Final Capstone

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Agenda

- Introduction

- Preliminary view of the data

- Analyzing the results

- Conclusions

Introduction

Time Series Analysis With Facebook Prophet

In this project I will analyze the market capitalization behavior over time of two leading companies in the renewable energy market: Siemens-Gamesa Renewable and Vestas Wind Systems.

For this analysis I will use the Prophet library and we will forecast the market capitalization of both companies and compare them.

Preliminary view
of the data

About the data

- Data publicly available through Yahoo Finance

- OHLC and Volume are the features/columns

- Daily data from November 2015 to November 2020

- No missing values

- No information about number of shares outstanding
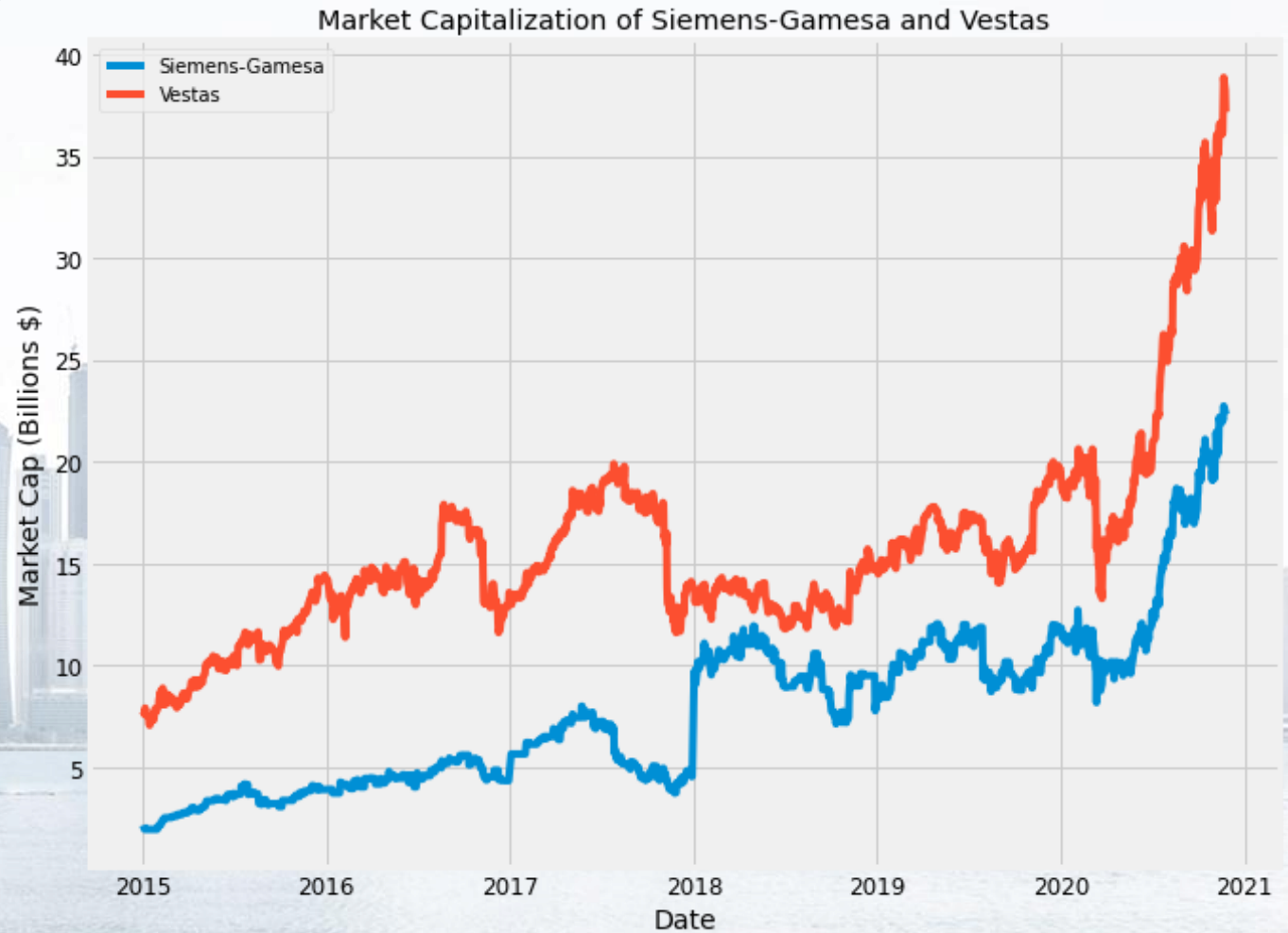

Siemens-Gamesa Renewable Energy Stock Price

Vestas Wind Systems Stock Price

Market Capitalization Calculations

- Market Capitalization = Yearly Average Number of Shares Outstanding * Adjusted Close Price

- Number of shares outstanding data obtained from Ycharts.

