

# Homework 1

Eco 4306 Economic and Business Forecasting

Spring 2019

Due: Wednesday, February 6, before the class

## Problem 1

Download time series for U.S. Real GDP quarter-over-quarter growth rate, series code A191RL1Q225SBEA in the FRED database [fred.stlouisfed.org/series/A191RL1Q225SBEA](https://fred.stlouisfed.org/series/A191RL1Q225SBEA). Download quarterly time series for inflation adjusted close price of the Standard & Poor's 500 Index, series code MULTPL/SP500\_INFLADJ\_MONTH on Quandl, [www.quandl.com/data/MULTPL/SP500\\_INFLADJ\\_MONTH](https://www.quandl.com/data/MULTPL/SP500_INFLADJ_MONTH). Import both time series into EViews into a same quarterly workfile.

- (a) Construct new time series in EViews for the S&P 500 index return using

$$return_t = 100 \frac{SP500_t - SP500_{t-1}}{SP500_{t-1}}$$

Create two time series plots: one for real GDP growth rate and one for S&P 500 return.

- (b) For both real GDP growth rate and the S&P500 returns obtain their descriptive statistics - mean, median, variance, standard deviation, skewness, and kurtosis. Are the two series right (positively) or left (negatively) skewed? Are they leptokurtic (with thick tails) or platykurtic (with thin tails)?
- (c) Recall that the null hypothesis for Jarque-Bera statistic is that time series are normally distributed. Are the S&P500 returns normally distributed? How about real GDP growth rates?
- (d) Create a scatter plot and calculate the correlation coefficient. Are these two series contemporaneously correlated?

## Problem 2

Use the data for GDP growth rate and S&P 500 return from Problem 2 to solve Exercise 3 from Chapter 2.