

Time Series

(Due: Tu., 3.2.2009, 1:15 pm, in the exercise classes)

1. (a) Download the dataset garch1.dat from the lecture's homepage. Plot the ACF of the data as well as the ACF of the squared data. Would you decide for a GARCH-model? Try to fit a GARCH(2,1) model to the data. Plot the acf and do a Q-Q-plot of the standardized residuals. What do you think about the quality of the fit.
(b) Repeat part (a) with the data set garch2.dat

(5 Credits)

2. (a) Let $(X_t)_{t \in \mathbb{Z}}$ denote an ARCH(1)-process. Try to find an (easy) algorithm to compute the Quasi-Maximum-Likelihood-Estimator for (α_0, α_1) .
Hint: Do the following steps:
 - Compute the conditional density $f_{X_2, \dots, X_n | X_1}(x_2, \dots, x_n | x_1)$.
 - Compute the first and second derivative of this expression w.r.t. α_0 and α_1 .
 - Use a Newton-Algorithm approach.(b) What are the problems that might occur using this algorithm?

(5 Credits)

<http://www.uni-ulm.de/mawi/zawa/lehre/winter2008/ts20082009.html>