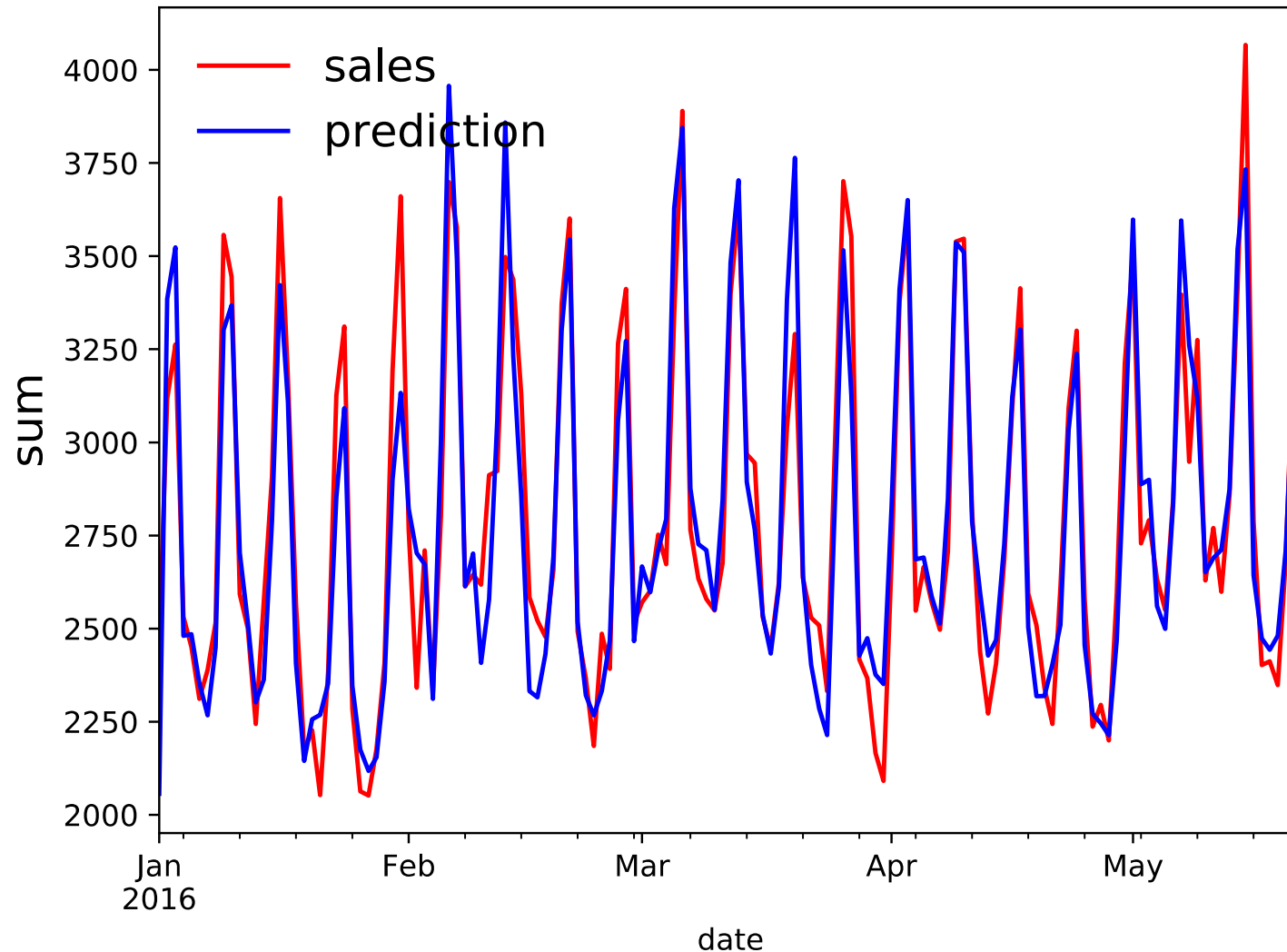
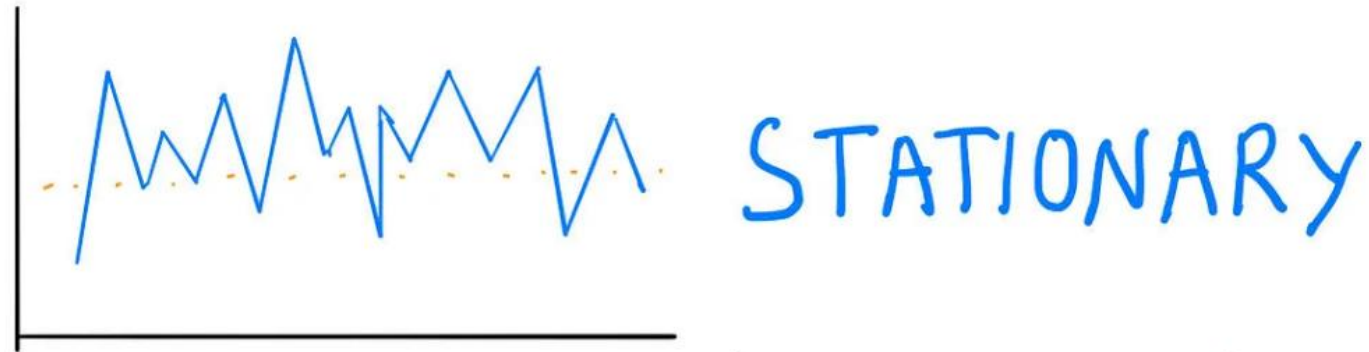


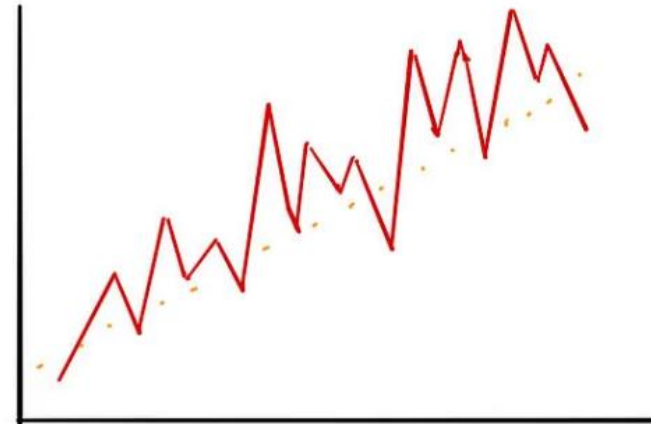
Forecasting means dealing with time series



