

Accepted Manuscript

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PII: S0022-1996(17)30118-6
DOI: doi:[10.1016/j.jinteco.2017.09.003](https://doi.org/10.1016/j.jinteco.2017.09.003)
Reference: INEC 3083

To appear in: *Journal of International Economics*

Received date: 2 February 2015
Revised date: 13 September 2017
Accepted date: 15 September 2017



Please cite this article as: Larch, Mario, Wanner, Joschka, Carbon Tariffs: An Analysis of the Trade, Welfare, and Emission Effects, *Journal of International Economics* (2017), doi:[10.1016/j.jinteco.2017.09.003](https://doi.org/10.1016/j.jinteco.2017.09.003)

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

Mario Larch and Joschka Wanner*

October 7, 2017

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

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