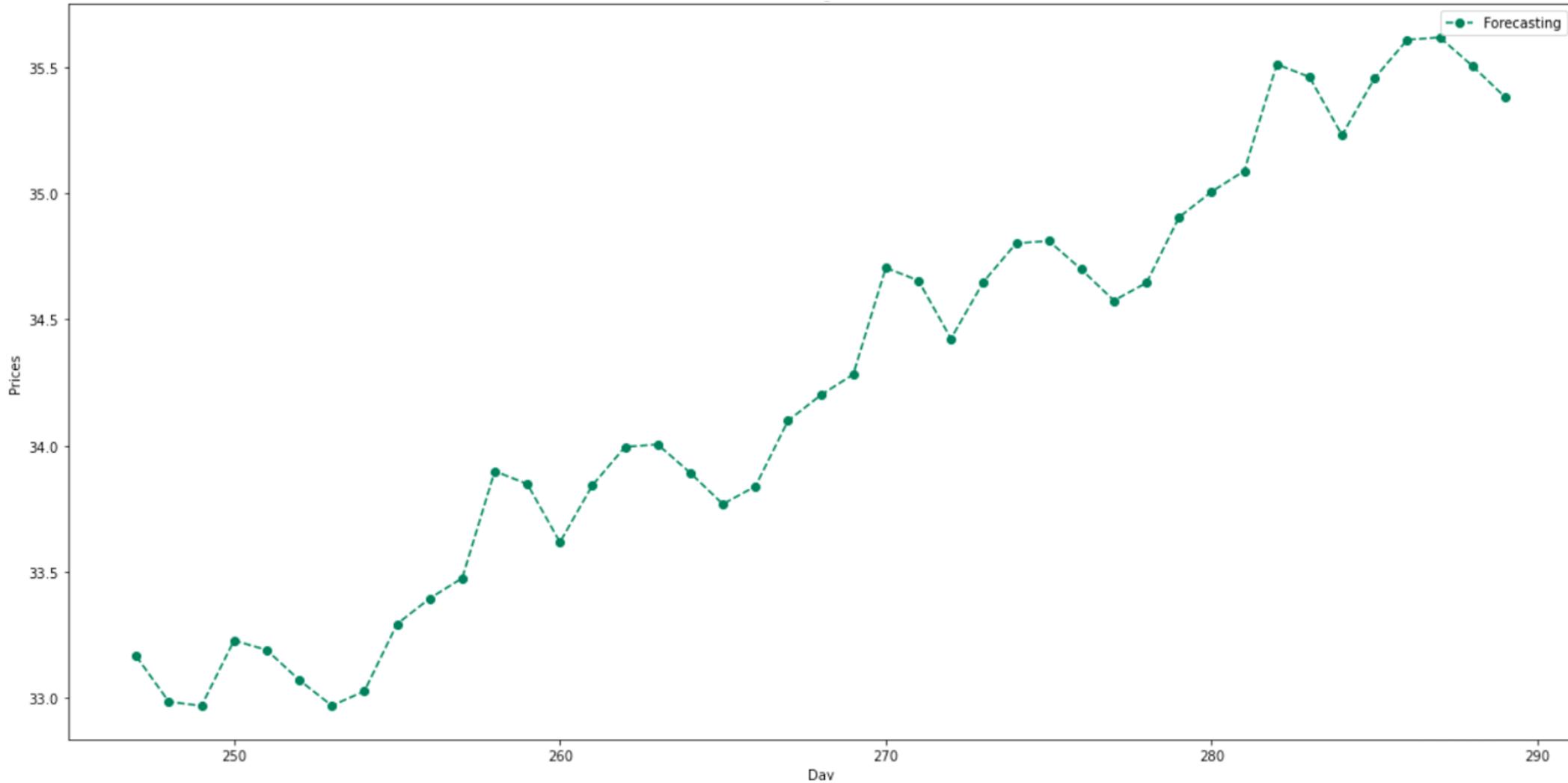
NIO 42 DAY STOCK FORECAST



XPEV 42 DAY STOCK FORECAST



LI 42 DAY STOCK FORECAST



Conclusions



Key Results & Deductions

All EV Stocks are forecasted to be trending higher

General Automotive market trend not included

General Stock market trend not included



Previous Short-term trend was currently up for all the EV stocks as well

Indication of short-term interest in all these stocks

Next Steps



General Market
& Industry
Inclusion



Stock trading
Volume
analysis



Publishing all
inclusive
results

Thank You



Brian Matsiko



Contact Number



matsikobrian@yahoo.com

