

Statistics 434: Homework No. 9

Reading

Read the S-Plus Help files for all of the new S-Plus functions that we have covered and explore the help files for the “related functions” that are given at the bottom of the help files.

Data

Get four year’s (or a little less) of daily returns from CRSP for some firm, but don’t use firms from your previous homework. As before, you’ll need a time series of length about 1000 or so, but there is no need to bother with the S-Plus details that one needs to handle longer series.

Rolling Analysis of Time Series

OK, you have a lot of experience now. Take a look at your series with our usual bag of tricks: JB and WS normal tests, LB test for autocorrelation, DF test for $I(1)$ structure (non-stationarity). One expects no surprises, but if there is a surprise it is better to face it sooner rather than later. Does your series conform to what we have come to expect from series of returns? Now, test out your new tools. Get plots of the rolling 25 day means and standard deviations.

- Do your data show a visual relation between “risk” and “reward”? If the indication is weak, how can you make it stronger?
- Use your EDA skills to look at these questions as deeply as you can. Think about how to best present what you have learned. Don’t forget about simple old tools like the box plot. Does your data support “No guts no sausage”? That is, when “risk” is higher, do you find that returns are higher? There is no “recipe” for answering these questions; you just use your down-to-earth imagination.

Now consider the same questions but replace the trailing standard deviations with the conditional standard deviations that you get from fitting GARCH(1,1) models to your series.

1. As a preliminary step, examine the relationship between these conditional standard deviations and the moving estimates. Be careful with the “boundary issues” due to the moving estimates dropping the first twenty five values, etc.
2. Does your data help us understand which is the better measure of risk, running standard deviation or conditional standard deviation? Is this a fair comparison—why or why not.
3. Do you get the same “risk and reward” story using conditional standard deviations that you get when using running standard deviations?

Quote of the Day

“History may not repeat itself, but it rhymes.” — Mark Twain