



The Contribution of Human Capital to Current and Future Growth: an Extension of the World Bank's Long-Term Growth Model (LTGM-HC)

First Submission: RR_WLD_2025_482

Ceren Huryol

reproducibility@worldbank.org

November 13, 2025

This review verifies the reproducibility of the exhibits included in the paper “*The Contribution of Human Capital to Current and Future Growth: an Extension of the World Bank's Long-Term Growth Model (LTGM-HC)*”.

Contents in this review:

1. Main findings
2. List of exhibits and reproducibility status
3. Reproduction Environment

Main findings

- **Every exhibit in the main paper and 10 randomly selected exhibits in the appendix were reproduced accurately.**
- The code was successfully executed on a new computer after:
 1. Changing the path in the main script and run the code.
- The output demonstrates consistent stability across multiple runs. Specifically, executing the code two times consecutively yielded identical results.
- The code takes approximately 30 minutes to run.
- We conducted our reproducibility analysis based on the paper shared by the authors by email on November 11th.
- **Verification Process and Data Handling:**
 - The reproducibility package relies on open data.
 - Open data is included in the public reproducibility package.
 - Reviewers used accessible data provided directly by the authors to conduct the reproducibility verification, and this is included in the public reproducibility package.
- **Reproducibility Summary:**
 - **Data:** All data sources are publicly available and included in the reproducibility package.
 - **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 created a new environment using the latest versions of dependencies available at the moment of the review.

List of exhibits and reproducibility status

Results in the Main Section of the Paper

- **Figure 1** Results reproduced, but table or figure includes manual changes from code output. Values were reproduced; however, the figure itself was created on Excel.
- **Figure 2** Reproduced.
- **Figure 3** Reproduced.
- **Figure 4** Reproduced.
- **Figure 5A-B** Reproduced.
- **Figure 5C-D** Reproduced.
- **Figure 6A-B** Reproduced.
- **Figure 6C-D** Reproduced.
- **Figure 7** Reproduced.
- **Figure 8** Reproduced.
- **Table 1** Does not apply. Table does not represent analysis results.
- **Table 2** Reproduced.
- **Table 3** Reproduced.
- **Table 4** Reproduced.

Results in the Annex

For the Appendix, we did not review every 27 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 578215, the Stata version used was 18.5, and the exhibits selected were: 3, 5, 10, 13, 14, 18, 20, 21, 23, 24.

- **Figure A3** Reproduced.
- **Figure B1** Reproduced.
- **Figure G1** Reproduced.
- **Figure H2** Reproduced.

- **Figure J1A** Reproduced.
- **Figure J4** Reproduced.
- **Figure J6** Reproduced.
- **Figure J7** Reproduced.
- **Figure J9** Reproduced.
- **Table K1** Reproduced.

Reproduction Environment

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

- OS: Windows 11 Enterprise
- Processor: Intel(R) Xeon(R) Gold 5218 CPU @2.30GHz
- Memory available: 6 GB
- Software version: Stata 18.5 MP