Homework 5

Ma641 Time Series I

due by class time 6:15pm, Monday July 27, 2009

Please try to submit a hardcopy of the report in class. If you chose the elearn submission option elearn please convert the report to pdf format before submitting.

In this assignment we will construct a heteroskedastic model of the return.

1. Download a daily time series of your choice for the past 5 years. Model the return. Obtain residuals and test for ARCH effects. If the effects are not present then download and test another equity. Repeat for as long as necessary to obtain an appropriate time series.
2. Specify a ARCH model for the data. Write down the model.
3. Construct a GARCH(1,1) for this model. Use each of the three options for the error distribution (gaussian, student-t, and generalized error distribution). Put the estimated coefficients from each model in a table and comment on the differences.
4. Calculate using the normal errors formula an iterative equation for predicting the variances
5. Figure a way to obtain the last a_h and the last σ_h from the output.
6. Using the numbers from the previous part and the iterative formula found earlier calculate the next 15 predicted volatility values.
7. Write a paragraph comparing the values you obtain with the outputted forecast from the *garchOxFit* function.

8. Fit an IGARCH(1,1) model using Student-t innovations. Write down the model.

9. Fit a GARCH-M(1,1) model using Student-t innovations. Write down the model. Is the ARCH in mean parameter significant?