

README for the Reproducibility Package for A Global Incentive Scheme to Reduce Carbon Emissions

This folder contains the reproducibility package for the Working Paper “A Global Incentive Scheme to Reduce Carbon Emissions” by Somik V. Lall, Raghuram Rajan, and Christian Schoder.

Software Requirements

R and R-Studio (code was last run with version 2022.07.2) were used to generate the results. Note that R-Studio automatically detects missing libraries when the scrip is opened. These missing libraries need to be installed: *tidyverse*, *writexl*, *zoo*, *plm*, *stargazer*, *readxl*, *wooldridge*, *countrycode*.

Once the libraries are installed, the file “*Lall_Rajan_Schoder_2024_Tables.Rmd*” will reproduce the results.

An optional environment file for *renv* is also included. This will allow replicators to recreate the exact environment in which results are guaranteed to be reproduced. To enable the optional environment, follow these steps:

1. install the package *renv*,
2. open the RStudio project file “*reproducibility package.Rproj*” in RStudio,
3. run the code: *renv::restore()* . If prompted to install any package, reply Yes.

Version 1.0.3 of *renv* was used to create the environment, though other version might also work.

Memory and Runtime Requirements

The code was last run on a Windows 11 laptop with 12GB of RAM.

The R script takes approximately 1 minute to run (once all required libraries have been installed).

Instructions to Replicators

The script produces the complete versions of the tables included in the the working paper. Note that each table included in the working paper reports a subset of the information contained in the corresponding table produced by the script. To execute the script, simply open it in R-Studio, make sure all libraries are installed, and “knit” the output. This will produce all the tables in pdf and xlsx formats, respectively. The file names indicate which output corresponds to which table in the working paper:

Lall_Rajan_Schoder_2004_Table_3.xlsx -> Table 3

Lall_Rajan_Schoder_2004_Annex_Table_A.xlsx -> Table 1 & Annex Table A

Lall_Rajan_Schoder_2004_Annex_Table_B.xlsx -> Table 2 & Annex Table B

Lall_Rajan_Schoder_2004_Annex_Table_C.xlsx -> Annex Table C

Lall_Rajan_Schoder_2004_Annex_Table_D.xlsx -> Annex Table D

Lall_Rajan_Schoder_2024_Tables.pdf -> Annex Table 1

Data Input

The script reads the following data files:

owid-co2-data.csv

Full dataset of CO2 emissions provided by Our World In Data: <https://ourworldindata.org/co2-emissions>

WDIData.csv

World Development Indicators provided by the World Bank:

<https://databank.worldbank.org/source/world-development-indicators>

Mean_pr_tmp.xlsx

Data on mean precipitation and temperature provided by Climate Change Knowledge Portal:

<https://climateknowledgeportal.worldbank.org/sub-page-types/country-summary/climate-data-historical-1>

country-coord.csv

Country coordinates provided by Ferlet (2021):

<https://gist.github.com/metal3d/5b925077e66194551df949de64e910f6>

Carbon content.xlsx

Global Forest Resources Assessment 2010 by the Food and Agriculture Organization of the United Nations: <https://www.fao.org/forest-resources-assessment/past-assessments/fra-2010/en/> (global tables)