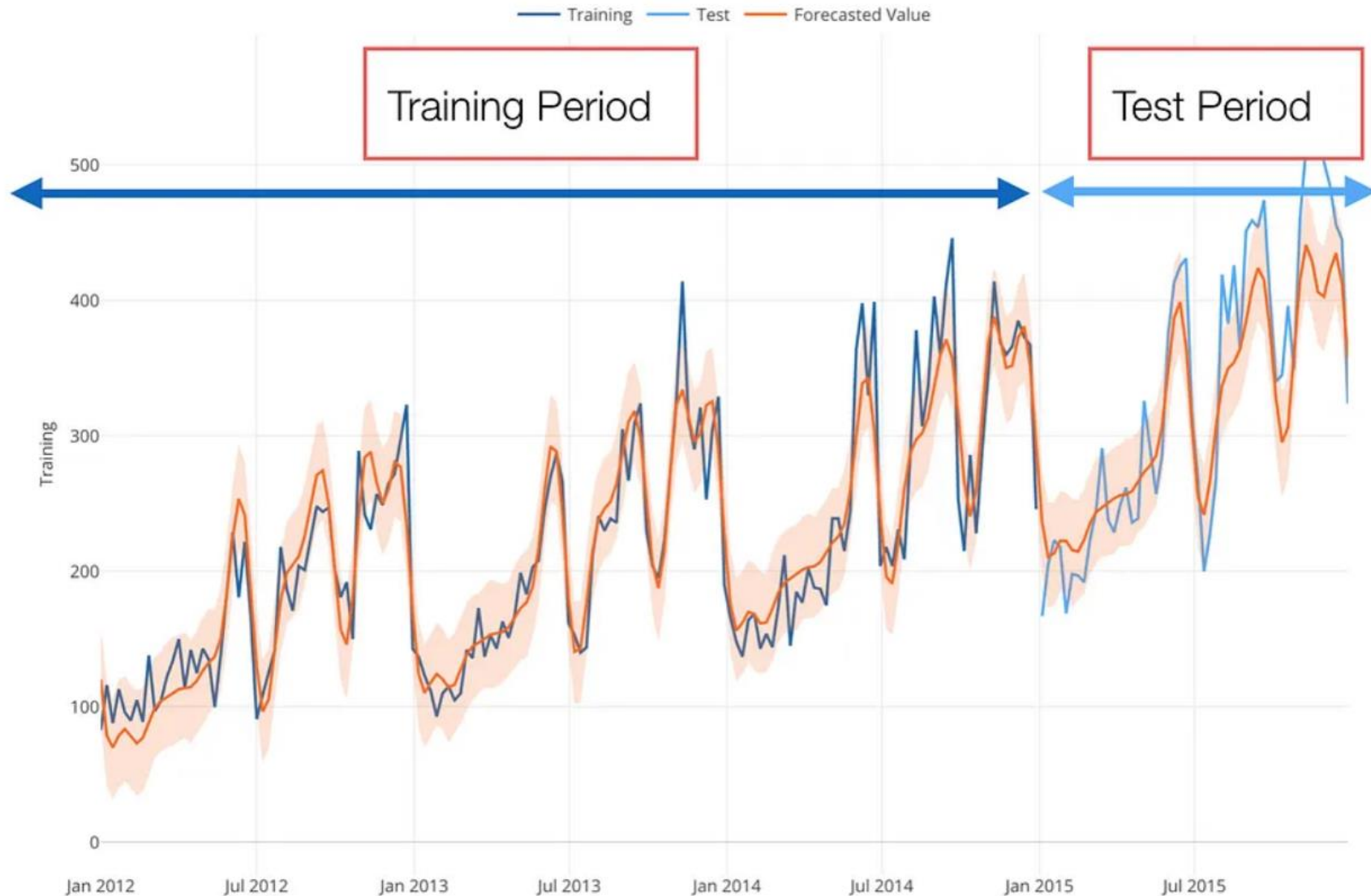
It works by statistically learning patterns



