Reproducible Research Repository

Development acupuncture: The network structure of multidimensional poverty and its implications

Second Submission: RR_WLD_2024_184
María Reyes Retana
reproducibility@worldbank.org
2024-10-23

This review verifies the reproducibility of the exhibits included in the paper " *Development acupuncture: The network structure of multidimensional poverty and its implications*".

Contents in this review:

1. Main findings

2. List of exhibits and reproducibility status

3. Reproduction Environment
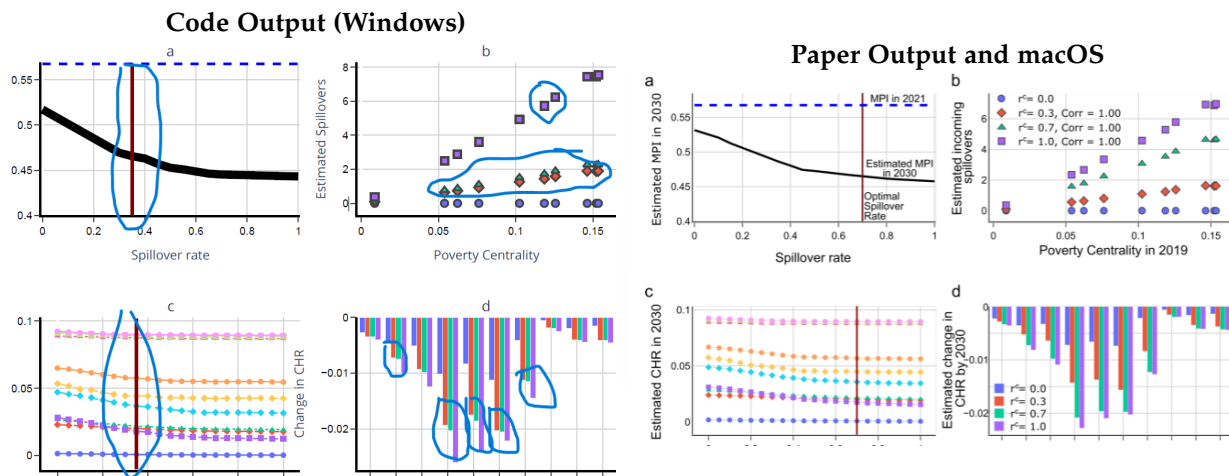
Main findings

- The code was successfully executed on a new computer after:

  1. Installing the required packages and running the Jupyter Notebook.

- The output demonstrates consistent stability across multiple runs. Specifically, executing the code two times consecutively yielded identical results.

- The code takes approximately 60 minutes to run.

- We conducted our reproducibility analysis based on the paper shared by the authors in their reproducibility package.

- Every exhibit has been reproduced accurately; however, this was only achieved using a macOS environment. The results do not reproduce on a Windows machine. In the meantime, we consider this package reproducible, but our team is investigating the issue and will update the package once resolved. See details in section List of exhibits and reproducibility status.

- **Reproducibility Summary**:

  - **Data**: All data sources are publicly available but not all are included in the reproducibility package.
  - **Code**: Not all code files are included in the reproducibility package. The reproducibility package includes code for all data analysis from the intermediate data. The code to generate the intermediate data is publicly available but licensed and cannot be republished in the package.
  - **Outputs**: All outputs are generated by code included in the reproducibility package.
  - **Reproducibility verification**: Reviewers used data provided directly by the authors to conduct the reproducibility verification, and this is not included in the public reproducibility package. The reviewers did not verify if publicly available data matches the data provided by the authors.

– **Dependencies environment**: The reviewers created a new environment for dependencies using the latest versions available for each dependency at the moment of the review.

List of exhibits and reproducibility status

Results in the Main Section of the Paper

- **Figure 1** Reproduced. The format in the paper is slightly different because the figure in the paper is more compact, but this does not jeopardize reproducibility.

- **Figure 2** Reproduced.

- **Figure 3** Reproduced using macOS environment. This figure was successfully reproduced only when running the code in a macOS environment. Although we consider this figure reproducible at this moment, for transparency, we are also including the results obtained when running the code on a Windows machine.

- **Table 1** Reproduced. The country and indicator dummy variables are missing, but this does not jeopardize reproducibility.

- **Table 2** Reproduced.

- **Table 3** Reproduced. The country and indicator dummy variables are missing, but this does not jeopardize reproducibility.

  Results in the Annex

- **Table A1.1** Does not show analysis results.

- **Table A1.2** Does not show analysis results.

- **Figure A2.2** Reproduced.

- **Figure A3.1** Reproduced. The order of the Upper-middle and Lower-middle income figures is different in the code-produced output and the paper, but this does not jeopardize reproducibility.

- **Figure A3.2** Reproduced. The order of Sub-Saharan Africa, Europe and Central Asia, South Asia, and Middle East and North Africa figures is different in the code-produced output and the paper, but this does not jeopardize reproducibility.

Reproduction Environment

- Paper exhibits were reproduced in two computers with the following specifications:

  1. Computer 1:
     - OS: Mac OS 15.0.1
     - Processor: Apple M1 Pro
     - Memory available: 32 GB
     - Software version: Python 3.13.

  2. Computer 2:
     - OS: Windows 10 Enterprise
     - Processor: Intel(R) Xeon(R) Gold 6226R CPU @ 2.90GHz, 2900 Mhz, 16 Core(s), 16 Logical Processor(s)
     - Memory available: 87.7 GB
     - Software version: Python 3.9.13