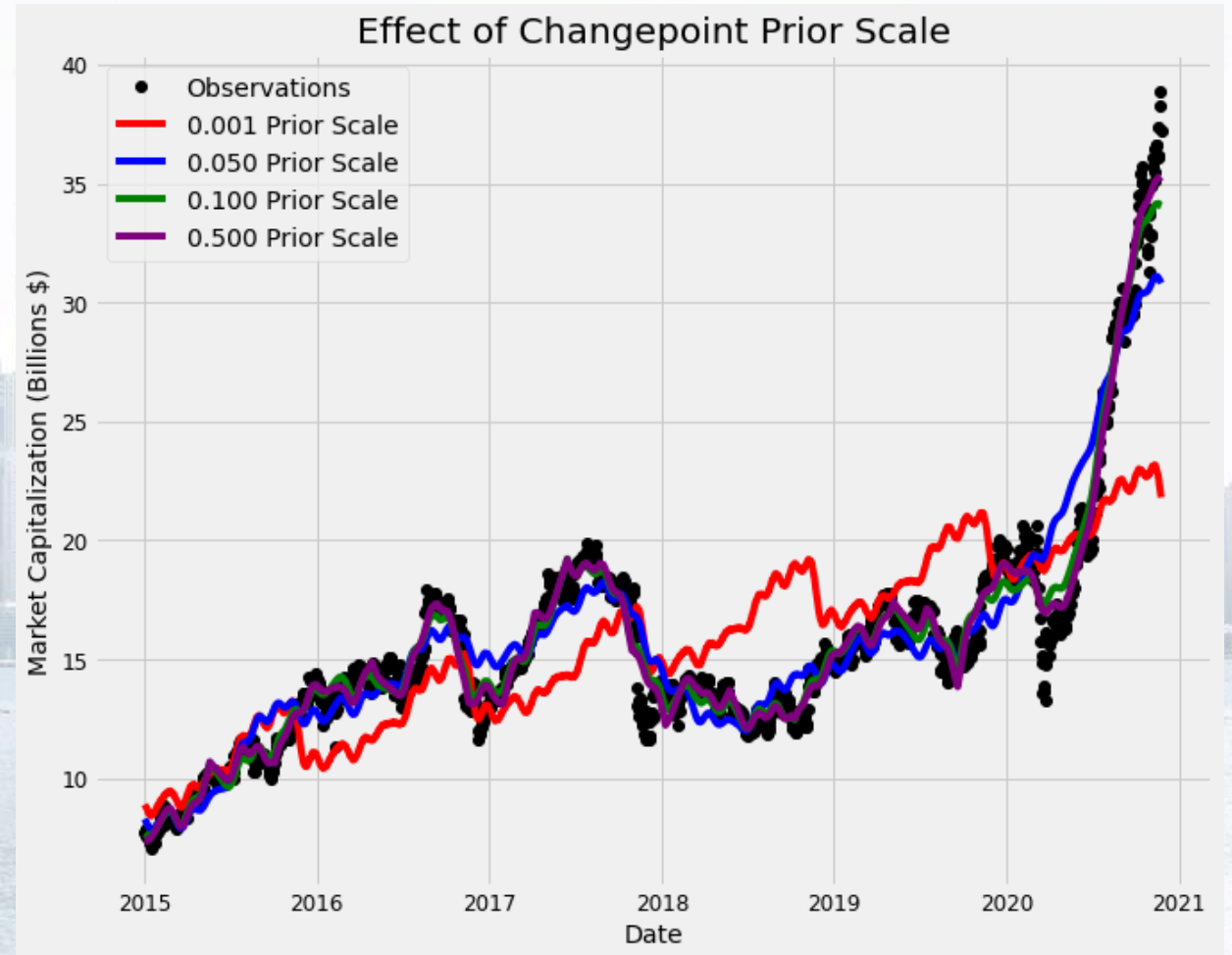- Similar trend and behavior since 2018.