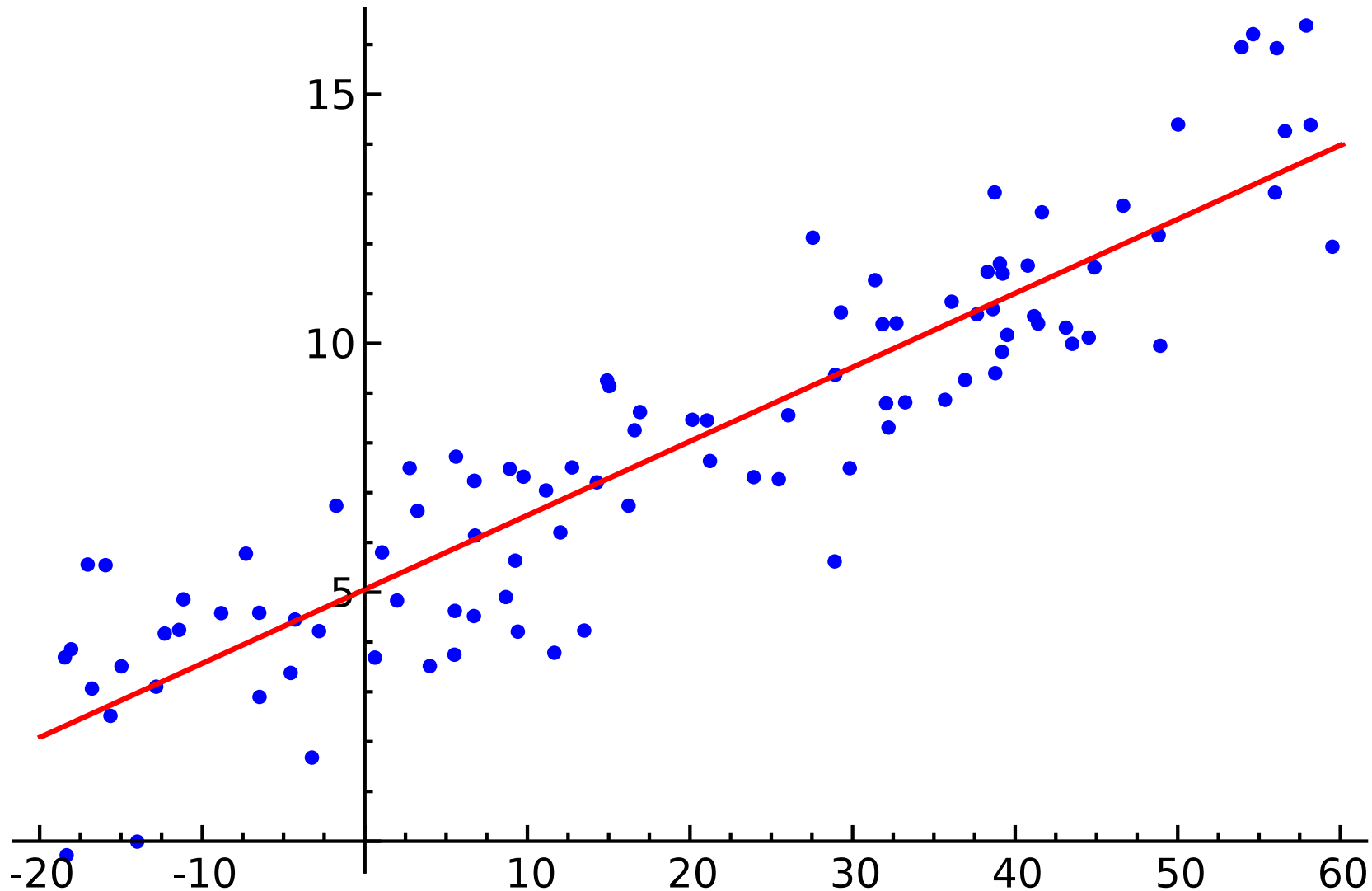
TREND



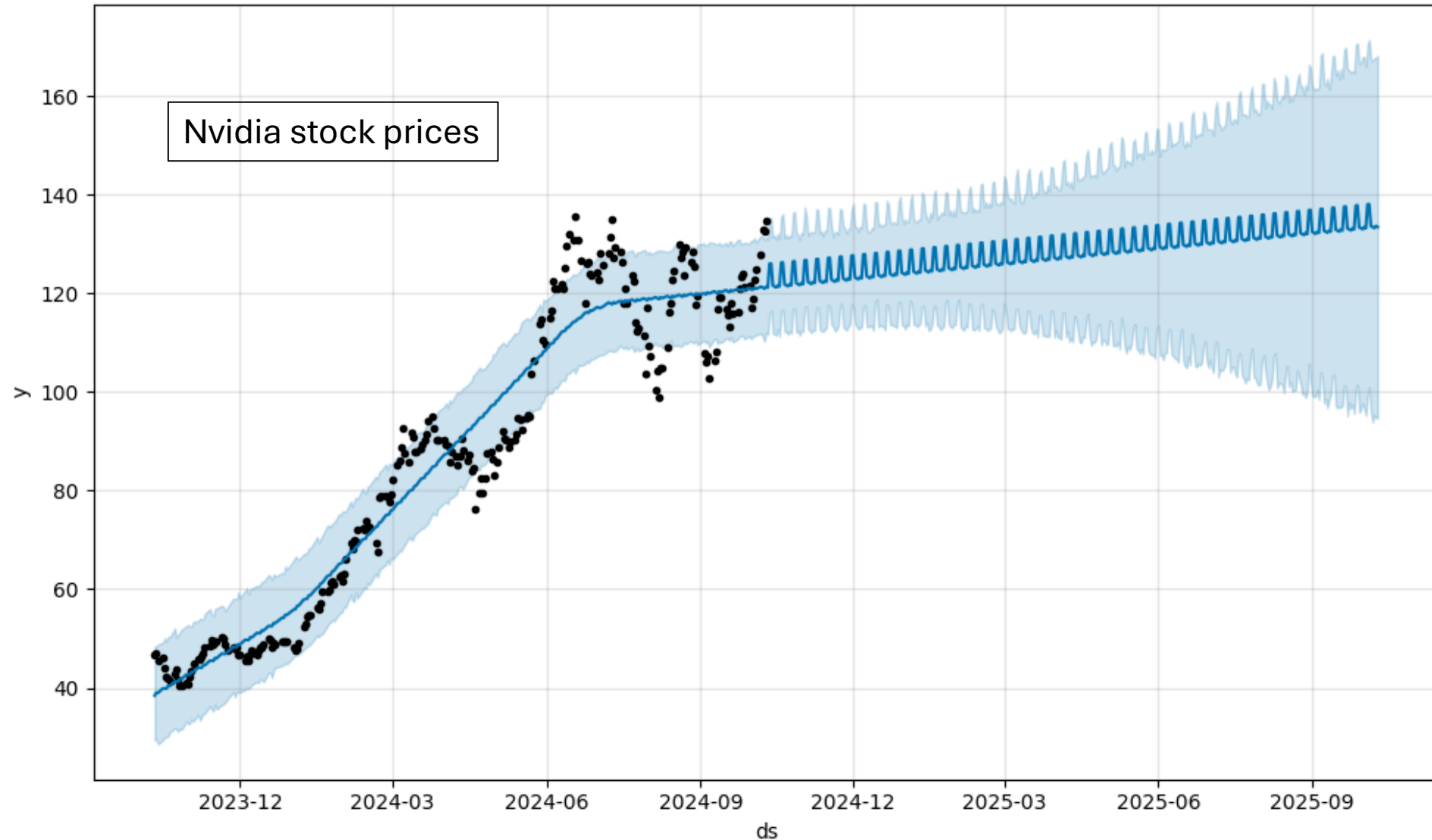
You need past data to learn from



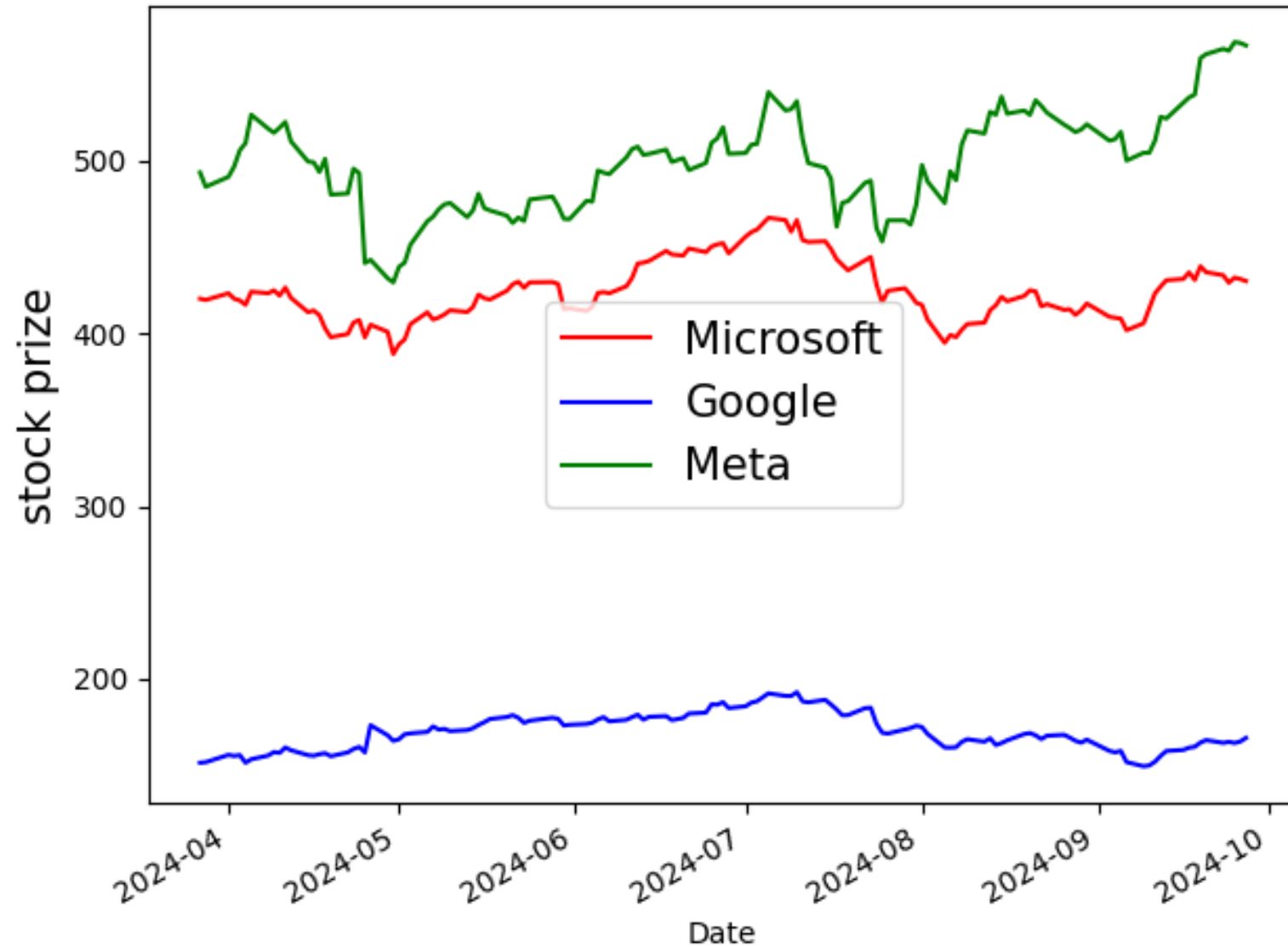
