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Mario Larch, Joschka Wanner

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Carbon Tariffs: An Analysis of the Trade, Welfare, and Emission Effects

Mario Larch and Joschka Wanner*

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Abstract

The potential of carbon tariffs to restore competitiveness, avoid carbon leakage, and reduce global carbon emissions has been prominently discussed. To analyze the effects of carbon tariffs on trade, welfare, and carbon emissions, we develop a multi-sector, multi-factor structural gravity model that allows an analytical and quantitative decomposition of the emission changes into scale, composition, and technique effects. Our analysis shows that carbon tariffs are able to reduce world emissions, mainly via altering the production composition within and across countries, hence reducing carbon leakage. This reduction comes at the cost of lower world trade flows and lower welfare, especially for developing countries. Applying our framework to investigate the effects of the emission reduction pledges made by the Annex I countries in the Copenhagen Accord, we find that combining national emission targets with carbon tariffs would increase the Accord’s effectiveness by lowering the leakage rate from 13.4 percent to 4.1 percent (with bootstrapped 95% confidence intervals of [11.5, 15.8] and [3.3, 4.9], respectively).

JEL Codes: F14, F18, Q56.

Keywords: Carbon tariffs, climate policy, gravity model, Copenhagen Accord, carbon leakage

*Larch: University of Bayreuth, CEPII, CESifo, ifo Institute, and GEP at University of Nottingham, Universitätsstraße 30, 95447 Bayreuth, Germany, mario.larch@uni-bayreuth.de. Wanner: University of Bayreuth, Universitätsstraße 30, 95447 Bayreuth, Germany, joschka.wanner@uni-bayreuth.de. Funding from the DFG under project 592405 is gratefully acknowledged. We thank Rahel Aichele, Gabriel Felbermayr, Carol McAusland, Sergey Nigai, Alejandro Riaño, João Santos Silva, Yoto Yotov, two anonymous referees, the handling editor Giovanni Maggi and participants at the European Trade Study Group 2013, the Goettinger Workshop “Internationale Wirtschaftsbeziehungen” 2014, the GEP Postgraduate Conference 2014, the Congress of the European Economic Association 2014, the Conference of the European Association of Environmental and Resource Economists 2015, the FIW Research Conference “International Economics” 2015, and the EAERE FEEM VIU European Summer School 2017, as well as seminar participants at the University of Bayreuth for helpful comments. All remaining errors are our own.
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