Market Capitalization of Siemens-Gamesa and Vestas
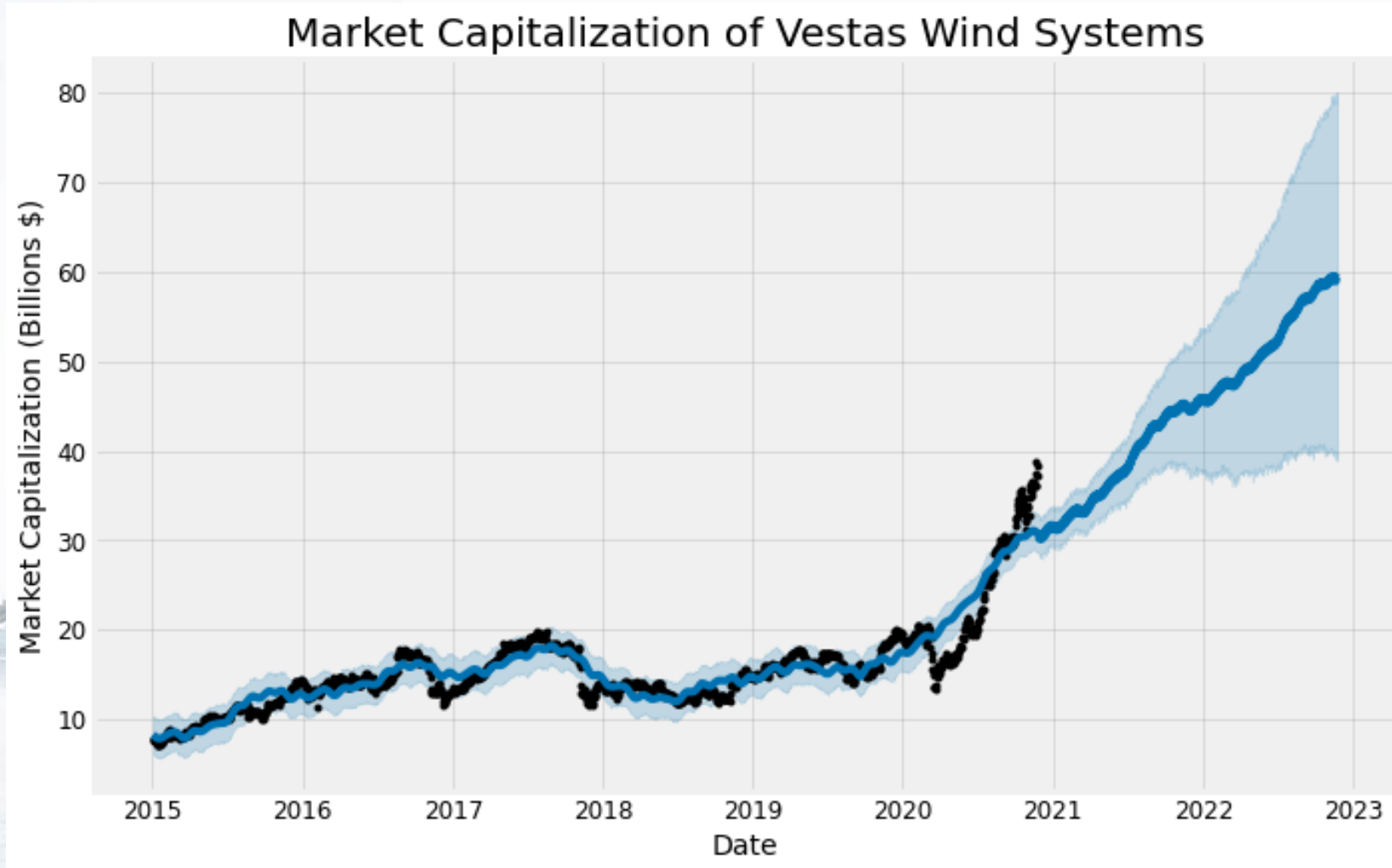
Modeling the data

