ST599 Project 3

Stock Data

Group 1

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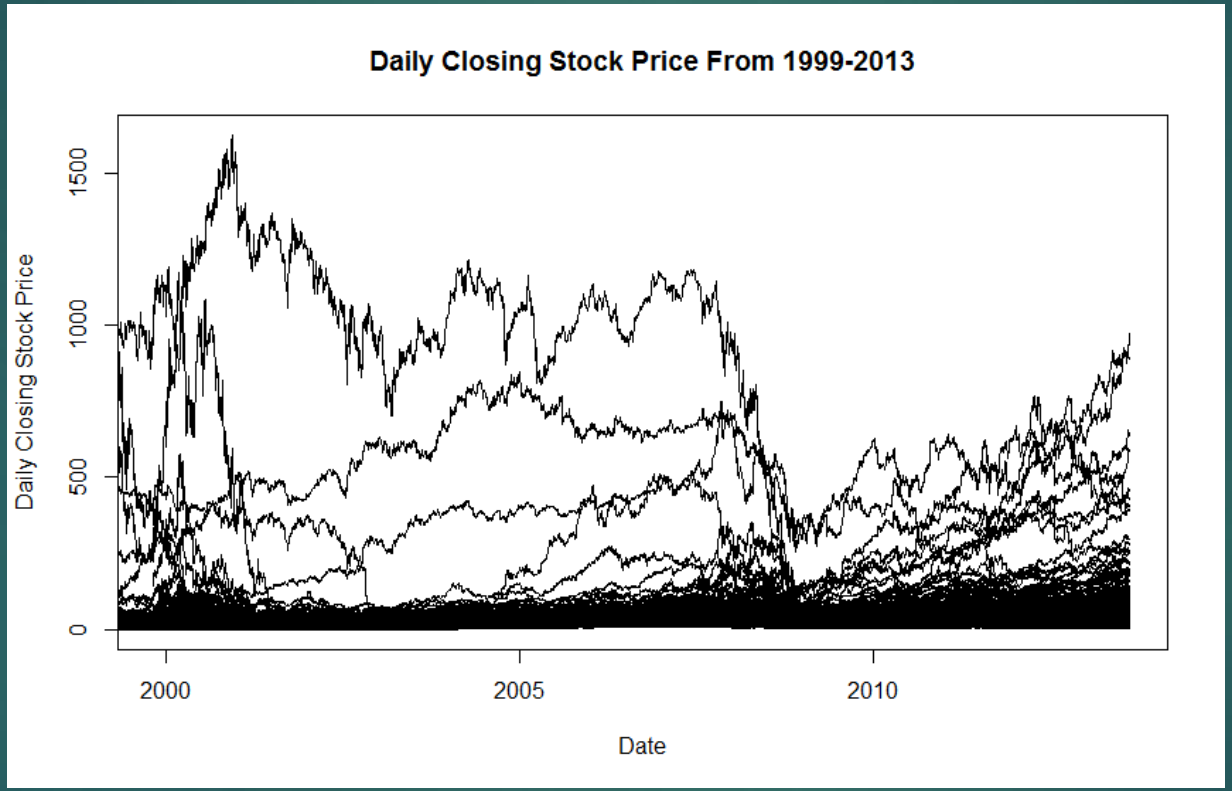
Research Questions

- Can we get reasonable predictions for average weekly closing stock price based off the closing stock prices of the previous 10 weeks of a given company?
- Which company predictions had the lowest MSPE using ridge regression on the previous 10 weeks of daily closing stock price?
- Does differencing using first order random walk help reduce season trends and give better predictions?

Raw Data



- Daily closing price over time for the 500 companies

Data Manipulation

- Calculated weekly averages of the closing stock price at the company level due to the large number of observations
  - Used 491 (out of 500) companies
- Transformed the numeric date provided into a formatted year-month-day format using the R package “lubridate”
- Generated the unique date of every Monday corresponding to the weekly average closing price

