

Overview

This describes the materials included in the replication package for “The Role of Market Frictions in Demand for Prepaid Electricity” by Megan Lang. It describes how the code produces the output in the paper and, for selected results, how to access the data needed to replicate the results in both the main paper and the appendix.

Data Availability

Some data cannot be made publicly available.

Data Sources

There are three data sources used in the paper, described below.

Administrative data from BBOX Ltd: 1) Customer-level data on system size adopted, date of adoption, who was offered the line of credit, borrowing from the line of credit, and all customer payments in the study period. These data start in July, 2019 and continue through February, 2020. The customer-level data is proprietary and can only be obtained by signing a data sharing agreement with BBOX Ltd.

Nationally representative data for Rwanda: 2) The Integrated Household Living Conditions Survey from 2017 can be located at <https://www.statistics.gov.rw/datasource/integrated-household-living-conditions-survey-eicv>. Note that this household survey is comprehensive and the paper uses a relatively small subset of the datasets included in the .zip file. Below, the source, URL, and access year are common for all datasets listed that are used in producing outputs in the paper.

- **Source:** National Institute of Statistics Rwanda
- **URL:** <https://www.statistics.gov.rw/datasource/integrated-household-living-conditions-survey-eicv>
- **Access year:** 2020
- **Filename 1:** cs_S0_S5_Household.dta
- **Filename 2:** cs_S1_S2_S3_S4_S6A_S6E_Person.dta
- **Filename 3:** cs_S8A3_expenditure.dtasla
- **Filename 4:** cs_S8B_expenditure.dta

Phone survey data: 3) Data from two phone surveys conducted with BBOX customers, one in winter 2019 and the other with treated customers in the fall. The anonymized versions of these surveys can be downloaded at <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/ATY3PU>. There are two files included:

- **Filename 1:** ipa_sur.csv
- **Filename 2:** TmtMM.csv

The first file contains survey data from a phone survey conducted with randomly selected customers in winter 2019. The second contains information from one follow-up call made by the solar company to customers in the RCT treatment group, which asks how long it takes them to reach the nearest mobile money agent.

Instructions for Replicators

New users should follow these steps to run the package successfully: - Users must first download all listed data from the World Bank Microdata Library and the Harvard Dataverse. They should go to the mentioned links, download the listed files, and place them in the Data folder.

- Ensure all required software and dependencies are installed as listed in lines 7-17 of ‘Replication - non-proprietary data.R’.
- Run ‘Replication - non-proprietary data.R’.

List of Exhibits

The script ‘Replication - non-proprietary data.R’ reproduces only tables and figures in the paper that rely on publicly available data. However, the script ‘Replication - proprietary data.R’ details all data cleaning and analysis for results produced using the proprietary data from the solar company, should a researcher obtain access to the proprietary data independently.

Exhibit name	Output filename	Script	Notes
Figure 1	TU.png	‘Replication - proprietary data.R’, Line 281	Relies on proprietary data
Figure 2	Elas_Plot.png	‘Replication - proprietary data.R’, Line 320	Relies on proprietary data
Figure 3	UR.png	‘Replication - proprietary data.R’, Line 418	Relies on proprietary data
Figure 4	Repo.png	‘Replication - proprietary data.R’, Line 507	Relies on proprietary data
Figure 5	NT.png, TS.png, WH.png	‘Replication - proprietary data.R’, Line 627	Relies on proprietary data
Figure A1	Appliances.png	‘Replication - proprietary data.R’, Line 680	Relies on proprietary data
Figure A2	EICV_Exp.png	‘Replication - non-proprietary data.R’, Line 83	
Figure A3	MMDist.png	‘Replication - non-proprietary data.R’, Line 96	
Figure A4	Ntrans_Pre.png, Meantrans_Pre.png	‘Replication - proprietary data.R’, Line 692	Relies on proprietary data
Figure A5	Time_MM_ToPay.png	‘Replication - non-proprietary data.R’, Line 122	
Figure A6	MMKnow.png	‘Replication - proprietary data.R’, Line 711	Relies on proprietary data
Figure A7	TenureDR.png	‘Replication - proprietary data.R’, Line 737	Relies on proprietary data
Figure A8	EICV_Comp.png	‘Replication - proprietary data.R’, Line 956	Relies on proprietary data
Figure A9	Util_Dist.png	‘Replication - proprietary data.R’, Line 969	Relies on proprietary data
Figure A10	Elas_Plot_SD.png	‘Replication - proprietary data.R’, Line 980	Relies on proprietary data
Figure A11	UR_SD.png	‘Replication - proprietary data.R’, Line 1037	Relies on proprietary data

Exhibit name	Output filename	Script	Notes
Figure A12	cum_totals.png	‘Replication - proprietary data.R’, Line 1070	Relies on proprietary data
Figure A13	valtime.png	‘Replication - proprietary data.R’, Line 1084	Relies on proprietary data
Figure A14	Dynamic_UR.png	‘Replication - proprietary data.R’, Line 1111	Relies on proprietary data
Figure A15	Dynamic_NT.png	‘Replication - proprietary data.R’, Line 1134	Relies on proprietary data
Table A1	balance.tex	‘Replication - proprietary data.R’, Line 1167	Relies on proprietary data
Table A2	tu_desc_updated.tex	‘Replication - proprietary data.R’, Line 1280	Relies on proprietary data
Table A3	robustness.tex	‘Replication - proprietary data.R’, Line 1328	Relies on proprietary data
Table A4	robustnessDemand.tex	‘Replication - proprietary data.R’, Line 1377	Relies on proprietary data

Requirements

Software Requirements

- **R version 4.3.0**

Memory and Runtime and Storage Requirements

Runs in under 10 minutes.

Folder Structure

Unzip the data folder provided when downloading the Integrated Household Living Standard Survey from the National Institute of Statistics Rwanda website. Save the resulting folder under the “Data” folder in the replication package. Open the code file directly from the directory. Doing so ensures that the filepaths will automatically be set such that the code runs.