Homework 6
Ma641 Time Series I
due by class time 6:15pm, August 10, 2009

Import the attached file *Caterpillar00-09.csv* which contains the daily stock data for Caterpillar (CAT) from Jan 2000 to July 2009 and calculate continuously compounded returns using the adjusted closing data. Test the order in the imported data.

Part 1   (75 points)

1. First model the returns. What is your fitted model.

2. Test for ARCH effects in the data. If there are none you can stop here.

3. Specify an ARCH model for the data. Write down the model.

4. Fit a GARCH(1,1) model to the data using all three error distributions (a total of 3 models). Write down the fitted models.

5. Among the 4 models chose one that you believe is the best. Explain.

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

7. Fit a GARCH-M(1,1) model using Student-t innovations. Write down the model.

8. Is the ARCH-in-mean parameter significant?

9. Fit a GJR(1,1) model with Student-t innovations. Write down the model.

10. Is the "leverage" parameter significant?

11. Finally, compare these last 3 models with the best model selected earlier. Which one do you believe it is better. Explain.

Part 2   (25 points)

Use the minute data from the first midterm and try to repeat the points of the previous problem with this data. Please write the final model you believe to be the best. Explain.