Assignment 2

1. Use the attached data of daily equity prices of Bank of America (BAC) starting in 1990. In each case estimate the model with an intercept.

a) Estimate an ARCH(1) model and report the Schwarz information criterion

b) Estimate an ARCH(9) model and report the Schwarz information criterion

c) Estimate a GARCH(1,1) model and report the Schwarz information criterion

d) Estimate a GARCH(1,2) model (one GARCH and two ARCH terms) and report the Schwarz information criterion

e) Pick another order GARCH model and report the Schwarz criterion

f) Introduce another lagged or deterministic variable to see if it is significant.

Which is preferred?

Do all of these models satisfy the basic criteria for a good model?

2. For the GARCH(1,2) model(one GARCH and two ARCH terms), calculate the time series of annualized volatilities. What was the maximum conditional volatility and when did this occur?

3. Test the autocorrelation of the standardized residuals and the squared standardized residuals with 10 lags. Does this model pass both tests? Explain.

4. Report the skewness and kurtosis of the standardized residuals. Compare these with the BAC returns.

5. Forecast the next year of daily volatility for BAC and plot the result.

6. Reestimate the GARCH(1,2) with student-t distribution. Now what is the Schwarz criterion? Does it find this estimate preferable?

7. Describe the volatility pattern of a GARCH(1,1):

a. When the sum of alpha plus beta is small?

b. When the sum of alpha plus beta is bigger than one?

c. When alpha is small and beta is big with a sum slightly less than one?

d. When alpha is big and beta is small with a sum slightly less than one?