

SP500 forecast

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Introduction

The purpose of this analysis is to determine if the SP500 Index (Index) is overpriced, as of August 2015, and complete some forecasting analysis. A forecast of the Index. The Index data was downloaded from Yahoo Finance in August after it had significant drops. Consumer Price Index data was used to deflate the Index's historical price. This data can be downloaded from [here](#). In conclusion, it seems that the Index is currently overpriced.

Analysis steps

- The data was downloaded
- Historical data was visualized
- Historical data adjusted by the CPI and then was visualized
- Forecasts were completed

SP500 Open Price by Month

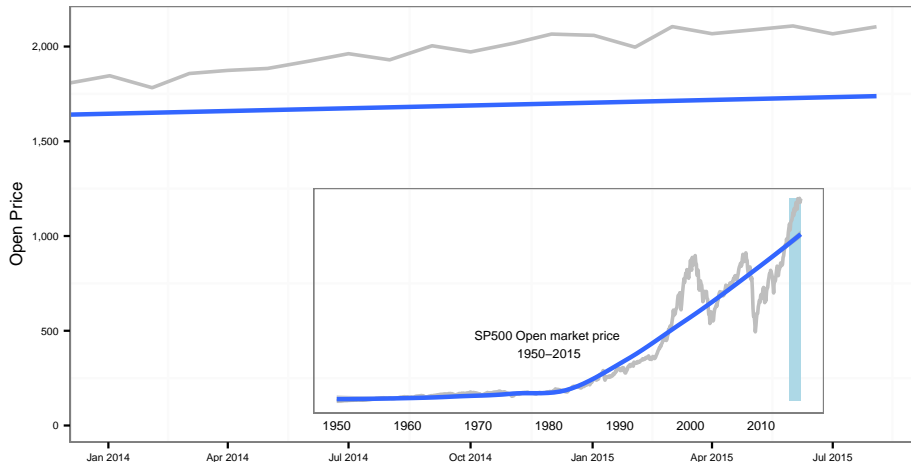


Figure 1: Open market price trend Jan 2014 - Jul 2015

SP500 Open Price adjusted with CPI by Month

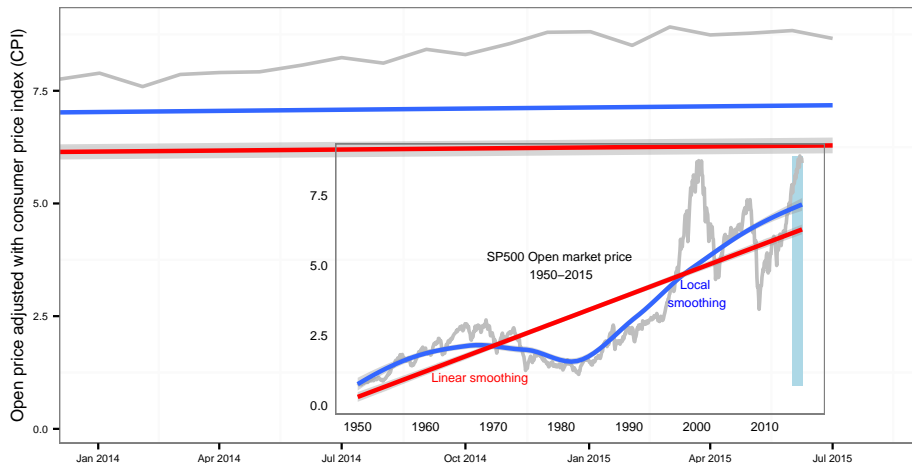


Figure 2: CPI adjusted open market price trend Jan 2014 - Jul 2015

Forecast graphs

Forecasts from ARIMA(1,0,0) with non-zero mean



Forecasts from ETS(M,N,N)



Forecasts from NNAR(12,1,25)



Forecasts from BATS(0.353, {0,0}, -, -)



Forecasts from BATS(0.353, {0,0}, -, -)



Forecasts from HoltWinters



Forecasts from Linear regression model



Forecast table

Model	ME	RMSE	MAE	MPE	MAPE
naive	25.2	202.5	154.2	0.5	11.7
theta	22.3	211.4	153.8	1.0	11.9
exp	14.4	222.4	161.6	-0.0	12.3
arima	15.9	260.0	187.3	0.7	14.8
sts	6.0	287.0	194.1	-0.4	15.1
neural	310.0	1,842.1	487.9	25.4	40.0

Table 1: Measure each model's accuracy

Forecast graphs 2

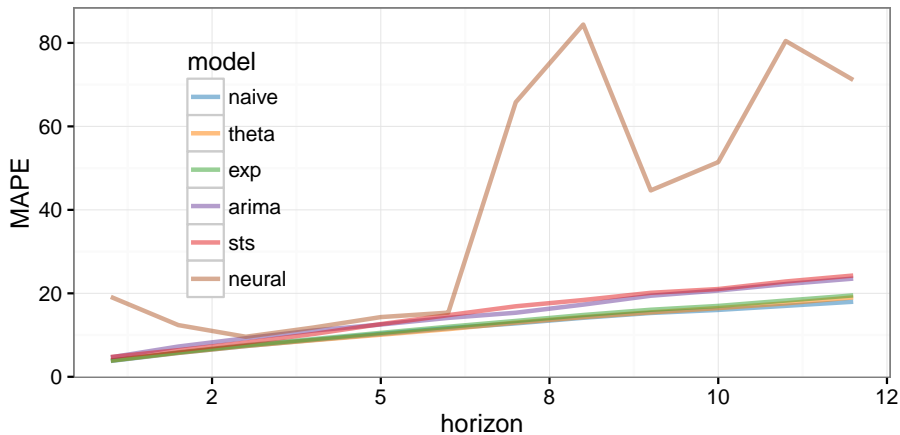


Figure 4:

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The analysis was completed on Fri Feb 26 11:43:56 AM 2016 in 4 seconds.