

Tracing CO2 Emissions in Global Value Chains

Topic: Tracing Carbon Emissions in Global Value Chains I

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This paper combines two independent lines of literature: trade in value-added and embodied emission trade into one unified accounting framework, in which both value-added and emissions can be systematically traced at country, bilateral, and sector levels through various GVCs routes. It consistently defines various trade related embodied emission measures at country, bilateral and sector levels and clearly quantifies their relations. Such a framework is not only able to identify value-added and emission generated from each production stage, but can also identify the special trade routes by which value-added and emission are created. By combining value-added and emissions accounting in a consistent way, the potential environmental cost along GVCs can also be estimated (e.g. emission with per unit of value-added created) from different perspectives (production, consumption and trade). This provides measures that clearly distinguish emissions of self-responsibility (emissions for domestic final demands without through international trade) and shared responsibility (emission through international trade) between producer and consumer located in different territories as well as their relative economic benefit/environment cost ratio. Based on this unified accounting method, we trace CO2 emission in global production and trade network among 41 economies in 35 sectors from 1995 to 2009 based on the World Input-Output Database (WIOD) database and show how they help us to better understand the impact of cross-country production sharing on the environment.