README for Reproducibility Packages

Project Overview

The reproducibility package reproduces the figures and tables of the paper “CLIMATE POLICIES AND THEIR IMPACT ON DEVELOPING COUNTRIES’ TRADE” by Maryla Maliszewska, Iryna Sikora, Paul Brenton, Vicky Chemutai, and Maksym Chepeliev. Scripts required to reproduce the results in the paper using the raw datasets are located in the categorized folders and generate outputs that are saved under the folder ‘Output’.

Data Availability Statement & Provenance Statements

□ This paper does not involve analysis of external data (i.e., no data are used or the only data are generated by the authors via simulation in their code).

Statement about Rights

☒I certify that the author(s) of the manuscript have legitimate access to and permission to use the data used in this manuscript.

□ I certify that the author(s) of the manuscript have documented permission to redistribute/publish the data contained within this replication package.

Summary of Availability

- ☐ All data are publicly available.
- ☒ Some data cannot be made publicly available.
- ☐ No data can be made publicly available.

CO2 emission intensity data were purchased under the contract with the GTAP center. We do not have a license to disclose raw trade data and raw tariff data obtained from the World Bank’s WITS. CO2 emission intensity data is made available exclusively for this research project through the corresponding author and the GTAP center. While at the time of the writing, we cannot share the data for other projects, we can provide access for replication purposes of this study (conditional on the signing of a confidentiality agreement and a security agreement). Individuals interested in accessing the data for replication purposes can contact Maryla Maliszewska (Mmaliszewska@worldbank.org). We will provide reasonable assistance with requests for clarification and replication.

Details on each Data Source

We list the sources of raw data, where to download them, and their names. We extract the needed data for analysis from the source, cleaned them, and maintain the folder structure for easy replication. While we provide some raw data, we lack the license to publish all files. The ones in red are not publicly available.

Data Sources Availability

1. **Gatun Lake Water Level History.xlsx: It is historical water level of Lake Gatun, downloaded from** https://evtms-rpts.pancanal.com/eng/h2o/index.html. The source is World Bank and Panama Canal Authority. Accessed on January 22, 2025.

- **Dashboard_rawdata.xlsx in Data\Exposure folder:** Advanced Query in Trade Data **(**UN COMTRADE) in World Integrated Trade Solution (https://wits.worldbank.org/WITS/WITS/AdvanceQuery/RawTradeData/QueryDefinition.aspx?Page=RawTradeData). To replicate the parameters of the search, please use the HS codes in the tab ***list*** of "Data/Exposure/Dashboard_rawdata.xlsx" file to insert the codes in ProductCodes. Accessed in 2024.

    - Tab ff: choose HS2022 in the Nomenclature, insert fossil fuel related HS codes identified in ProductCodes, select All, China, the EU-UK and the US in ReporterNames, select every country in PartnerNames, select 2022 in Year and select Import in TradeFlowName.

    - Tab cm: choose HS2017 in the Nomenclature, insert critical minerals related HS codes identified in ProductCodes, select All, China, the EU-UK and the US in ReporterNames, select every country in PartnerNames, select 2022 in Year and select Import in TradeFlowName.

    - Tab ev: choose HS2022 in the Nomenclature, insert EV related HS codes identified in ProductCodes, select All, China, the EU-UK and the US in ReporterNames, select every country in PartnerNames, select 2022 in Year and select Import in TradeFlowName.

    - Tab ev comp: choose HS1996 in the Nomenclature, insert EV components related HS codes identified in ProductCodes, select All, China, the EU-UK and the US in ReporterNames, select every country in PartnerNames, select 2022 in Year and select Import in TradeFlowName.

    - Tab battery: choose HS2022 in the Nomenclature, insert EV batteries related HS codes identified in ProductCodes, select All, China, the EU-UK and the US in ReporterNames, select every country in PartnerNames, select 2022 in Year and select Import in TradeFlowName.

    - Tab renewable: choose HS1996 in the Nomenclature, insert renewables and components related HS codes identified in ProductCodes, select All, China, the EU-UK and the US in ReporterNames, select every country in PartnerNames, select 2022 in Year and select Import in TradeFlowName.

    - Tab eudr: choose HS2017 in the Nomenclature, insert EUDR related HS codes identified in ProductCodes, select All and the EU-UK in ReporterNames, select every country in PartnerNames, select 2022 in Year and select Import in TradeFlowName.

