TIME SERIES ANALYSIS LECTURE 1

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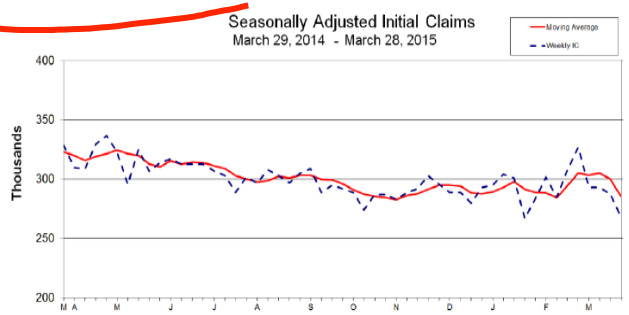
Examining Time Series Correlation—Autocorrelation Function: Example 2

Example: U.S. Initial Jobless Claims

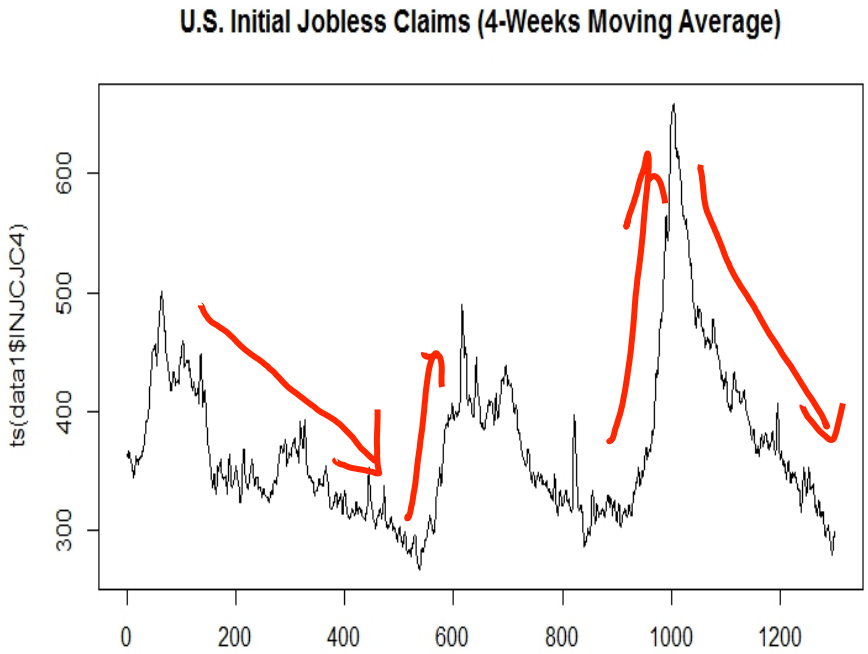
- The U.S. initial jobless claims can be downloaded from various public sources, such as the **Bureau of Labor Statistics**. For instance, the latest report can be downloaded from http://www.dol.gov/ui/data.pdf.
- The following chart is extracted from the report released on April 2, 2015.
- It showed the seasonally adjusted initial unemployment insurance claims per week from March 2014–March 2015 as well as the four-week moving average.



- The data used in this example is downloaded from a Bloomberg terminal.