Predictors and Response

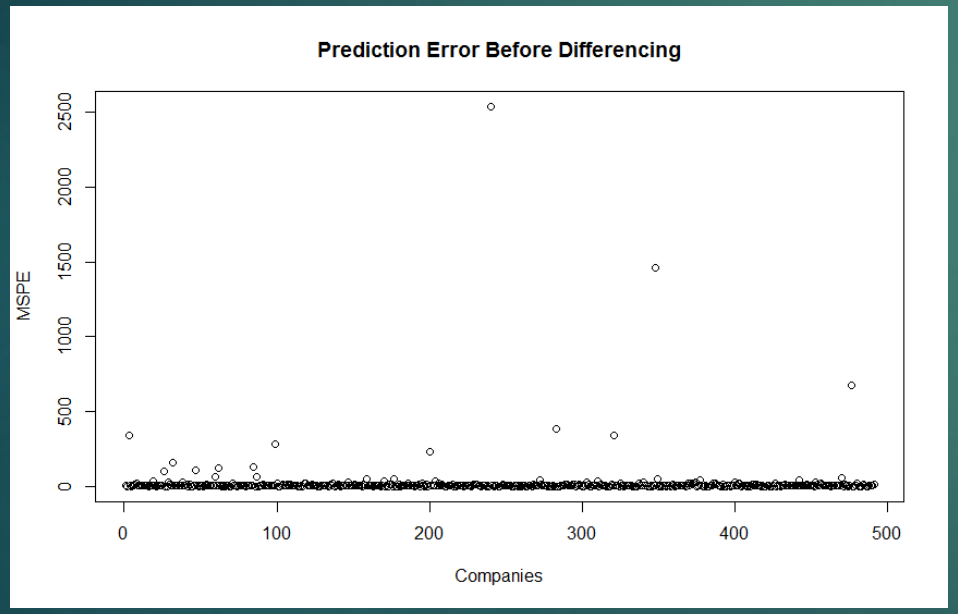
- Start response variable at 11^{th} weekly average closing stock price
- Explanatory variables are previous 10 weekly averages
- Test dataset was the eight most recent observations
- Remaining observations used as training set

Stationarity

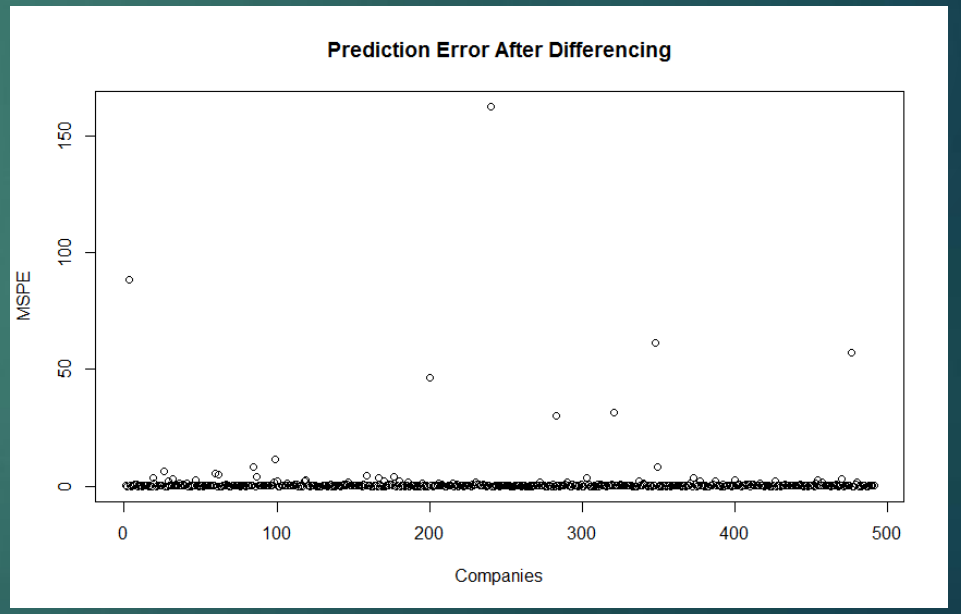
- Large range of mean square prediction errors (0.02 to 3000)
- Tried to correct for seasonal trends
- Took iterative differences starting with the first two weekly average closing prices

Results

- Below are before differencing and after differencing plots of the mean square prediction error of the 491 companies:



Before



After

Future Work/Complications

- Having access to the entire dataset could produce better/more accurate results
- Considered using other companies to predict the future of a different company
- Having more knowledge on time series for making the data stationary