Homework 8

Eco 4306 Economic and Business Forecasting
Spring 2018
Due: Tuesday, April 24, before the class

Problem 1

Download the workfile in hw08.zip which contains following quarterly time series: U.S. real GDP `rGDP` and GDP deflator `GDPDEF`, the average closing value of S&P 500 Index `SP500`, and finally the Leading Index for the United States, `LI`.

(a) Use the data to construct the following two time series:

$$\begin{aligned} dlrGDP_t &= 400\Delta \log rGDP_t \\ &= 400 \times (\log rGDP_t - \log rGDP_{t-1}) \end{aligned}$$

which approximates the annualized growth rate of the U.S. real GDP, and

$$\begin{aligned} dlrSP500_t &= 100(\Delta \log SP500_t - \Delta \log GDPDEF_t) \\ &= 100 \times \big((\log SP500_t - \log SP500_{t-1}) - (\log GDPDEF_t - \log GDPDEF_{t-1})\big) \end{aligned}$$

which approximates the inflation adjusted quarterly return of S&P 500. Create two time series plots, showing y_{1t} and y_{2t}.

(b) Estimate a bivariate reduced form VAR for $\mathbf{y}_t = (dlrGDP_t, dlrSP500_t)'$ for the period 2000Q1-2016Q4, use information criteria to select number of lags.

(c) Run Granger causality tests for both variables. What do the results suggest about the predictive power of the two variables? Discuss the economic intuition behind your results of Granger causality test.

(d) Create time series plot, showing LI_t.

(e) Estimate another VAR model, which includes LI_t as third variable, in addition to $dlrGDP_t$ and $dlrSP500_t$. Use the estimation sample 2000Q1-2016Q4, do not transform LI_t into logs or differences.

(f) Estimate a univariate AR model for $dlrGDP_t$ for the period 2000Q1-2016Q4.

(g) Use the two VAR models, from parts (b) and (e), and the AR model from part (f) to create three fixed scheme forecasts for the period 2017Q1-2018Q1. Compare RMSE for these three forecasts.

(h) Compare your three forecasts for real GDP growth rate in 2018Q1 with (1) the Federal Bank of New York Nowcast, (2) the GDPNow Federal Bank of Atlanta forecast, and (3) the minimum, the average, and the maximum forecasts in the Wall Street Journal Economic Forecasting Survey.