Replication Kit for "Spatial Influences in Upward Mobility"
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Intro and Disclaimer

The contents of this archive reproduce the main results of "Spatial Influences in Upward Mobility." Due to the large amount of code involved in this progress and the fact that this code has been being modified for several years, the output of this archive may differ very slightly the results reported in the published paper. The author has verified that all such differences are both qualitatively and quantitatively trivial in the model's estimates, robustness, and takeaways.

Structure of Archive

The root directory has two files both named "sium_master." One is a Stata dofile and one is a file runnable in the Julia programming language. The main results of the paper were generated with Julia version 1.7x. Version differences may result in very slight quantitative changes in the model's output.

Along with the files, the directory has five sub-directories:

- Data: location of all raw datafiles to be read into and manipulated with either Stata or Julia
- Dofiles: additional Stata dofiles called by sium_master involved in all parts of the paper.
- Model: additional Julia files called by sium_master.jl involved with model estimation and simulation.
- Output: Location where final figures and regression tables are stored.
- Temp: location where all intermediate files are placed before being deleted at the end of sium_master.do

Variables Needed from ACS Data

Broad Steps for Replication

1. Some data will need to be unzipped. The contents of "root/Data/IPEDS," and "root/Data/Amenities\Lee_lin\Supplementary\data/" will need to be extracted so that the data contained in the sub-archives is accessible by Stata. You will also need to download the "sium_replication_acs" archive, move it to the "root/Data/ACS" directory, and extract it there.
2. Edit line 8 of sium_master.do to reflect your local directory and run lines 8 through 65 of sium_master.do (alternatively just hit control-D – an exit command at line 66 will prevent the dofile from running further). This will generate both some of the motivating figures and regressions and will prepare files required for the model to run.
3. Edit line 8 of sium_master.jl to reflect your local directory and run sium_master.jl. This will estimate the structural model, produce simulation output and run counterfactual simulations.

4. Run lines 72 through 108 of sium_master.do. This will input the simulated data from the model and report features of the model's fit, counterfactual experiments, and decompositions. Finally, the model will clean out the Temp directory. You may also want to clean out the "root/Model/simulated_data" directory if you have simulated a good deal of data in your replication.

Be advised that running sium_master.jl in its entirety will take a **very long time** due to containing multiple estimation runs procedures and hundreds of simulation exercises. It is highly advised that you run the model on a remote server with at least 10 cores, and preferably 25. If you would prefer to replicate a particular result of the paper instead of the entire set of results, refer to the next section.

Instructions for Reproducing Specific Statistics, Tables and Figures

These directions assume you have completed steps 1 and 2 in the previous section.
Work in Julia should begin by running lines 1 through 24 of sium_master.jl to set up the Julia environment.

MAIN TEXT

A. TABLES
   1) Table 1: N/A
   2) Table 2: Run lines 29 through 54 of sium_master.jl, as well as lines 394 through 431 of sium_master.jl. This will estimate the model parameters and report standard errors. Note that the output of this may differ very slightly from reported estimates, and this will also take a long time.
   3) Table 3: Data moments targeted may be found in "root/Model/moments/moments.csv" after running steps 1 and 2 in the previous section. The model's moments will be reported by Julia when running line 66 (or any call of the "objective_function" function).
   4) Table 4: run lines 59 through 69 of sium_master.jl. Then run line 72 of sium_master.do. The relevant figures are reported in the Stata window. Notably in lines 184-191 of 10_model_fit.do.
   5) Table 5: Run lines 59 through 99 of sium_master.jl. Then run line 76 of sium_master.do. This will output the maps as well as the content of Table 5.
   6) Table 6: Run lines 123 through 164 of sium_master.jl. Then run line 82 of sium_master.do.
   7) Table 7: Run lines 310 through 339 of sium_master.jl (note that this will take a long time and produce a lot of data!). Then run line 80 of sium_master.do. The table will be reported in the Stata window, and the file will also produce statistics mentioned in text.
   8) Table 8: Run line 189 through 267 of sium_master.jl. Then run line 81 of sium_master.do. This will output the table and compute the estimate of labor supply elasticity to schooling shocks mentioned in text if lines 270 through 283 of sium_master.jl have also been run.