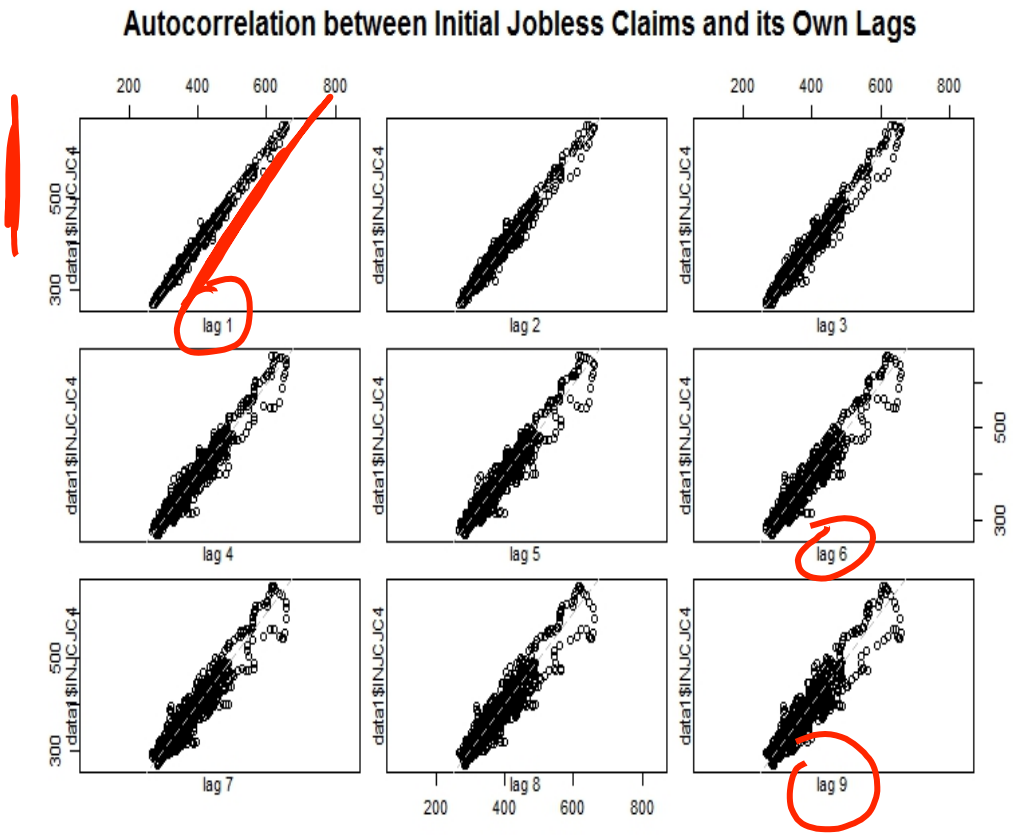
Example: Initial Jobless Claims (2)

- The series' "ticker name," which is a term used in the Bloomberg Machine, is called **INJCJC4**.
- This is a weekly series from January 5, 1990, to November 28, 2014, with 1,300 observations.
- The series appears very persistence, implying the correlation with its own lags would be high. It also means that stationarity in mean, variance, and autocorrelation may not be satisfied.



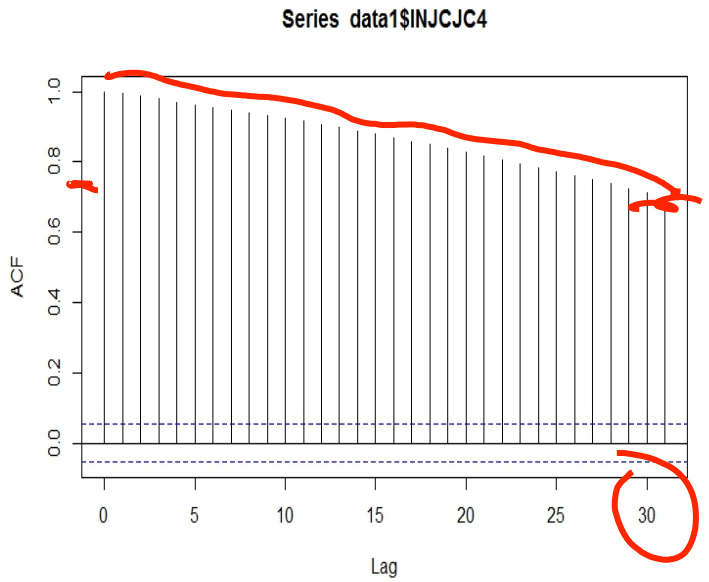
Example 3: Initial Jobless Claims (3)

- As hinted above, the persistent initial jobless claims should have very high correlation with its own lags, as shown in the following scatter plot matrix.
- The scatter plot shows that the variable and its lag almost fall on a straight line/
- Even after nine weeks, the correlation remains very high.



Example 3: Initial Jobless Claims (4)

- The persistence of the series as shown in the time series plot and the high correlation with its own lags as shown in the scatter plot matrix are evidenced in the correlogram, the graph of autocorrelation function (ACF).
- If we were to plot the ACF (ignoring the strong trend), the correlogram shows that even after 20 lags, the correlation remains above 0.8.
- Remember that the definition of ACF requires stationarity in mean and variance.
- To analyze the series using a stationary model, the trend (and seasonal effects) need to be first removed.



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