- **GHG_EI_CBAM.dta and trade ouput.dta:** Datasets from Chepeliev and Corong (2022) and Chepeliev et al. (2022) is obtained under the contract between the GTAP center and the World Bank as the GTAP database is commercially available. The raw data is not available for the public while the processed data is available for reproducibility. If WB staff are interested in getting the entire dataset of GTAP database, please contact Senior Economist Maryla Maliszewska in ETIRI, mmalizsewska@worldbank.org. If non-WB staff are, please go to this website

https://www.gtap.agecon.purdue.edu/databases/pricing.asp and contact the GTAP center contactgtap@purdue.edu.

- **WITS_HS2017_Bilateral_2022.xlsx:** Query on UN COMTRADE database executed through World Integrated Trade Solution (https://wits.worldbank.org/WITS/WITS/AdvanceQuery/RawTradeData/QueryDefinition.aspx?Page=RawTradeData). To replicate the parameters of the search, please choose HS2017 in the Nomenclature, insert the list of HS codes identified from the annex 1 of CBAM legislation in ProductCodes, select every country excluding European Union in ReporterNames, select every country in PartnerNames, select 2022 in Year and select Import in TradeFlowName.

- **gdp.dta in 'CBAM folder' and GDP.dta in 'Exposure folder':** 2022 GDP (current US$) data is obtained from World Bank WDI in 2024. https://databank.worldbank.org/source/world-development-indicators Gross domestic product (current prices U.S. dollars) of Taiwan, Venezuela, Eritrea, and South Sudan data is from IMF World Economic Outlook in 2024. https://www.imf.org/en/Publications/WEO/weo-database/2024/October/select-country-group

- **ISO_Region_Income.dta in 'CBAM folder', ISO_Region_Income1.dta in 'Exposure folder' and WB_Class.dta in 'DTA folder', ISO_Region_Income.dta in 'GVC folder':** This is based on World Bank's country classification. Link is here.

- **Carbon price.xlsx**: This is the data from World Bank's Carbon Pricing Dashboard. https://carbonpricingdashboard.worldbank.org/

- **DTA 1.0 - Horizontal Content (v2).xlsx and DTA 2.0 - Vertical Content (v2).xlsx:** This is collected from World Bank's Deep Trade Agreement dashboard. https://datatopicsqa.worldbank.org/dta/dashboard.html

- **TC2_EG tariff.xlsx**: This is collected from World Bank's WITS. Data is downloaded from the World Ban's WITS using the HS codes from the APEC list of environmental goods (https://www.apec.org/meeting-papers/leaders-declarations/2012/2012_aelm/2012_aelm_annexc.) Replicators can choose Total trade in ProductTree and insert HS combined in the Nomenclature, insert HS codes identified in ProductCodes, select every country in ReporterNames, select World in PartnerNames, select 2016 through 2023 in Year and select Import in TradeFlowName.

- **Trade.xlsx, Output.xlsx and Emissions.xlsx**: The dataset is obtained under the contract between the GTAP center and the World Bank as the GTAP database is commercially available. If you are interested in getting the entire dataset of GTAP database, please go to this website https://www.gtap.agecon.purdue.edu/databases/pricing.asp and contact the GTAP center contactgtap@purdue.edu.

- **indicators_csgroup_c_1990_2021.dta:** This raw dataset is obtained from the authors of Direct and Indirect trade Indicators. Arvis, J-F, A Burman, Espitia, J-C Maur, D. Rocha, D. Ulybina (2024), "Measuring Exposure and Vulnerability to International Shocks," https://wwwstg.worldbank.org/en/programs/trade-exposure/direct-and-indirect-trade-indicators/eora

- **sec_des.dta:** This is sourced from the EORA database website. The Eora26structure.xlsx file on the website is utilized to create this dta file. https://worldmrio.com/countrywise/

- **GTAP Sectors Exports and Emissions.xlsx**: Datasets from Chepeliev and Corong (2022) and Chepeliev et al. (2022) is obtained under the contract between the GTAP center and the World Bank as the GTAP database is commercially available. The raw data is not available for the public while the processed data is available for reproducibility. If WB staff are interested in getting the entire dataset of GTAP database, please contact Senior Economist Maryla Maliszewska in ETIRI, mmalizsewska@worldbank.org. If non-WB staff are, please go to this website.

