Structural Analysis of the Top Five Most GHG Emitting Economies

Topic: (6.2) Environmental IO modelling (4)
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In this paper, we analyze the economies of the five most GHG emitting countries in 2011, according to the data from the World Bank. These countries signed the Paris Agreement on Climate Change in December of 2015, and participated in the Conference of the Parties, of the United Nations Framework Convention for Climate Change in which they established their goals for GHG emissions reduction, called Intended National Determined Contributions.

The purpose of studying these five countries has been concentrated on analyzing the trends their GHG emissions will follow from 2011 to 2030. In order to accomplish this objective, we have used some techniques derived from Input-Output Analysis and the I-O data from the World Input-Output Database. These allowed us to determine which sectors of the five economies can be considered key sectors. Also, we could establish which sectors were the higher GHG emitting ones in each of the economies under study.

We also built an Environmental Input-Output model, with the purpose of forecasting GHG emissions of each of the five economies, under two alternative scenarios. One of the scenarios was the so-called â€œBusiness as usualâ€•, which means doing nothing to reduce GHG emissions. The other scenario utilized a different Input-Output Matrix one which was modified to incorporate a technological change in four selected sectors. That is, we simulate a technical change in the selected five economies.

The results were that three countries, the USA, Russia and Japan established clear and feasible goals for 2030 and their targets trends suggest they will be applying mitigation policies that consist in technological changes in sectors that are key or high emitting sectors, or both, like the ones we chose for the study. Chinaâ€™s committed goals for 2030 are very low as compared to the other four countries, relatively speaking. Our simulated forecasting of GHG emissions reduction through technical change is above the level they are committed to reach. India, is not committed to reduce the absolute GHG emissions level, so in order to actually reduce this level of emissions for 2030, it becomes clear that they should apply a technological change.