

Homework 2

Eco 4306 Economic and Business Forecasting

Spring 2018

Due: Thursday, February 8, before the class

Problem 1

Solve Exercise 3 from Chapter 3. In addition to the four time series listed there, also import into EViews and analyze in the same way the following data from www.quandl.com

- (e) Index of Consumer Sentiment: code [UMICH/SOC1](#), change the frequency to quarterly, and consider the sample 1952q1-2017q4
- (f) All Employees, Total Nonfarm Payrolls: code [FRED/PAYEMS](#), keep the monthly frequency, and consider the sample 1950m1-2017m12
- (g) Average Weekly Hours of Production and Nonsupervisory Employees: Manufacturing: code [FRED/AWHMAN](#), keep the monthly frequency, and consider the sample 1950m1-2017m12

For the time series in (a)-(g) which are not stationary, generate in EViews either the difference Δy_t or log difference $\Delta \log y_t$ to obtain stationary time series. Create time series plot for the transformed time series.

Problem 2

Download the quarterly data for U.S. Real Gross Domestic Product, code [FRED/GDPC96](#) from www.quandl.com and import it into EViews. Let Y_t denote the GDP at time t and let $y_t = \log Y_t$.

- (a) Generate time series for the quarter-over-quarter growth rate (percentage change) of the real GDP

$$grGDPQ_t = 100 \times \frac{Y_t - Y_{t-1}}{Y_{t-1}}$$

and for the first log-differences of the real GDP

$$dlrGDPQ_t = 100 \times (y_t - y_{t-1}) = 100 \times (\log Y_t - \log Y_{t-1})$$

Plot $grGDPQ_t$ and $dlrGDPQ_t$ together in the same time series plot. Do you observe any significant differences?

- (b) Generate time series for the year-over-year growth rate (percentage change) of the real GDP

$$grGDPA_t = 100 \times \frac{Y_t - Y_{t-4}}{Y_{t-4}}$$

and for the first log-differences at lag 4 of the real GDP

$$dlrGDPA_t = 100 \times (y_t - y_{t-4}) = 100 \times (\log Y_t - \log Y_{t-4})$$

Plot $grGDPA_t$ and $dlrGDPA_t$ together in the same time series plot. Do you observe any significant differences?

- (c) Plot correlograms - the ACF and PACF functions - for $dlrGDPQ_t$ and for $dlrGDPA_t$. Comment on the ACF and PACF plots, are the autocorrelation coefficients statistically different from zero? Which growth rate shows more linear dependence (higher autocorrelation coefficients), $dlrGDPQ_t$ or $dlrGDPA_t$?