Instrumental variable estimation of the proportional hazards model by presmoothing: replication package

Lorenzo Tedesco, Jad Beyhum, Ingrid Van Keilegom

Overview

The code in this replication package is written in R and can be used to reconstruct the simulation table and the empirical application table and figure of the paper.

Data Availability and Provenance Statements

Statement about Rights

- ☑ I certify that the author(s) of the manuscript have legitimate access to and permission to use the data used in this manuscript.
- ☑ I certify that the author(s) of the manuscript have documented permission to redistribute/publish the data contained within this replication package.

Summary of Availability

- ☑ All data **are** publicly available.

Details on each Data Source

Data.Name	Data.Files	Location	Provided	Citation
"The Illinois Unemployment Incentive Experiments: Dataset"	illinois.dta	empirical/	TRUE	Department of Employment Security, State of Illinois (1985)

Data on The Illinois Unemployment Incentive Experiments were provided by the Department of Employment Security, State of Illinois. The raw data

were downloaded from https://www.upjohn.org/data-tools/employment-research-data-center/illinois-unemployment-incentive-experiments on the 25th July 2023, and it is included in the replication package.

Computational requirements

Software Requirements

- R 4.0.2
  - `Survival` (3.2.11)
  - `foreach` (1.5.1)
  - `doParallel` (1.0.16)
  - `nprobust` (0.4.0)
  - `xtable` (1.8.4)
  - `KernSmooth` (2.23.20)
  - `haven` (2.5.0)

Controlled Randomness

- Random seed is set at line 139 of program simulation_design_discrete.R
- Random seed is set at line 145 of program simulation_design_continuous_beta.R
- Random seed is set at line 145 of program simulation_design_continuous_uniform.R
- Random seed is set at line 197 of program estimation.R

Memory and Runtime Requirements

Summary Approximate time needed to reproduce the analyses on a standard 2023 desktop machine: 4 days.

Details Each program completes to run in less than 24 hours on a **16 cores - AMD Ryzen 9 7950X Processor with 64 GB RAM, 200 GB SSD local disk**.

Description of programs/code

The programs require setting the variable `path` at Line 1 to be equal to the containing folder of the file program.

- Programs in `simulation/` will replicate the simulation results presented in Table 2.
- Programs in `simulation/simulation_design_discrete.R` will replicate the simulation results related to the Discrete (Bernulli) design. The program obtains a final output called `simulation_design_discrete.csv`
- The `simulation/simulation_design_continuous_beta.R` will replicate the simulation results related to the Continuous (Beta) design. The program obtains a final output called `simulation/simulation_design_continuous_beta.csv`.

- The `simulation/simulation_design_continuous_uniform.R` will replicate the simulation results related to the Continuous (Uniform) design. The program obtains a final output called `simulation/simulation_design_continuous_uniform.csv`.
- Programs in `empirical/estimation.R` will replicate the empirical estimation results of the proposed estimator of Table 4. The program obtains a final output called `empirical/estimation.csv`.

Description of Dataset

The dataset `empirical/illinois.dta` contains multiple variables. The only used variables are:

- *age*: integer variable indicating the age of the subject at the start of the experiment;
- *hie*: boolean variable indicating the HIE treatment status;
- *jsie*: boolean variable indicating the JSIE treatment status;
- *lagree*: boolean variable indicating the participation in assigned programs;
- *wkpaid*: integer variable indicating the unemployment duration.
- *black*: boolean indicator for black skin color.
- *male*: boolean indicator for male gender.

License for Code

Instructions to Replicators

For all the programs, the same following procedure applies.

- Set the value of the variable `path` at Line 1 to be equal to the containing folder of the file program.
- Run the program.

References

Department of Employment Security, State of Illinois (1984-1985). *The Illinois Unemployment Insurance Incentive Experiments: Dataset.* https://www.upjohn.org/data-tools/employment-research-data-center/illinois-unemployment-incentive-experiments