Data replication for *Measuring the Macroeconomic Impact of Carbon Taxes*

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All programs are in Stata

Run master_MetcalfStock.do to replicate the results. Change the directory in this file to your local computer.

Replication files and details		
1: Creating the base dataset		
Task	**Do file**	**Output file**
Define names and IDs for countries to make them comparable across datasets	names.do	names.dta
Compile GDP data	gdp.do	gdpdata.dta
Compile carbon tax data	ctax.do	ctax_CTI.dta
Compile employment data	employment.do	employment.dta
Merge all the above data and run calculations to create the final dataset	merge and calculate 2018.do	ctax_gdp_AERPP2018.dta
2: Replication of AERPP results		
Create tables 1 and 2 for Metcalf and Stock (2020)	EUctax_IRF_AERPP.do	AERPP_Tables.xlsx
3: Appendix figure		
Create final figure	EUctax_IRF_5.do	Final figures and plots written to the "results" folder
	EUctax_IRF_CIRF_lin_tabfig.do	
master_MetcalfStock.do runs all these files and replicates the final results. Change the directory in this file to replicate the results on your device.		

*Note that there are small discrepancies from the paper results due to a rounding error in the original code.

1. Creating the base dataset:

Names
Do file: names.do
Output dataset: names.dta
Input file: names_2digit_corrected.xlsx

Corrects names and acronyms of different countries to make them comparable across datasets.

GDP data
Do file: gdp.do
Output dataset: gdpdata.dta
Replicability with 2022 data:
- Replicable, refer to the Read Me sheet in OECD_GDP.xlsx, Irish modified GNI.xlsx, and Norway_mainland_gdp.xlsx
- Need to reshape the data. Have added a do file: "Rearrange raw data.do" which does this
- For Norway's GDP data, make sure the file is arranged properly. Compare to the previous dataset.

Compiles GDP data the following datasets:

Data	File	Source
GDP deflator 2015, 2016	OECD GDP/US GDP deflator (FRED)	FRED: Implicit price deflator (A191RI1A225NBEA)
OECD PPP for each country	OECD GDP/OECD PPP	OECD PPP
Real GDP (LCU)	OECD GDP/real GDP LCU	World bank GDP constant LCU
GDP deflator in LCU, base year varies	OECD GDP/real GDP deflator LCU	World bank GDP deflator
Irish GDP	Irish modified GNI	GDP: Ireland CSO CPI: Ireland CSO
Norwegian GDP	Norway_mainland _gdp	Statistics Norway

Carbon taxes
Do file: ctax.do
Output data: ctax_CTI.dta
Replicability with 2022 data:

- These data were compiled by the authors

Compiles carbon tax data, mainly from the World Bank's carbon pricing dashboard.

Merges the following datasets:

Data	File	Source
Share of the jurisdictions' GHG emissions covered	WB_CarbonTaxData/share	Data compiled by authors based on information from the carbon pricing dashboard. Goes on to generate the share of emissions covered by carbon taxes in 2019.
Carbon tax rates in local currency	WB_CarbonTaxData/ rate_LCU	Data compiled using the carbon pricing dashboard

Employment
Do file: employment.do
Output file: emissions 2018
Input file: Total employment domestic_Thousand persons.xlsx"]
Source: Eurostat (Employment by A*10 industry breakdowns)
Replicability:
- Update the "EUarea.." variable names in global in do file

Merges total employment for the relevant countries and renames them (using names.dta) to maintain consistency with the rest of the data.

Merge and Calculate
Do file: merge and calculate 2018.do
Input files: gdpdata.dta, ctax_CTI.dta, employment.dta
Output: ctax_gdp_2018, ctax_gdp_AERPP2018
Replicability:
- Update the variable names
This file merges all the above datasets, modifies them, and creates the final dataset for calculations.

2. Replication of AERPP results
Input: ctax_gdp_AERPP.dta
Output: AERPP_results.xlsx (Table 2)

Replicates the results for Metcalf and Stock (2020).

Do files:
- EUctax_IRF_AERPP.do: This is the main program.
- EUctax_IRF_AERPP_out_r1.do: formatting and writing output, called by main file

NOTE: In March 2020 we found a data bug that makes minor changes to some EU2 results. So, the EU2 results in the out\AERPP_results.xlsx spreadsheet don't match Table 2 exactly for EU2, although they do match for the CT20 countries (countries with CT >= $20). There are no qualitative changes. For example, the upper left estimate in Table 2 is 0.10 (SE = 0.43). Using the corrected data, the result is (0.14) (SE = 0.41).

3. Appendix figure

Input: ctax_gdp_AERPP.dta
Output tables and figures stored in stata/results.
These files create the final figures and tables:
- EUctax_IRF_5.do: produces linear IRF plots
- EUctax_IRF_CIRF_lin_tabfig.do: called by EUctax_IRF_5.do

The version in the replication file only runs the results for the full data set ("EU+").

Other notes for these files:
- Levels/differences option controls whether long run effect of the tax on the growth of the variable is 0 (parallel path)
- IRFs are the effect of the tax increase on the growth rate of the dependent variable
- Intervention is an increase of $40, held at that level, covering 30% of emissions (as in the paper)