



World Development Report 2025: Standards for Development

Fifth Submission: FR_WLD_2025_460

Ceren Huryol, Maria Reyes Retana

reproducibility@worldbank.org

November 25, 2025

This review verifies the reproducibility of the exhibits included in the paper “*World Development Report 2025: Standards for Development*”.

Contents in this review:

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

Main findings

- **Every exhibit in the paper has been reproduced accurately.**
- The code was successfully executed on a new computer after:
 1. Following the specific instructions for each chapter.
- The output demonstrates consistent stability across multiple runs. Specifically, executing the code two times consecutively yielded identical results.
- The code takes approximately 5 hours to run.
- We conducted our reproducibility analysis based on the paper included in the authors’ reproducibility package.
- **Verification Process and Data Handling:**
 - The reproducibility package relies on 4 types of data: open, accessible (public but not included in the reproducibility package), limited-access, and restricted data (available only from the authors).
 - Open data is included in the public reproducibility package.
 - Reviewers used data provided directly by the authors to conduct the reproducibility verification, and not all is 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 forthcoming; accessible/limited-access and restricted data can use this file to verify that the data has not been altered.
- **Reproducibility Summary:**
 - **Data:** Some data is restricted, and it is not included in the reproducibility package. For more details, please see the README file 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

Overview

- **Figure O.1** Does not show analysis results.
- **Figure O.2** Does not show analysis results.
- **Figure O.3** Does not show analysis results.
- **Figure O.4** Reproduced. Figure 3.7
- **Figure O.5** Reproduced. Figure 4.6
- **Figure O.6** Reproduced with manual changes. The o6_pollution_monitoring.R Script shows the results on the console for potential gain in life expectancy. The results on air quality are sourced from this report and incorporated into the Excel file.
- **Figure O.7** Reproduced. Figure 7.4
- **Table O.1** Does not show analysis results.
- **Figure O.8** Reproduced. Figure 8.4: Verified against standards_timeline.png and pm_plot_heavy.png. It has some formatting differences and differences in axis, but, as the numbers match, this figure is considered reproducible.
- **Figure O.9** Does not show analysis results.

Chapter 1

- **Figure 1.1** Reproduced with manual changes. The figure is constructed in Excel using publicly available information sourced from Hector Vera, “The Social Life of Measures: Metrication in the United States and Mexico, 1789–2004”, PhD dissertation, Sociology and Historical Studies, New School for Social Research, 2011, pp. 494–497.
- **Table 1.1** Figure sourced from another paper. The figure is sourced from another paper: : Crum 1910, 17–18; France, Ministère des Travaux Publics 1899; Hunter 1986; Thurston 1907, 717.
- **Figure 1.2** Reproduced. Verified against oil_spills_by_decade_final.png. The format of the figure in the paper is slightly different, but as the numbers match, this is considered fully reproducible.

Chapter 2 Does not contain analysis exhibits

Spotlight 2

- **Table S2.1** Does not show analysis results.
- **Figure S2.1 Reproduced.** Verified against *Figure_S2.1.png*. It has some formatting differences, but as the numbers match, this figure is considered reproducible.
- **Figure S2.2 Reproduced.** Verified against *Figure_S2.2.png*. It has some formatting differences, but as the numbers match, this figure is considered reproducible.
- **Table S2.2** Does not show analysis results.
- **Figure S2.3 Reproduced.** Verified against *Figure_S2.3.png*. It has some formatting differences, but as the numbers match, this figure is considered reproducible.
- **Table S2.3 Reproduced.** Verified against *TableS2.3*.

Chapter 3

- **Figure 3.1** Does not show analysis results.
- **Table 3.1** Does not show analysis results.
- **Figure 3.2** Does not show analysis results.
- **Figure 3.3 Reproduced with manual edits** The figure was fully produced in Excel using public sources to compile the data. The figure shown in the Excel file matches the figure in the paper, with some formatting differences that do not affect reproducibility.
- **Figure 3.4** Does not show analysis results.
- **Figure B3.3.1** Does not show analysis results. Source: Kellermann 2019a
- **Figure 3.5 Reproduced.** Verified against *Figure 3_5_with_data_points.png*.
- **Figure 3.6 Reproduced with manual edits** The figure was fully produced in Excel using data from the Survey for National Standards Bodies. The figure shown in the Excel file matches the figure in the paper, with some formatting differences that do not affect reproducibility.
- **Figure 3.7 Reproduced with manual edits** The figure was fully generated in Excel using data from the Survey for National Standards Bodies. The Excel output matches the figure presented in the paper, with only minor formatting differences that do not affect reproducibility. There is a small discrepancy in the lower-middle-income category under “Other,” where the paper reports 23 while the Excel output shows 24. This difference is likely due to rounding and does not jeopardize reproducibility.
- **Figure 3.8** Does not show analysis results.
- **Figure 3.9 Reproduced.** Verified against *Figure 3.9*. Figure has some formatting differences, but as the numbers match, this figure is considered reproducible.
- **Figure 3.10 Reproduced.** Verified against *Figure 3_10*. Figure has some formatting differences, but as the numbers match, this figures is considered reproducible.

