ECONOMETRIC MODELS OF CLIMATE CHANGE: THE GLOBAL CARBON BUDGET CASE B

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Congratulations on having advanced to the final of the Econometric Game 2019! In the final's case, we are taking up the global carbon budget data again where we left off yesterday and consider national instead of global emissions. The main data file for this case is the spreadsheet

`National_Carbon_Emissions_2018v1.0.xlsx`

provided by the Global Carbon Project (Le Quéré et al., 2018).[1] The second tab entitled "Territorial Emissions" provides CO_2 emissions in million tons of carbon per year for 213 countries and territories. There are Kyoto Protocol, OECD, EU, and continental aggregations in the last 16 columns.

1) Extend your model, or specify a new one, to allow for emissions from different countries, or groups of countries. Within this model, study the implications of the RCP CO_2 concentration scenarios for the different regions included in your model (Meinshausen et al., 2011). Propose a distribution scheme for the required emission reductions across countries and/or across groups of countries.

2) Further extend this new model to capture a connection between emissions of a country, or a group of countries, and a broad indicator of economic activity of that country or that group of countries, such as an industrial production index. You can focus on your own home country, or, if you think that the data situation does not allow for this, you can focus on the EU or the US. Explore what the required emission reductions imply for economic activity according to your model.

Carefully discuss your findings, addressing possible shortcomings of your model and issues such as changes in technologies and differences between developed and developing countries.

Le Quéré, C. et al., 2018, The Global Carbon Budget 2018, *Earth System Science Data* 10: 2141-2194.

https://doi.org/10.5194/essd-10-2141-2018

Meinshausen, M. et al., 2011, The RCP greenhouse gas concentrations and their extensions from 1765 to 2300, *Climatic Change* 109: 213–241.

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[1] http://www.icos-cp.eu/GCP/2018

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