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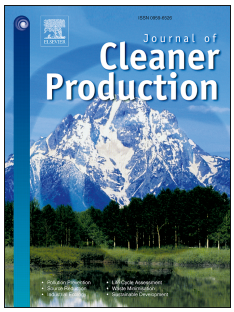

Driving factors of carbon emissions embodied in China–US trade: A structural decomposition analysis

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Driving factors of carbon emissions embodied in China–US trade: A structural decomposition analysis

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Abstract: Based on the environmental multi-regional input–output model, this study employed structural decomposition analysis to investigate the driving factors of carbon emissions embodied in China–US trade over the period of 1995–2009. Effective driving factors were classified into six groups, and each group included both factors at home and abroad. The results show that, factors "trade structure of intermediate products at home" and "export structure of final products at home" presented the largest positive impacts to increments in carbon emissions embodied in Chinese exports to the US. While the majority of negative impacts was generated by changes in "energy intensities at home." The increment in carbon emissions embodied in US exports to China was mostly contributed by "total demands abroad." Impacts of other driving factors were much smaller. At the sectoral level, both positive and negative impacts of driving factors were largely limited to a few sectors (e.g., "Textiles Products," "Machinery," "Transport Equipment" and "Electrical Equipment"); here, positive impacts were mostly contributed by "export structure of final products at home" and "total demands abroad," and negative impacts were mainly contributed by "energy intensities at home." Policy implications deduced from the results were discussed.

Keywords: Carbon emissions embodied in trade; China–US trade; Driving factors; Multi-regional input–output model; Structural decomposition analysis

JEL codes: F18, N70, Q56

1. Introduction[1]

The growing impacts of global climate change have made carbon reduction an urgent necessity in recent years (Stern, 2007). Considering the large-scale carbon emissions induced by

In this study, "CRS" denotes carbon emissions embodied in Chinese exports to the US, "SCRS" represents carbon emissions embodied in Chinese sectoral exports to the US; similarly, "CSR" denotes carbon emissions embodied in US exports to China, and "SCSR" represents carbon emissions embodied in US sectoral exports to China.

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