

Assessing the drivers of CO2 emissions: An hybrid MRIO-panel data analysis

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The concerns on the actual effects and potential consequences of climate change have notably increased in the last decades. There exists nowadays consensus in the literature regarding the direct link between greenhouse emissions and rising temperatures at the global level (Stern, 2006; IPCC, 2014). Despite large advances on the understanding of this phenomenon, further research on the economic determinants of gas emissions is necessary to shed light on the transmission mechanisms into the environment.

In this context, this paper aims to study the trajectories and explaining factors of CO2 emissions in the world during fifteen years. Our methodology relies on a multiregional input-output model (MRIO) environmentally extended to estimate CO2 emissions both from the consumer and producer approaches. Drawing on data from the World Input-Output Database (WIOD), we estimate embodied emissions in production and consumption activities in 40 countries from 1995 to 2009. This empirical approach allows us to examine regional and sectorial features from a long term perspective. Secondly, we will assess the determinants of CO2 emissions combining IO (Input-Output) modelling alongside with panel data analysis. A correct specification of the model requires data from external sources (e.g. World Bank World Development Indicators, FAOSTAT, etc.). In addition, the MRIO tables provide rich information to build indicators controlling for some of the CO2 emissions drivers. Therefore, our analysis will include explanatory factors such as economic and demographic growth, technological change, the growing integration of economies, sectorial specialization, variation in consumption patterns, structural change, efficiency improvements, the quality of institutions and the ratification of the Kyoto protocol, among others.

This paper will contribute to the environmental literature offering a new and robust methodological approach that explains and quantifies the factors lying behind pollution. The combination of IO analysis and panel data econometrics will suppose a step forward on the assessment of the impact of economic growth, and the processes associated with it mentioned above, on CO2 emissions.