

# Financial Econometrics

## Fall 2014

### Homework 2

HOMEWORK 2 DUE MONDAY OCTOBER 20, 2014

#### INSTRUCTIONS:

Download homework from NYU Classes. Fill it in as a word document and then upload it to NYU Classes in the Assignments section.

**Print out your own copy of the homework and bring it to class for discussion.**

- 1) Using the data on S&P realized volatility from Oxford Mann website that is loaded in sprv.homework12.wfl. You may want to use the page called “continuous”.
  - a) Estimate a TAR(1,1) and test for the addition of lags of the following realized measures: rv (5minute vol), rk (realized kernel, a smoother), and high/low range. Which is the best predictor?
  - b) Estimate a MEM model for each of the realized measures.
  - c) For the best predictor from question a) fit an improved MEM that includes past returns and asymmetric shocks.
  - d) With this measure, evaluate the ABDL’s three claims on page 581.
- 2) Use the data on Google trades for the month of April 2012.
  - a) Are the durations autocorrelated?
  - b) What are zero durations?
  - c) Fit an ACD(1,1) model. How persistent are the shocks?
  - d) Fit a higher order ACD to find a better model.
  - e) Fit a volatility model for returns
  - f) Introduce durations
- 3) Use the data on vixsp12.
  - a) Show that the change in log vix is correlated with contemporaneous returns. Can you find Granger Causality between volatility and returns? Is there evidence against the efficient market hypothesis? Make sure you correct for heteroskedasticity when doing the inference.
  - b) Estimate a volatility of volatility model for the vix using as dependent variable the log change in vix and letting the log of lagged vix be the explanatory variable along with a constant. Using an asymmetric volatility model, do you find the conventional asymmetry?
  - c) Discuss: Why is the lagged level significant in the mean? Is the sign on the asymmetry consistent with ICAPM pricing kernel? Can you develop a model where the risk premium on the vix depends upon the volatility of volatility?