

THE UNIVERSITY OF CHICAGO
Graduate School of Business
Business 41914, Spring Quarter 2007, Mr. Ruey S. Tsay

Homework Assignment 2

Note:

- You may discuss problems with other students, but must hand in your OWN solutions.
 - You may use any software to do the empirical analysis even though I use SCA in the demonstration.
 - The assignment is due in one week once assigned.
1. The data set “mtshw3.dat” contains two time series. Build a vector AR model for the series. Write down the fitted model. Perform model checking and use the fitted model to produce 1-step to 4-step ahead forecasts at the end of the data.
 2. The data set “mtshw4.dat” contains two time series. Build a vector AR model for the series. Write down the fitted model. Perform model checking and use the fitted model to produce 1-step to 4-step ahead forecasts at the end of the data.
 3. The data set “mtshw1.dat” contains two time series. Build a vector MA model for the series. Write down the fitted model. Perform model checking and use the fitted model to produce 1-step to 2-step ahead forecasts at the end of the data.
 4. Consider n observations from the 2-dimensional MA(1) model:

$$\mathbf{z}_t = \mathbf{a}_t - \boldsymbol{\theta}\mathbf{a}_{t-1}, \quad t = 1, \dots, n,$$

where $\{\mathbf{a}_t\}$ is a sequence of independent and identically normal random vectors with mean zero and identity covariance matrix. Derive the exact log likelihood function for the data.