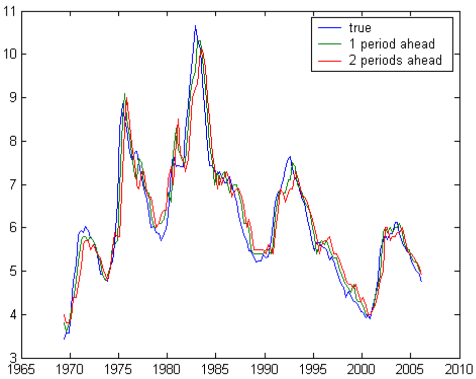
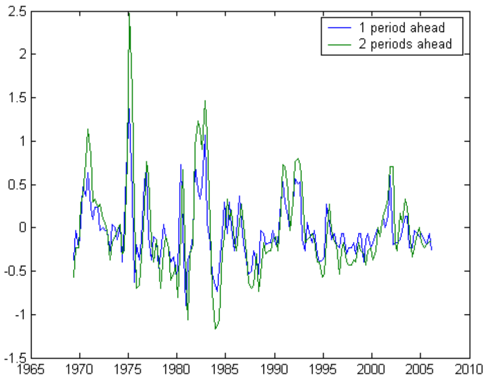
Econ232C Homework #3

Anton Cheremukhin

June 9, 2006

1) We first plot the graphs of the data and the two forecasts. Then we compare the forecast errors for both.





Then we perform the forecast unbiasedness test. We regress the errors on a constant: $\varepsilon_{t,\tau} = \widehat{y}_{t,\tau} - y_{t+\tau} = a + u_t$, $\tau = 1, 2$. We test $H_0 : a = 0$. For the variance we use HAC(0) and HAC(1). The corresponding p-values are 0.13 and 0.73. Both forecasts are unbiased.

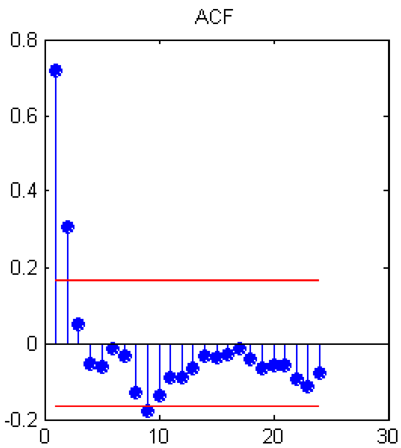
2) Breusch-Godfrey Test for one-quarter ahead forecast errors:

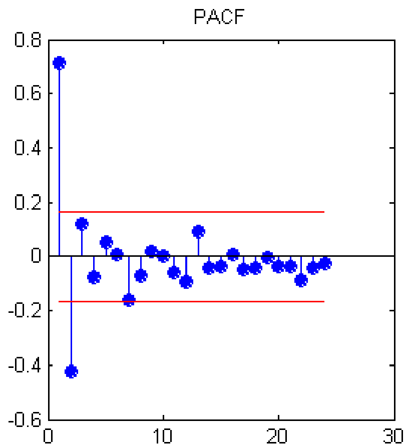
R-squared: 0.3424 $T * R^2 = 50.7$ P-value: 0.00000000101

Hypothesis: No serial correlation. Rejected at 1%.

The forecast errors are correlated.

3) Diagrams for two-quarter ahead forecast errors:

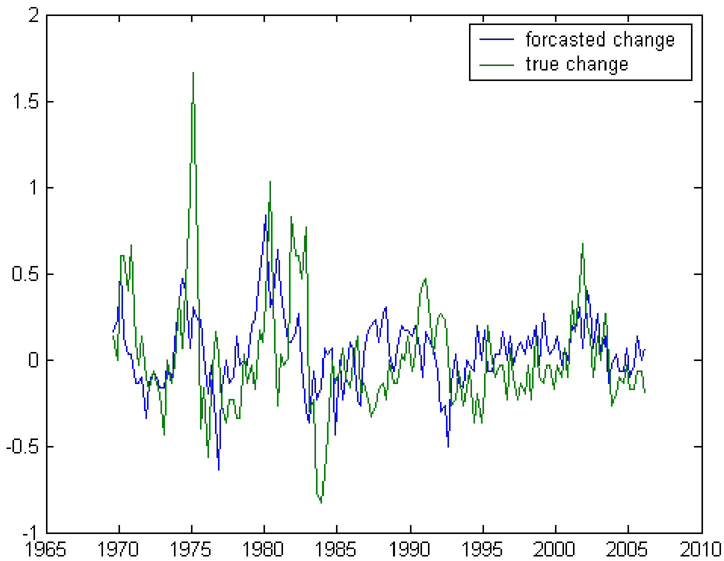




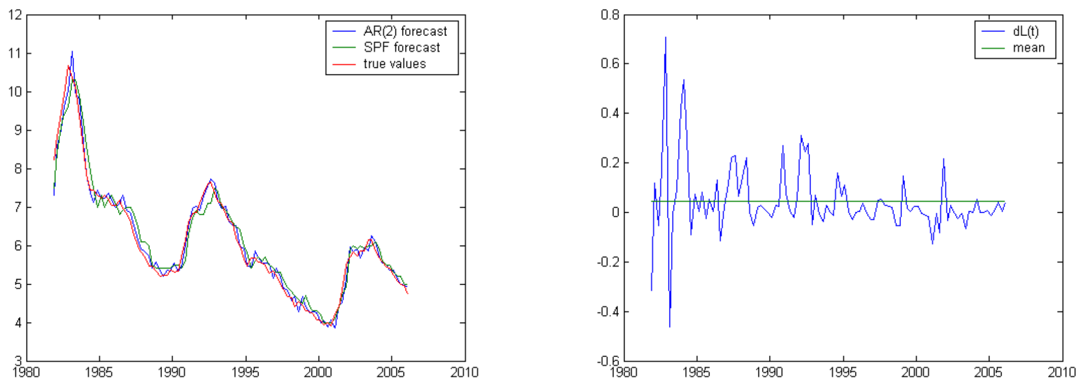
They do not contradict the MA(1) model. However, there are probably 2 lags, which are significant. Probably ARMA(1,1) or MA(2) would fit as well.

4) The test for sign predictability regresses dummies:

$1\left(\Delta y_{t+\tau} > 0\right) = a + b\left(\Delta \widehat{y}_{t,\tau} > 0\right) + u_t$, $\tau = 1$. We test $H_0 : b = 0$. For the variance we use HAC(0). The p-value for the hypothesis is 0.0067296. The forecast does predict the sign of change.



5) We estimate AR(p) for unemployment for a rolling window m=50. BIC indicates, that the optimal number of lags is p=2. We plot our forecast and the SPF forecast and the difference between their squared errors (the loss functions).



We compute the mean and estimate the variance of dL by HAC(6) as suggested in the problem. The Diebold-Mariano t-statistic is equal to 3.0035. The p-value is 0.0013344. We reject the null that our forecast is no better at 1%. That means, that a simple AR(2) forecast beats the SPF forecast significantly.

In fact median forecast means that absolute error was used as a loss function to compute it, while we compare it using a quadratic loss. If we took the mean forecast, maybe it won't have been be beaten by our AR(2) model.