THE UNIVERSITY OF CHICAGO
Graduate School of Business
Business 41912-01, Spring Quarter 2008, Mr. Ruey S. Tsay

Homework Assignment #1

Due Date: April 11, 2008 (before class). You may use any software to solve the problem. Don't hand in all outputs; use cut-and-paste to select the relevant part of the output. Each student should answer his/her own assignment, even though discussions between students are encouraged.

Data files: Most datasets are available either from the web pages of the book or the course.

Course web site:
http://faculty.chicagogsb.edu/ruey.tsay/teaching/ama/

1. Compute the sample means, sample covariance matrix, and sample correlation matrix of the monthly simple returns of IBM, Hewlett-Packard Co. (HPQ), Merrill Lynch (MER), Bank of America (BAC), and Standard and Poor's 500 index from 1977 to 2007. The file has 6 columns namely date, IBM, HPQ, MER, BAC, and SP5. It also has column names on top of the file.

2. Find the maximum and minimum of $\frac{\boldsymbol{x}'\boldsymbol{A}\boldsymbol{x}}{\boldsymbol{x}'\boldsymbol{x}}$, where $\boldsymbol{x} \neq \boldsymbol{0}$ is a bivariate real-valued vector and
$$\boldsymbol{A} = \begin{bmatrix} 1 & .5 & .3 \\ .5 & 1 & .5 \\ .3 & .5 & 1 \end{bmatrix}.$$
Also, compute the symmetric square-root matrix of $\boldsymbol{A}$.

3. Problem 4.3 of the textbook, p. 201.

4. Problem 4.13 of the textbook, p. 203.

5. Parts (a) and (b) of Problem 4.39 of the textbook, p. 207.

Reading assignments: Chapters 1 to 4 of the textbook.