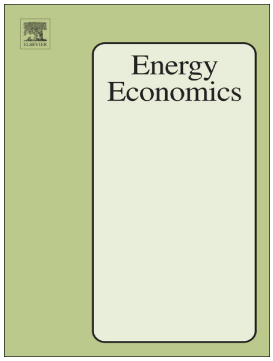

Technology-Adjusted National Carbon Accounting for a Greener Trade Pattern

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Technology-Adjusted National Carbon Accounting for a Greener Trade Pattern

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Abstract: Crediting green trade patterns is essential for effective national carbon accounting. Neither production- nor consumption-based accounting satisfies this condition. Thus, Kander *et al*. [Kander, A., Jiborn, M., Moran, D.D., Wiedmann, T.O., 2015. National greenhouse-gas accounting for effective climate policy on international trade. Nature Climate Chang. 5(5):431–435.] proposed a technology-adjusted consumption-based carbon accounting method that focuses on interregional differences in sectoral carbon intensity. The intermediate input structure is also closely related to the production technology level. Therefore, this study recommends a new technology-adjusted consumption-based carbon accounting framework that distinguishes between direct and cumulative exports, forward and backward industrial linkages, and different trade patterns. Based on the consideration that production-based accounting will remain the core indicator for regional emissions in the near future, this study proposes a technology-adjusted production-based accounting framework. The empirical study is based on the World Input-Output Database, and the results indicate that technology-adjusted carbon accounting will redraw the global emissions map if the intermediate input linkage is considered. The technology-adjusted carbon accounting method satisfies the conditions of additivity, sensitivity, monotonicity, and scale invariance, through proper selection of the world average emissions multipliers.

Keywords: Carbon accounting; intermediate input structure; technology adjustment; trade pattern; input-output model.

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