Assessed Computer Assignment 3

Answer all questions. Your answers must be handed in to me in class on Monday, April 25. Please hand in a hard copy of both your program and all relevant output.

The data series for this assignment are the natural logarithms of the exchange rate between the US dollar and UK pound at the daily, bi-weekly and monthly frequencies. The data series span June 1, 1973 through January 28, 1985. The series can be downloaded from the course web page: http://www4.ncsu.edu/~arhall/ECG752.htm.

Define $x(d)$, $x(bw)$ and $x(m)$ to be the first differences of the natural logarithms of, respectively, the daily, bi-weekly and monthly exchange rates for the US dollar versus UK pound.

1. Present time series plots of $x(d)$, $x(bw)$ and $x(m)$. Contrast the time series behaviour of these three variables.

2. In this question, you must estimate a GARCH model for $x(d)$, $x(bw)$ and $x(m)$. You are to restrict attention to GARCH($n$,$n$) models where $n = 0, 1, 2, 3$. Use AIC and SIC to determine the most appropriate choice of $n$ for each of the three series. Report the estimation results for each of the three chosen models using each information criterion. Comment briefly on the differences across the chosen models for $x(d)$, $x(bw)$ and $x(m)$.

3. Present time series plots of the estimated conditional variances obtained for the models for $x(d)$, $x(bw)$ and $x(m)$ chosen in question 2. Contrast the estimated conditional variances across the three series.

4. Using the results from Questions 1-3, comment on the sensitivity of the volatility pattern in this exchange rate series to the sampling frequency.