

## Homework #3

Due Monday, June 12

You can work in groups of two people. Include a printout of the code and of the relevant graphs.

The goal of this exercise is to evaluate the median forecast of unemployment from the Survey of Professional Forecasters (SPF) (<http://www.phil.frb.org/econ/spf/index.html>). The file `SPFmedian.xls` contains the median one- and two-quarters ahead forecasts of unemployment as well as the current quarter forecast. From FREDII, download the civilian unemployment rate series and construct the series of quarterly realizations of unemployment that correspond to the one- and two-quarters ahead forecasts. Do the following:

1. Conduct a forecast unbiasedness test for both forecast horizons using a squared error loss function. Are the forecasts unbiased?
2. Test whether the one-quarter-ahead forecast errors are uncorrelated.
3. Plot the autocorrelogram and partial autocorrelogram of the two-quarter-ahead forecast errors. Do they suggest that the forecast errors follow an MA(1) process?
4. Compute the implied forecasts for unemployment *changes* by taking the difference between the one-quarter-ahead forecasts and the current quarter forecasts. Also compute the corresponding observed changes of unemployment. Conduct a test of sign predictability (Henriksson and Merton, 1981).
5. Construct sequences of one-step-ahead forecasts of unemployment using an AR(p) model estimated with a rolling window procedure with window size  $m = 50$ , selecting  $p$  by BIC over the first estimation window. Compare the out-of-sample performance of the AR(p) forecasts to that of the SPF forecasts over the remaining observations by performing a Diebold and Mariano (1995) test for a squared error loss (using 6 lags for the HAC estimator).
6. Briefly comment on the results.