Facebook Prophet

Prophet is designed for analyzing time series with daily observations that display patterns on different time scales.
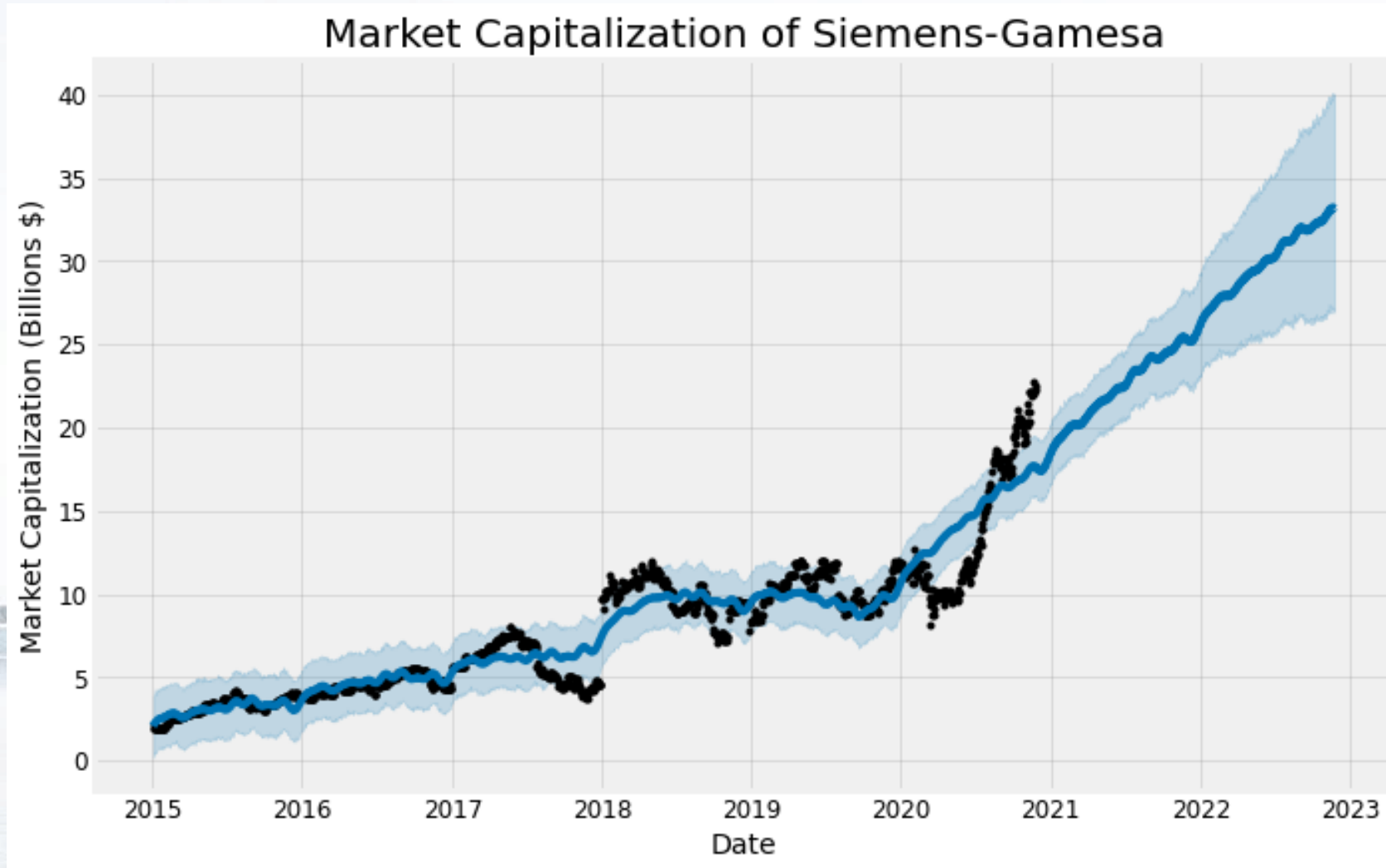
- Changepoint prior scale is used to control how sensitive the trend is to changes, with a higher value being more sensitive and a lower value less sensitive.

