

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

This is a readme file of NLLS estimation method used in Choi, S., R. Fisman, D. Gale, and S. Kariy, "Consistency and Heterogeneity of Individual Behavior under Uncertainty," *American Economic Review*, December 2007.

A version 6.5 of the Matlab software is used in coding the NLLS programs.

The directory "Estimation_NLLS" contains two sub-directories, named "CRRA" and "CARA", which contain the Matlab files related to nonlinear least squares (NLLS) estimation in both symmetric and asymmetric treatments with corresponding econometric specifications (CRRA/CARA) as reported in the manuscript and the appendices.

Each of CRRA and CARA directories contains three sub-directories, named "Sym", "Asym1", and "Asym2". The Sym sub-directory contains the Matlab files related to NLLS estimation with the data in the symmetric treatment (ID 201~219 and ID 301~328). The Asym1 sub-directory contains the Matlab files related to NLLS estimation with the data in the asymmetric treatment where the probability of state 1 being selected is 1/3 (ID 401~417). The Asym2 sub-directory contains the Matlab files related to NLLS estimation with the data in the asymmetric treatment where the probability of state 1 being selected is 2/3 (ID 501~520 and ID 601~609).

Each of the three directories (Sym/Asym1/Asym2) contains one data file (data_sym.mat/data_asym1.mat/data_asym2.mat), one m-file (fssr.m), and two m-files (estm_sym.m/estm_asym1.m/estm_asym2.m and bstrap.m).

The data file (data_sym.mat/data_asym1.mat/data_asym2.mat) in each treatment is a $((50 \times n) \times 6)$ matrix, where n is the total number of subjects in a treatment. 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 six columns collect decisions made by each subject and the parameters determining budget sets, y intercept and x intercept in a 2-dimensional budget line.

The fssr.m file returns the sum of squared residuals at each value of two parameters (α , ρ), given the data consisting of the log of price ratios and the log of demand ratios. This file is served as an objective function in the minimization problem of estimating the nonlinear least squares estimation.

The estm__ file (estm_sym.m/estm_asym1.m/estm_asym2.m) is a file executing the NLLS estimation procedure. The Nelder-Mead Simplex method is used in searching for minimizing the objective function.

The bstrap.m file returns the standard errors of two parameters (α , ρ) using the bootstrap method. The number of replication is 500.

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