Perfect predictions are not possible



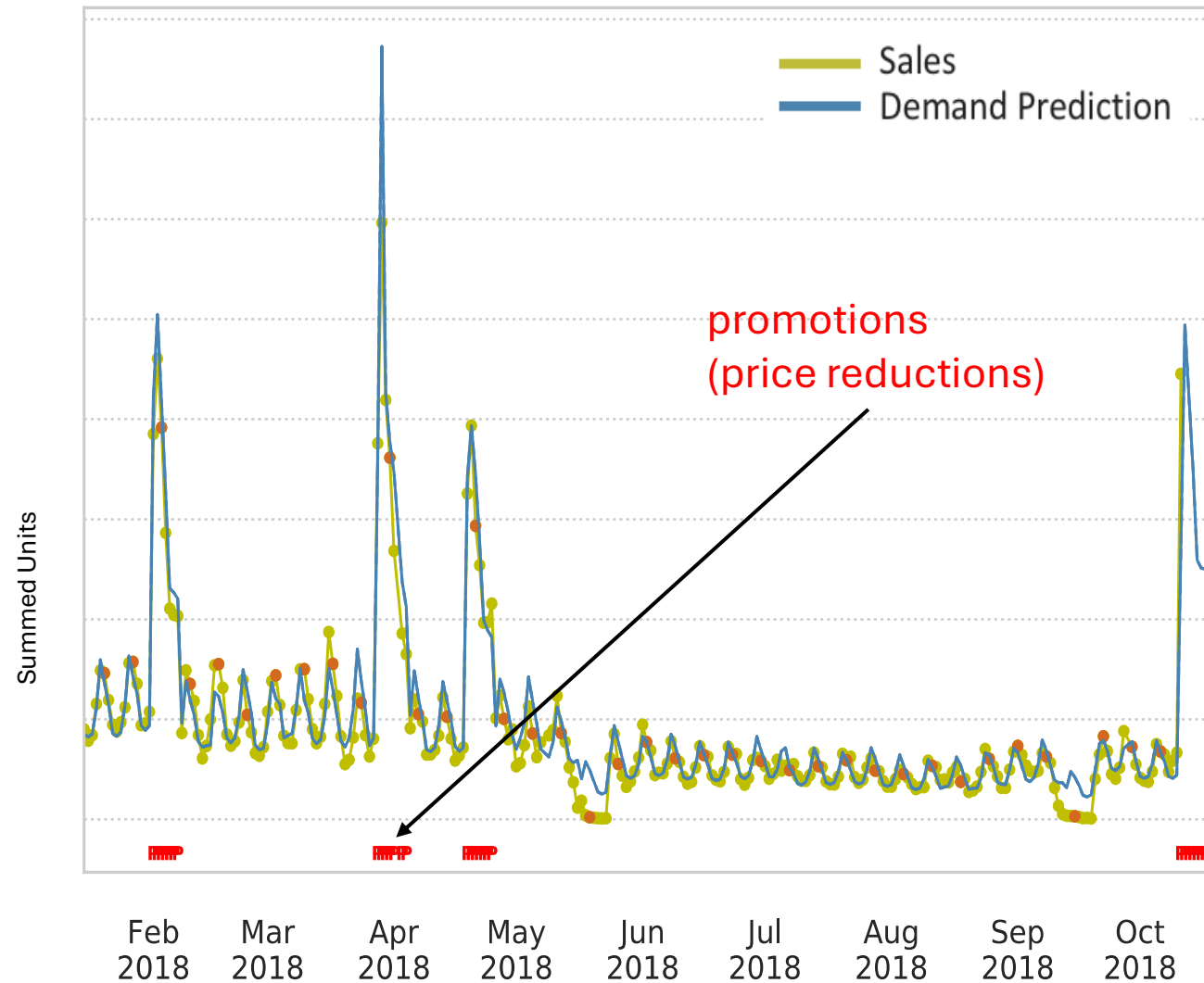
Uncertainty increases with forecast horizon



