

Key global value chains: a global multi-region structural path decomposition

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Abstract

Decomposition analysis is a popular and well-established method for analysing the decoupling (or lack there-of) across a range of environmental and socio-economic indicators. Structural Decomposition Analysis (SDA) is a form of decomposition analysis that uses input-output (IO) relationships to describe the changing technological relationships between systems of production and the final demand of a population. Structural Path Decomposition (SPD) is an extension of SDA that works on the individual path level. In this work we apply the SPD method in a global setting, where the drivers of growth in world greenhouse gas emissions along (the most important) individual supply chains (or paths) are quantified. To our knowledge this is the first global multi-region (GMR) SPD application, as so far all the SPD applications focus solely on national economies (see e.g., our review in the next section) neglecting the role of inter-regional (inter-country) supply linkages. For this purpose, we use the EXIOBASE database which is a global multi-regional environmentally extended supply-use and input-output database, covering 43 countries (accounting for 95% of the global economy) and 5 rest of the world regions. We further use a novel representation of the multi-regional input-output using topological transforms to isolate trade related effects

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