TWO-WAY MODELS FOR GRAVITY

README FOR REPLICATION FILES

KOEN JOCHMANS[*]

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This file describes how to replicate the numerical results in the paper. The folder containing the MATLAB code and data set is called 'Gravity replication' and contains two subfolders: 'Simulations' and 'Application'.

I. Simulations

The subfolder 'Simulations' contains the MATLAB code to replicate Tables 1–3 in the paper. It contains the following m-files:

- 'Designs.m': This MATLAB routine calls 'NumericalExperiments.m' for the simulation ten designs introduced in the paper. The parameters n and R can be modified and determine the sample size and number of Monte Carlo replications, respectively. Table 1 is obtained with $n = 25$. Table 2 is obtained with $n = 100$.

  To generate Table 3, introduce rounding error in 'DataGeneration.m' (see below).

- 'NumericalExperiments.m': This routine performs the Monte Carlo study for a particular design. For each of R replications it first generates data according to the design by calling 'DataGeneration.m'. It then calculates the Poisson pseudo maximum likelihood estimator and the GMM estimators (GMM1 and GMM2)—as well as associated standard errors—as defined in the paper, by calling 'PMLE.m', 'GMMA.m', and 'GMMB.m', respectively.

[*] Address: Sciences Po, Département d'économie, 28 rue des Saints Pères, 75007 Paris, France; koen.jochmans@sciencespo.fr.

- 'DataGeneration.m': This routine is called by 'NumericalExperiments.m' and generates data for the specified design.

  To introduce rounding error in the dependent variable (to recreate Table 3) toggle on/off the command Y = round (Y);

- 'GMMA.m': This routine calculates the estimator GMM1 and its standard error as defined in the paper. Calculations use efficient evaluation of the moments, Jacobian matrix, and variance of the moments, as described in the Supplementary Material to the paper.

- 'GMMB.m': This routine calculates the estimator GMM2 and its standard error as defined in the paper. Calculations use efficient evaluation of the moments, Jacobian matrix, and variance of the moments, as described in the Supplementary Material to the paper.

- 'PMLE.m': This routine calculates the Poisson pseudo maximum likelihood estimator and its standard error. Calculation is performed by working with the profile likelihood for the common parameters.

II. Empirical application

The subfolder 'Application' contains the MATLAB code to compute the GMM estimators for the trade data of Santos Silva and Tenreyro (2006) (see Tables 4 and 5 of the paper). It contains the following files:

- 'SSTdata.xls': The data in Excel format as downloaded from the website

  `http://personal.lse.ac.uk/tenreyro/LGW.html`

- 'SST_panel_vectorized.mat': The data in MATLAB format, organized in columns (as in the Excel file).

- 'SST_panel_3.mat': The data re-arranged in matrices (as needed to compute the GMM estimator).

- 'DataArrangement.m': This routine transforms 'SST_panel_vectorized.mat' into 'SST_panel_3.mat'.

- 'TradeLevel.m': This routine loads the data set in 'SST_panel_3.mat' and computes the estimator GMM2 (as defined in the paper) and the associated standard error. Note that this calculation does not use efficient evaluations of the criterion function (as described in the Supplementary Material and implemented in the simulations).

- 'Newton.m': This routine contains a Newton-Raphson algorithm used to calculate the GMM estimator.