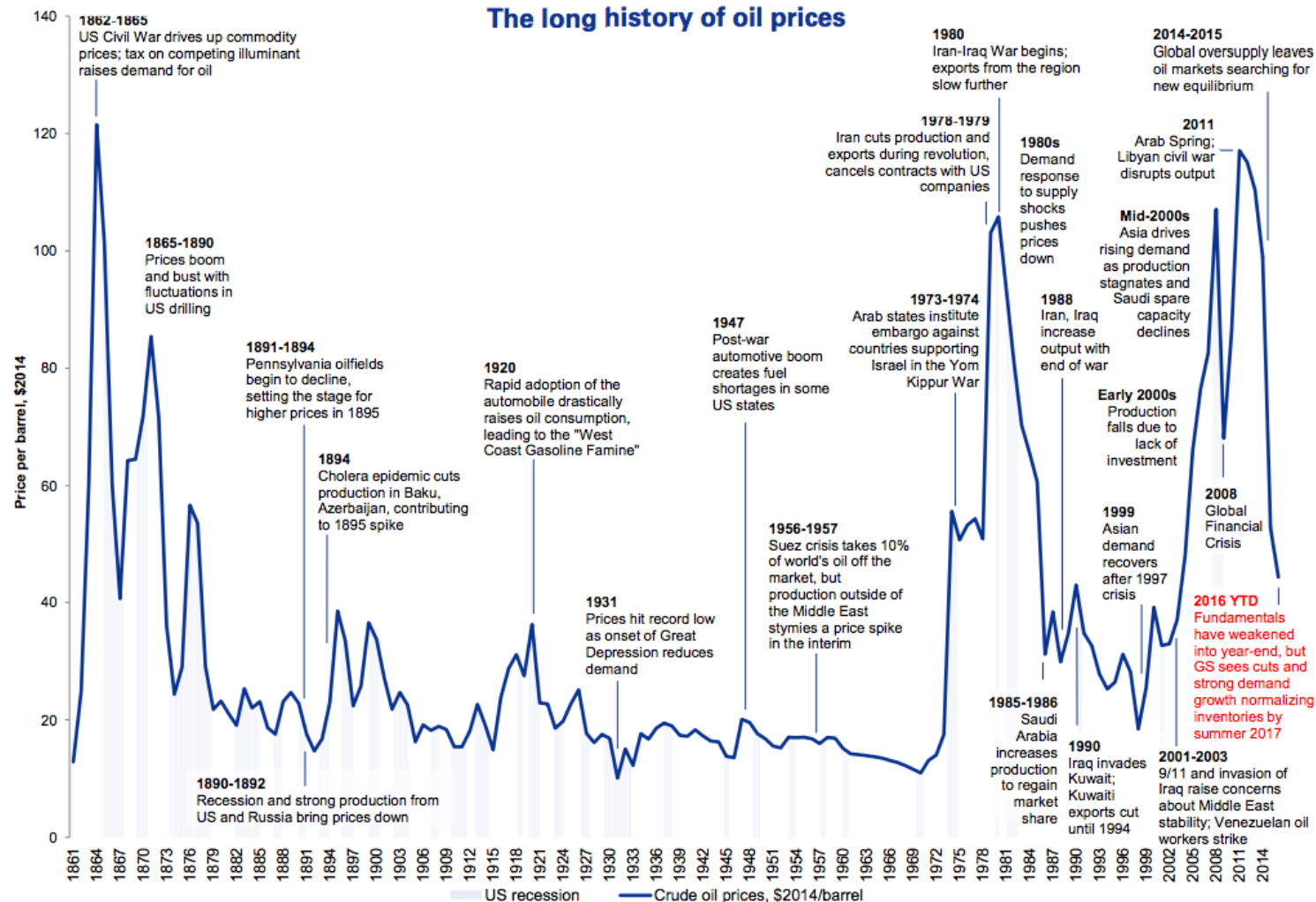
You can decrease uncertainty by looking at similar time series