B. FIGURES
   1) Figure 1: run line 20 of sium_master.do

2) Figure 2: N/A
3) Figure 3: run line 19 of sium_master.do
4) Figure 4: run lines 59 though 69 of sium_master.jl. Then run lines 72 and 73 of sium_master.do. This will output the maps, and the relevant correlations are reported in the Stata window. In lines 208 through 222 of 10_model_fit.do
5) Figure 5: run lines 59 through 69 of sium_master.jl. Then run line 72 of sium_master.do. This will output the maps, and the relevant correlations are reported in the Stata window. In lines 208 through 222 of 10_model_fit.do
6) Figure 6: Run lines 59 through 99 of sium_master.jl. Then run line 76 of sium_master.do. This will output the maps as well as the content of Table 5.

C. STATEMENTS IN TEXT
1) Labor supply elasticities discussed in Section 5.2 (Other determinants of mobility): run lines 271 through 304 of sium_master.jl. Then run lines 79 and 81 of sium_master.do. The labor supply elasticities will be reported in the Stata window at the end of each dofile.
2) Moving costs discussed in Section 4.4 (Model fit): Run lines 170 through 184 of sium_master.jl. Then run line 91 of sium_master.do.

APPENDIX

1. TABLES
   a. Table A1: Run lines 29 through 54 of sium_master.jl, as well as lines 394 through 431 of sium_master.jl. This will estimate the model parameters and report standard errors. Note that the output of this may differ very slightly from reported estimates, and this will also take a long time.
   b. Table A2: Data moments targeted may be found in "root/Model/moments/moments_race.csv" after running steps 1 and 2 in the previous section. The model's moments will be reported by Julia when running line 66 (or any call of the "objective_function" function).
   c. Table A3 and A4: Run lines 447 through 698 of sium_master.jl and lines 77 and 78 of sium_master.do. Julia will output the parameter estimates of the alternate model specifications along with standard errors as well as the value of the objective function, and Stata will report the correlation between the main results in the baseline specification to these alternate specifications.
   d. Table B1: Run line 20 of sium_master.do
   e. Table B2: run lines 59 through 69 of sium_master.jl. Then run line 72 of sium_master.do. The contents of the table will appear in the Stata window. In particular, line 111 of 10_model_fit.do produces the quintile transition matrix (data moments from Chetty et al 2014), lines 99 through 105 produce Table B2b) (data moments from Lee and Seshadri 2021), and lines 286 through 324 produce the final two tables (data moments from NLSY97).
2. FIGURES
   a. Figure A1, A2: Prepared in Step 2 of the previous section.

b. Figure A3: Figures A3a) and A3b) are prepared in Step 2. The latter two may be produced by lines 86 and 87 of sium_master.do
c. Figure A4: Run lines 88 and 90 of sium_master.do
d. Figure A5: Run line 89 of sium_master.do
e. Figure A6: Run line 19 of sium_master.jl. Then run line 72 of sium_master.do. Marriage probability plots are made at the end of 10_model_fit.do
f. Figure A7: run lines 59 through 69 of sium_master.jl. Then run line 72 of sium_master.do. This will output the maps, and the relevant correlations are reported in the Stata window. In lines 208 through 222 of 10_model_fit.do
g. Figure B1: Run lines 345 through 389 of sium_master.jl and line 85 of sium_master.do.
h. Figure B2: run lines 59 through 69 of sium_master.jl. Then run line 72 of sium_master.do.
i. Figure B3: Run lines 59 through 99 of sium_master.jl. Then run line 76 of sium_master.do.
j. Figure B4: Run lines 59 through 99 of sium_master.jl. Then run line 76 of sium_master.do.
k. Figure B5: Run lines 270 through 304 of sium_master.jl. Then run lines 79 and 81 of sium_master.do