

Global value chains and CO₂-emissions: a conditional structural decomposition analysis

Topic: International Trade II

Author: Rutger Hoekstra

Co-Authors: Bernhard Michel, Sangwon Suh

International trade in goods and services influences the carbon profiles of countries through carbon emissions embodied in imports and exports. Increases in net emissions embodied in trade between Annex I and non-Annex I countries are often referred to as carbon leakage. A vast and continuously growing literature analyses carbon profiles and carbon leakage at the level of individual countries, regions and at the global level. Evidence of carbon leakage in developed countries is readily interpreted as an indication that they replace emission-intensive domestic production by imports from developing countries. The idea is that the reorganisation of global value chains contributes to reducing carbon emissions in developed countries at the expense of emissions in developing countries.

To provide further empirical evidence on the idea that participation in global value chains matters for a country's CO₂ emission levels, this paper examines the contributions to changes in countries' emission levels in greater detail. This is done by applying structural decomposition analysis (SDA) to a multi-regional input-output (MRIO) model for CO₂-emissions. The data used for computing the decomposition come from the WIOD database and cover the years 1995-2007. As the spread of global value chains goes hand in hand with increased trade in intermediates, the contribution of interregional trade flows that satisfy intermediate demand is isolated in the decomposition. Moreover, flexible decomposition formulas that are dependent on the characteristics of the country and its trading partners will be applied. Using this novel decomposition methodology the underlying driving forces of various "trade vs. environment" hypotheses can be tested.