



## *Electronic Payment Technology and Tax Compliance: Evidence from Uruguay's Financial Inclusion Reform*

Package ID: PP\_URY\_2023\_51-v01

María Reyes Retana

reproducibility@worldbank.org

January 19th, 2023

This review verifies the reproducibility of the exhibits included in the paper “*Electronic Payment Technology and Tax Compliance: Evidence from Uruguay's Financial Inclusion Reform*”.

### **Contents in this review:**

1. Main findings
2. Reproducibility assessment
3. List of exhibits and reproducibility status

### *Main findings*

- This reproducibility package has two components, one with private data, which needs to be run on a private server, and one with public data.
- The public part was successfully executed on a new computer after:
  1. Changing the path of the data in the Master\_public\_data.do.
  2. The code takes approximately 2 minutes to run.
  3. This part of the code reproduces exhibits Figure A.1; Figure A.9, Figure D.5, and Figure B.8.
- The private part was successfully executed on a new computer after:
  1. Requesting access to the private server.
  2. Changing the path of the data in the o\_master\_replication.do.
  3. The complete code takes approximately 3 days to run.
  4. The simplified version of the code takes 8 hours to run.
- The private part of the code was reproduced in a server, where we couldn't connect to GitHub, and therefore its stability couldn't be verified. The public part of the code shows stable results after two consecutive runs of the code.
- Every exhibit has been reproduced accurately by the provided package.

### *Reproducibility assessment*

- The public part of the code was reproduced in 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 version 17
- Private part of the code was reproduced in a private server with the following specifications:
  - OS: Windows 10 Enterprise
  - Processor: Intel(R) Xeon (R) CPU @ 2.80GHz
  - Memory available: 71.1 GB
  - Software version: Stata version 17
- We conducted our reproducibility analysis based on the paper in the package the authors shared. Our validation involved comparing the results generated by the code with the exhibits in the paper to assess their consistency.
- The authors have provided an optimized version of the code which significantly reduces the runtime to approximately 8 hours. This enhancement is primarily due to alterations in the synthetic difference-in-difference estimation (SDID) method, wherein the number of bootstrap iterations has been reduced.
- The replication process was conducted using both the optimized and the original full versions of the code. When using the full version, the standard errors were replicated exactly as in the original analysis. With the optimized version, the results were found to be very similar. For the purposes of this verification, the analysis and results are based on the extended version of the code.
- The majority of the exhibits verified were produced by the private part of the code, which would require access to a private server. A replicator seeking to reproduce all the exhibits would need access to said server. The exhibits that can be reproduced with the public part are noted in the list of exhibits.

### *List of exhibits and reproducibility status*

#### **Results in the Main Section of the Paper**

- **Figure 1** Reproduced.
- **Figure 2** Reproduced.
- **Figure 3** Reproduced with manual steps. - For panel C1 manual changes specified in the README are required.
- **Figure 4** Reproduced.
- **Table 1:** Reproduced.

### Results in the Online Appendix

- **Table A.1** Does not show analysis results.
- **Table A.2** Does not show analysis results.
- **Table A.3** Reproduced.
- **Figure A.1** Reproduced by public part of the code.
- **Figure A.2** Does not show analysis results.
- **Figure A.3** Reproduced.
- **Figure A.4** Does not show analysis results.
- **Figure A.5** Does not show analysis results.
- **Figure A.6** Does not show analysis results.
- **Figure A.7** Reproduced.
- **Figure A.8** Does not show analysis results.
- **Figure A.9** Reproduced by public part of the code.
- **Figure A.10** Reproduced.
- **Figure B.1** Reproduced.
- **Figure B.2** Reproduced.
- **Figure B.3** Reproduced.
- **Figure B.4** Reproduced.
- **Figure B.5** Reproduced.
- **Figure B.6** Reproduced.
- **Figure B.7** Reproduced.
- **Figure B.8** Reproduced by Public part of the code.
- **Figure B.9** Reproduced.
- **Figure B.10** Reproduced.
- **Table B.1** Reproduced.
- **Table B.2** Reproduced.
- **Table B.3** Reproduced.
- **Table B.4** Reproduced.

- **Table B.5** Reproduced.
- **Table B.6** Reproduced.
- **Figure B.11** Reproduced.
- **Figure B.12** Reproduced.
- **Figure B.13** Reproduced. To exactly replicate this figure, the number of bootstrap iterations was changed, as specified in the README.
- **Figure B.14** Reproduced. To exactly replicate this figure, the number of bootstrap iterations was changed, as specified in the README.
- **Table C.1** Reproduced.
- **Table C.2** Reproduced. To exactly replicate this figure, the number of bootstrap iterations was changed, as specified in the README.
- **Table C.3** Reproduced. To exactly replicate this figure, the number of bootstrap iterations was changed, as specified in the README.
- **Figure C.1** Reproduced. To exactly replicate this figure, the number of bootstrap iterations was changed, as specified in the README.
- **Table C.4** Reproduced.
- **Table C.5** Reproduced.
- **Table C.6** Reproduced. To exactly replicate this figure, the number of bootstrap iterations was changed, as specified in the README.
- **Figure C.2** Reproduced with manual steps. Manual changes specified in the README are required.
- **Table C.7** Reproduced. To exactly replicate this figure, the number of bootstrap iterations was changed, as specified in the README.
- **Figure C.3** Reproduced.
- **Figure C.4** Reproduced.
- **Figure C.5** Reproduced.
- **Figure C.6** Reproduced. To exactly replicate this figure, the number of bootstrap iterations was changed, as specified in the README.
- **Table C.8** Reproduced.
- **Figure D.1** Reproduced.
- **Figure D.2** Reproduced.
- **Figure D.3** Reproduced.

- **Figure D.4** Reproduced.
- **Figure D.5** Reproduced by public part of the code.
- **Figure D.6** Reproduced.
- **Table E.1** Reproduced.
- **Table E.2** Reproduced.
- **Table E.3** Reproduced.
- **Table E.4** Reproduced.