- This is used to manage overfitting and underfitting

- It's important to find the right balance of fitting the training data and being able to generalize to new data
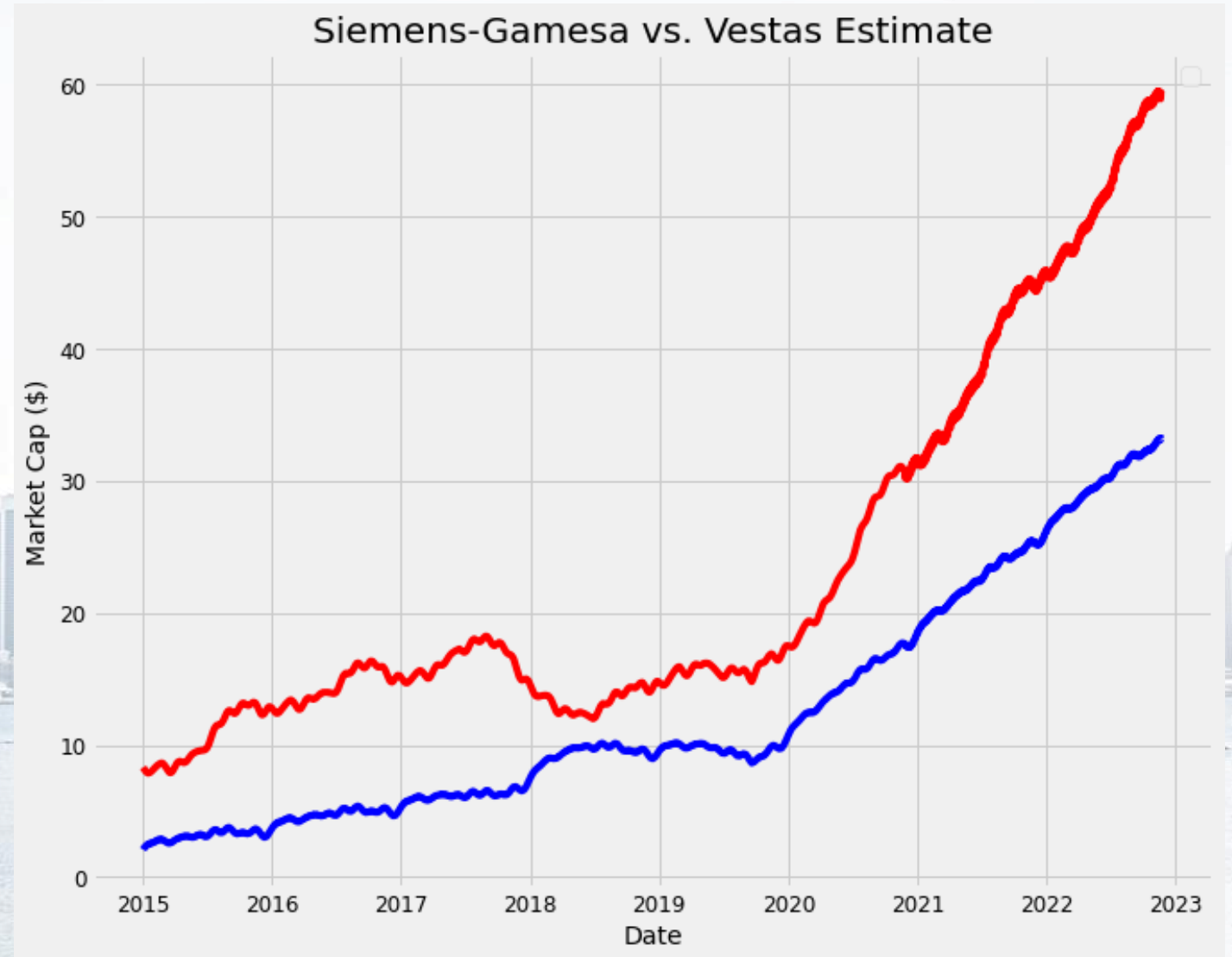
Predictions for 2 years

