** An Instruction to Use the NLLS Estimation Files **

This is a readme file of nonlinear least squares (NLLS) estimation method used in Ahn, D., S. Choi, D. Gale, and S. Kariv (2013), "Estimating Ambiguity Aversion in a Portfolio Choice Experiment."

A version R2010b of the Matlab software is used in coding the NLLS estimation programs.

The directory "ACGK_Estimation" contains three sub-directories, named "AlphaMEU" for the kinked specification, "RDU" for the generalized kinked specification, and "REU" for the smooth specification. Each contains the Matlab files for the estimation of the corresponding model.

Each model uses the data file (AllData.mat) that is a (50xN)x8 matrix of the experimental data, where N is the total number of subjects in the experiment. The first column vector denotes subject ID who made decisions. The second one denotes the number of decision rounds among 50 rounds for each subject. The third to fifth columns collect decisions in the three states made by each subject. The sixth to eighth columns collect the parameters determining budget sets, x intercept, y intercept, and z intercept in the three-dimensional budget plane. State y is unambiguous state whose probability is equal to 1/3.

Each model directory contains several m-files.

The NLLS_xxx.m file is a file executing the NLLS procedure in each model. We use fmincon command to solve the constrained minimization problem.

The bstrap.m file returns the variance-covariance matrix using the bootstrap method. The number of replication is 500 in each of the AlphaMEU model and the RDU model, while 100 in the REU model. Because the REU model involves much heavier computation than the other two models, we adopted the smaller number of replication in the REU model.

The ssr.m (or ssr1.m) file returns the sum of squared residuals, which is the objective function in the NLLS procedure.

The rest of files in each directory are for the computation of optimal demands in a given set of parameter values. The demand.m file returns the optimal demand in given parameter values. The other files support the computation of optimal demand in the demand.m file. The details of computing optimal demands in each model are given in the appendices.

In order to run the NLLS estimation, simply open and run an NLLS_xxx.m file.