Tracing Brazilian Regionsâ€™ CO2 Emissions in Domestic and Global Trade

Topic: Why Do Regions Matter? Recent Developments in Interregional I-O Analyses II
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The current Brazilian position on climate change has been formalized with the law of National Climate Change Policy (PNMC, in Portuguese), established in December 2009, which provides a legal framework for national actions aimed at mitigation and adaptation. Within PNMC, the country has defined its national voluntary reduction targets for greenhouse gases emissions, with reductions between 36.1% and 38.9% of projected emissions by 2020. The distribution of the corresponding mitigation efforts by regions is of great concern in a large country like Brazil, with substantial regional variation in economic development, physical geography, production system, and energy consumption. In fact, most of Brazilian states have established public policies on climate change. Out of the 27 states, four have mandatory targets for reducing greenhouse gas emissions: SÃ£o Paulo and Rio de Janeiro, in the most developed Southeast region; Mato Grosso do Sul, in the Central-West region; as well as ParaÃ-ba, in the Northeast region. In this context, questions raised in the literature on global climate change, such as the environmental responsibility for emissions embodied in trade, also apply at the regional level, and perhaps even to a larger extent. In order to analyze at regional level the current relationship between Brazilâ€™s CO2 emissions and domestic and global value chains, in this study we adopt a new framework that combines a world input-output table (WIOT) with an inter-regional input-output table (IRIOT). In our approach, we have chosen not to take one of the datasets (say the WIOT) as a starting point and adapt the other dataset (i.e. the IRIOT) accordingly, instead we construct input coefficients for which both datasets are used. For the empirical application, we use the WIOT for 2008 that was constructed in the World Input-Output Database (WIOD) project. It is a full inter-country input-output table covering 40 countries and the rest of the world as a 41st country. Our IRIOT for 2008 covers the 27 Brazilian states. Both the WIOT and the IRIOT were aggregated to 28 compatible industries. Also, a new database is compiled on Brazilian statesâ€™ energy use (by fuel) and related CO2 emissions at sectoral level, based on statesâ€™ official energy balances and estimates of national greenhouses gases emissions for 2008 from Brazilâ€™s Ministry of Science and Technology. We are able to evaluate the CO2 emissions in each of the 27 Brazilian states, considering their respective intra-regional productive structure, energy use, as well as their trade with other states or foreign countries. In this way, our results reveal how CO2 emissions are produced in Brazilian regions by means of domestic and global value chains.