



Spatial Analysis of Income Disparities in LICs and MICs

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This review verifies the reproducibility of the exhibits included in the paper “*Spatial Analysis of Income Disparities in LICs and MICs*”.

Contents in this review:

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2. List of exhibits and reproducibility status
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Main findings

- **Every exhibit in the main section of the paper and 10 randomly selected exhibits in the appendix were reproduced accurately**
- The code was successfully executed on a new computer after:
 1. Opening the R project *spat-disp-insight-main/spat-disp-insight-main.Rproj*.
 2. Restoring the environment by running `renv::restore()` and following the prompts.
 3. Specifying the path to data folder by defining the `fldr_dta_root` in the line 110 of *spat-disp-insight-main/vignettes/01-setup.R*
 4. Getting access to the Data LibWeb following the instructions in the README. DLW access is restricted to World Bank Group staff and consultants with a valid WB network account. Contact the data-access contacts listed in the README for alternative arrangements.
 5. Running *spat-disp-insight-main/vignettes/00-master.R*.
- The output demonstrates consistent stability across multiple runs. Specifically, executing the code two times consecutively yielded identical results.
- The code takes approximately 2 hours to run.
- We conducted our reproducibility analysis based on the paper shared by the authors in the reproducibility package on July 21.
- **Verification Process and Data Handling:**
 - The reproducibility package relies on two types of data: open, and restricted data.
 - Open data is included in the public reproducibility package.

- Reviewers used restricted data provided directly by the authors to conduct the reproducibility verification, and this is not included in the public reproducibility package.
- *data_hash_report.csv* lists the SHA256 hashes of all files in the Data folder to support data integrity checks. Users who acquire the restricted data can use this file to verify that the data has not been altered.
- **Reproducibility Summary:**
 - **Data:** Some data is restricted and has not been included in the reproducibility package. For more details, please refer to the README file.
 - **Code:** All code files (from cleaning to analysis) are included in the reproducibility package.
 - **Outputs:** All outputs are generated by code included in the reproducibility package.
 - **Dependencies environment:** The reviewers reproduced an existing environment for dependencies using dependency files or an environment metadata file provided by the authors.

List of exhibits and reproducibility status

Results in the Main Section of the Paper

- **Table 1** Does not show analysis results.
- **Table 2** Does not show analysis results.
- **Table 3** Reproduced. Verified against tables/Table 3.docx.
- **Figure 1** Reproduced. Verified against figures/fig-1.png.
- **Figure 2** Reproduced. Verified against figures/fig-2.png.
- **Figure 3** Reproduced. Verified against figures/fig-3.png.
- **Figure 4a** Reproduced. Verified against figures/fig-4a-locfe.png.
- **Figure 4b** Reproduced. Verified against figures/fig-4b-skills.png.
- **Figure 4c** Reproduced. Verified against figures/fig-4c-reg-ind.png.
- **Figure 4d** Reproduced. Verified against figures/fig-4d-loc-obs.png.
- **Figure 5** Reproduced. Verified against figures/fig-5.png.
- **Figure 6** Reproduced. Verified against figures/fig-6.png.
- **Figure 7** Reproduced. Verified against figures/fig-7.png.
- **Figure 8** Reproduced. Verified against figures/fig-8.png.
- **Figure 9** Reproduced. Verified against figures/fig-9.png.
- **Figure 10** Reproduced. Verified against figures/fig-10.png.

- **Figure 11a Reproduced.** Verified against figures/fig-11-a.png.
- **Figure 11b Reproduced.** Verified against figures/fig-11-b.png.
- **Figure 12 Reproduced.** Verified against figures/fig-12.png.

Results in the Annex

For the Appendix, we did not review every exhibit. Instead, we randomly selected 10 exhibits from the remaining datasets to assess the appendix. Our review was based on those 10 exhibits. Since they were chosen randomly, we are operating under the assumption that if all randomly selected exhibits are reproducible, then the rest should be as well. The seed used to generate the random selection was 301656, the Stata version used was 19, and the exhibits selected were: Table A2-1, Table A2-4, Table A2-6, Table A2-9, Table A3-1, Table A4-5, Figure A2-3, Figure A2-4, Figure A2-10, and Figure A3-3.

- **Table A2-1 Reproduced.** Verified against tables/Table A2-1.docx.
- **Table A2-4 Reproduced.** Verified against tables/Table A2-4.docx.
- **Table A2-6 Reproduced.** Verified against tables/Table A2-6.docx.
- **Table A2-9 Reproduced.** Verified against tables/Table A2-9-Informal-Adm2.docx.
- **Table A3-1 Reproduced.** Verified against tables/Table A3 1-2.docx.
- **Table A4-5 Reproduced.** Verified against Table 1.3 in tables/Table A5 5.docx.
- **Figure A2-3 Reproduced.** Verified against figures/fig-a2_3_rate_edu_sec.png.
- **Figure A2-4 Reproduced.** Verified against figures/fig-a2_4_rate_edu_hi.png.
- **Figure A2-10 Reproduced.** Verified against figures/fig-a2-10.png.
- **Figure A3-3a Reproduced.** Verified against figures/fig-a3-3a.png. A difference of 0.01 is observed in the slope, but this fall within the 1% tolerance range and are therefore considered acceptable.
- **Figure A3-3b Reproduced.** Verified against figures/fig-a3-3b.png.
- **Figure A3-3c Reproduced.** Verified against figures/fig-a3-3c.png.
- **Figure A3-3d Reproduced.** Verified against figures/fig-a3-3d.png.

Reproduction Environment

Paper exhibits were reproduced on a computer with the following specifications:

- OS: Windows 11 Enterprise
- Processor: Intel(R) Xeon(R) Gold 6226R CPU @ 2.90GHz
- Memory available: 32.0 GB
- Software version: R 4.5.1