

### Title

# OPTIMAL UNILATERAL CLIMATE POLICY WITH CARBON LEAKAGE AT THE EXTENSIVE AND THE INTENSIVE MARGIN

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#### Abstract

We analyse the optimal design of climate policy in an open economy where the government is committed to a target for reduction of CO<sub>2</sub> emissions from domestic territory but where it is also concerned about carbon leakage. We highlight the importance of distinguishing between leakage at the extensive margin where firms relocate to a foreign country to avoid the domestic carbon tax, and leakage at the intensive margin where domestic firms lose world market shares to foreign competitors due to the tax. When international trade rules prevent the domestic government from implementing carbon border tax adjustments, the optimal policy includes taxes on emissions and on final consumption goods differentiated according to their marginal effects on foreign emissions, an output subsidy as well as a lump-sum location subsidy to leakage-exposed firms, subsidies to carbon capture, taxes on domestic energy use and on domestic production of fossil fuels, and a subsidy to domestic production of green energy. Simulation experiments indicate that the social welfare gain attained by moving from a single uniform emissions tax to the optimal leakage-adjusted tax-subsidy scheme could be considerable. A location subsidy aimed at reducing leakage at the extensive margin contributes significantly to reducing the welfare loss from leakage.