

# Quantifying Climate Damages When Regions Trade: A Structural Gravity Approach

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## Abstract

This paper presents a method for estimating treatment effects of local climate shocks when regions trade with each other. Because of spillovers induced by trade flows, comparing the evolution of outcomes between pre-shock and post-shock periods in regions exposed versus unexposed to local shocks leads to a biased estimate of treatment effect. We model these across-region dependencies using standard assumptions from international trade theory. We use our model-consistent estimation strategy to revisit the literature on the evaluation of impacts from climate change onto country-sector gross output using year-to-year variation in temperature and counterfactual scenarios where the observed warming from 1991 to 2019 would not have occurred or considering future warming predictions.

**Keywords:** climate change , spillovers, trade, gravity

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