Replication of "Fiscal Drag in Theory and in Practice: a European Perspective"

The replication package is stored in:
https://github.com/garcia-miralles/replicationFiscalDragEurope

The replication package contains this README.pdf file as well as (A) the files that replicate the results of the paper and the online appendices. (B) a description of the data used and how to obtain it. (C) step-by-step instructions to run the entire analysis.

A. Files

A1. for the replication of the paper, appendix A and online appendix D:

- The file **CountriesXML.zip** contains all our programming based on the EUROMOD software (there is one folder for each of the 21 countries considered). It can be downloaded as a Github release: https://github.com/garcia-miralles/replicationFiscalDragEurope/releases/tag/v1.0.0
- The file **Master_Template_Figures_Tables.xlsx** that creates the Figures and Tables.

A2. for the replication of online appendix C:

- The **do_files_online_appendix.zip** file that contains all Stata programs (a total of 5 do files) that read the data and produce the Figures.

B. Data:

We cannot directly provide the data used in this analysis, as these are proprietary to Eurostat and the Spanish Tax Agency. Below, we describe the data used and how to request access.

B1. for the replication of the paper, appendix A and online appendix D:

The analysis uses the 2020 input data of EUROMOD, which is based on the EU-SILC (the European Union Survey of Income and Living Conditions). Access to EUROMOD input data is described in the data section of this link: https://euromod-web.jrc.ec.europa.eu/download-euromod#section-3390 which explains that a valid Research Project Proposal (RPP) approved by Eurostat is needed. A form to request access can be found at this link: https://euromod-web.jrc.ec.europa.eu/download-euromod/data-request-form?version=all. Contact information for data access: JRC-EUROMOD@ec.europa.eu

The data versions used for each country are the following:

- AT_2020_b2
- BE_2020_c2
- CY_2020_b2
- DE_2020_b1
- EE_2020_f1
- EL_2020_c2
- ES_2020_b1
- FI_2020_b1
- FR_2020_c2
- HR_2020_b3
- HU_2020_b1

- IE_2020_b1
- IT_2020_b1
- LT_2020_a1
- LU_2019_a1
- LV_2020_b2
- MT_2020_b1
- NL_2020_b2
- PT_2020_a1
- SK_2020_b1
- SI_2020_c2

B1. for the replication of the Online Appendix C:

The online appendix used three datasets.

- The first dataset "es_2019_std.txt" is produced automatically from EUROMOD after running the main analysis, as described later in Section C.
- The second dataset "es_2019_inc1_std.txt" is equally produced after running EUROMOD.
- The third dataset uses administrative tax records. The data, provided by the Spanish Tax Agency and the "*Instituto de Estudios Fiscales*" is described here: https://sede.agenciatributaria.gob.es/Sede/en_gb/estadisticas/muestras-datos-fiscales/panel-hogares.html and the instruction to request the data (in Spanish) are here: https://www.ief.es/Investigacion/Est_panelHogares.vbhtml

C. Step-by-step instructions:

C1. for the replication of the paper:

1. EUROMOD software and model

The analysis is conducted using EUROMOD model, an open-source software hosted by the European Commission that simulates the tax-benefit systems of all 27 EU Member States. It can be downloaded from this link: https://euromod-web.jrc.ec.europa.eu/download-euromod#section-3386

To replicate our analysis, download EUROMOD model version I.6.0+ and software version 3.7.6 from the EUROMOD website. These specific versions can be accessed through the "Software archive – all versions" and "Model archive – all versions" sections of the download area. Any version of the model or of the software more recent than those indicated would still be able to produce the correct results, however, some warnings may arise when running the model.

2. Running the analysis

2.1. Add our programs (XML parameters)

After downloading EUROMOD, open the folder "EUROMOD_RELEASES_I6.0+", and then the folder "XMLParameter". Empty the content of the folder "Countries" and replace it with the content of the file **XML.zip** included in this package. It contains 21 country folders, one for each country.