Data Sources Availability

'Data' folder	Filename	Description	Notes
Data folder	Gatun Lake Historical Water Levels.xlsx	World Bank and Panama Canal Authority	Public
Data folder	GTAP Sectors Exports and Emissions.xlsx	GTAP emission and export data	Commercially available.
Exposure folder	Dashboard_rawdata.xlsx	Import from Reporting countries to Partner countries by selected HS codes in 2022.	Confidential due to no license
	GDP.dta	Processed dataset at country level and USD current price in 2022	Public
	ISO_Region_Income1.dta	World Bank country classification in 2024	Public
CBAM folder	WITS_HS2017_Bilateral_2022.xlsx	Raw dataset providing imports of reporting countries form partner countries in 2022, using HS2017 nomenclature.	Confidential due to no license
	gdp.dta	Processed dataset at country level and USD current price in 2022	Public
	GHG_EI_CBAM.dta	Processed dataset that provides CO2 emission intensity of aluminum, cement, fertilizer and iron and steel in 2017.	Commercially available.
	trade output.dta	Processed dataset that provides 2017 output and export data at country and sector level.	Commercially available
	ISO_Region_Income.dta	World Bank country classification in 2024	Public
	carbon price.xlsx	Raw data from World Bank carbon pricing dashboard at country and sub-regional level	Public
DTA folder	DTA 1.0 - Horizontal Content (v2).xlsx	Raw data that provides countries with trade agreements and provisional information by country and year	Public
	DTA 2.0 - Vertical Content (v2).xlsx		Public
	WB_Class.dta	World Bank country classification in 2024	Public
EG tariff	TC2_EG tariff.xlsx	Raw data from World Bank WITS	Confidential due to no license
	ISO_Region_Income.dta	World Bank country classification in 2024	Public
GVC exposure	indicators_csgroup_c_1990_2021.dta	World Bank's Direct and Indirect trade Indicators (EORA Tableau).	Confidential
	ISO_Region_Income.dta	World Bank country classification in 2024	Public
	sec_des.dta	EORA sector description	Public

Figure5678	Trade data: File 'Trade', tab 'exp_WLD', range A1:X35 Output data: File 'Output', tab 'xp', range A1:X43 Emissions data: File 'Emi', tab 'Emi', range A1:X47	Bilateral trade data by country and sector Output data by country and sector Emissions data by country and sector	Commercially available.
Data folder	Envisage.xlsx	CGE output	Commercially available.

Note: files in red are not available publicly.

Computational Requirements

Software requirements

Required software is Stata. The code was run in version 18, but it perfectly works in any previous Stata version. The main difference between Stata 18 and older versions is the appearance of graphs. Our master do file includes a global setting that harmonizes the figure's appearances whether the code is run in version 18 or any previous one.

Memory and runtime requirements

The code was run for the last time in a Dell laptop with Windows 11 Enterprise version, 16 GB RAM, and an 11th Gen Intel ® Core™ processer. A replicator could expect the whole code to run in less than 10 minutes.

Instructions for Replicators

Folder structure

For full replication of the project, we suggest the following, complete folder structure.

1_Data
2_Code
3_Output

The code in the folder 'Code' will reproduce some of results included in the report. Please download codes from folder 'Code' and raw data from 'Data' and follow the steps.

- Open the folder and navigate to codes. Please update the directory to your own, following the code's direction.
- Run a do file to generate the underlying data to create the figures.
- All figures in the manuscript are manually created.

List of Exhibits

The provided code and data reproduce:

- ☐ All numbers provided in text in the paper

- ☒ All tables and figures in the paper
- ☐ Selected tables and figures in the paper, as explained and justified below

Table below provides a mapping between all tables of the paper (including the online appendix) and the codes producing these results.

