**Fitting a 2d CCC-GARCH(1,1) Model**

For this type of model, we start with the following:

Note that need not be normal; we are just doing that for this example.

We assume that we have samples . We have to assume an initial value for the covariance matrix ; I suggest the sample covariance matrix .Now we calculate

Note that because this is GARCH(1,1), we need only go back one step in each term, not all the way back to the beginning. Because we are assuming a strict white noise process which is normal for ,the log likelihood now becomes

In the above formula, we substitute the recursive relationships:

I will now show you in a spreadsheet how this works. I will use the Excel solver to back out a local max for this log likelihood for a certain set of alphas and betas.