- **Figure 3.11 Reproduced with manual edits** The figure was fully produced in Excel using public sources to compile the data. The figure shown in the Excel file matches the figure in the paper, with some formatting differences that do not affect reproducibility.
- **Figure 3.12** Does not show analysis results.
- **Figure 3.13** Does not show analysis results.
- **Figure 3.14** Does not show analysis results.

Spotlight 3

- **Table S3.1** Does not show analysis results.
- **Figure S3.1 Reproduced.** Figure has some formatting differences, but as the numbers match, this figure is considered reproducible.
- **Table S3.2** Does not show analysis results.
- **Figure S3.2 Reproduced.** Figure has some formatting differences, but as the numbers match, this figure is considered reproducible.
- **Figure S3.3 Reproduced.** Figure has some formatting differences, but as the numbers match, this figure is considered reproducible.
- **Figure S3.4 Reproduced.** The figure has some formatting differences, but since the numbers match, it is considered reproducible.
- **Figure S3.5 Reproduced.** The figure has some formatting differences, but since the numbers match, it is considered reproducible.

Chapter 4

- **Figure 4.1 Reproduced.** Panel A verified against Exporter_v_Nonexporter_share_adopters_GDPpk_LastY_q; Panel B verified against Exporter_v_Nonexporter_share_adopters_GQII_LastY_q. The figure has some formatting differences, but since the numbers match, it is considered reproducible.
- **Table 4.1** Does not show analysis results.
- **Figure 4.2 Reproduced.** Verified against logsales_incomegroup. The figure has some formatting differences, but since the numbers match, it is considered reproducible.
- **Table 4.2** Does not show analysis results.
- **Figure 4.3 Reproduced.** Verified against standard_size. The figure has some formatting differences, but since the numbers match, it is considered reproducible.
- **Figure 4.4 Reproduced.** Verified against export_quality_by_country. The figure has some formatting differences, but since the numbers match, it is considered reproducible.
- **Figure 4.5** Does not show analysis results.

- **Figure 4.6 Reproduced.** The figure has some formatting differences, but since the numbers match, it is considered reproducible.
- **Figure 4.7 Reproduced.** The figure has some formatting differences, but since the numbers match, it is considered reproducible.
- **Figure 4.8 Reproduced.** The figure has some formatting differences, but since the numbers match, it is considered reproducible.
- **Figure 4.9 Reproduced.**
- **Figure 4.10 Reproduced.** The figure has some formatting differences, but since the numbers match, it is considered reproducible.
- **Figure B4.6.1 Reproduced.**
- **Figure 4.11** Does not show analysis results.

Spotlight 4

- **Figure S4.1 Reproduced.** The figure has some formatting differences, but as the numbers seem to match, this figure is considered reproducible.
- **Figure S4.2 Reproduced.** Verified against `findex_SSA_ID_MMbars.png`. The figure has some formatting differences, but as the numbers seem to match, this figure is considered reproducible.

Chapter 5

- **Figure 5.1 Reproduced, includes manual changes.** This figure was fully produced in Excel using information from publicly available sources. The numerical values in the Excel file match those presented in the figure in the paper, although the formatting and colors differ. These visual differences do not affect reproducibility.
- **Figure 5.2 Reproduced, includes manual changes.** This figure was fully produced in Excel using information from a forthcoming paper. The numerical values in the Excel file match those presented in the figure in the paper, although the formatting and colors differ. These visual differences do not affect reproducibility.
- **Figure 5.3 Reproduced.** The figure has some formatting differences; the figure produced by the code is larger, and therefore points are more spread out, but as the numbers seem to match, this figure is considered reproducible.
- **Figure 5.4 Reproduced.** Figure is sourced from : Bedoya, Das, and Dolinger 2023. Available [here](#)
- **Figure 5.5 Reproduced.** Figure was verified against `Fig_5.5_toilet.png`. It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.
- **Figure 5.6 Reproduced, includes manual changes.** This figure was fully produced in Excel using information from publicly available sources. The numerical values in the Excel file match those presented in the figure in the paper, although the formatting and colors differ. These visual differences do not affect reproducibility.