Exhibit name	Output filename	Code	Notes
Figure E2a	Tab ES2a in TC2_Figure 10 14 15 16		Manually copy the result from the raw data generated by the code into the final figures sheets
Figure E2b	Tab ES2b in TC2_Figure 10 14 15 16		Manually copy the result from the raw data generated by the code into the final figures sheets
Figure1	Fig1.png		Built by authors
Figure2	TC2_fig2.xlsx		
Figure3	TC2_fig3.xlsx		README and Calculations in the file
Figure4	fig4.png	Screenshot	Science-Based Targets Initiative Monitoring Report (2023), p25
Figure5	TC2_fig5 6 7 8.xlsx		README and Calculations in the file
Figure6	TC2_fig5 6 7 8.xlsx		README and Calculations in the file
Figure7	TC2_fig5 6 7 8.xlsx		README and Calculations in the file
Figure8	TC2_fig5 6 7 8.xlsx		README and Calculations in the file
Figure9	TC2_fig9.xlsx		README and Calculations in the file
Figure10	TC2_fig10 14 15 16.xlsx	exposure.do (line 8-108)	Manually copy the result from the raw data generated by the code into the final figures sheets
Figure11	TC2_fig 11 12.xlsx	cbam.do (line 8-262)	Manually copy the result from the raw data generated by the code into the final figures sheets.
Figure12	TC2_fig 11 12.xlsx	cbam.do (line 8-262)	Manually copy the result from the raw data generated by the code into the final figures sheets

Figure13	TC2_fig13	gvc.do	Manually copy the result from the raw data generated by the code into the final figures sheets
Figure14	TC2_fig10 14 15 16.xlsx	exposure.do (line 8-108)	Manually copy the result from the raw data generated by the code into the final figures sheets
Figure15	TC2_fig10 14 15 16.xlsx	exposure.do (line 8-108)	Manually copy the result from the raw data generated by the code into the final figures sheets
Figure16	TC2_fig10 14 15 16.xlsx	exposure.do (line 8-108)	Manually copy the result from the raw data generated by the code into the final figures sheets
Figure17	Fig17.png		Built by authors
Figure18	TC2_fig18.xlsx	cbam.do (line 263-273)	Manually copy the result from the raw data generated by the code into the final figures sheets
Figure19	Fig19.png	Screenshot	Singh and Bacher (2015), p13
Figure20	TC2_fig20.xlsx	eg tariff.do (line80-110)	Manually copy the result from the raw data generated by the code into the final figures sheets
Figure21	TC2_fig21.xlsx	dta.do	Manually copy the result from the raw data generated by the code into the final figures sheets
Figure A1	TC2_figA1.xlsx		README in the file.

Description of programs and code

The project is organized as follows. First, we use the raw data files to create the datasets used in the analysis. The replicator can adjust the links in these files centrally without needing to adjust the (relative) paths in the specific cleaning or analysis parts. Moreover, the master do-file installs all packages needed in the project that are downloaded from SSC.

Creation of data sets for analysis

- master.do

    - exposure.do
    - cbam.do
    - eg tariff.do
    - dta.do
    - gvc.do
- This do-file takes raw and processed datasets to produce the analyzed data to create figures.

Inputs:
$main\Data\CBAM\gdp.dta
$main\Data\CBAM\GHG_EI_CBAM.dta
$main\Data\CBAM\ISO_Region_Income.dta
$main\Data\CBAM\trade output.dta
$main\Data\CBAM\carbon price.xlsx
$main\Data\CBAM\WITS_HS2017_Bilateral_2022.xlsx
$main\Data\DTA\WB_Class.dta
$main\Data\DTA\ DTA 1.0 - Horizontal Content (v2).xlsx
$main\Data\DTA\ DTA 2.0 - Vertical Content (v2).xlsx
$main\Data\DTA\WB_Class.dta
$main\Data\EG tariff\TC2_EG tariff.xlsx
$main\Data\EG tariff\ISO_Region_Income.dta
$main\Data\Exposure\ISO_Region_Income1.dta
$main\Data\Exposure\GDP.dta
$main\Data\Exposure\Dashboard_rawdata.xlsx
$main\Data\Figure5678\Emi.xlsx
$main\Data\Figure5678\Trade.xlsx
$main\Data\Figure5678\Output.xlsx
$main\Data\GVC\ indicators_csgroup_c_1990_2021.dta
$main\Data\GVC\ ISO_Region_Income.dta
$main\Data\GVC\sec_des.dta

Outputs:
$main\Output\fig1.png
$main\Output\fig4.png
$main\Output\fig17.png
$main\Output\fig19.png
$main\Output\TC2_fig2.xlsx
$main\Output\TC2_fig3.xlsx
$main\Output\TC2_fig5 6 7 8.xlsx
$main\Output\TC2_fig9.xlsx
$main\Output\TC2_fig10 14 15 16.xlsx
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