Homework 3

Eco 5316 Time Series Econometrics
Spring 2018
Due: Saturday, February 10, 11.55pm

Problem 1

Take "Data Visualization with ggplot2 (Part 1)" course on datacamp.com.

Problem 2

Submit your solution for Problem 2 in the form a short report, prepared using R Markdown. Compile the report into a pdf or an html file and upload it to your dropbox folder together with the source Rmd file.

(a) Obtain the quarterly Real Personal Consumption Expenditures, available on FRED under code `PCECC96` and on Quandl under `FRED/PCECC96`. Import it either using `Quandl` or `tq_get`. Make sure that the resulting data is in `ts` format.

(b) Construct the log changes in the Real Personal Consumption Expenditures $\Delta \log c_t = \log c_t - \log c_{t-1}$ where c_t is the original quarterly Real Personal Consumption Expenditures. Plot the time series for c_t and $\Delta \log c_t$ using `autoplot`.

(c) Construct and plot the ACF and the PACF for y_t, using `ggAcf` and `ggPacf`.

(d) Use the ACF and PACF to identify suitable AR and/or MA model(s), and estimate them using `Arima`.

(e) Perform diagnostics of model(s) from part (d) using `ggtsdiag` and also plot inverted AR and MA roots to check stationarity and invertibility using `plot`. Modify and reestimate the model if needed, if there are several competing specifications use AIC, BIC, Q statistics to compare their properties.

(f) Use the `auto.arima` function to find the model specification that minimizes AIC and the model specification that minimizes BIC. Again perform the model diagnostics for these two models.

(g) Summarize your findings.