You can predict effects of foreseeable events



But you cannot predict effects of unforeseeable events



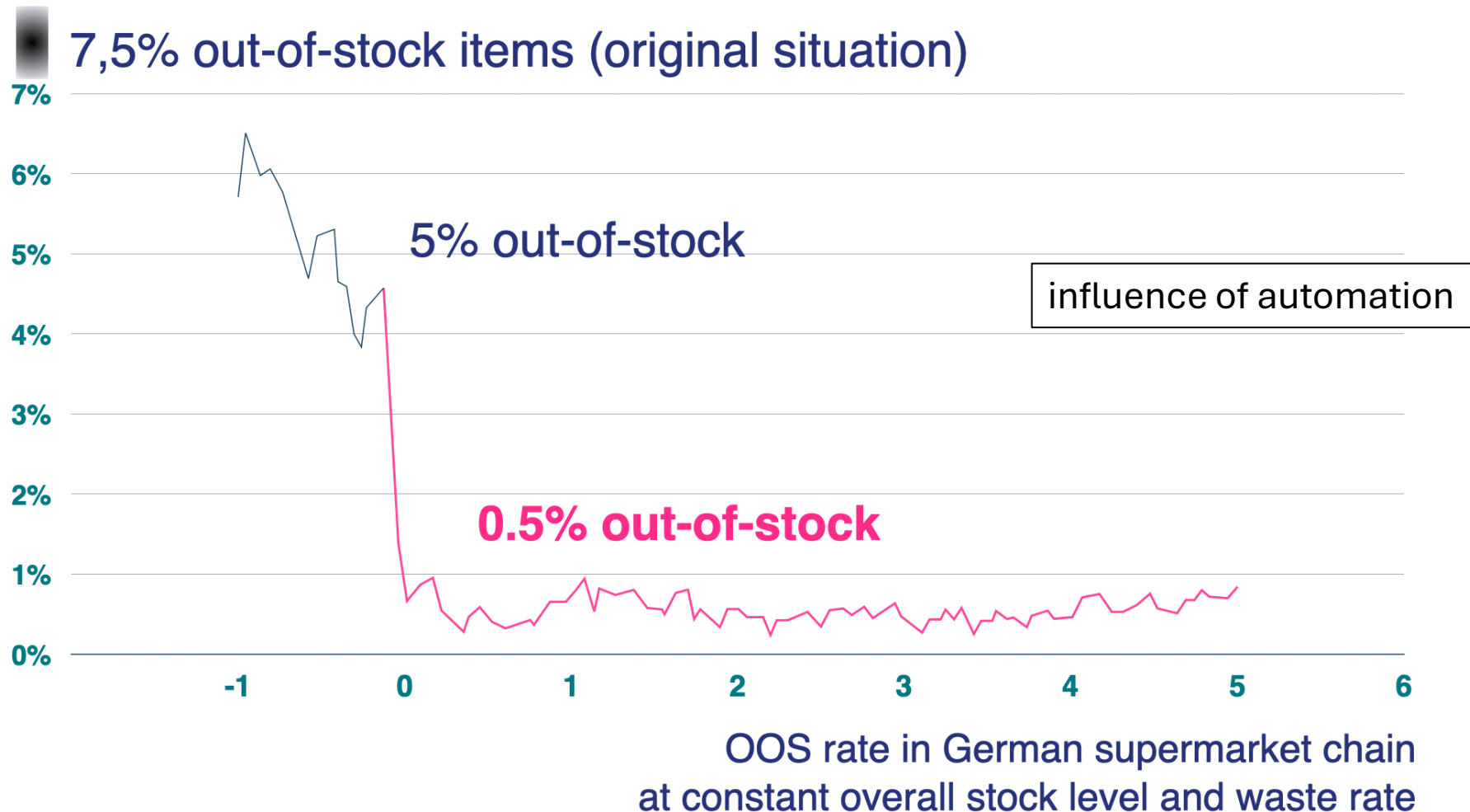
An earlier version of this chart appeared on pg. 16 of *Top of Mind* Issue #52: OPEC and Oil Opportunities.

Note: 2016 price shown is YTD average as of Dec. 19, 2016.

Source for data: BP, NBER/Federal Reserve Bank of St. Louis, Haver Analytics.

Source for annotations: ©James Hamilton, "Historical Oil Shocks," University of California, San Diego, February 2011; various news sources; Goldman Sachs Global Investment Research.

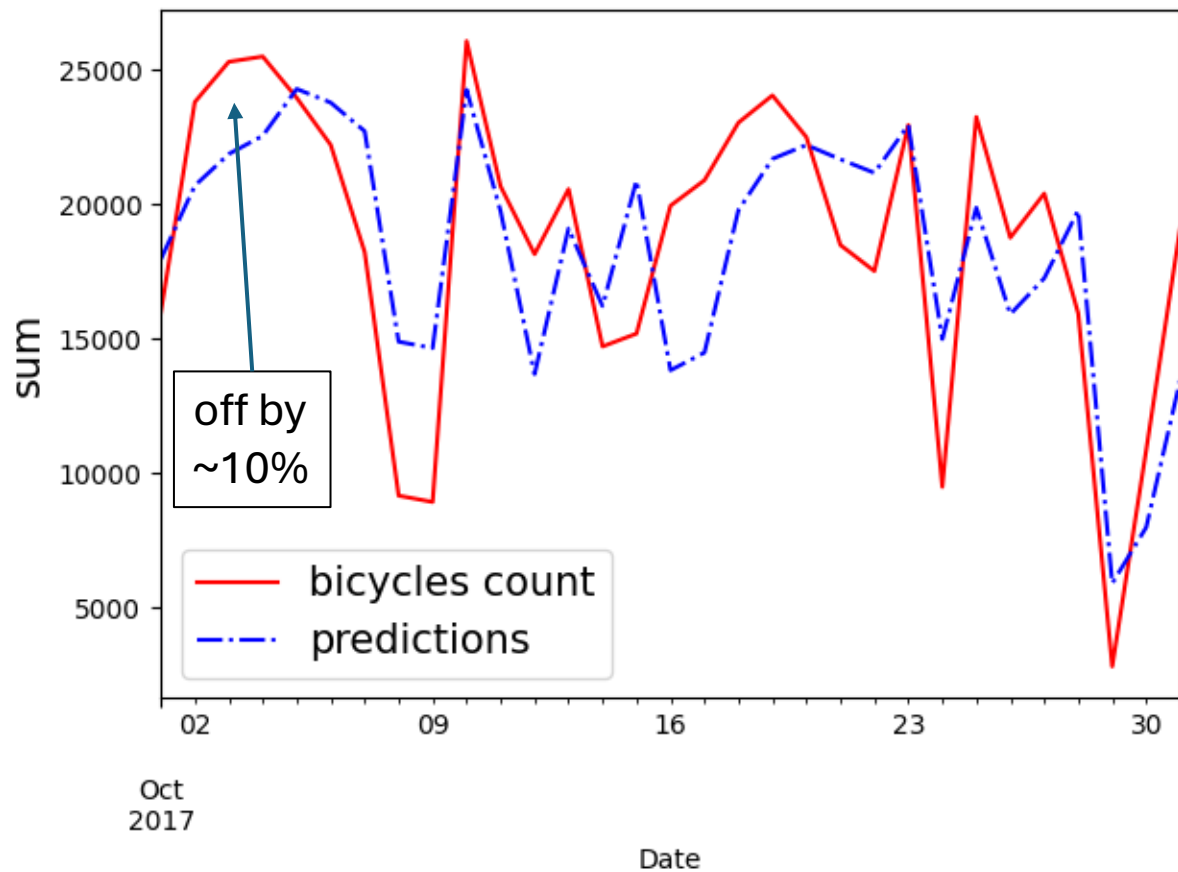
So it's no magic, but better than your gut feeling



