Convergence between the Eora, WIOD, EXIOBASE, and OpenEU's consumption-based carbon accounts

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Multi region input-output (MRIO) accounts provide a map of the global economic structure. But no map is perfect. Each MRIO implementation can be understood as an imperfect observation of the correct global MRIO account. How divergent are these observations? What is the reliability of each observation? How much divergence is due to conceptual differences and how much is due to implementation particularities and stochastic error? Can we establish an error budget prioritizing steps toward MRIO convergence, and can we even assume that the different observations are converging on the true value? This paper compares the results of four global MRIOs: Eora, WIOD, EXIOPOL, and the GTAP-based OpenEU. We use Monte Carlo analysis to estimate the robustness of each models' results and we conditionally exogenize the environmental satellite account to see how much this factor, rather than the economic structure itself, causes divergence in carbon footprint results between models. The aim is to arrive at some estimates of how much confidence may be placed in each model's estimate of carbon footprints. Confidence estimates are necessary if MRIO methods and consumption-based accounting are to be used in setting multinational environmental policy.