Market Capitalization of Vestas Wind Systems

Predictions for 2 years

Market Capitalization of Siemens-Gamesa

Comparing Forecasts
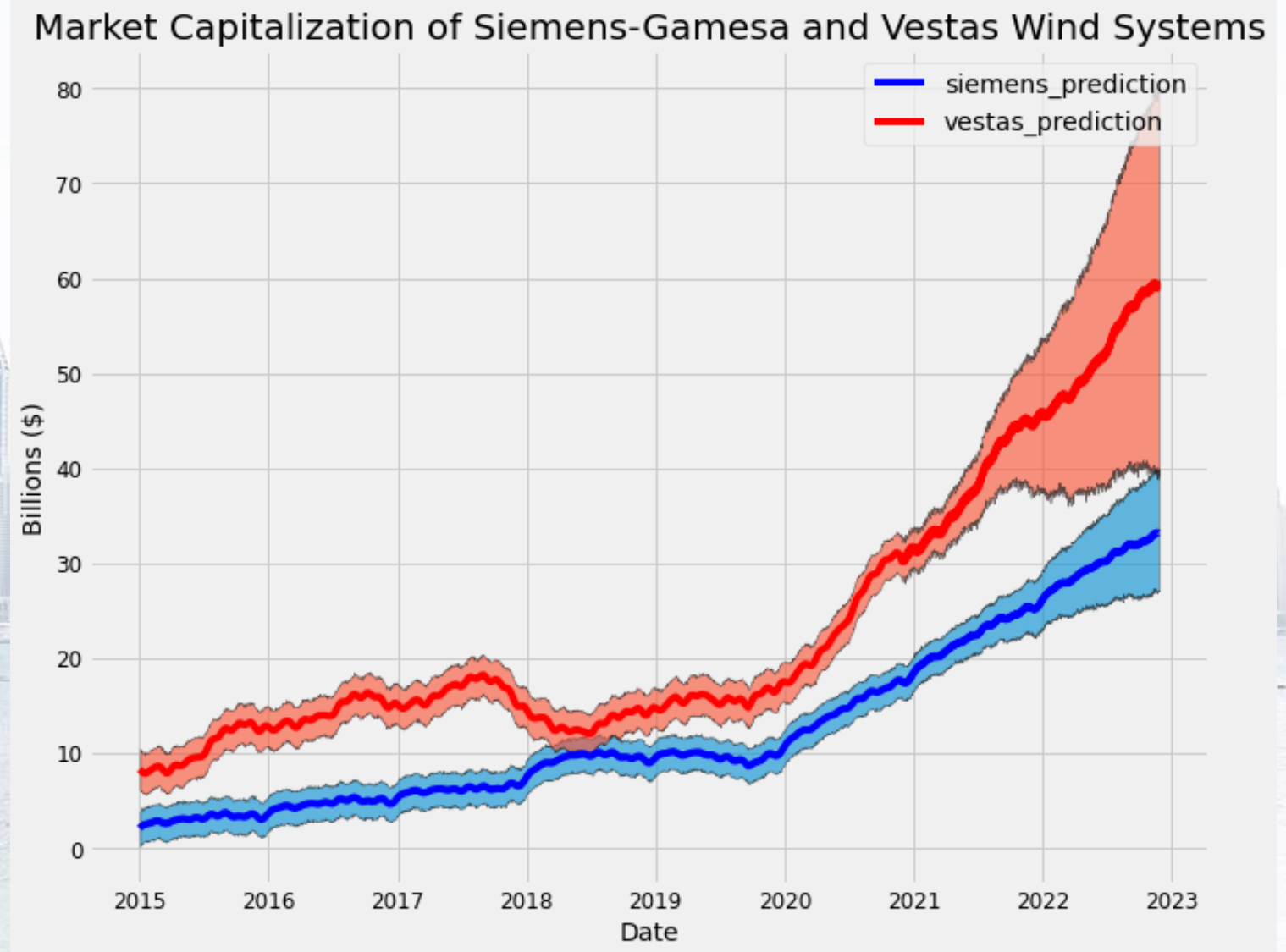
Plot of estimates

- The estimate smooths out some of the noise in the data, so it looks a little different than the raw plots.

- The level of smoothness will depend on the changepoint prior scale.

Siemens-Gamesa vs. Vestas Estimate

Forecast With Uncertainty Bounds

By creating this plot with uncertainty bounds we can see that the uncertainty increases over time, as expected.

The value of both companies is expected to keep increasing, Vestas is expected to increase at a faster rate than Siemens but with higher uncertainty.

Market Capitalization of Siemens-Gamesa and Vestas Wind Systems

Conclusions

Conclusions

We analyzed a very simple forecast for the market capitalization of two companies and create different plots with the forecasts along with uncertainty bounds. Facebook's Prophet library is a library with impressive capabilities.

Recommendations and warnings:

1. Past performance is no indicator of future performance.

2. The trends clearly show an increase in the values of both companies based entirely on data from the past. It might show promising performance in the years to come, further analysis of both companies (fundamentals) would provide a more accurate forecast.

3. Further analysis using other machine learning methods, such as LSTM, might provide other insights in this data.

4. Stock predictions comes with much uncertainty because of the great number of variables that come into play, before making an investment decision the risks should be clear for everyone.

Thank you