Chapter 6

- **Map 6.1 Reproduced.** Verified against *Map6_1.png*
- **Figure 6.1 Reproduced.** Figure was verified against *fig6_1* . It has some formatting differences, but as the numbers match, this figure is considered reproducible.
- **Figure 6.2a Reproduced.** Figure was verified against *fig6_2a* . It has some formatting differences, but as the numbers match, this figure is considered reproducible.
- **Figure 6.2b Reproduced.** Figure was verified against *fig6_2b* . It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.
- **Figure 6.3 Reproduced.** Figure was verified against *fig6_3* . It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.
- **Figure 6.4a Reproduced.** Figure was verified against *fig6_4a*. It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.
- **Figure 6.4b Reproduced.** Figure was verified against *fig6_4b*. It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.
- **Figure 6.5 Reproduced.** Figure was verified against *fig6_5*. It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.
- **Figure 6.6a Reproduced.** Figure was verified against *WDR_fig_6_6*. It has some formatting differences, but as the numbers match, this figure is considered reproducible.
- **Figure 6.6b Reproduced.** Figure was verified against *Fig6_6b_cumulativeenum.png*. It has some formatting differences, but as the numbers match, this figure is considered reproducible.
- **Figure 6.7 Reproduced.** Figure was verified against *Fig6_7*. It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.
- **Map 6.2 Reproduced.** Verified against *Map6_2.png*
- **Map 6.3 Reproduced.** Verified against *Map6_3.png*
- **Table B6.5.1** Does not show analysis results.
- **Map 6.4 Reproduced.** Verified against *Map6_4.png*

Chapter 7

- **Figure 7.1 Reproduced.** Figure was verified against *fig_7_01_cor_gdp_vs_budgetexecution.png*. It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.
- **Figure B7.1.1 Reproduced.** Verified against *fig_7_b1_correlation_gdp_management.png*.
- **Figure 7.2 Reproduced.** Figure was verified against *fig_7_02_total_public_sector_income_group.png*. It has some formatting differences, but as the numbers match, this figure is considered reproducible.

- **Figure 7.3 Reproduced.** Figure was verified against *fig_7_03_public_sector_gdp.png*. It has some formatting differences, but as the numbers match, this figure is considered reproducible.
- **Figure 7.4 Reproduced.** Figure was verified against *fig_7_04_share_merit_institution.png*. It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.
- **Figure 7.5 Reproduced.** Figure was verified against *fig_7_05_cor_budget_transparency_vs_gdp_per_capita.png*. It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.
- **Figure 7.6 Reproduced.** Figure was verified against *fig_7_06_cor_merit_gdp.png*. It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.
- **Figure 7.7 Reproduced.** Figure was verified against *fig_7_07_compliance_gap_procurement.png*. It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.
- **Figure 7.8a Reproduced.** Figure was verified against *fig_7_08a_dejure_stringency.png*. It has some formatting differences, but as the numbers match, this figure is considered reproducible.
- **Figure 7.8b Reproduced.** Figure was verified against *fig_7_08b_share_firms_paidontime.png*. It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.
- **Figure 7.9 Reproduced.** Figure was verified against *fig_7_09_rais_mun_hiring_cycles.png*. It has some formatting differences, but as the numbers match, this figure is considered reproducible.
- **Map 7.1 Reproduced.** Figure was verified against *map_7_1_brazil_mun_procurement_delays.png*.
- **Figure 7.10 Reproduced.** Figure was verified against *fig_7_10_performance_motivation_mission.png*. It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.
- **Figure 7.11 Reproduced.** Figure was verified against *fig_7_11_gtmi_diffusion_mis.png*. It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.

Chapter 8

- **Table 8.1** Does not show analysis results.
- **Figure 8.1** Does not show analysis results.
- **Figure 8.3** Does not show analysis results.
- **Figure 8.4 Reproduced.** Verified against *standards_timeline.png* and *pm_plot_heavy.png*. It has some formatting differences and differences in axis, but as the numbers match, this figure is considered reproducible.

Reproduction Environment

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

- OS: Windows 11 Enterprise
- Processor: Intel(R) Core(TM) i5-1145G7 CPU @ 2.60GHz
- Memory available: 15.7 GB
- Software version: Stata 18.5 MP, R version 4.4