2.2. Add the data

Store the EUROMOD input data in the folder called "Input".

2.3. Run all simulations

Open EUROMOD and access its interface, which will include the spines of each of the countries tax and benefit systems provided in our xml files. The EUROMOD software allows you to run the analysis sequentially, for each country. Each country contains a column for each simulation used in the paper, as described below.

2.3.1. Results of Section 4 of the paper (fiscal drag in theory)

To replicate the results of Section 4, run with EUROMOD the following systems, where CC stands for the country code (for example DE for Germany or PT for Portugal):

- CC_2019
- CC_2019_inc1
- CC_2019_inc1_upd1
- CC_2019_inc1_upd1_back
- CC_2019_inc1_upd1_back_b1
- CC_2019_inc1_upd1_back_b1b2
- CC_2019_inc1_upd1_back_b1b2b3 (if available)

Running EUROMOD implies clicking the "RUN" icon on the model interface and choosing the systems indicated above in the window that pops up. Then, navigate to "Applications" > "In-depth Analysis" and load the output results (set *CC_2019_std.txt* as baseline and all other systems as counterfactuals following the same order as above).

Before running the in-depth analysis, set the "Distributional settings" and "Inequality & poverty settings" in the "Advanced Settings" of the "In-depth Analysis" application menu:

- In the settings of Table 2.1, set the breakdown by deciles of equivalised disposable income using the variable *il_fiscaldrag_all*
- In the settings of Table 2.2, add to the "Variables formulas" box the personal income tax variable (*tin_s* in most countries).
- In the settings of Table 2.2, add to the "Variables formulas" box the variables: *il_fiscaldrag_all, il_fiscaldrag_lab, il_fiscaldrag_benef, il_fiscaldrag_self, il_fiscaldrag_cap.*
- In the settings of Table 2.2, set the level of analysis to "Household".
- In the settings of Table 3.2, specify as Gross income: *il_fiscaldrag_all,* as Net income: *il_fiscaldrag_all-tin_s* (or the country-specific personal income tax variable, if different).
- In the settings for Tables 3.1, 3.3, 3.4, set as Original income: *il_fiscaldrag_all.* Moreover, include in the box underneath the following elements (they should be listed under "Add to previous"):
    a. *-tin_s-* (or the country-specific personal income tax variable, if different),
    b. -il_fiscaldrag_all+tin_s+ils_origy+ils_ben
    c. -tin_s-ils_sicdy

In this way, the inequality statistics will be calculated for tax base before taxes (*il_fiscaldrag_all*), taxable income after personal income tax (a), all incomes before taxes (b), and all incomes after taxes (c).

Replicate the same steps for 2023 and store the output as an Excel file named "CC_Part1_v2.xlsx".

2.3.2. Results of Section 5 of the paper (fiscal drag in practice)

To replicate the results of Section 5, run with EUROMOD the following systems, where CC again stands for the country code:

- CC_2019
- CC_2020
- CC_2021
- CC_2022
- CC_2023
- CC_2023_19noindex
- CC_2023_19indexIG
- CC_ 2023_19indexLHCPI
- CC_2023_19indexCHCPI
- CC_2023_noindex

Then, run the "In-depth Analysis" using the same settings described above and again using as baseline the output file *CC_2019_std.txt* and as counterfactual the other output files in the same order as the systems described above.

Store the output as an Excel file named "CC_Part2_v2.xlsx"

The two output files (CC_Part1_v2.xlsx and CC_Part2_v2.xlsx) can then be read by the master file (**Master_Template_Figures_Tables.xlsx**) included in this replication package, which performs calculations and produces all Figures and Tables reported in the paper.

C1. for the replication of the Online Appendix C:

The analysis is done in Stata. The file **do_files_online_appendix.zip** contains 5 do files. Executing the first do file: "0_master.do" will run all the analysis.

These are the do files:

0_master.do
1_collect_clean.do
2_percentile_computation.do
3_percentile_comparison.do
4_euromod_on_registro.do
5_elasticity.do