Replication files for "Misspecified Moment Inequality Models: Inference and Diagnostics"

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The compressed file "code_and_data.zip" includes the code and data to replicate the empirical results given in Section 6 and the related sensitivity analysis results reported in the Appendix. The data file is located in the "data" directory in RData format.

The dataset used in the analysis is the airline market data originally analyzed by Kline and Tamer (2016), which is publicly available[1] in Matlab format.

All replications files can be run using R, and the required packages (all available on CRAN) are `doRNG`, `foreach`, `nloptr`, `matrixStats`, `mvtnorm`, and `randtoolbox`. The total runtime is approximately 2 hours for the baseline specification on an n Intel Xeon Gold 6240 processor (18 cores, 36 threads).

The R script files included in the "functions" directory collect the functions commonly used throughout the code:

- **run_emp.R** computes $\widehat{\Delta}_n^{\inf}$ and other bootstrap values necessary to calculate the projection confidence intervals (CIs)
- **common-testfunctions.R** collects the definition of the different test functions given in the paper
- **common-emp.R** contains the objective functions of the optimization problem that must be solved to obtain the critical values

[1] `https://www.econometricsociety.org/publications/quantitative-economics/2016/07/01/Bayesian-inference-in-a-class-of-partially-identified-models/supp/371-1736-1-SP.zip`

- **SPUR2_emp_sens.R** contains functions that performs the (SPUR1, SPUR2, and GMS) test given an alternative
- **common-basic.R** contains miscellaneous functions

Running "master_run_replication.R" provides all results. This script runs the following three scripts:

- **get_proj_CI_sobol.R** calculates the projection CIs at initial values drawn from a sobol sequence
- **get_proj_CI_more_init_vals.R** calculates the projection CIs at initial values drawn from additional initial values, as described in Section 10 of the Appendix
- **comp_proj_CI_tables.R** combines the results from the above two scripts to compute the projection CIs and creates the relevant tables. The outputs are "mici_table.csv" and "baseline_table.csv", which correspond to the two tables reported in the empirical application section.

An R package to implement the SPUR2 test in under development, and the source code for the current version can be found at `https://github.com/patrick-rhatigan/mispur`.

References

Kline, B. and E. Tamer (2016), "Bayesian Inference in a Class of Partially Identified Models," *Quantitative Economics,* 7, 329–366.