Statistics 434: Homework No. 8

Data

Get four years' (or a little less) of daily returns from CRSP for one of your favorite firms, or perhaps of some ragged mutual fund, or some interesting ETF. For this assignment you'll need a time series of length 1000 or so.

GARCH Basics

1. Plot your return series and the square of your return series. Plot the ACF for both of these. Do you observe significant correlations in these series? More for the squares than for the plain returns?

2. Test you return series for an ARCH effect. Comment on your result.

3. Fit a constant mean Garch(1,1) model to your return series and evaluate your model as carefully as you can. Here are some of the questions that your evaluation should answer.

   (a) Comment on the normality tests of the **standardized residuals**. Are the WS and JB tests "consistent"? Does the QQ plot look consistent with the Gaussian hypothesis?

   (b) Do the residuals from your fit show any autocorrelation? How about the squares of these ressiduals? Specifically,what does Ljung-Box tell you in each case.

   (c) Comment on the statistical significance of your estimated coefficients.

   (d) For a Garch fit the function plot() gives you a whole zoo of diagnostic plots. Look at all of these for your fit and then comment on what you learn from *just two* of these.

   (e) Does it look like your model has practical merit?

   (f) What are the weak points and strong points of the analysis?

Presentation

As usual, you want to squeeze your story into one tight, articulate, and insightful page. Code and S-output should be consigned to the appendices. Still, if you want to incorporate a table of your own construction into your summary, that would be fine.

Quote of the Day

"The variability that you have seen is always less than the variability that you have not seen." — J.W. Tukey