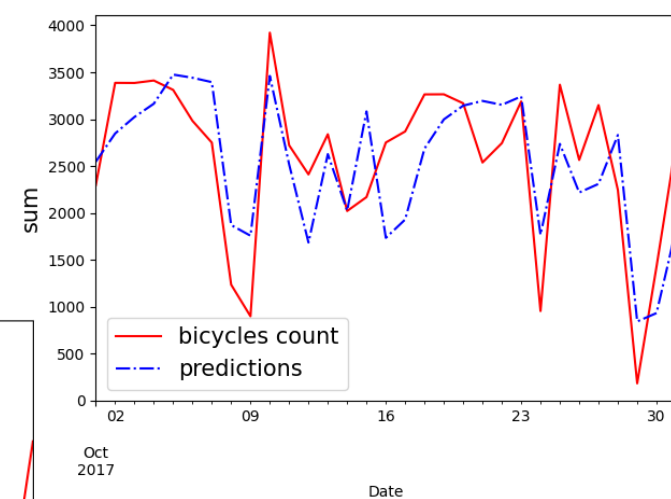
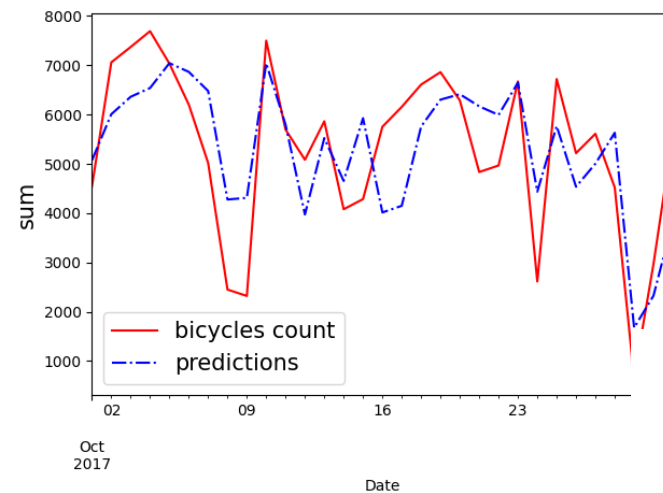
Examples for prediction accuracy

