Fin 335 Assignment 3

Updated **2/20/2009**

Wei-Choun Yu

1. Due February 24 (T) (6:00pm). No late submission will be accepted.
2. Total scores: 50 points. You can discuss the assignment with your classmates *but you need to do the assignment on your own hands and write down your own answers*. Otherwise, you learn little form this assignment.
3. After finishing your homework, turn in your assignment electronically via D2L Dropbox.
4. In this assignment, you will have to submit one MS document file (a03.doc), including one estimation result (15 points), data proc: popforecast (15 points), SAS graph (10 points) and a SAS script (10 points).

Q1.

Say you are an analyst in Congress Budget Office (CBO), your boss – Whitney asked you to investigate the long-run trend of the US population in order to forecast the future budget forecast. You are ready to use Model 1 you learned in Fin 335 to estimate the trend.

1. Collect the monthly population data from 1952:1 to 2007:12 (total 672 observation). Open the pop.xls you have downloaded before (from course website). →Copy and paste the date and data only onto another Excel file (name it popnew.xls) because SAS cannot read the data description in the first thirty rows of pop.xls.
2. Next to data, in Column C, create a time trend series (name it Time) from 1 to 672.
3. Create a new SAS program (name it a03.sas) and write two basic procs to import this data and observe the first ten rows of data.
   Note: To do this and the following more efficient, you can open 04trend.sas →Click File on the toolbar → Click Save As →Type your file name "a03.sas"
4. Before you estimate the model, write the SAS ODS to create your estimated output file as "pop.doc".
5. Write and run the Model 1 – linear model → check the output and the estimates: beta0 (intercept) and beta1 (slope).
6. Use the above estimates to predict the next period population (January 2008). Create a **data step** (name it popforecast) for step 6 and step 7.
   Note: $pop_{t+1} = Beta_0 + Beta_1 \times time_{t+1}$, for January 2008, time = 673.
7. **Out-of-sample evaluation.** Go to FRED website to get the actual/realized population data in January 2008. http://research.stlouisfed.org/fred2/series/POP?cid=104
   Calculate the mean squared error and mean absolute error (see H07 page1) as follows,
   $MSE = (y - \hat{y})^2 / N; MAE = |y - \hat{y}| / N$
   where y is actural value, $\hat{y}$ is predicted value, N is the number in out-of-sample period.
   Use the SAS Solution: Analysis: Time Series Forecasting System to plot the forecasting graph and read the Forecast data set. Compare its predicted value (January 2008) with the result you got from Model 1 estimates.
8. Briefly explain your results.