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Academy of Mathematics and Systems Science, CAS
Colloquia & Seminars

Speaker: 祝坤福，中国人民大学

Inviter:

Title: Reevaluation of the carbon emissions embodied in global value chains based on an inter-country input-output model with multinational enterprises

Time & Venue: 2022.11.17 14:30-15:10 内部讨论班

Abstract: Multinational enterprises actively participate in global production networks. However, the current global value chain accounting framework fails to consider the emissions originating from the production activities of multinational enterprises in the host country and may underestimate the carbon emissions embodied in global value chain activities. This paper proposed an Inter-Country Input-Output decomposition framework that can distinguish domestic firms and multinational enterprises and recalculated global value chain emissions including emissions embodied in international trade (trade-related GVC emissions), foreign direct investment (FDI-related GVC emissions), and both (trade and FDI related GVC emissions). We found that 1) the carbon emissions originating from global value chain activities were underestimated by about 13.8 percentage points under the original framework in 2016, and a large part was classified as emissions stemming from pure domestic production activities; 2) the FDI-related GVC emissions were notable in high-income economies and high-tech manufacturing sectors; 3) foreign direct investment mainly drove the emissions of upstream domestic firms through the joint domestic production linkage between domestic firms and multinational enterprises, especially in upper-middle-income countries; 4) from 2005 to 2016, the FDI-related GVC emissions increased by approximately 704.6 million tons, which was mainly attributed to the scale effect, whereas the carbon intensity effect caused a reduction. The results of this study exhibit a potential significance for the correct identification of the environmental impacts of global production fragmentation, and support policy decisions on national emission responsibilities and quotas determination, differentiated foreign investment decisions, and cleaner production development.

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