NY bridges bicycles count

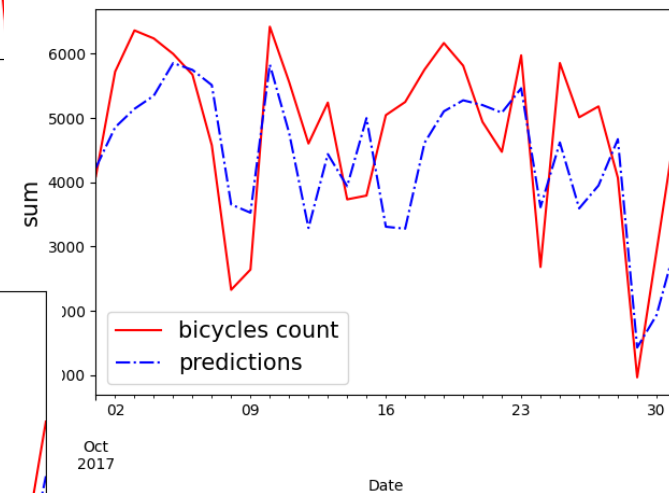
total



Manhattan bridge

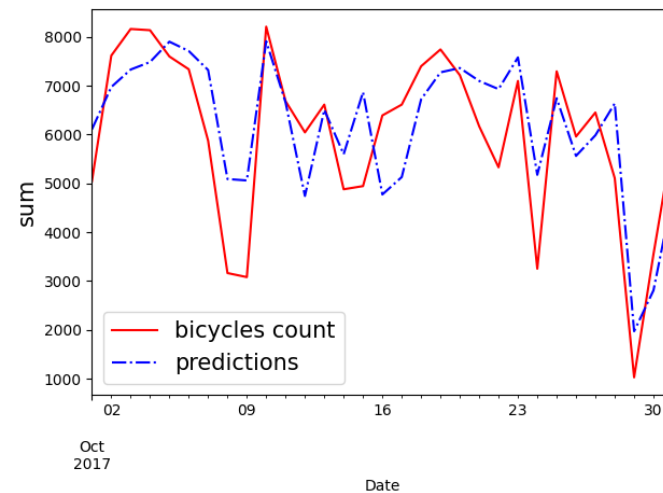


Brooklyn bridge



Queensboro bridge

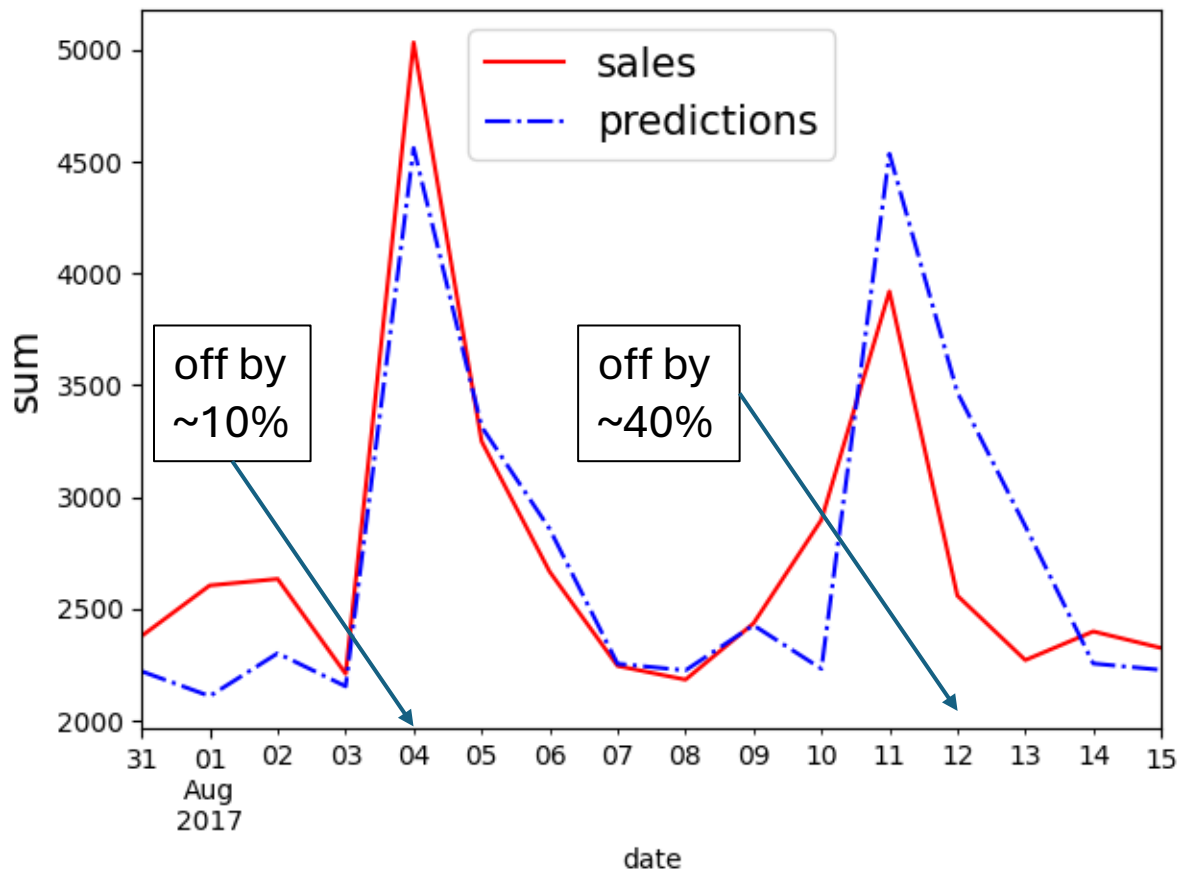
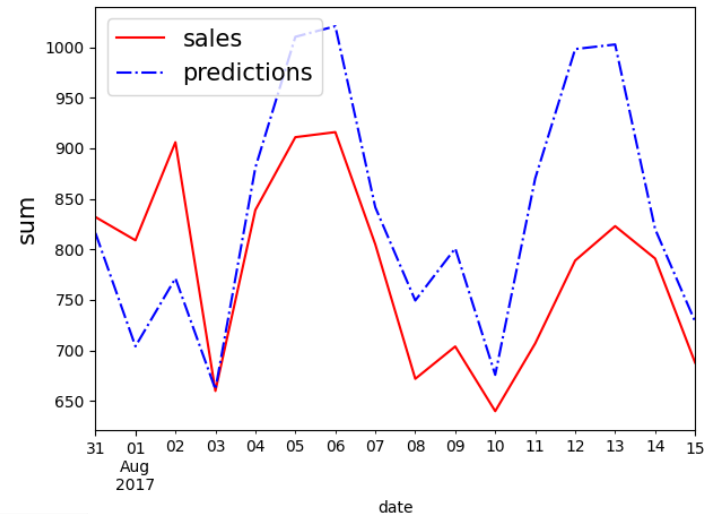
Williamsburg bridge



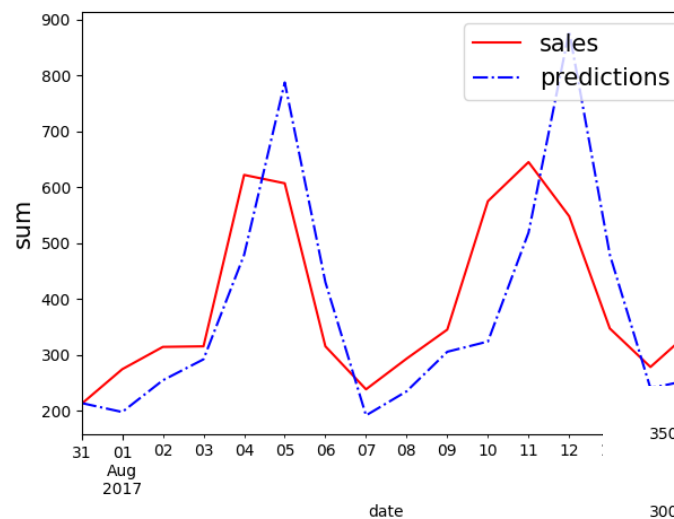
Store sales

total

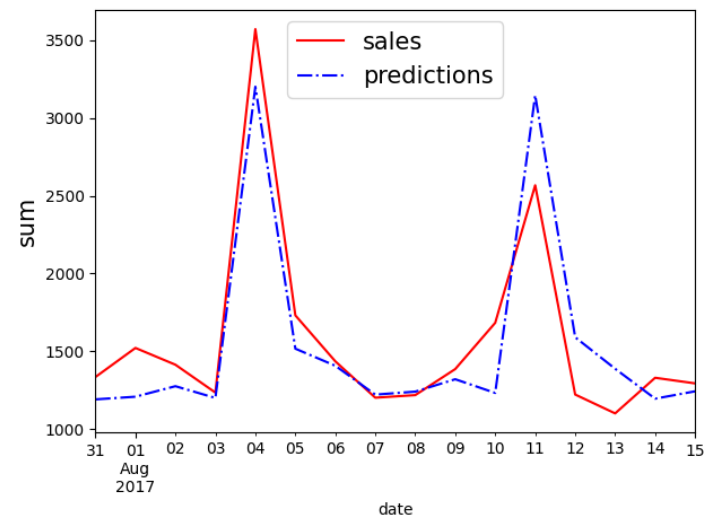
sum over several stores



liquor, wine, beer



eggs



meats

Quiz time

How accurate can this be predicted?

Retail sales of toilet paper

Retail sales of toilet paper during COVID

Orders of an individual customer
during a given week

Orders of all customers during a given week
or
orders of an individual customer during a full year