Homework 4

Eco 5316 Time Series Econometrics
Spring 2018
Due: Thursday, February 17, 11.55pm

Problem 1

Take the "Data Manipulation in R with dplyr" course, aftr that complete the first three chapters from the "Joining Data in R with dplyr" course.

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 quarterly Real Personal Consumption Expenditures, available on FRED under code `PCECC96` and on Quandl under `FRED/PCECC96`. Import the 1955Q1-2017Q4 sample either using `Quandl` or `tq_get`.

(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.

(c) As in the example discussed in class and the lecture slides, split the sample into two parts: first one up to 2008Q4, second one from 2009Q1 onward. Use `auto.arima` with `ic=aic` and `stationary = TRUE`, `stepwise = FALSE`, `approximation = FALSE` to find the best model. Check the estimated model for adequacy - plot inverted AR na MA roots to check stationarity and invertibility using `plot`, diagnose residuals using `ggtsdiag`.

(d) Use the estimated model with `forecast` to generate 1 to 36 step ahead forecast for the prediction subsample, 2009Q1-2017Q4.

(e) Use the rolling scheme to generate a sequence of 1 period ahead forecasts for the prediction subsample, 2009Q1-2017Q4.

(f) Plot the multistep forecast and the 1 step ahead rolling forecasts, with their confidence intervals.

(g) Use `accuracy` to evaluate the out of sample accuracy of the two sets of forecasts.